16.3 Vendor shall provide installation procedure of all SCADA hardware, software and networking devices. Vendor shall also provide the procedure for re-generating software license for any hardware in case of its failure.

16.4 SAT shall involve integrated testing of complete SCADA system. Site Acceptance Testing will be done based on the stipulations in the approved SAT document. Once the test is successfully performed, then the system would be ready for commencement of test run.

16.5 The SAT for the complete system shall start only after all hardware and software (network database, I/O point database, graphics etc.) have been implemented at MCS / ECS.

17.0 Test Run

This test aims at keeping the complete integrated system operational for a period of 30 days for all the 24 hours a day with required system reliability and availability.

17.1 In case of failure, the tests will be restarted till the system operates without failure of any system functionality for 30 days (If failed between 14 to 20 days) and for 15 days (if failed between 21st to 30th day). Failure of tests shall be limited to such system failures which will affect system availability & reliability and shall not be dependent upon established failure of third party supplied items. PMS/ Client shall have the right to reject the complete system or part there of in event of acceptance tests failing in two attempts.

17.3 Test run shall be carried out as per approved test plans & procedures. The 'Test Run' will be carried out after successful SAT, duly witnessed by PMC/Client.

17.4 A log of all failed hardware and software modules shall be maintained which shall give date and time of failure, description of the failed components & cards/ software along with designation, effect of failure on the system, cause of failure and number of hours of operation of the part before it failed.

17.5 Upon failure of the components/ cards/ modules, the same shall be replaced by better graded components/cards and the test shall be restarted from the beginning or the previous logical point as the case may be. If after this one replacement, the unit of sub-system still fails to meet the specifications, the Vendor shall replace the complete unit or sub-system with the one that meets the requirements and restart the test all over again.

17.6 If a unit or sub-system has failed during the test and is not repaired and made successfully operational or not replaced within few hours of active repair time after the failure, the test shall be suspended and restarted all over again only after the Vendor has placed the device back into acceptable operation. The Client /PMC's approval shall be obtained for any allowable logistic time required to replace the failed component/sub-system. All cost for repair/ replacement of defective component/ system shall be to Vendor's account.

17.7 After successful completion of test run, Commissioning & handing over will be done within 10 days and certificate will be issued by client / PMC, thereafter Warranty will start.

18.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROGRAM/RECORDS

The Bidder shall ensure the quality of all equipment and software delivered, installed and commissioning and all works performed under this Contract according to a Quality Policy and a Quality Assurance Programme submitted along with his Bid.

The Bidder shall submit:

a) Quality Control Plans showing the activities to be examined by Quality Control group of Bidder along with the documentation which shall be maintained and submitted to the Client / Consultant.

b) Quality Control & Quality Assurance organisation set up proposed to be deployed by the Bidder.

c) Procedure for Tests, Calibration, Maintenance of software, Instruments and Equipments.

A log shall also be maintained by the Bidder during the time the system remains at Bidder's works from the time of purchase/putting the system for the purpose until system is cleared to dispatch the India. This log shall be sent along with the system to the Client / Consultant.

POWER CONSUMPTION AND UPS REQUIREMENTS (PCUR) FORM

This form shall be duly filled and signed by bidder and it shall be submitted along the bid.

A. AC LOAD AT MMS & BMS

Item	Qty	Max. Power Consumption			In rush current			Peak Current	
		Unit (VA)	Total (VA)	Power Factor	Unit (A)	Total (A)	Duration (msec)	Total (A)	Duration (msec)
SCADA Server with peripheral devices									
HMI Work Stations with peripheral devices									
Web Server									
CCU									
WAN Router									
GPS Line Server									
Colour Inkjet Printer									
Any Item/s not included above									

Total Power Consumption=_____VA at_____Power Factor.
Total Inrush Current=_____A for a period of _____msec.
UPS Requirement=_____VA
UPS Sizing factor as (applicable) =_____
UPS Size=_____VA at_____Power factor with inrush current of_____A for msec

B. AC LOAD AT RWS LOCATION

Item	Qty	Max. Power Consumption			In rush current			Peak Current	
		Unit (VA)	Total (VA)	Power Factor	Unit (A)	Total (A)	Duration (msec)	Total (A)	Duration (msec)
Remote Workstation with peripheral devices									
WAN Router									
Colour Ink Jet Printer									
Any Item/s not included above									

Total Power Consumption=_____VA at _____Power Factor.

Total Inrush Current=_____A for a period of _____msec.

UPS Requirement= _____VA

UPS Sizing factor as (applicable)= _____

UPS Size=_____VA at_____Power factor with inrush current of_____A for msec

C. RTUs DC Load Requirements

S.No	RTUs Name	All RTU Cards		Max. Power consumption		Complete RTUs DC power requirements (Watts)
		TYPE	QUANTITY	Unit Consumption (Watts)	Total Consumption (Watts)	
1	RTU #1	AI				
		AO				
		DI				
		DO				
		Serial				
		CPU, Communication. Memory. Power supply unit				
		Any item/s not included above				

NOTE:

1 All RTU cards (Including CPU, communication cards, AI, AO, DI, DO, Serial cards along with power supply unit) be included for power consumption.

2 The digital output cards power consumption(watts) shall also include the power requirements for interposing relays

3 The above table is typical and the data shall be filled for all the RTUs being supplied.

ANNEXURE-III to PJS
SCADA SYSTEM

INSPECTION AND TESTING

1.0 INSPECTION

All equipment and components of the system shall be subjected to inspection and testing both during and upon completion of manufacturing and at site. Bidder shall provide full details of all type tests carried out on boards and modules and tests normally carried out in their works including to what standards these are carried out. These test preferably in accordance with International / National Standards.

1.1 All factory tests will be witnessed by Client / Consultant.

1.2 Client / Consultant shall have free entry and access at all phases of the project to all parts of Bidder's facilities associated with manufacturing and testing of system.

1.3 Bidder shall invite Client / Consultant well in advance with minimum 2 months notice of the date at which the system is ready for testing.

1.4 The equipment will not be shipped before they have been officially released in the form of release notes by Client / Consultant.

1.5 Bidder shall provide Client / Consultant with all reasonable facilities necessary to determine compliance to the system specification.

1.6 Bidder to note that acceptance of the equipments and the system of inspection and testing shall in no way absolve the bidder of his responsibility to deliver the equipment meeting all the requirements specified in the specification. Bidder shall be responsible till the completion of the warranty, for any corrections/modifications including supply and implementation of hardware & software to fulfil the requirements of the contract. If after acceptance of the system certain changes are required such as debugging of the software supplied or any other related issues which cannot be ascertained during the final handover of the system, these changes shall be carried out by the vendor at their cost

1.7 Bidder personnel shall be actively involved during factory acceptance and site acceptance testing.

2.0 TESTING

Testing shall concern SCADA equipments at all stations including RTUs and application software system. The test shall consist of:

a) Pre-Factory Acceptance Test (Pre-FAT)
b) Factory Acceptance Testing (FAT)
c) Pre-Site Acceptance Test (Pre-SAT)
d) Site Acceptance Test (SAT)

e) Test Run

Bidder shall submit to Client / Consultant detailed test plans and procedures, three months prior to all actual testing for factory and site acceptance test and run over review.

2.1 **PRE-FAT**

During the PRE-FAT testing phase, the Bidder is to ensure that system performs in compliance to specifications of the tender, FDS prior to offering the system for FAT by Client / Consultant.

PRE-FAT shall be conducted based on the approved FAT documentation signed by system engineering group of the bidder and On successful clearance of PRE-FAT, the Bidder shall make available to the Client / Consultant, the PRE-FAT signed and approved reports and thereafter clearance for conducting the FAT by Client / Consultant shall be given as above.

2.2 **FACTORY ACCEPTANCE TESTING (FAT)**

2.2.1 The Bidder shall prepare FAT documentation covering all hardware, software including SCADA software and system functionalities including system expansion requirements and submit it 3 months in advance for Client / Consultant review and approval. Factory acceptance test will be done based on the stipulations in the approved FAT document, which shall completely fulfil the contract requirements and approved SCADA FDS documents.

2.2.2 FAT shall be carried out in SCADA vendor's premises. FAT shall cover the testing & Integrated SCADA System with RTUs

Testing shall systematically, fully and functionally test all the hardware and software in the presence of Client / Consultant inspectors to ascertain compliance with the contract document and approved FDS documents. Test Bed shall be prepared with all the equipments (SCADA Servers, HMI, RWSs, RTUs, Routers, and Peripherals etc) interconnected to actual configuration to perform the testing on total integrated SCADA system. All the workstation desks, cabinets with mounting, wiring, interconnection of the equipments shall be available for this testing.

The equipment to be supplied shall be type-tested for electromagnetic Compatibility.

2.2.3 The SCADA system testing shall cover the following aspects as a minimum:

a) Visual and mechanical testing to ensure correct, proper, good and neat workmanship.

b) Input/Output testing and serial interface with flow computers, GC, CP panels to meet the requirements of P& IDs and electrical parameters for RTUs. Flow computer for the testing shall be arranged by the Bidder.

c) Input/Output simulation to verify the system response. Integrated testing with the RTUs

d) Demonstration of the complete system functionalities, hardware, and software compliance w.r.t all the equipments including RTUs.

e) Checking of complete database definitions for the proper system configuration.

f) Checking of displays, graphics and reports w.r.t approved HMI documents.

g) Checking of correct functioning of keyboards & mouse operation for operator & engineering functions.

h) Checking of hot standby functions, switching of SCADA server switchover, routers functioning, data channels to meet the system functional requirements without any loss of data and operation.

i) Testing and proper functioning of all printers.

j) Testing of system passwords, security and key lock features.

k) Testing the synchronisation of clock between the nodes of MS/EMS and the RTUs as per the specification.

l) Checking of various log formats, reports, archiving and trending functions.

m) Checking of system loading w.r.t CPU, memory, disk, comm., channels, LAN as per the specification.

n) Checking of CRT updates, database updates and display call up timings.

o) Checking of system diagnostics for all the equipments as per the requirements, power failure and system restart.

p) Switchovers and recoveries.

q) System building procedures and verifications.

r) Database and alarms synchronisation.

s) Computer workstation system resources utilisation test including the future expansion.

t) Pipeline shutdown, various sequences, interlocks and flow path verification as per pipeline operation and control philosophy.

u) Network testing and Remote workstations testing.

v) Web Functionality testing.

2.3 **PRE-SAT**

2.3.1 All RTUs shall be tested online when all the MCS / EMS hardware & software w.r.t SCADA system have been successfully tested, with regards to correctness of database using plan simulator, remote diagnostics, representation off all RTUs data on graphics, alarms, trending, reports etc. checking of operation of various control commands i.e. valves open/close, pumps start/stop, pipeline ESD, interlocks etc. complete checking and testing of signals from other equipments (FC

& GC & CP etc) to RTU, checking of field valves. Field device status, controls of field devices and set points from MS/ EMS and as per the Client / Consultant approved test plans and procedures.

2.3.2 During the RTU online testing, SCADA vendor shall ensure that all the information from suppliers of Flow Computers, Gas chromatographs panel, CP panel has been correctly configured to establish fully functional serial interfaces with these instruments / panel for transfer of data to SCADA system to meet the complete functionality.

2.3.3 PRE-SAT shall be conducted by the Bidder after successful integration and testing of the complete system and after all actual fields signals have been interfaced with the SCADA system including the successful completion of on-line testing of all the RTUs and complete system having been made fully operational w.r.t SCADA.

2.3.4 PRE-SAT shall be carried out by the Bidder based on the approved test plans and procedures for SAT. On successful clearance of PRE-SAT, the Bidder shall make available to the Client / Consultant; the PRE-SAT signed and approved reports and thereafter clearance for conducting the SAT by Client / Consultant shall be given.

3.0 SITE ACCEPTANCE TESTING (SAT)

3.1 The Bidder shall prepare SAT test plans and procedures document for integrated SCADA system and submit it 1 month in advance of Client / Consultant review and approval.

3.2 SAT shall involve integrated testing of complete SCADA system. Site Acceptance Testing will be done based on the stipulations in the approved SAT document. Once the test is successfully performed, then the system would be ready for commencement of test run.

3.3 SAT shall be done inline with FAT, wherein simulated signals shall be replaced by actual field signal and integration with Telecom system has been carried out.

3.4 SAT shall be conducted by the experienced system engineering group of the SCADA vendor (having experience and involved in system design, engineering, integration & FAT.)

Refer Annexure – IV also for details.

4.0 TEST RUN

Test for continuous functional operation of the system with the required system reliability and availability. This test aims at keeping the complete integrated system operation for a period of 30 days for all the 24 hours a day.

In case of failure, the test will be restarted till the system operates without failure of any system functionality for 30 days. Failure of test shall be limited to such system failures which will affect system availability and reliability and shall not be dependent upon established failure of third party supplied items. Client / Consultant shall have the right to reject the complete system or part there of in the event of two successive failures of test run.

The 'Test Run' will be carried out after the commissioning of complete pipeline duly witnessed by Client / Consultant. After the successful completion of Test run, Warranty phase will start and system taking over certificate will be issued by the Client / Consultant.

4.1 **TEST REPORTS**

The observations, exceptions and test result obtained during the various test shall be documented and produced in the form of a report by the Bidder within 15 days of completion of Test Run which shall be subsequently reviewed / approved by Client /Consultant within 10 days of submission of repost. The warranty phase will start only after the approval of documents / acceptance of the system.

5.0 FAILURE OF COMPONENTS

A log of all failed hardware and software modules shall be maintained which shall give date and time of failure, description of the failed components & cards/software along with designation, effect of failure on the system, cause of failure and number of ours of operation of the part before it failed.

Upon failure of the components/cards/modules, the same shall be replaced by better graded components/cards. And the test shall be restarted from the beginning or the previous logical points as the case may be. If after this one replacement the unit of sub-system still fails to meet the specifications, the Bidder shall replace the complete unit or sub-system with one that meets the requirements and restarts the test all over again.

