

PL.HQ.PJ.PNGRB-MRPL

15th July, 2024

To,
The Petroleum and Natural Gas Regulatory Board,
First Floor, World Trade Centre,
Babar Road,
New Delhi-110 001.

Kind Attn: Shri Md. Tanweer Akhter, Director I/C (Authorization)

Subject : Pipelines connecting Mumbai Refinery and Rasayani Terminal

Reference: 1. BPCL's Letter no. ITF.WR.28.MRPL.PNGRB dated 06.09.18
2. PNGRB Letter No. PNGRB/Auth/3-PPPL(05)2023(Part-I) dated 13.02.24
3. BPCL's Letter no. PL.HQ.PJ.PNGRB-MRPL dated 19.02.24
4. MOM vide PNGRB Letter No. PNGRB/Auth/3-PPPL(05)/2023(Part-I) dated 28.03.24
5. BPCL's Letter no. PL.HQ.PJ.25.GEN- PNGRB-MRPL dated 02.04.2024

Dear Sir,

We write further to above referred letters and MOM wherein we had submitted additional information as sought by the PNGRB. We would again like to submit that BPCL's proposed Pipelines from Mumbai Refinery to Rasayani are being developed as a system Pipelines to interconnect Mumbai Refinery and Rasayani terminals. These Pipelines are integral to Mumbai Refinery operations and for the purpose of debottlenecking of our Mumbai Refinery.

Considering the importance of these pipelines for BPCL's Mumbai Refinery and considering the fact that considerable investment and progress have already made in Rasayani Pipelines and Rasayani Terminal Works, it is once again requested to kindly withdraw the directions passed by PNGRB vide letter no. PNGRB/Auth/3-PPPL(05)2023(Part-I) dated 13.02.2024.

Since considerable progress has been made in terms of approvals / NOCs and financial commitments with regard to the project, suggest that suitable clauses as deem fit under **clause no. 19 (2)(d)** of Authorization regulation may be referred to.



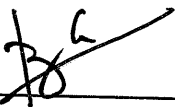
In this regard, the following information are submitted for kind consideration of the Board.

- Project Brief – Annexure A
- Tentative Route Map – Annexure B
- Pipeline Schematic – Annexure C

Thanking You,

Yours faithfully,

For **BHARAT PETROLEUM CORPORATION LIMITED**



BIJU GOPINATH
ED (PIPELINES)



PROJECT BRIEF

FOR

MUMBAI REFINERY – RASAYANI PIPELINES



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1. INTRODUCTION

Bharat Petroleum Corporation Limited owns and operates a 12 MMTPA Refinery at Mahul village, Mumbai. This compact Refinery is the only Refinery in the country without evacuation of products by Rail. In order to debottleneck, BPCL is in the process of acquiring about 700 acre of land at Rasayani, Raigad District, and Maharashtra which is about 55 Kms (via road) from Mumbai Refinery. BPCL envisages to develop following facilities at Rasayani.

- POL Installation with Rail loading siding
- Lube Oil Blending Plant
- Base Oil Storage Plant
- Petrochemical Plant in Future

The raw material/finished products is required to be transported from Mumbai Refinery to Rasayani for above proposed plants. For this purpose, BPCL envisages to put up pipelines from Mumbai Refinery to Rasayani to transport following products

- LOBS - for Lube oil blending plant.
- MS, HSD, SKO, ATF – for POL Installation
- Propylene in Future

The details of pipelines from Mumbai Refinery to Rasayani are as below:

Pipelines	Throughput (MMTPA)
Multi product Pipeline (MS/ HSD/ PCK/ ATF/ Naphtha) from Mumbai Refinery (MR) to Rasayani	6.5
Lube Oil Base Stock (LOBS) Pipeline from Mumbai Refinery (MR) to Rasayani	0.65
Future Pipeline (Propylene for Pet-chem project)	0.45



PIPELINE ROUTE DESCRIPTION

The Route for Pipelines from Mumbai refinery to Rasayani Complex is approx. 43 kilometers.