6.0 Bidder shall depute experienced one software & one hardware engineer fully conversant with the system at MS /EMS during the test run, and they will coordinator for APPS system integration with APPS sub-vendor engineer during the test run.

7.0 All the tests will be necessary in connection with the execution of works as per approved document shall be carried out at the Bidder's premise, testing laboratory and work site of the Client / Consultant at Bidder's cost. The Bidder shall provide assistance, instruments, labour and materials as are normally required for the examining, measuring and testing any workmanship as may be selected and required.

8.0 Factory Acceptance Test shall be carried out at Bidder's factory. These tests will encompass all the material and equipment delivered and software pertaining to SCADA system including the equipment and software supplied by Bidder and sub-vendor. Pre-FAT report duly witnessed and accepted by the SCADA vendor shall be available for reference during FAT.

9.0 Various observations and test results obtained during the various test shall be documented and produced in the form of a report by the Bidder. Each report shall contain:

a) Purpose.

b) Method.

c) Deviation from procedures described in previously submitted test plans, if any, with cause for the same.

d) Result of test compared with expected results as per the test plan.

e) Exceptions and action plan.

10.0 If a unit or sub-system has failed during the test and is not repaired and made successfully operational or not replaced within four hours of active repair time after the failure, the test shall be suspended and restarted all over again only after the Bidder has placed the device back in to acceptable operation. The Client / Consultant's approval shall be obtained for any allowable logistic time required to replace the failed component/system shall be to Bidder's account.

11.0 The Client / Consultant shall be free to request any specific test on any equipment and the system considered necessary by him, although not listed in the testing documents to verify the compliance with the specifications.

12.0 Any statutory test/inspection certificate, as may be required, under any law or directive issued by Govt. or any competent authority, shall be furnished to the Client / Consultant.

13.0 For operational software tests, the plans shall include summery of the method, a list of typical test cases, the sequence of execution and expected results.

For hardware tests, the plans shall include purpose of the test, definition of test inputs, specifications of test procedures and definition of results to be obtained.

14.0 It shall be Bidder's responsibility to modify the operational and diagnostics software in case of any mal-operation is revealed during online operation of the system after commissioning with in the guarantee period.

15.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROGRAM/RECORDS

The Bidder shall ensure the quality of all equipment and software delivered, installed and commissioning and all works performed under this Contract according to a Quality Policy and a Quality Assurance Programme submitted along with his Bid.

The Bidder shall submit:

a) Quality Control Plans showing the activities to be examined by Quality Control group of Bidder along with the documentation which shall be maintained and submitted to the Client / Consultant.

b) Quality Control & Quality Assurance organisation set up proposed to be deployed by the Bidder.

c) Procedure for Tests, Calibration, Maintenance of software, Instruments and Equipments.

A log shall also be maintained by the Bidder during the time the system remains at Bidder's works from the time of purchase/putting the system for the purpose until system is cleared to dispatch the India. This log shall be sent along with the system to the Client / Consultant.

ANNEXURE-XVI to PJS
SCADA System

TECHNICAL CHECKLISTS

Name of Bidder :
Bidder / Vendor works & address :
Name of Sub Vendor (as applicable) :

This Technical Check list shall be dully filled in and submitted along with un-priced sets of offers to avoid further queries and to ensure proper evaluation of your offer in time. If this is not complied with your offer is liable to be rejected.

Sl. No	Checklist point	Yes / No
	Have you filled up the following formats, which form a part of technical checklist	
1.	Submit Un-priced SOR with indicated "Quoted" in price part	
2.	ANNEXURE VI Project Management & Responsibility (PMR) Form	
3.	ANNEXURE-VII Logistic Support Form	
4.	ANNEXURE-VIII Source Of Supply (SOS) Form	
5.	ANNEXURE-IX Deviation form	
6.	ANNEXURE – XV Power Consumption & Ups Reqmt Form (PUCR Form)	
7.	Bill of Material (Supply) for SCADA System - submitted (Yes /No)	
8.	Submit Data Sheets/Technical Specifications (Yes / No)	
9.	SCADA System Configuration Drawing Submitted (Yes/No)	
10.	Submit signed & stamped tender documents	
11.	Submit Clause wise technical compliance of PJS with Annexure	
12.	Have you filled up 'NO DEVIATION FORM' and submitted the same?	
13.	Have you provided list of spares for operation and maintenance along with unit rates?	
14.	Have you provided list of commissioning spares?	
15.	Have you enclosed the catalogs/literature in ENGLISH language including model decoding details, drawing etc necessary for evaluation of your offer?	
16.	Have you confirmed that documents required as per vendor data requirement will be supplied after placement of order?	
17.	Have you furnished System Architecture for SCADA	
18.	Have you furnished and 'PERFORMANCE GUARANTEE CERTIFICATE'?	
19.	Have you furnished 'Vendor Data Requirement' with all necessary documents	
20.	You quoted as OEM or System Integrator	
21.	You have 24 hr service support for O&M	
22.	Indicate deviation / discrepancy with supporting documents / reasons etc.	
23.	PWMC	
Sl. No	**Compliance to**	**Noted (Yes / No)**
1.	Quoted for all the items	
2.	Time Schedule.	
3.	Furnished documents supporting BEC	
4.	Tender MR requirements and scope as per Job Specification	
5.	Payment Terms as per tender	
6.	Training as per tender	

Signature of the Bidder authorized signatory

Name of the Bidder authorized signatory

Stamp and Date

LIST OF VENDORS FOR BOUGHT-OUT ITEMS

I) CABLES

1) M/s ASSOCIATED CABLES
2) M/s ASSOCIATED FLEXIBLES
3) M/s DELTON Cables Ltd, India
4) M/s BROOK
5) M/s KEI Industries Ltd INDIA
6) M/s Suyog Electricals Ltd, India
7) M/s Thermo Cables Ltd
8) M/s Udey Pyrocables Pvt Ltd, India

II) SURGE PROTECTION DEVICES

1) M/s MTL
2) M/s Phoenix Contact

III) PUSH BUTTONS/LAMPS:

1) L&T
2) SIEMENS

IV) MCB'S:

1) HAVELL'S
2) L&T
3) SIEMENS
4) ABB

V) POWER SUPPLY CONVERTERS (DC-DC, AC-DC)

1) PHOENIX CONTACT
2) OMRON

VI) RTU and Server PANEL

1) M/s BCH
2) M/s RITTAL
3) M/s Pyrotech
4) M/s Positronics Pvt. Ltd.

VII) Consoles and Printer Table

1) M/s BCH
2) M/s RITTAL
3) M/s Pyrotech

4) M/s Positronics Pvt. Ltd.

VIII) Ethernet Switches and Routers

1) M/s Hirchmann
2) M/s Moxa
3) Cisco
4) M/s Phoenix
5) M/s Nortel
6) M/s Juniper

IX) Relay

1) PHOENIX CONTACT
2) OMRON

X) UTP/Communication Cable

1) M/s AMP
2) M/s Morex
3) M/s DELTON Cables Ltd, India
4) M/s LAPP

XI) Terminal Blocks

1) M/s Elmex
2) M/s Wago
3) M/s Phoenix

XI) Barriers

1) M/s MTL
2) M/s P&F
3) M/s Phoenix

Note-1

For procuring bought out items from vendors other than those listed above, the same may be acceptable subject to the following: -

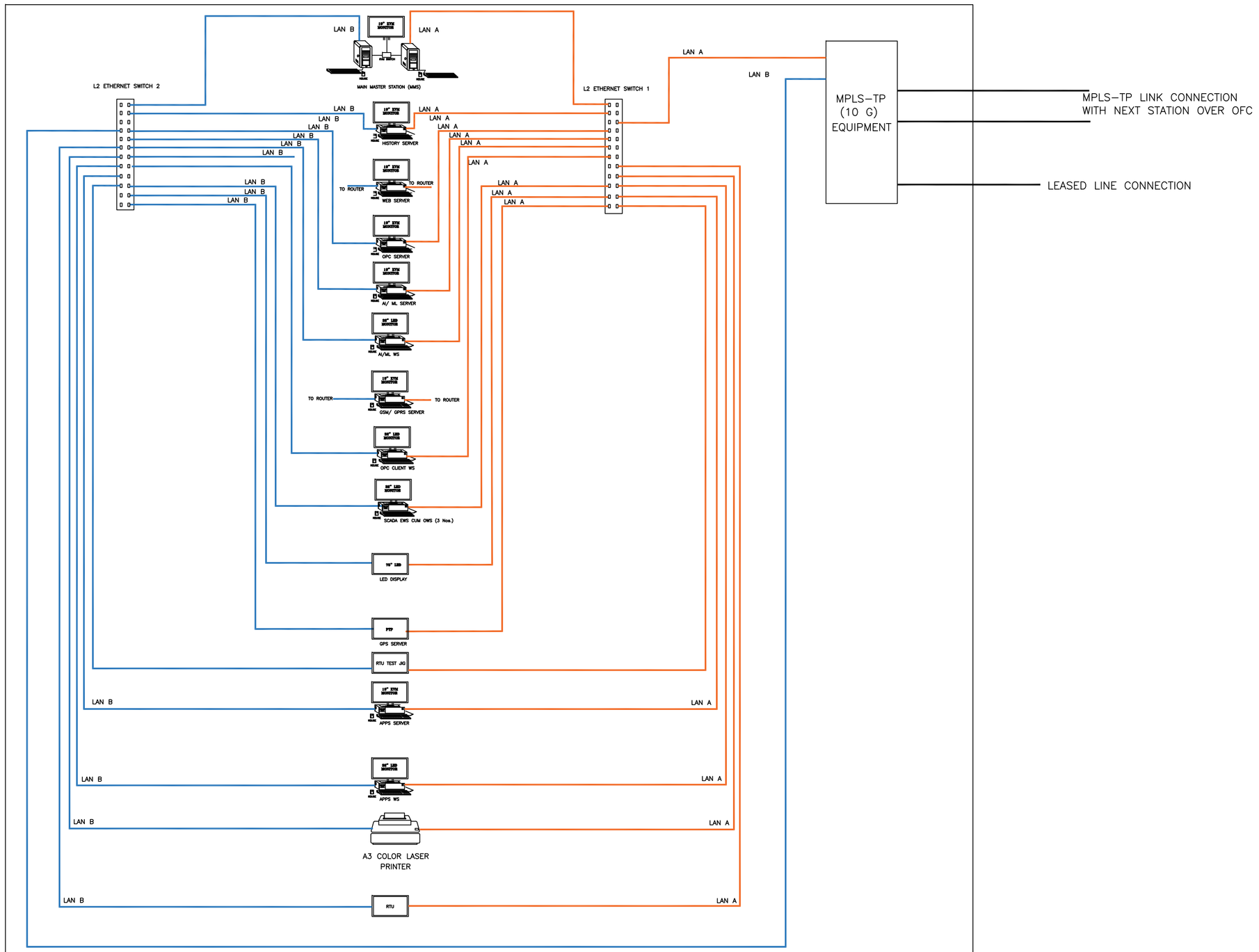
a) The vendor/ supplier of bought out item(s) is a regular and reputed manufacturer/ supplier of said item(s) for intended services and the sizes being offered is in their regular manufacturing/ supply range.
b) The vendor/ supplier should not be in the Holiday list of any PSU or government entity.

c) Should have supplied at least 50% of required quantity or minimum 1 number whichever is higher of maximum size and rating of item(s) as required for intended services.

The bidder should enclose documentary evidences i.e. PO copies, Inspection Certificate etc. for the above, along with their bids. However, the decision of IGGL/ MECON to accept/ reject the items from vendors other than those listed above shall be final and binding to the bidder.

Note-2

The bidder is not required to enclose documentary evidences (PO copies, Inspection Certificate etc.) along with their offer, however in case of successful bidder these documents shall be required to be submitted by them within 30 days from date of Placement of Order.



SCADA SYSTEM AT MMS, NUMALIGARH

FOR TENDER PURPOSE ONLY

NOTES: –

1. THIS DRAWING SHALL BE READ IN CONJUCTION WITH PJS & TS.
2. THE NUMBER OF PORTS IN ETHERNET SWITCH SHALL BE DECIDED DURING DETAIL ENGINEERING.
3. MPLS–TP CONNECTIONS ARE INDICATIVE ONLY. THE ACTUAL CONNECTION PHILOSOPHY SHALL BE AS PER RESPECTIVE DRAWING
4. THE NUMBER OF ROUTERS AND ETHERNET SWITCH SHALL BE DECIDED DURING DETAIL ENGINEERING.
5. SINGLE 19" INTEGRATED KVM MONITOR WITH KVM SWITCH, INTEGRATED KEYBOARD AND MOUSE SHALL BE PROVIDED FOR EACH SERVER RACK.
6. THIS DRAWING IS TENTATIVE. ACTUAL CONFIGURATION SHALL BE PROVIDED BY THE BIDDER INCORPORATING COMPLETE TENDER REQUIREMENTS AND SAME SHALL BE SUBMITTED FOR APPROVAL DURING DETAIL ENGINEERING.

REV. NO.	DATE	ZONE	DESCRIPTION	BY	VERIFIED
△					

REVISIONS

THIS DRAWING IS THE PROPERTY OF MECON AND IS ISSUED FOR THE SPECIFIC PROJECT MENTIONED THEREIN. THIS IS NOT TO BE COPIED OR USED FOR OTHER PROJECTS UNLESS EXPRESSLY PERMITTED BY MECON.

INDRADHANUSH GAS GRID LIMITED (IGGL)

MECON LIMITED

SECTION	INST. & PROC.	
LOCATION	DELHI	
DESIGNED	RATNADEEP	DEC. '21
DRAWN	BOBBY	DEC. '21
CHECKED AND VERIFIED	VIKAS JAIN	DEC. '21
APPROVED	PANKAJ SRIVASTAVA	
	DATE	DEC. '21

NATURAL GAS PIPELINE PROJECT FOR NORTH EAST GAS GRID PIPELINE

SCADA SYSTEM ARCHITECTURE

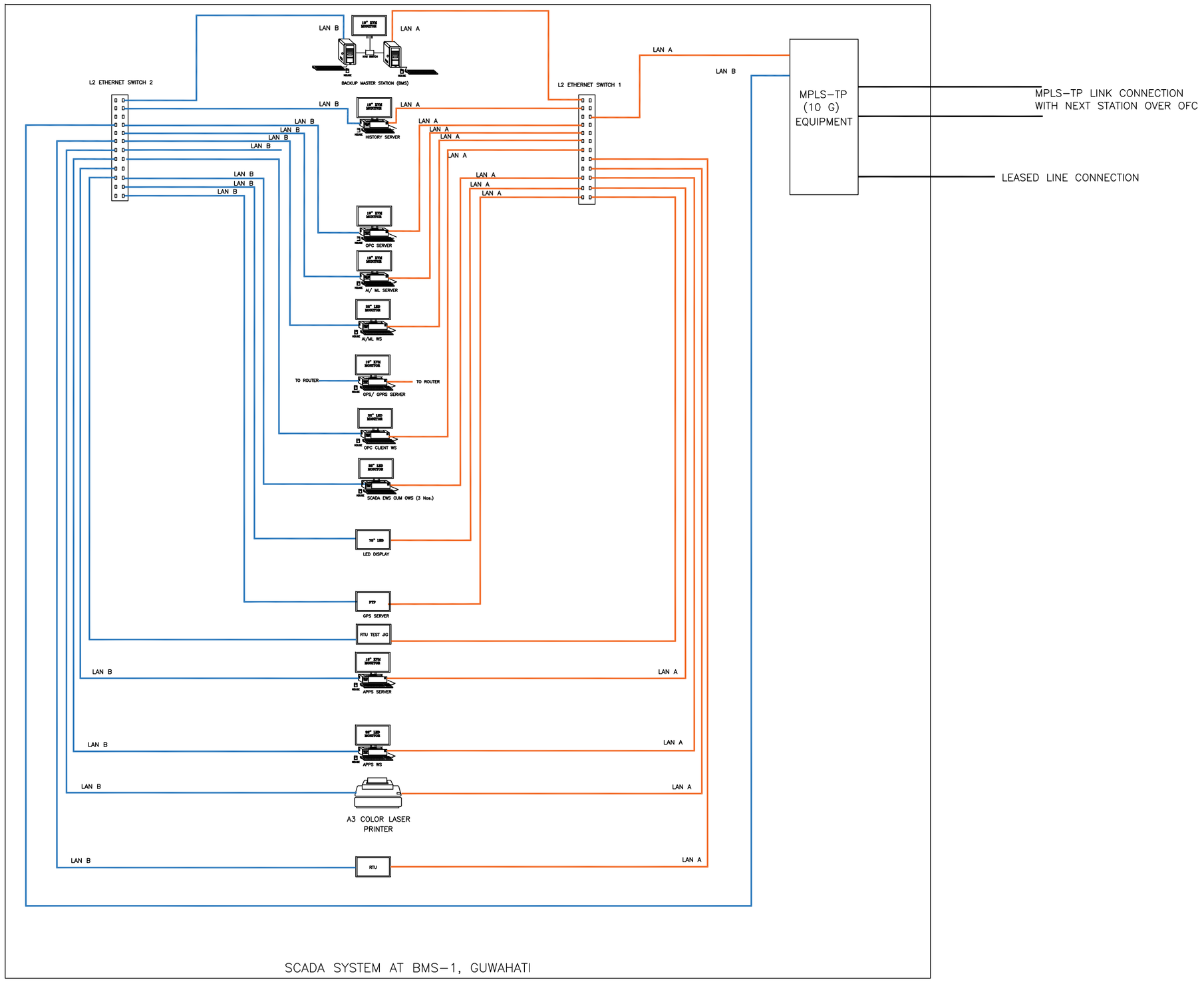
SCALE – NTS

DRG.No. MEC/23VC/05/E5/T/IGGL/1521

SHEET 1 OF 3

REV. 0

DRG.No. MEC/23VC/05/E5/T/IGGL/1521



SCADA SYSTEM AT BMS-1, GUWAHATI

FOR TENDER PURPOSE ONLY

NOTES: –

1. THIS DRAWING SHALL BE READ IN CONJUCTION WITH PJS & TS.
2. THE NUMBER OF PORTS IN ETHERNET SWITCH SHALL BE DECIDED DURING DETAIL ENGINEERING.
3. MPLS-TP CONNECTIONS ARE INDICATIVE ONLY. THE ACTUAL CONNECTION PHILOSOPHY SHALL BE AS PER RESPECTIVE DRAWING
4. THE NUMBER OF ROUTERS AND ETHERNET SWITCH SHALL BE DECIDED DURING DETAIL ENGINEERING.
5. SINGLE 19" INTEGRATED KVM MONITOR WITH KVM SWITCH, INTEGRATED KEYBOARD AND MOUSE SHALL BE PROVIDED FOR EACH SERVER RACK.
6. THIS DRAWING IS TENTATIVE. ACTUAL CONFIGURATION SHALL BE PROVIDED BY THE BIDDER INCORPORATING COMPLETE TENDER REQUIREMENTS AND SAME SHALL BE SUBMITTED FOR APPROVAL DURING DETAIL ENGINEERING.

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△					

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DRAWN	BOBBY	DEC. '21
CHECKED AND VERIFIED	VIKAS JAIN	DEC. '21
APPROVED	PANKAJ SRIVASTAVA	
	DATE	DEC. '21

NATURAL GAS PIPELINE PROJECT FOR NORTH EAST GAS GRID PIPELINE

SCADA SYSTEM ARCHITECTURE

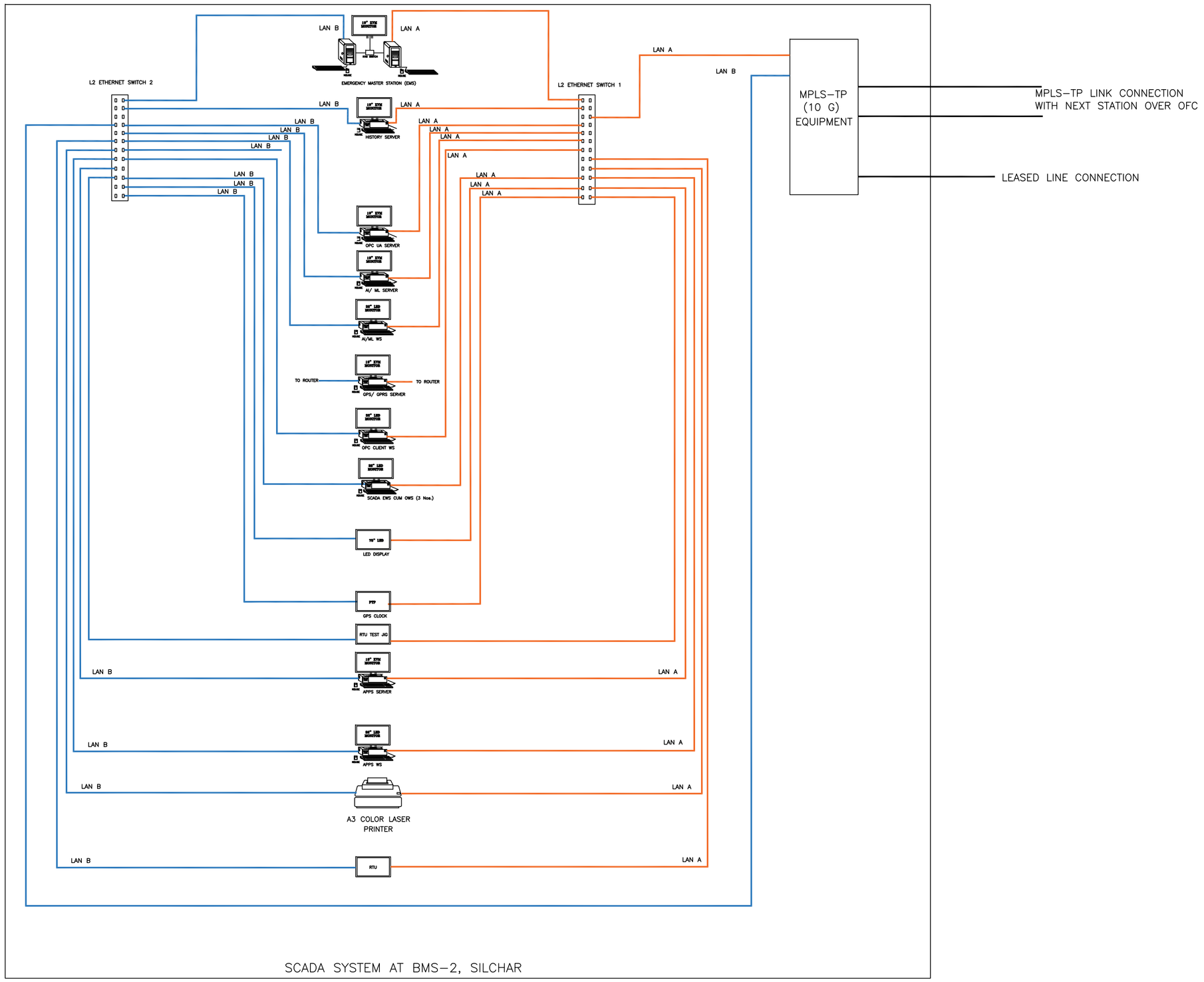
SCALE – NTS

DRG.No. MEC/23VC/05/E5/T/IGGL/1521

SHEET 2 OF 3

REV. 0

DRG.No. MEC/23VC/05/E5/T/IGGL/1521



SCADA SYSTEM AT BMS-2, SILCHAR

FOR TENDER PURPOSE ONLY

NOTES: –

1. THIS DRAWING SHALL BE READ IN CONJUCTION WITH PJS & TS.
2. THE NUMBER OF PORTS IN ETHERNET SWITCH SHALL BE DECIDED DURING DETAIL ENGINEERING.
3. MPLS-TP CONNECTIONS ARE INDICATIVE ONLY. THE ACTUAL CONNECTION PHILOSOPHY SHALL BE AS PER RESPECTIVE DRAWING
4. THE NUMBER OF ROUTERS AND ETHERNET SWITCH SHALL BE DECIDED DURING DETAIL ENGINEERING.
5. SINGLE 19" INTEGRATED KVM MONITOR WITH KVM SWITCH, INTEGRATED KEYBOARD AND MOUSE SHALL BE PROVIDED FOR EACH SERVER RACK.
6. THIS DRAWING IS TENTATIVE. ACTUAL CONFIGURATION SHALL BE PROVIDED BY THE BIDDER INCORPORATING COMPLETE TENDER REQUIREMENTS AND SAME SHALL BE SUBMITTED FOR APPROVAL DURING DETAIL ENGINEERING.

REV. NO.	DATE	ZONE	DESCRIPTION	BY	VERIFIED
△					

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INDRADHANUSH GAS GRID LIMITED (IGGL)

MECON LIMITED

SECTION	INST. & PROC.	
LOCATION	DELHI	
DESIGNED	RATNADEEP	DEC. '21
DRAWN	BOBBY	DEC. '21
CHECKED AND VERIFIED	VIKAS JAIN	DEC. '21
APPROVED	PANKAJ SRIVASTAVA	
	DATE	DEC. '21