The route may be described briefly as below:

- a) **Mumbai Refinery (MR) to Land Fall Point (LFP-1) (Onshore) (Approx. 6 Km):** The pipeline will be routed inside refinery premises as it is originated from various units and it crosses southern side of Refinery boundary wall and enters into MbPT pipeline manifold area and cross TATA road and thereafter after leaving MbPT area it will pass through tata nala and creek and reach land fall point after crossing HPCL Jetty road.
- b) **LFP-1 to LFP- 2 (Offshore) (Approx. 15 Km):** The pipeline shall be laid underground subsea in available corridor.
- c) **LFP-2 to Rasayani-(Onshore)(Approx. 22 Km):** From LFP-2 the pipeline traverses around CIDCO area's internal roads, private land to be procured under PMP Act'1962, crossing Indian Railways, SH & NH and traverse through Protected & Reserve forests and reaches Rasayani Unit.

The route includes crossing the hill by HDD at Ch. 15.400 km for a length of 500m. The entire pipeline laying activity at offshore area shall be done by sub-sea method. While open cut method shall use for pipeline laying activity at on shore area and it shall be done by on developed area i.e. by side of road or in private land to be acquired by PMP Act.



2. BASIC PARAMETERS

		Multi Product Pipeline	LOBS/DAS Pipeline	Future Pipeline (Propylene for Pet-chem project)
2.1	Products to be transported	<ul style="list-style-type: none"> • Motor Spirit (MS) • High Speed Diesel (HSD) • Aviation Turbine Fuel (ATF) • Naphtha • Pipeline Compatible Kerosene (PCK) 	Base Oil De-aromatized solvents	Propylene
2.2	Pipeline Design Throughput, MMTPA	6.5	0.65	0.45
2.3	Design Codes	<p>The latest Edition of ASME B31.4, OISD and PNGRB guidelines will be followed as applicable.</p> <p>However, in case of contradictory stipulations, the stringent conditions will prevail.</p>		



3. PROJECT SCOPE

The proposed pipelines shall have the facilities as per the OISD 141 / PNGRB T4S standards along with the facilities related to Safety, Security and operation convenience so that seamless operations of Pipeline can be achieved.

The facilities may be listed as follows:

a. Mumbai Dispatch Station

- VFD driven Mainline Pumps
- Booster Pumps
- Pump House
- Control Room
- Sub-station
- Metering Area

b. Cross Country Pipelines from Mumbai Refinery to Rasayani

- SCADA & Leak Detection System
- Telecommunication system
- Cathodic Protection System
- OFC based Pipeline Intrusion Detection System

c. Sectionalizing Valve station

- SV-1

d. Rasayani Receipt Station

- Control Room
- Sub-station
- Metering Area



4. PIPELINE PARAMETERS

		Multi Product Pipeline	LOBS/DAS Pipeline	Future Pipeline (Propylene for Pet-chem project)
4.1	Pipeline Design life	25 years		
4.2	Pipeline Length	43 KM		
4.3	Main Pipeline Diameter	Multi-product – 22 inch LOBS/DAS – 10 inch Propylene – 8 inch		
4.4	Pipeline roughness	45 microns		
4.5	Material of Construction for Pipeline	Carbon steel		
4.6	Pipeline Corrosion allowance	0.5 mm on calculated thickness (onshore portion) 3.0 mm on calculated thickness (offshore portion)		
4.7	Design Codes	The latest Edition of ASME B31.4, OISD and PNGRB guidelines will be followed as applicable. However, in case of contradictory stipulations, the stringent conditions will prevail.		
4.8	Sectionalizing valves	Sectionalizing valves shall be provided as per ASME B31.4. PNGRB & OISD-141		
4.9	Pigging facilities	Uni-directional permanent pigging facilities suitable for “Intelligent Pigging” shall be provided for the pipelines.		
4.10	Basis for hydraulic Calculation	Pipeline hydraulics shall be carried out based on product properties for 8000 hrs per annum operation.		



4.11	Subsoil temperature (1m below ground)	20 -25 deg C throughout the entire length of the pipeline.
4.12	Maximum Allowable Operating Pressure (MAOP)	90 % of Pipeline design pressure
4.13	Design Temperature	(0 °C / 45°C) for Buried facilities (0 C / 65°C) for aboveground facilities
4.14	Surge control	Suitable surge control/ surge relief system will be provided as per requirement. Surge analysis shall be carried out as required.
4.15	Pipeline laying	Buried
4.16	Pipeline corrosion protection system	Pipeline external protection – External coating shall be provided. Details shall be covered in engineering documents. Cathodic protection by impressed current & Sacrificial anode for buried portion of pipeline shall be provided as applicable
4.17	Corrosion Monitoring System	Corrosion monitoring system shall be provided as required.
4.18	Design Pressure	49.0 kg/cm ² g