NATURAL GAS PIPELINE PROJECT FOR NORTH EAST GAS GRID PIPELINE

SCADA SYSTEM ARCHITECTURE

SCALE – NTS

DRG.No. MEC/23VC/05/E5/T/IGGL/1521

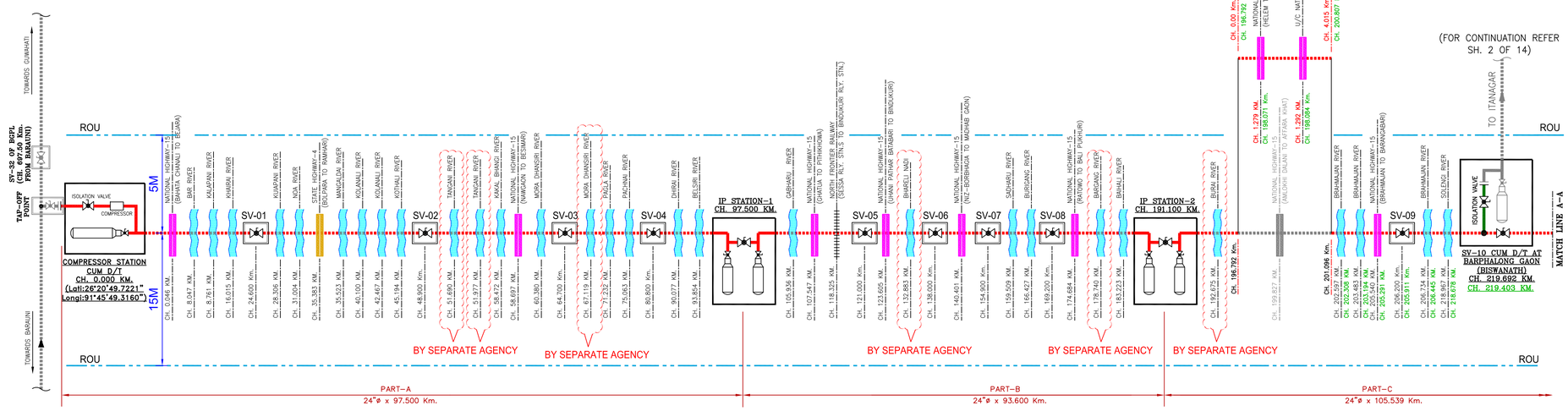
SHEET 3 OF 3 REV. 0

DRG.No. MEC/23VC/05/E5/T/IGGL/1521

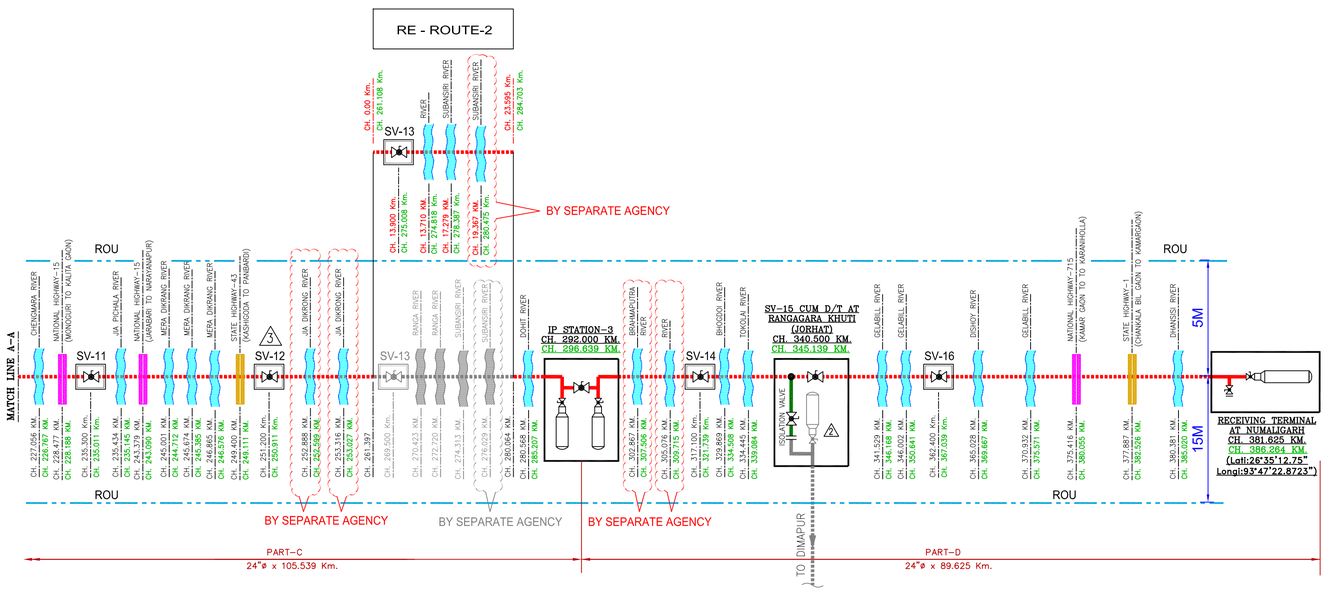
DRG. NO. MEC/23UU/05/28/M/000/0021

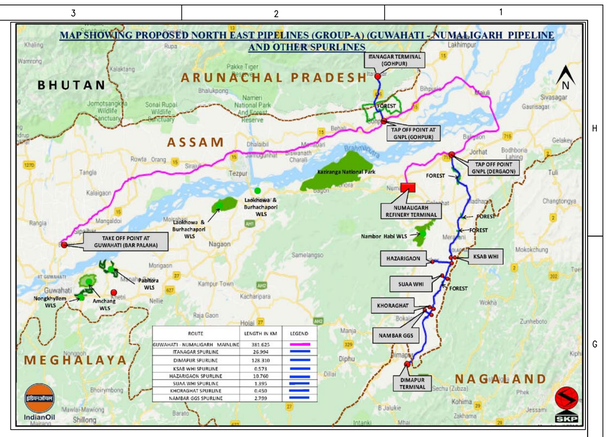
SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT
GUWAHATI - NUMALIGARH (PIPELINE SECTION-1) 24"x386.264 Km.

3



RE - ROUTE-1





ROUTE	LENGTH IN KM	LEGEND
GUWAHATI - NUMALIGARH MAINLINE	381.625	
ITANAGAR SPURLINE	20.994	
DIMAPUR SPURLINE	128.838	
KSAB WMI SPURLINE	0.571	
HAZARIGAON SPURLINE	10.760	
SUAA WMI SPURLINE	1.193	
KHORAGHAT SPURLINE	0.450	
NAMBAR GGS SPURLINE	2.799	

KEY PLAN (ROUTE MAP)

SL. NO.	DESCRIPTION	QUANTITY MAIN LINE
01	RAILWAY CROSSING	01 NOS.
02	NATIONAL/STATE HIGHWAY	12/03 NOS.
03	RIVER	49 NOS.
04	CANAL/ CHANNELS	84 NOS.
05	NALA/DRAIN	106 NOS.
06	OTHER ROAD	175 NOS.
07	FOREST	--
08	MARSHY LAND	16.851 Km.

LEGEND

- 24"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP STATION	SV STATION	TAP-OFF/ INJECTION POINT
	MAIN LINE							
01	COMPRESSOR STATION CUM D/T TO RT AT NUMALIGARH	24"	386.264 Km.	01	01	03	16	--

COLOUR LEGEND

1. BLACK COLOUR CHAINAGES – AS PER ORIGIONAL SURVEY
2. RED COLOUR CHAINAGES – REROUTE CHAINAGE
3. GREEN COLOUR CHAINAGES – CUMULATIVE CHAINAGE CONSIDERING RE-ROUTE 1 & 2

FOR PLANNING PURPOSE

INDRADHANUSH GAS GRID LTD.

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NOTES :-

1. THE ABOVE DRAWING HAS BEEN PREPARED ON THE BASIS OF PDI DATA AND CROSSING DETAILS PROVIDED BY M/s IGGL.

REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
3	21.08.20	REVISED AS PER REROUTE 1 & 2	K.P.	HEMANT
2	07.07.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	K.P.	HEMANT
1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" FOR ITANAGAR SPURLINE	KRISHNA	SHALINI

REVISION

REFERENCES	DOC NO./DRG. NO.
IGGL MAIL DATED 03.09.2019	
MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL-NEGG-DFR-RO DATED 30.08.2018

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM GUWAHATI – NUMALIGARH (PIPELINE SECTION-1)

SCALE : N.T.S | SH. 1 OF 14 | REV 3

DRG. NO. MEC/23UU/05/28/M/000/0021

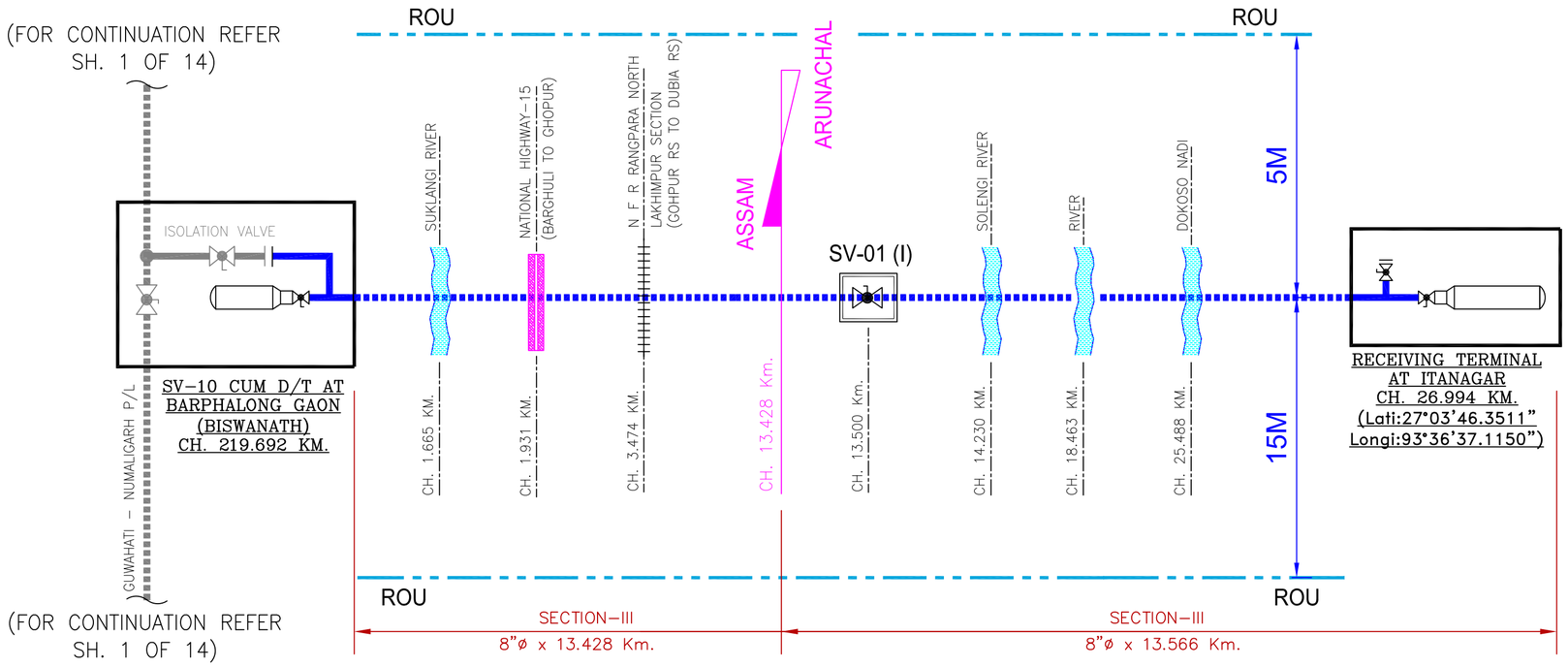
CONCURRED BY

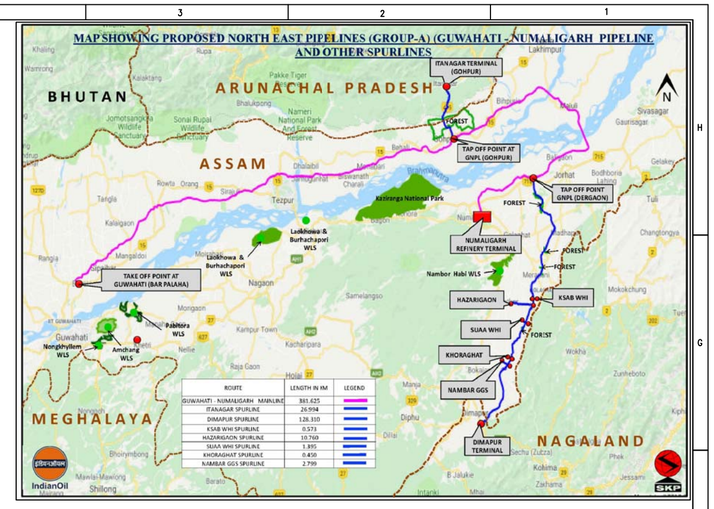
DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

GOHPUR TO ITANAGAR 8"x26.994 Km. SPURLINE

2





KEY PLAN (ROUTE MAP) GROUP-A

LEGEND

8"Ø PROPOSED PIPELINE	RT : RECEIVING TERMINAL
	DT : DESPATCH TERMINAL
	TOP : TAP-OFF POINT
	IP : INTERMEDIATE PIGGING STATION
	SV: SECTIONALISING VALVE STATION

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP STATION	SV STATION	TAP-OFF/ INJECTION POINT
1	TAP-OFF POINT AT BARPHALONG GAON (BISWANATH) TO RECEIVING TERMINAL AT ITANAGAR	8"1	26.994 Km.	01	01	--	01	--

SL. NO.	DESCRIPTION	QUANTITY ITANAGAR SPURLINE
01	RAILWAY CROSSING	01 NOS.
02	NATIONAL/STATE HIGHWAY	01/-- NOS.
03	RIVER	04 NOS.
04	CANAL/ CHANNELS	03 NOS.
05	NALA/DRAIN	32 NOS.
06	OTHER ROAD	07 NOS.
07	FOREST	4.968 Km.
08	MARSHY LAND	--

NOTES :-

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REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
2	07.07.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	K.P.	HEMANT
1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" FOR ITANAGAR SPURLINE	KRISHNA	SHALINI

REVISION

REFERENCES	DOC NO./DRG. NO.
IGGL MAIL DATED 03.09.2019	
MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL-NEGG-DFR-R0 DATED 30.08.2018

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FOR PLANNING PURPOSE

INDRADHANUSH GAS GRID LTD.

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MECON LIMITED

SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM GOHPUR TO ITANAGAR SPURLINE (SECTION-2)

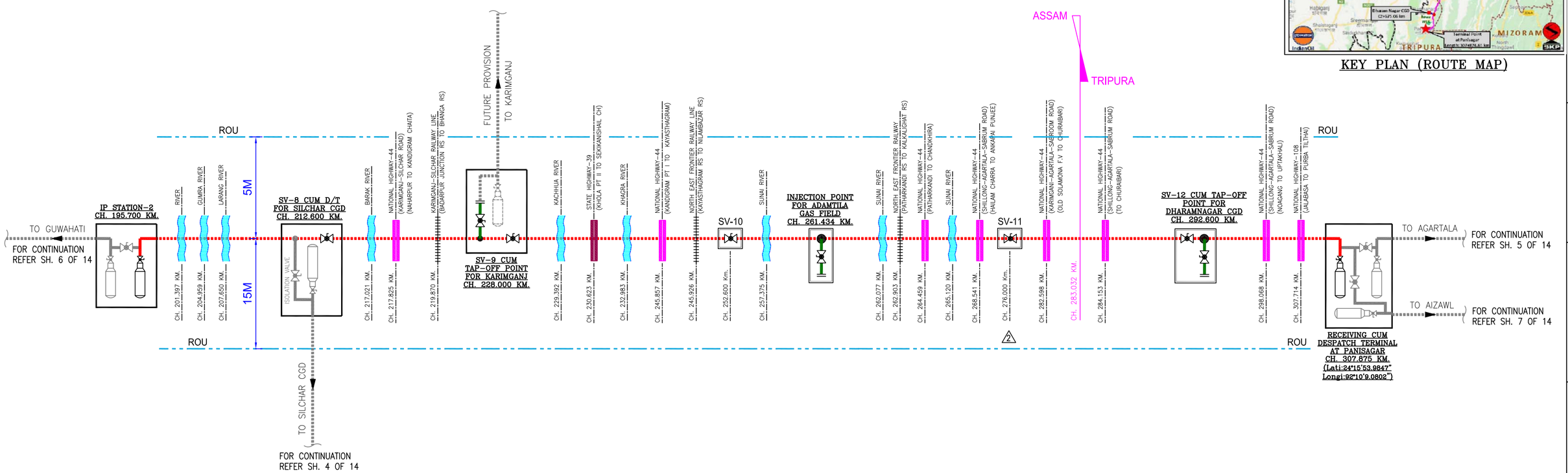
SCALE : N.T.S | SH. 2 OF 14 | REV 2

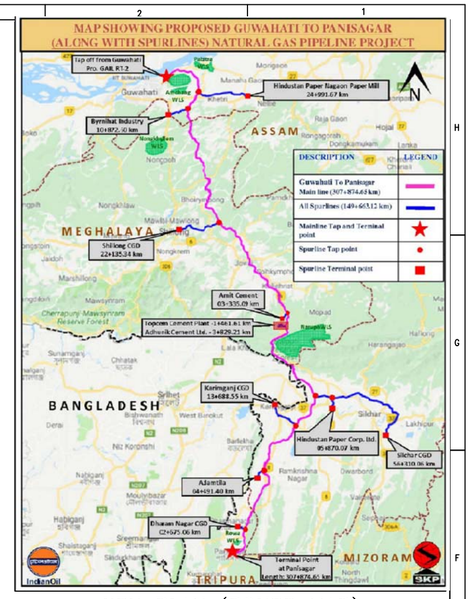
DRG. NO. MEC/23UU/05/28/M/000/0021

CONCURRED BY

DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT
SILCHAR (IP-2) TO PANISAGAR PIPELINE SECTION
18"x112.175 Km. MAINLINE





KEY PLAN (ROUTE MAP)

FOR PLANNING PURPOSE

LEGEND	
18"Ø PROPOSED PIPELINE	RT : RECEIVING TERMINAL DT : DESPATCH TERMINAL TOP : TAP-OFF POINT IP : INTERMEDIATE PIGGING STATION SV: SECTIONALISING VALVE STATION

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP STATION	SV STATION	TAP-OFF POINT/ INJECTION POINT
	MAIN LINE							
01	SILCHAR IP-2 TO RECEIVING CUM DESPATCH TERMINAL AT PANISAGAR	18"	112.175 Km.	--	01	01	05	--/01

SL. NO.	DESCRIPTION	QUANTITY MAIN LINE
01	RAILWAY CROSSING	03 NOS.
02	NATIONAL/STATE HIGHWAY	08/01 NOS.
03	RIVER	09 NOS.
04	CANAL/ CHANNELS	15 NOS.
05	NALA/DRAIN	58 NOS.
06	MDR ROAD	01 NOS.
07	OTHER ROAD	47 NOS.
08	FOREST	1.22 Km.
09	MARSHY LAND/WATER LOGGED AREA/POND	30.589 Km.

NOTES :-

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REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
2	07.07.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	R.R.	A.A.
1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" AS PER PROJECT Email Dtd. 13.03.20	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
IGGL MAIL DATED 03.09.2019	
MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL-NEGG-DFR-R0 DATED 30.08.2018

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM SILCHAR (IP-2) TO PANISAGAR (SECTION-3)

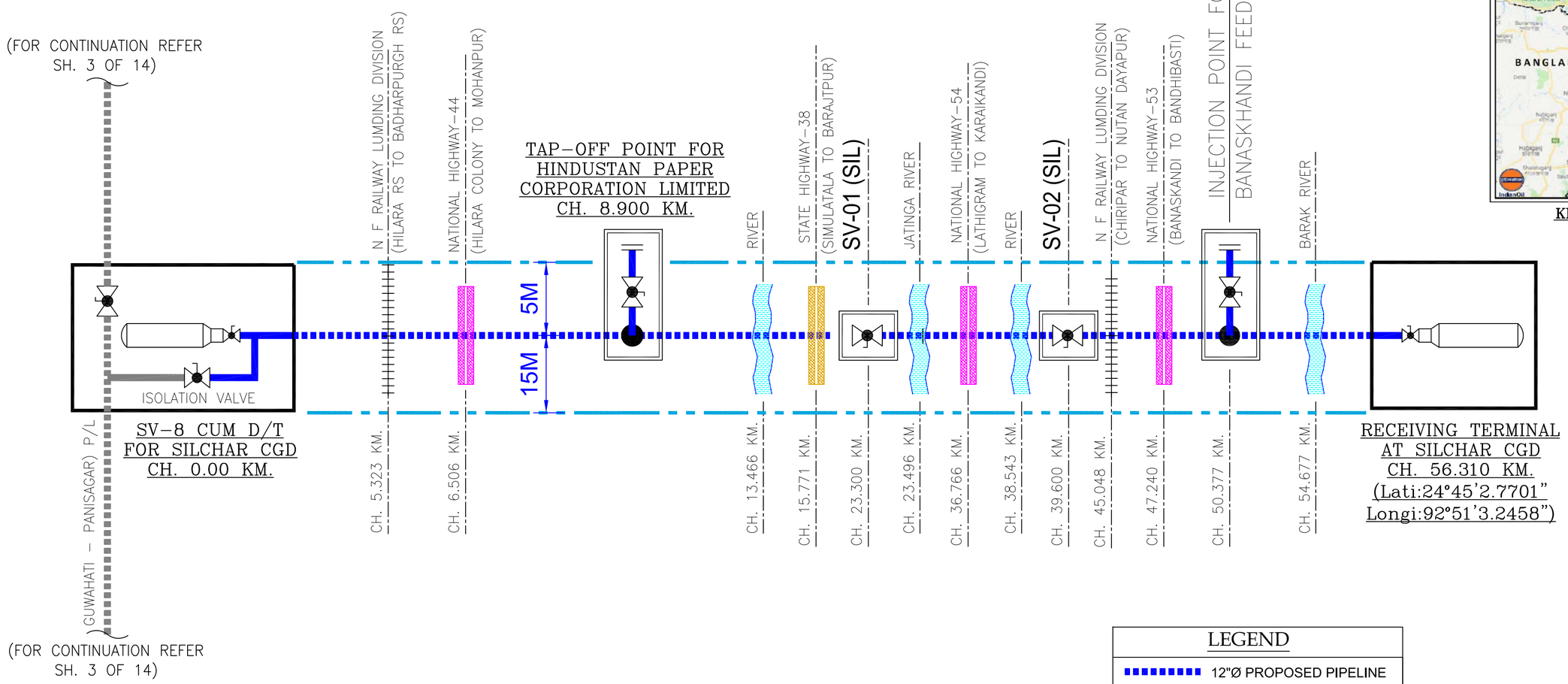
SCALE : N.T.S | SH. 3 OF 14 | REV 2

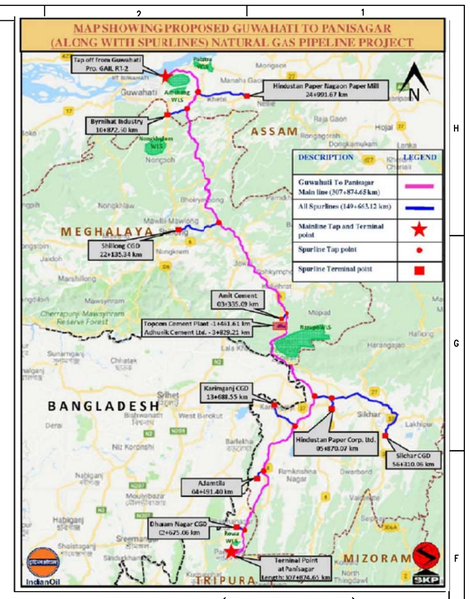
DRG. NO. MEC/23UU/05/28/M/000/0021

DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

BANASKHANDI FEEDER LINE CUM SILCHAR CGD & OTHER FEEDER LINES (PIPELINE SECTION-4) 12"x56.310 Km. △2





KEY PLAN (ROUTE MAP)

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP STATION	SV STATION	TAP–OFF POINT/ INJECTION POINT
	MAIN LINE							
01	SV–08 CUM D/T TO R/T AT SILCHAR CGD	12"	56.310 Km.	01	01	--	02	01/01

SL. NO.	DESCRIPTION	QUANTITY MAIN LINE
01	RAILWAY CROSSING	02 NOS.
02	NATIONAL/STATE HIGHWAY	03/01 NOS.
03	RIVER	04 NOS.
04	CANAL/ CHANNELS	05 NOS.
05	NALA/DRAIN	33 NOS.
06	MDR ROAD	--
07	OTHER ROAD	21 NOS.
08	FOREST	--
09	POND	1016.43 Mtr.
10	MARSHY LAND/WATER LOGGED AREA	2289.3 Mtr.

LEGEND

- 12"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

FOR PLANNING PURPOSE

INDRADHANUSH GAS GRID LTD.

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NOTES :–

1. THE ABOVE DRAWING HAS BEEN PREPARED ON THE BASIS OF PDI DATA AND CROSSING DETAILS PROVIDED BY M/s IGGL.

REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
△2	11.09.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
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MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL–NEGG–DFR–RO DATED 30.08.2018

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM BANASKHANDI FEEDER LINE CUM SILCHAR CGD & OTHER FEEDER LINES (PIPELINE SECTION–4)

SCALE : N.T.S | SH. 4 OF 14 | REV 2

DRG. NO. MEC/23UU/05/28/M/000/0021

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△	
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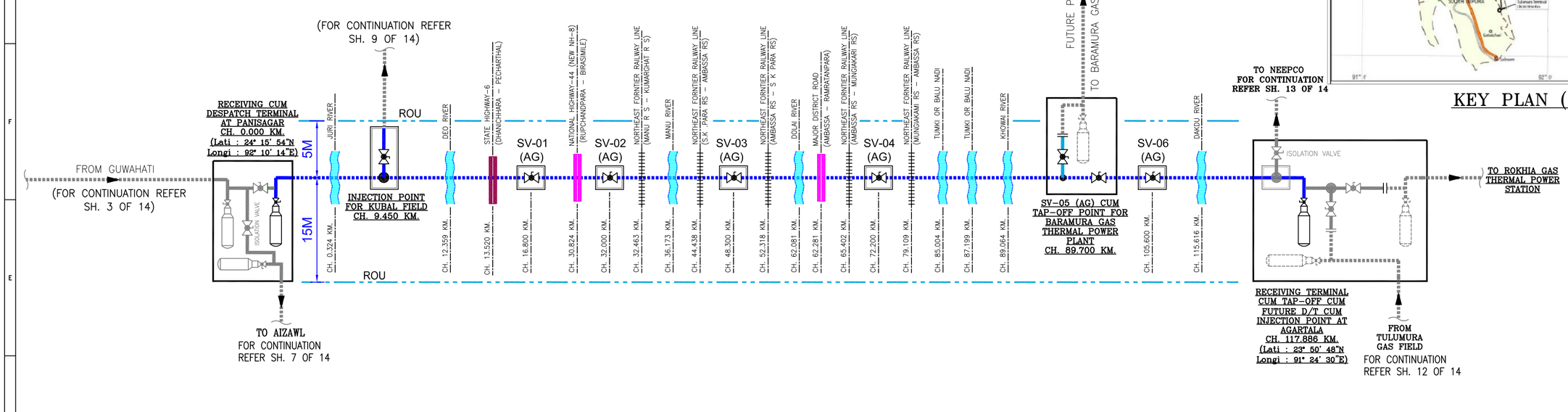
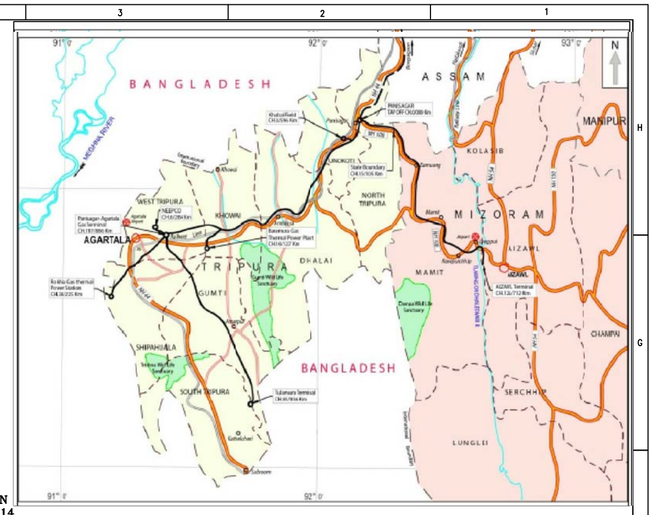
DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

PANISAGAR TO AGARTALA 12"x117.886 Km. MAINLINE





KEY PLAN (ROUTE MAP)

LEGEND

12"Ø PROPOSED PIPELINE	RT : RECEIVING TERMINAL DT : DESPATCH TERMINAL TOP : TAP-OFF POINT IP : INTERMEDIATE PIGGING STATION SV: SECTIONALISING VALVE STATION

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP	SV	TAP-OFF POINT/ INJECTION POINT
	MAIN LINE							
01	RECEIVING CUM DESPATCH TERMINAL AT PANISAGAR TO RECEIVING TERMINAL CUM TAP-OFF CUM INJECTION POINT AT AGARTALA	12"	117.886 Km.	01	01	--	06	01/01

SL. NO.	DESCRIPTION	QUANTITY MAIN LINE-1
01	RAILWAY CROSSING	05 NOS.
02	NATIONAL/STATE HIGHWAY	01/01 NOS.
03	RIVER	08 NOS.
04	CANAL/ CHANNELS	02 NOS.
05	NALA/DRAIN	33 NOS.
06	MDR ROAD	01 NOS.
07	OTHER ROAD	188 NOS.
08	FOREST	48.280 Km.
09	MARSHY LAND / WATER LOGGED AREA / POND	1622.79 M.

FOR PLANNING PURPOSE

INDRADHANUSH GAS GRID LTD.