5. STATION PARAMETERS

Pipeline

Dispatch Station Location	Mumbai Refinery
Receipt Station Location	Rasayani
Supply temperature, Deg C (nor) at B/L	20-35 (Ambient conditions)
Battery limit conditions at dispatch	Fluid shall be made available at booster pump suction at a minimum pressure corresponding to lowest level of storage.
Arrival pressure, kg/cm ² g (nor) at B/L	5.0 at receipt terminal pipeline outlet battery limit Lube Oil Pipeline

Despatch Station Parameters

1	Dispatch Station Location	Mumbai Refinery
2	Source of Products	Atm. Storage tanks
3	Battery limit	From product isolation valve at suction header of booster pumps
4	Elevation difference between the lowest storage tank and booster pumps.	1M
5	Piping distance between the farthest POL product storage tank and booster pumps.	2.0 km (equivalent length)



Receipt Station Parameters

1	Receipt Station Locations	Rasayani
2	Products to be received in	Atm. Storage tanks
3	Arrival pressure, kg/cm ² g	5.0 (at pig receiver B/L)
4	Battery limit	delivery battery limit will be product manifold outlet valve
5	Piping distance between the farthest product storage tank and Receipt terminal	1.5 km (equivalent length)

6. INSTRUMENTATION

1	General	Dispatch and Receipt stations shall be provided with PLC based instrumentation. Supervisory Control and Data Acquisition (SCADA) system shall be designed for Remote monitoring and control.
2	Type of control	Electronic
3	Final control element	Electro-Hydraulic at all locations.
4	Control Room location	New control room shall be considered at Rasayani.



7. METERING SYSTEM

Flow meters	*ULTRA SONIC / Turbine flow meters with one spare run shall be provided at Mumbai and Rasayani.
	Density Meters: Density meters will be provided on main line at Mumbai and Rasayani stations for density measurement.
	Also, Density meters will be provided on main line at Rasayani for interface detection.

8. SCADA & TELECOMMUNICATION SYSTEM

Effective and reliable control, management and supervision of this pipeline is envisaged by monitoring and controlling by SCADA system using Remote Telemetry Units along pipeline & controlled centrally from SCADA Master Control Station (SMCS) located at Mumbai.

In addition, the system shall be considered which will facilitate running of Application Software (APPS) package for reliable operation of the pipeline viz. a. Leak detection & location.