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NOTES :-

1. THE ABOVE DRAWING HAS BEEN PREPARED ON THE BASIS OF PDI DATA AND CROSSING DETAILS PROVIDED BY M/s IGGL.

REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
2	07.07.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	R.R.	A.A.
1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" AS PER PROJECT Email Dtd. 13.03.20	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
IGGL MAIL DATED 03.09.2019	
MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL-NEGG-DFR-R0 DATED 30.08.2018

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM PANISAGAR TO AGARTALA PIPELINE (SECTION-5)

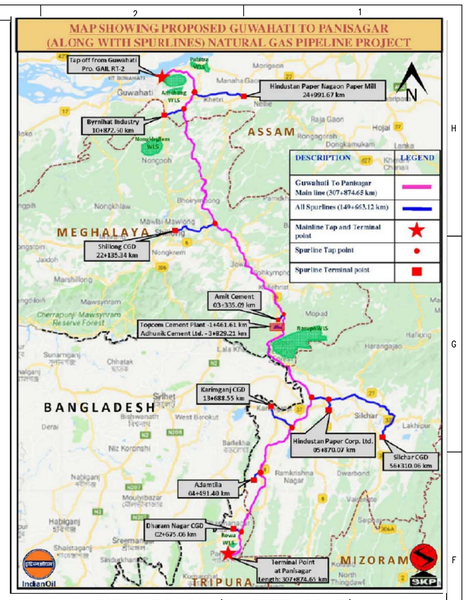
SCALE : N.T.S | SH. 5 OF 14 | REV 2

DRG. NO. MEC/23UU/05/28/M/000/0021

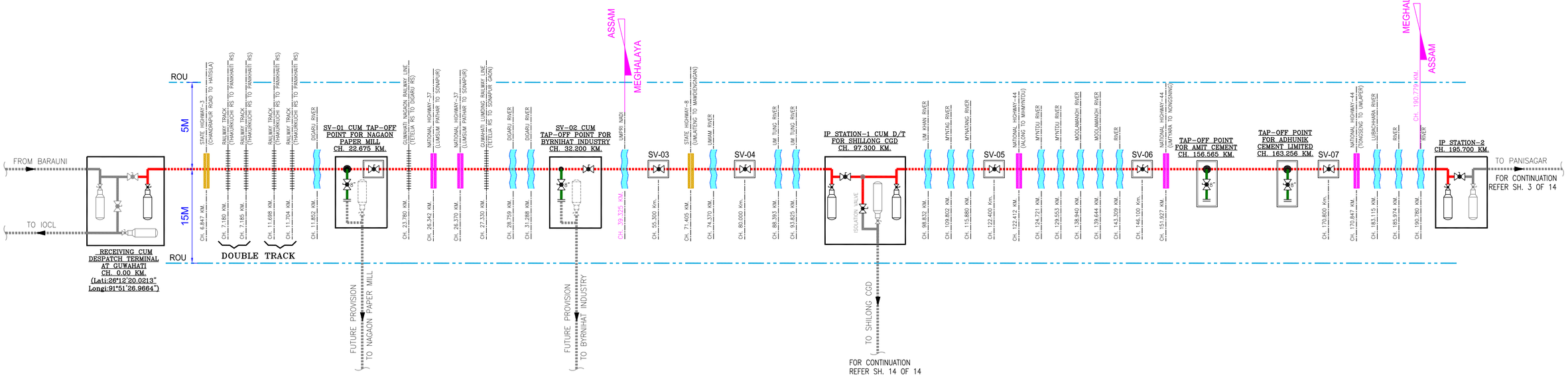
REV / SEC — CONCURRED BY

DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT
GUWAHATI - SILCHAR (IP-2) (PIPELINE SECTION-6) 18"x195.700 Km. △2



KEY PLAN (ROUTE MAP)



SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP STATION	SV STATION	TAP-OFF POINT/ INJECTION POINT
	MAIN LINE							
01	RECEIVING CUM DESPATCH TERMINAL AT GUWAHATI TO SILCHAR (IP-2)	18"	195.700 Km.	01	--	02	07	02/--

SL. NO.	DESCRIPTION	QUANTITY MAIN LINE
01	RAILWAY CROSSING	04 NOS.
02	NATIONAL/STATE HIGHWAY	05/02 NOS.
03	RIVER	18 NOS.
04	CANAL/ CHANNELS	39 NOS.
05	NALA/DRAIN	106 NOS.
06	MDR ROAD	01 NOS.
07	OTHER ROAD	49 NOS.
08	FOREST	25.888 Km.
09	POND	349.29 Mtr.
10	MARSHY LAND/WATER LOGGED AREA	2.004 Km.

LEGEND

- 18"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

FOR PLANNING PURPOSE

INDRADHANUSH GAS GRID LTD.

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NOTES :-

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REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
△2	11.09.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
IGGL MAIL DATED 03.09.2019	
MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL-NEGG-DFR-R0 DATED 30.08.2018

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM
GUWAHATI - SILCHAR (IP-2)
(PIPELINE SECTION-6)

SCALE : N.T.S | SH. 6 OF 14 | REV 2

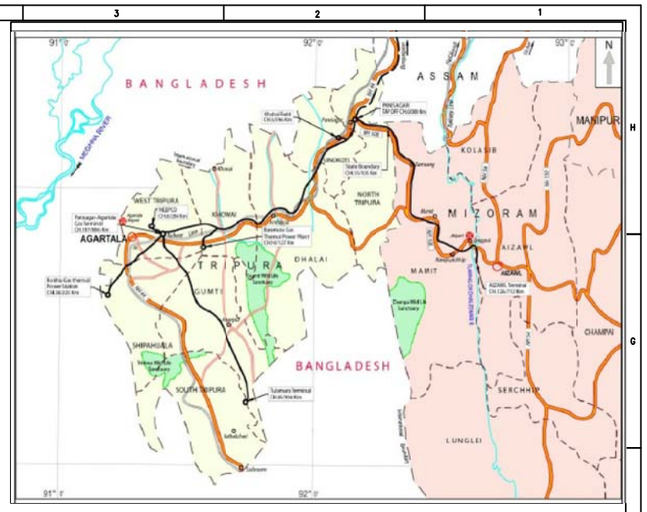
DRG. NO. MEC/23UU/05/28/M/000/0021

REV / SEC — CONCURRED BY

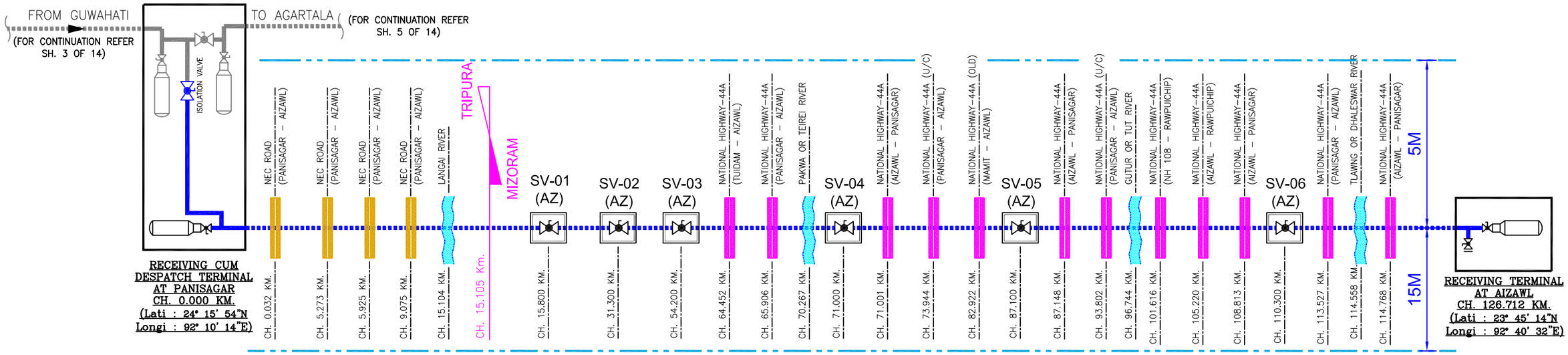
DRG. NO. MEC/23UU/06/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

PANISAGAR - AIZAWL (PIPELINE SECTION-7) LINE 12" x 126.712 Km. △3



KEY PLAN (ROUTE MAP)



SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP	SV	TAP-OFF POINT/ INJECTION POINT
	FEEDER LINE							
01	RECEIVING CUM DESPATCH TERMINAL AT PANISAGAR TO RECEIVING TERMINAL AT AIZAWL	12" △3	126.712 Km.	01	01	--	06	--/--

SL. NO.	DESCRIPTION	QUANTITY
01	RAILWAY CROSSING	--
02	NATIONAL/STATE HIGHWAY	12/04 NOS.
03	RIVER	04 NOS.
04	CANAL/ CHANNELS	--
05	NALA/DRAIN	57 NOS.
06	MDR ROAD	07 NOS.
07	OTHER ROAD	72 NOS.
08	FOREST	23.840 Km.
09	POND	95.81 Mtr.
10	MARSHY LAND/WATER LOGGED AREA	--

LEGEND

- 12"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

FOR PLANNING PURPOSE

INDRADHANUSH GAS GRID LTD.

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NOTES :-

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REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
△3	04.12.20	REVISED AS PER IGGL EMAIL DTD. 11.11.2020	K.P.	H.K.
△2	11.09.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	R.R.	A.A.
△1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" AS PER PROJECT Email Dtd. 13.03.20	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
IGGL MAIL DATED 03.09.2019	
MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL-NEGG-DFR-R0 DATED 30.08.2018

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM PANISAGAR – AIZAWL (PIPELINE SECTION-7)

SCALE : N.T.S | SH. 7 OF 14 | REV 3

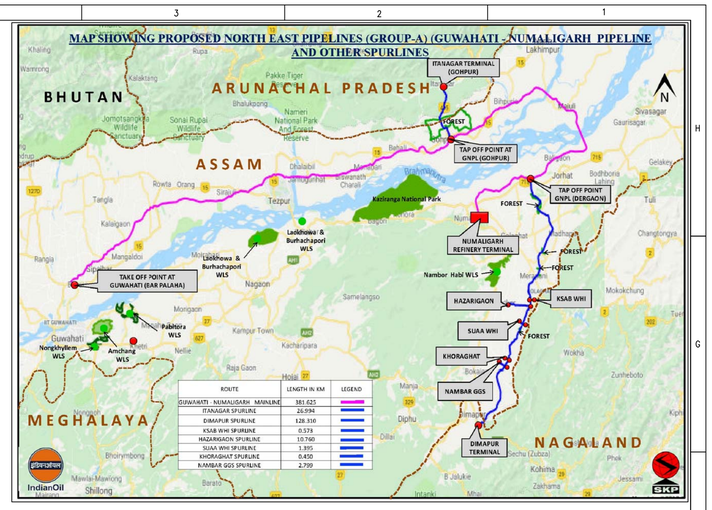
DRG. NO. MEC/23UU/05/28/M/000/0021

CONCURRED BY

DRG. NO. MEC/23UU/05/28/M/000/0021

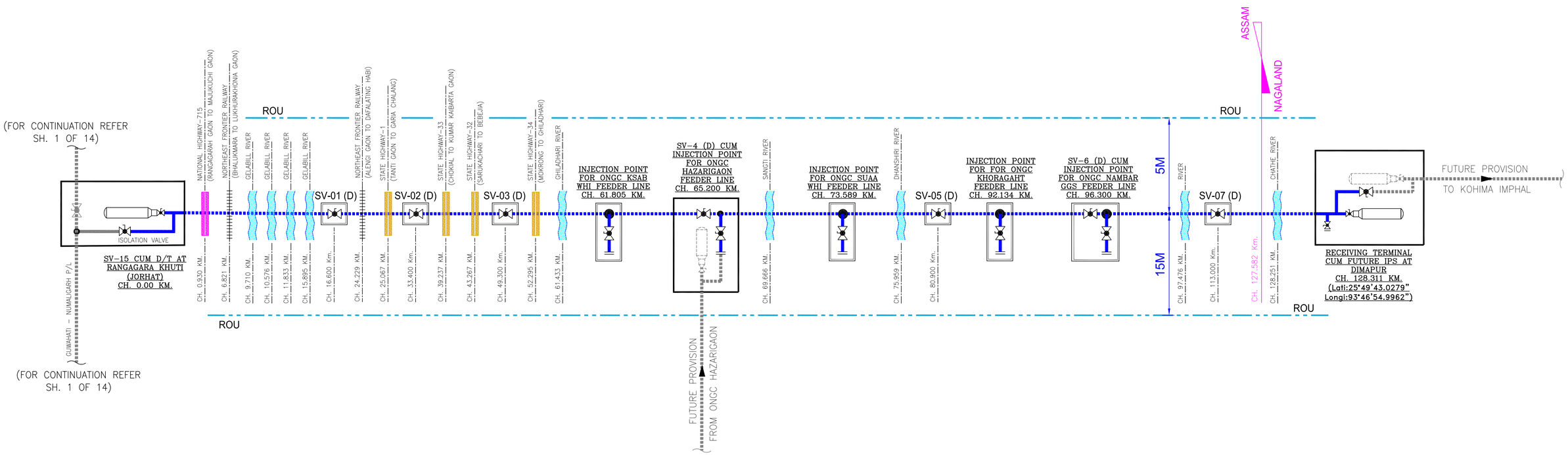
SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

DERGAON - DIMAPUR **(PIPELINE SECTION-8)** 12"x128.311 Km.△2



ROUTE	LENGTH IN KM	LEGEND
GUWAHATI - NUMALIGARH MAINLINE	381.625	
ITANAGAR SPURLINE	28.994	
DIMAPUR SPURLINE	128.310	
KSAB WHI SPURLINE	0.579	
HAZARIGAON SPURLINE	10.760	
SUAA WHI SPURLINE	1.895	
KHORAGHAT SPURLINE	0.450	
NAMBAR GGS SPURLINE	2.799	

KEY PLAN (ROUTE MAP) GROUP-A



SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP STATION	SV STATION	TAP-OFF/ INJECTION POINT
01	SV-15 CUM D/T AT RANGAGARA KHUTI (JORHAT) TO RECEIVING TERMINAL AT DIMAPUR	12"	128.311 Km.	01	01	--	07	--/03

SL. NO.	DESCRIPTION	QUANTITY
01	RAILWAY CROSSING	02 NOS.
02	NATIONAL/STATE HIGHWAY	01/04 NOS.
03	RIVER	09 NOS.
04	CANAL/ CHANNELS	48 NOS.
05	NALA/DRAIN	44 NOS.
06	MDR ROAD	--
07	OTHER ROAD	41 NOS.
08	FOREST	79.528 Km.
09	POND	487.98 Mtr.
10	MARSHY LAND/WATER LOGGED AREA	733.74 Mtr.