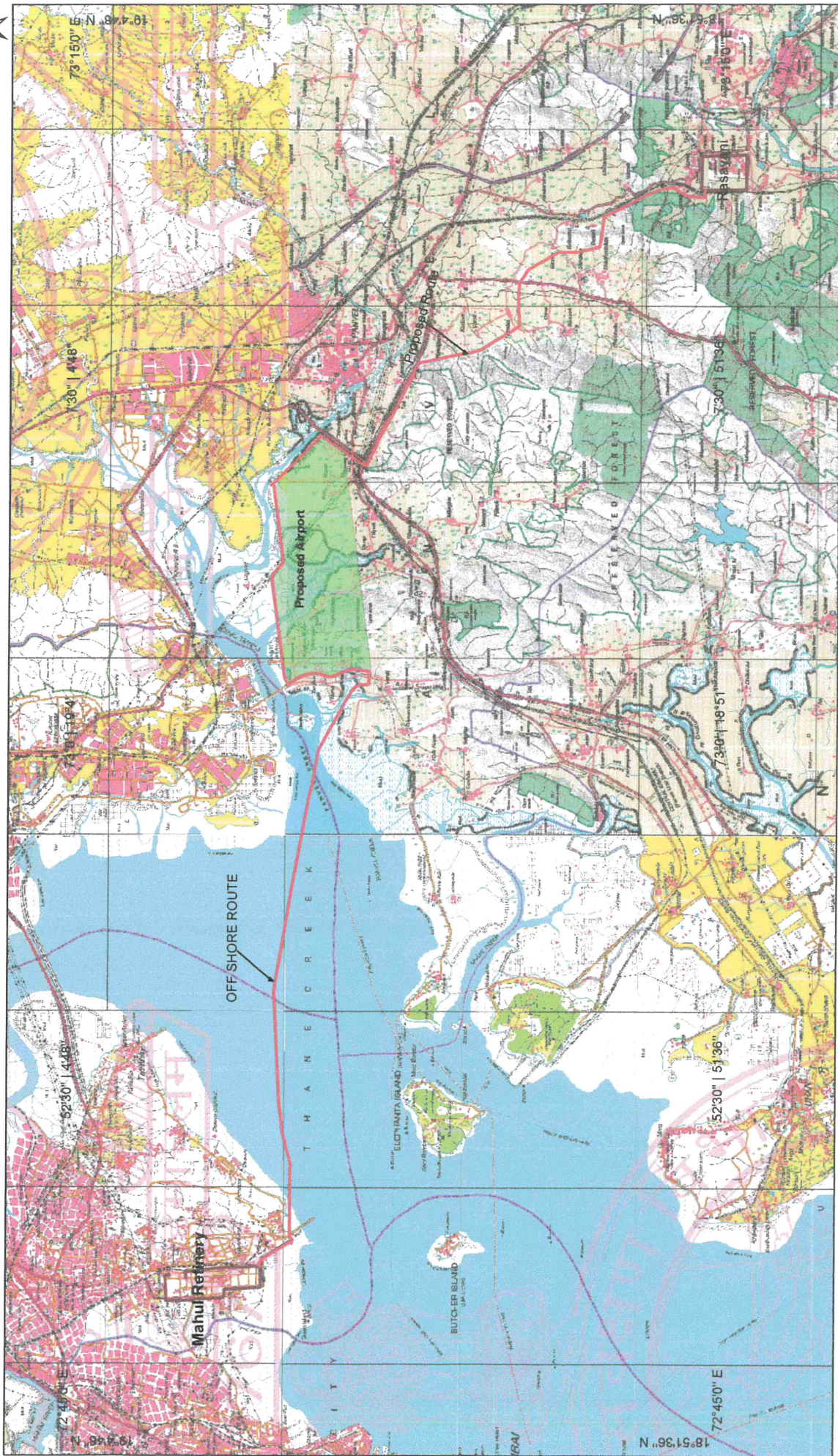
Telecommunication systems for the entire pipeline shall be provided.

9. LEAK DETECTION AND OTHER APPS SYSTEM

Real time leak detection system & Batch tracking integrated with SCADA network will be provided. Intrusion detection and negative pressure wave-based leak detection system shall be explored.



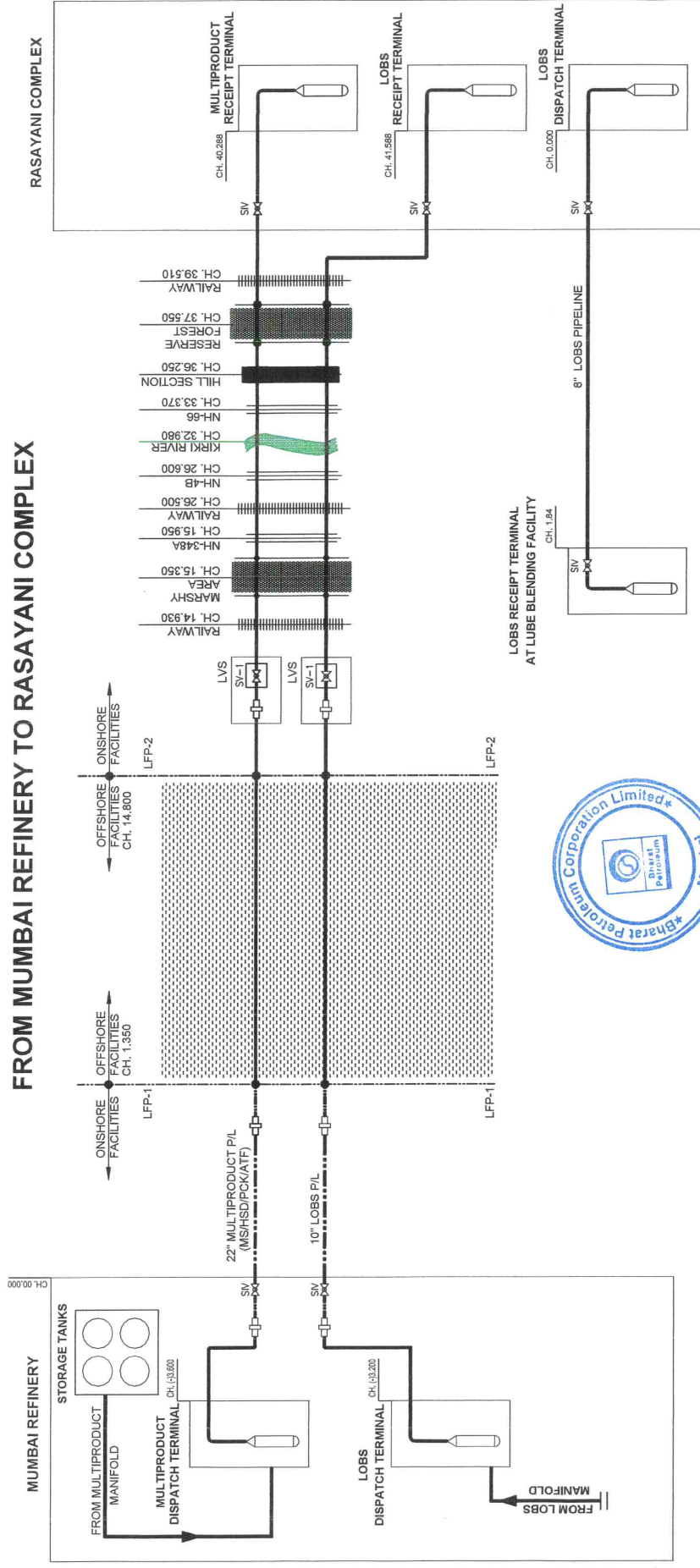
MAHUL REFINERY TO RASAYANI ROUTE MAP



Legend

— Proposed Pipeline

SCHEMATIC ARRANGEMENT OF PIPELINE FACILITIES FROM MUMBAI REFINERY TO RASAYANI COMPLEX



LEGEND:		PIPELINE DETAILS	
22" MULTI PRODUCT BURIED PIPELINE	22" MULTI PRODUCT PIPELINE (MS, HSD, PCK, ATF)	10" LOBS PIPELINE	8" LOBS PIPELINE
22" MULTI PRODUCT A/G PIPELINE	ONSHORE	ONSHORE	ONSHORE
10" LOBS BURIED PIPELINE	OFFSHORE	OFFSHORE	OFFSHORE
10" LOBS A/G PIPELINE	559 (22')	273 (10')	219.1 (8')
8" LOBS BURIED PIPELINE	30.438	31.338	13.450
INSULATION JOINT	9.6	12.7	12.7
SCRAPER TRAP	API BL Gr. X-60, PSL2	API 5L Gr. X-60, PSL2	API BL Gr. X-60, PSL2
RIVER CROSSING	49	49	49
LVS LANDFALL VALVE STATION	65 (ABOVE GROUND) [MAX.]	45 (BURIED) [MAX.]	65 (ABOVE GROUND) [MAX.]
SECTIONALIZING VALVE (SV) STATION	45 (SUBSEA) [MAX.]	45 (SUBSEA) [MAX.]	45 (BURIED) [MAX.]
	3LPE (EXT.) WITH ANTI-SLIP COATING + 75 mm CCWC	3LPE (EXT.) WITH ANTI-SLIP COATING + 50 mm CCWC	3LPE (EXT.)
	3LPE (EXT.)	3LPE (EXT.)	3LPE (EXT.)
	DM/AKS	DM/AKS	DM/AKS
	CHK	CHK	CHK
	APPROVED	APPROVED	APPROVED

REVISION	DATE	BY	CHK	APPROVED
A	11.10.2023	KS	DM/AKS	RK
B	20.10.2023	KS	DM/AKS	RK

PROJECT :	PROPOSED PIPELINES FROM MUMBAI REFINERY, MAHUL TO RASAYANI COMPLEX, RAIGAD
CLIENT :	M/s BHARAT PETROLEUM CORPORATION LTD. (BPCL)
JOB NO. :	B795

ENGINEERS INDIA LIMITED NEW DELHI	SCHEMATIC ARRANGEMENT OF PIPELINE FACILITIES	DRAWING NO. B795-000-83-41-30001	REV. B
			SHEET 1 OF 1

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Annexure - C