LEGEND

- 12"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

FOR PLANNING PURPOSE

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NOTES :-

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REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
△2	11.09.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	KRISHNA	HEMANT

REVISION

REFERENCES	DOC NO./DRG. NO.
IGGL MAIL DATED 03.09.2019	
MOM DATED 09.05.2019	
DETAILED ENGG. SURVEY REPORT	
DFR	IOCL-NEGG-DFR-R0 DATED 30.08.2018

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM
DERGAON - DIMAPUR
(PIPELINE SECTION-8)

SCALE : N.T.S | SH. 8 OF 14 | REV 2

DRG. NO. MEC/23UU/05/28/M/000/0021

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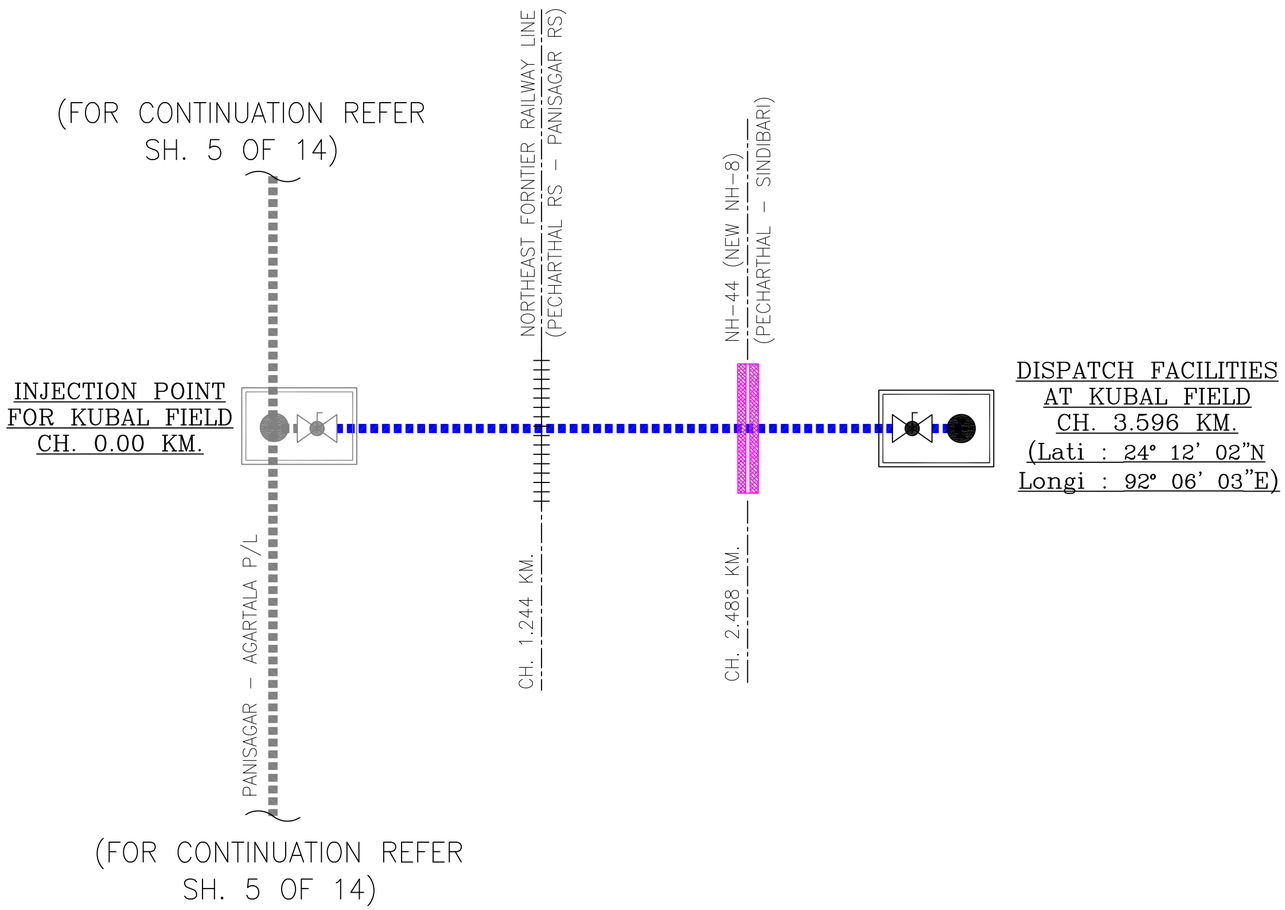
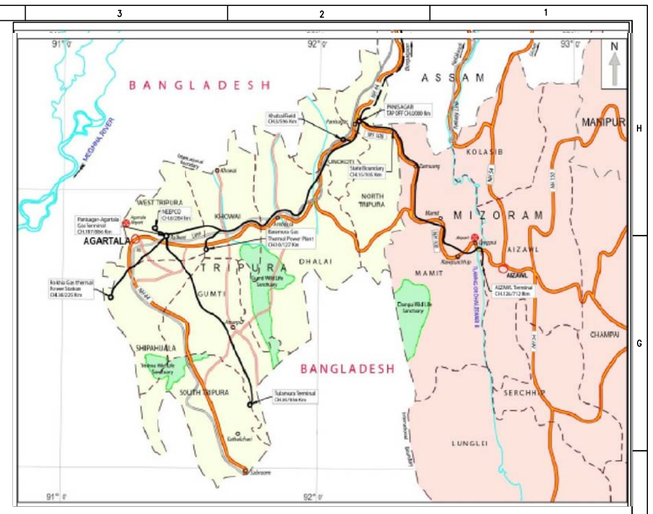
DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

KUBAL FIELD 12" x 3.596 Km. SPURLINE





KEY PLAN (ROUTE MAP)

LEGEND

12"Ø PROPOSED PIPELINE	RT : RECEIVING TERMINAL DT : DESPATCH TERMINAL TOP : TAP-OFF POINT IP : INTERMEDIATE PIGGING STATION SV: SECTIONALISING VALVE STATION

SL. NO.	DESCRIPTION	QUANTITY
01	RAILWAY CROSSING	01 NOS.
02	NATIONAL/STATE HIGHWAY	01/-- NOS.
03	RIVER	--
04	CANAL/ CHANNELS	--
05	NALA/DRAIN	11 NOS.
06	MDR ROAD	--
07	OTHER ROAD	05 NOS.
08	FOREST	--
09	MARSHY LAND / WATER LOGGED AREA / POND	13.03 M.

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP	SV	TAP-OFF POINT/ INJECTION POINT
	FEEDER LINE							
01	INJECTION POINT FOR KUBAL FIELD TO DISPATCH FACILITIES AT KUBAL FIELD	12"	3.596 Km.	01	--	--	--	--/01

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REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
2	07.07.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	R.R.	A.A.
1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" AS PER PROJECT Email Dtd. 13.03.20	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM KUBAL FIELD SPURLINE (SECTION-9)

SCALE : N.T.S | SH. 9 OF 14 | REV 2

DRG. NO. MEC/23UU/05/28/M/000/0021

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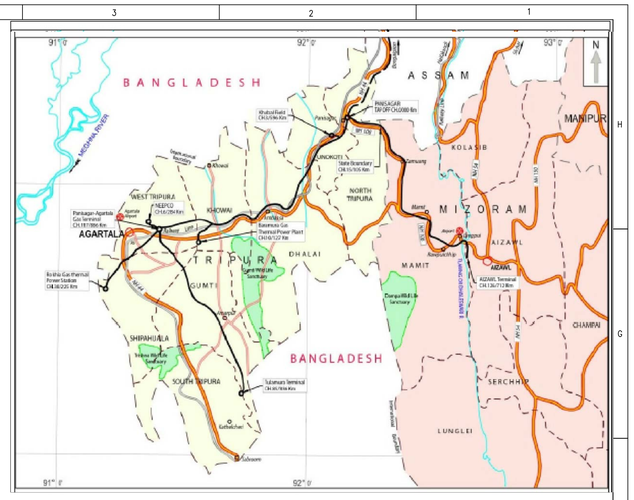
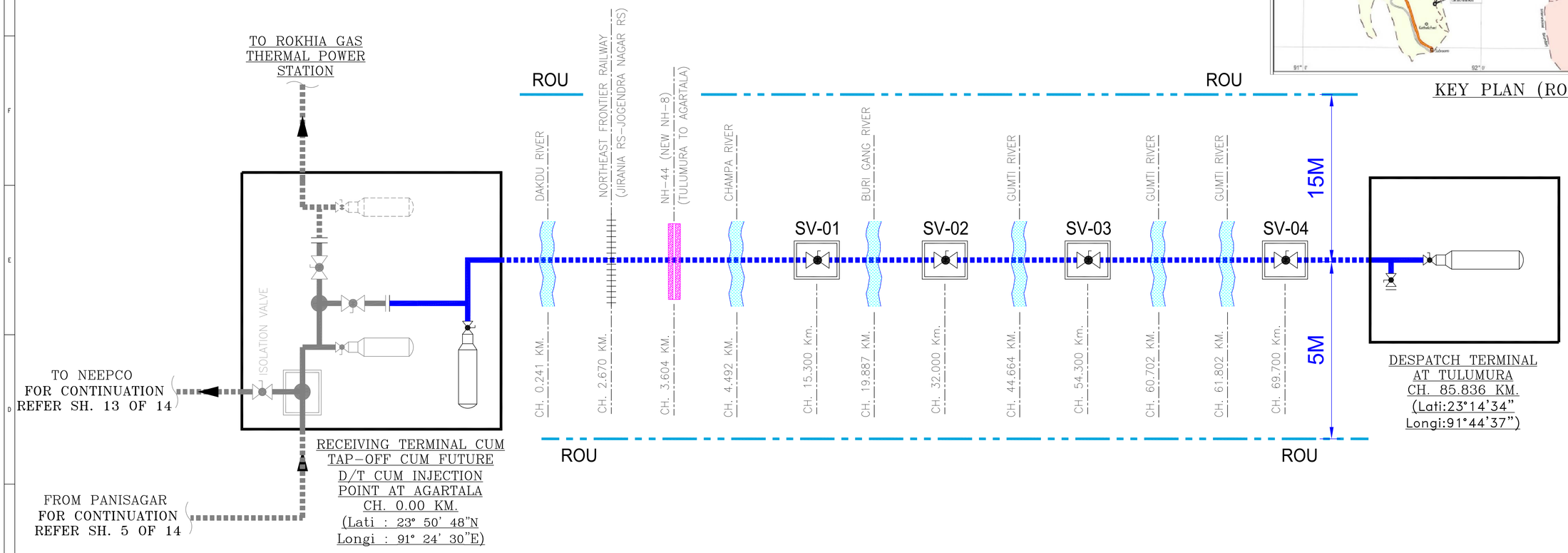
SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

AGARTALA - TULUMURA FEEDER LINE (PIPELINE SECTION-12) LINE *12" x 85.836 Km. △3



KEY PLAN (ROUTE MAP)



SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP	SV	TAP-OFF POINT/ INJECTION POINT
	FEEDER LINE							
01	AGARTALA-TULUMURA FEEDER LINE	*12"	85.836 Km.	01	01	--	04	--/--

SL. NO.	DESCRIPTION	QUANTITY
01	RAILWAY CROSSING	01
02	NATIONAL/STATE HIGHWAY	01/-- NOS.
03	RIVER	06 NOS.
04	CANAL/ CHANNELS	--
05	NALA/DRAIN	26 NOS.
06	MDR ROAD	--
07	OTHER ROAD	65 NOS.
08	FOREST	7.570 Km.
09	POND	116.77 Mtr.
10	MARSHY LAND/WATER LOGGED AREA	13.76 Mtr.

LEGEND

- 12"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

FOR PLANNING PURPOSE

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2. * SIZE OF FEEDER LINE IS NOT INDICATED IN DFR. THE SAME TO BE CONFIRMED BY IGGL.

REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
2	11.09.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	KRISHNA	HEMANT

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APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM AGARTALA - TULUMURA FEEDER LINE (PIPELINE SECTION-12)

SCALE : N.T.S | SH. 12 OF 14 | REV 2

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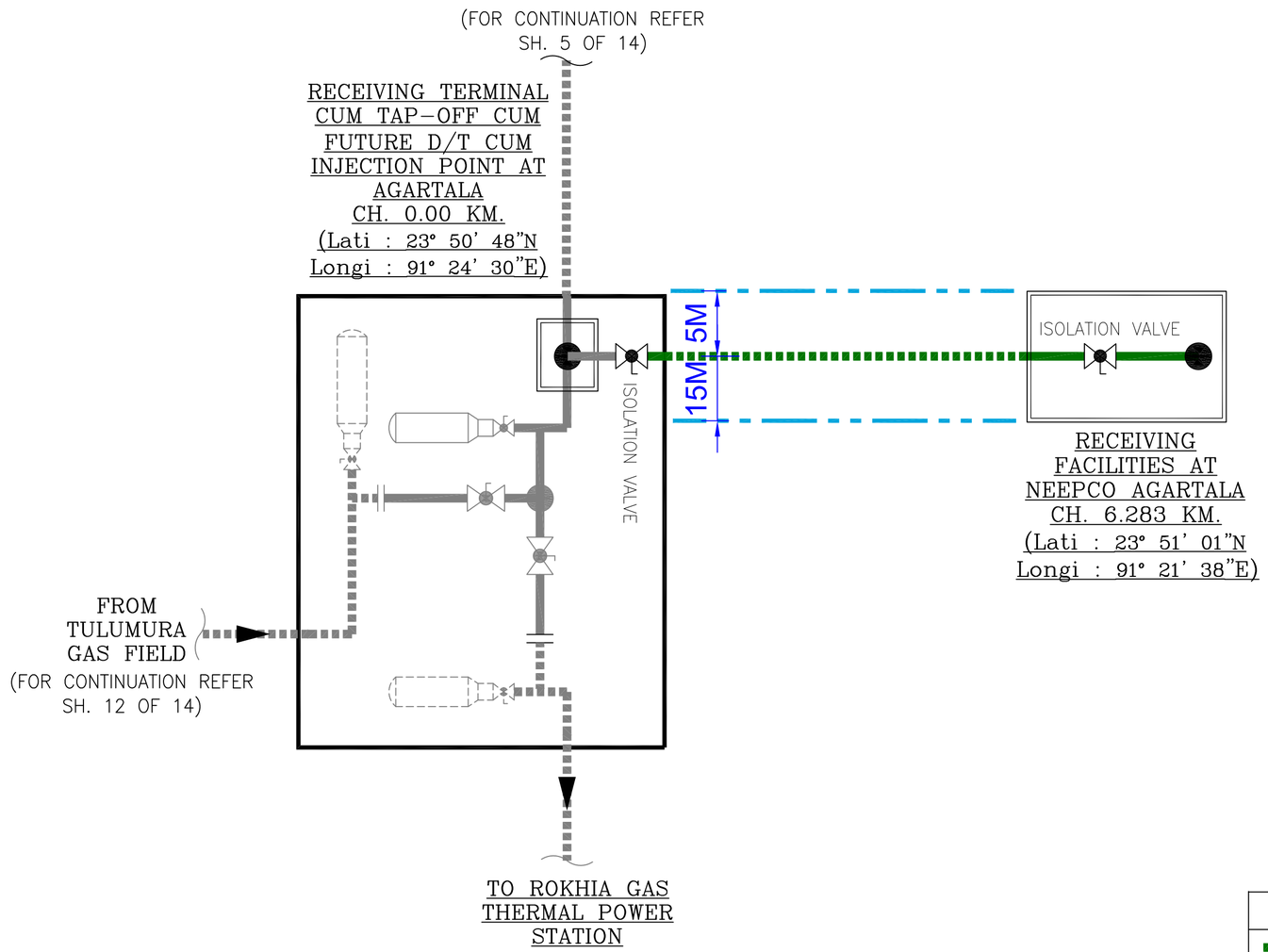
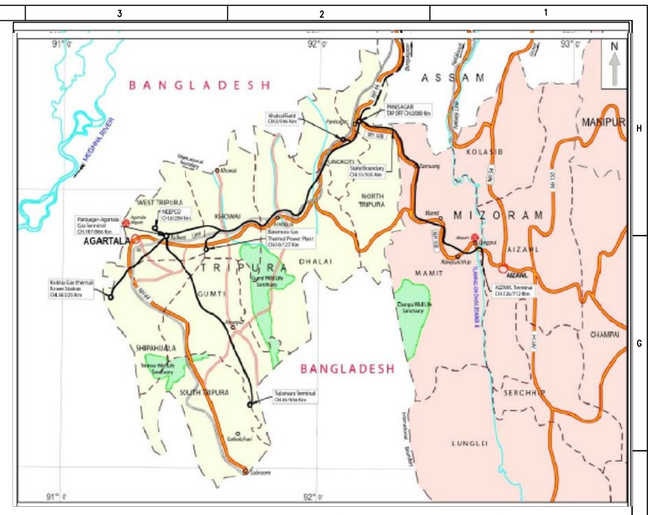
DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT

AGARTALA - NEEPCO (PIPELINE SECTION-13) LINE 8" x 6.283 Km. △2





KEY PLAN (ROUTE MAP)

SL. NO.	DESCRIPTION	QUANTITY
01	RAILWAY CROSSING	-- NOS.
02	NATIONAL/STATE HIGHWAY	--/-- NOS.
03	RIVER	--
04	CANAL/ CHANNELS	--
05	NALA/DRAIN	03 NOS.
06	MDR ROAD	--
07	OTHER ROAD	06 NOS.
08	FOREST	--
09	POND	20.47 Mtr.
10	MARSHY LAND/WATER LOGGED AREA	--

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP	SV	TAP-OFF POINT/ INJECTION POINT
	FEEDER LINE							
01	AGARTALA TO NEEPCO	8"	6.283 Km.	--	01	--	--	--/--

LEGEND

- 8"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

FOR PLANNING PURPOSE

INDRADHANUSH GAS GRID LTD.

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△2	11.09.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	R.R.	A.A.
△1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" AS PER PROJECT Email Dtd. 13.03.20	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
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LOCATION	DELHI
DESIGNED	KRISHNA
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CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM
AGARTALA - NEEPCO
(PIPELINE SECTION-13)

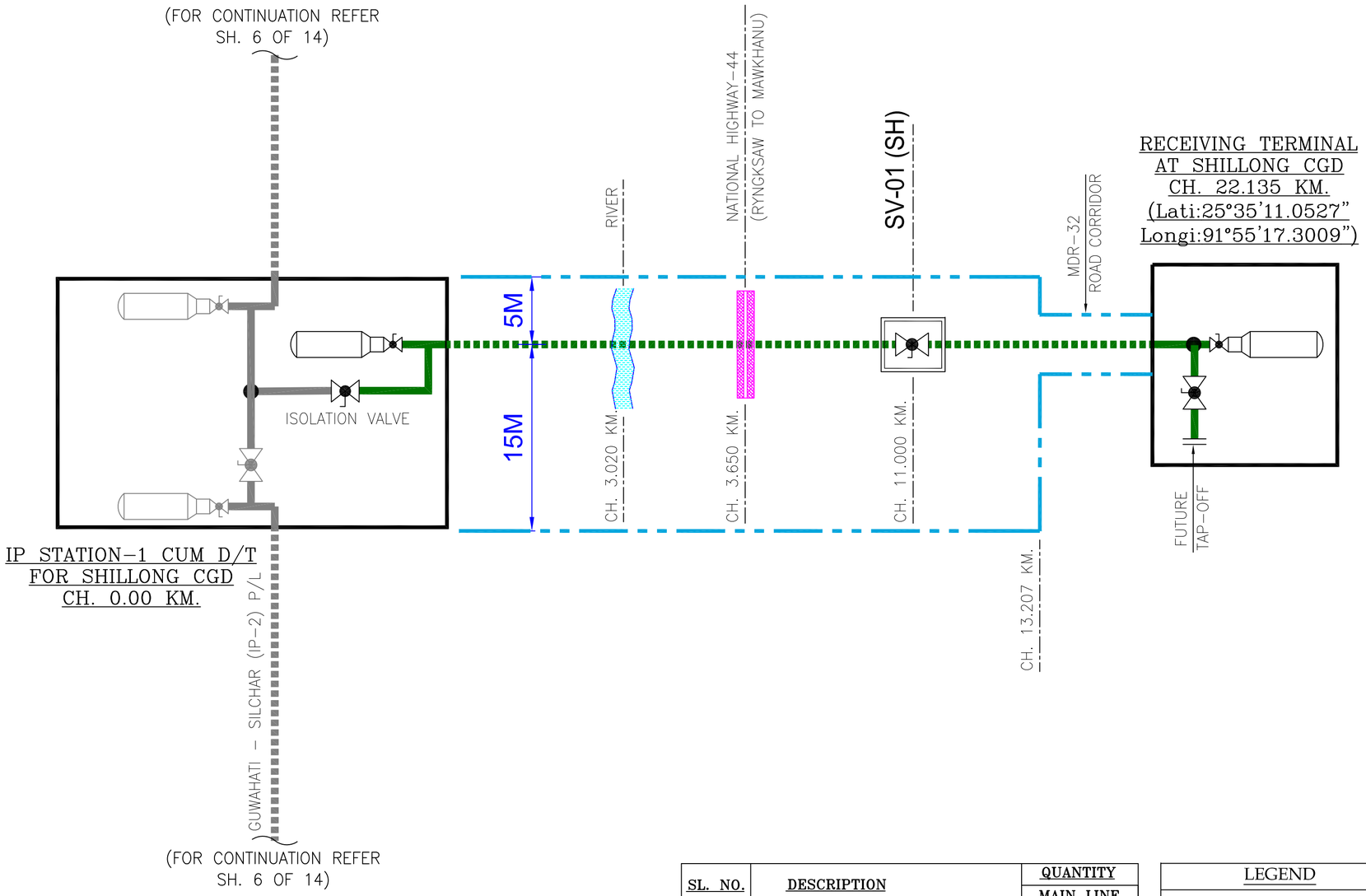
SCALE : N.T.S | SH. 13 OF 14 | REV 2

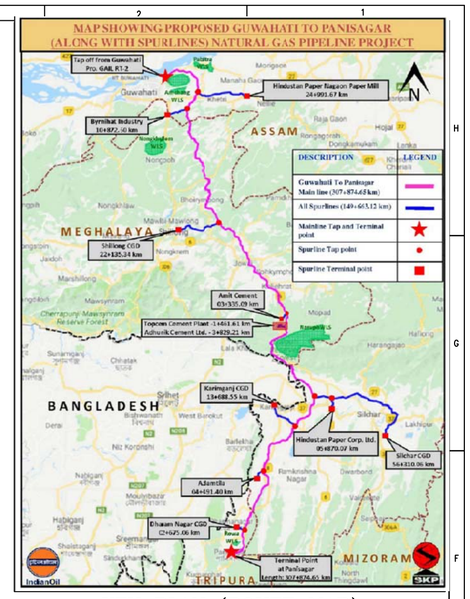
DRG. NO. MEC/23UU/05/28/M/000/0021

CONCURRED BY

DRG. NO. MEC/23UU/05/28/M/000/0021

SCHEMATIC ROUTE DIAGRAM FOR NORTH - EAST GAS GRID PIPELINE PROJECT
SHILLONG CGD (PIPELINE SECTION-14) 8"x22.135 Km. △2





KEY PLAN (ROUTE MAP)

SL. NO.	DESCRIPTION	SIZE	LENGTH	DT	RT	IP STATION	SV STATION	TAP-OFF POINT/ INJECTION POINT
	MAIN LINE							
01	IP-1 CUM DESPATCH TERMINAL TO RECEIVING TERMINAL AT SHOLLONG CGD	8"	22.135 Km.	--	01	01	01	--/--

SL. NO.	DESCRIPTION	QUANTITY MAIN LINE
01	RAILWAY CROSSING	--
02	NATIONAL/STATE HIGHWAY	01/-- NOS.
03	RIVER	01 NOS.
04	CANAL/ CHANNELS	01 NOS.
05	NALA/DRAIN	02 NOS.
06	MDR ROAD	04 NOS.
07	OTHER ROAD	25 NOS.
08	FOREST	--
09	POND	--
10	MARSHY LAND/WATER LOGGED AREA	--

LEGEND

- 8"Ø PROPOSED PIPELINE
- RIVER
- NATIONAL HIGHWAY
- STATE HIGHWAY
- RAILWAY LINE

RT : RECEIVING TERMINAL
DT : DESPATCH TERMINAL
TOP : TAP-OFF POINT
IP : INTERMEDIATE PIGGING STATION
SV: SECTIONALISING VALVE STATION

FOR PLANNING PURPOSE

NOTES :-

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REV. NO.	DATE	DESCRIPTION	BY	VERIFIED
△2	11.09.20	REVISED AS PER IGGL REQUIREMENT VIDE EMAIL DTD. 15.06.2020	KRISHNA	HEMANT
△1	13.03.20	LINE PIPE DIAMETER CHANGED FROM 12" TO 8" AS PER PROJECT Email Dtd. 13.03.20	R.R.	A.A.

REVISION

REFERENCES	DOC NO./DRG. NO.
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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	KRISHNA
DRAWN	SUNIL
CHECKED AND VERIFIED	HEMANT
APPROVED	SIG (A.GANGAL)
	DATE 09.10.19

NORTH - EAST GAS GRID PIPELINE PROJECT

PIPELINE SCHEMATIC ROUTE DIAGRAM SHILLONG CGD (PIPELINE SECTION-14)

SCALE : N.T.S | SH. 14 OF 14 | REV 2

DRG. NO. MEC/23UU/05/28/M/000/0021

DRG. NO. MEC/23UU/05/28/M/000/0001

SYMBOLS & ABBREVIATIONS

SYMBOLS

- VP–PLUG VALVE
- VB–BALL VALVE WELDED END
- VB–BALL VALVE FLANGED END
- GATE VALVE
- GV–GLOBE VALVE
- PRESSURE RELIEF OR SAFETY VALVE (PSV)
- PRESSURE REGULATING VALVE (PCV) (SELF ACTUATING TYPE)
- NON RETURN VALVE
- CONTROL VALVE WITH SLAM SHUT–OFF VALVE
- SOLENOID VALVE
- GAS ACTUATED ISOLATION VALVE
- GAS ACTUATED ISOLATION VALVE WITH HANDWHEEL
- REDUCER
- FLANGE
- FLAME ARRESTOR (FA)
- RTU — REMOTE TERMINAL UNIT
- DIAPHRAM
- XXLS — PIG SIGNALLER
- VENT
- SPECTACLE BLIND

SYMBOLS

- PD METER
- TURBINE METER
- INSULATION JOINT (IJ)
- FLOW TEE (FWT)
- FIELD MOUNTED INSTRUMENT
- CONTROL PANEL MOUNTED INSTRUMENT
- ULTRASONIC METER
- SCADA INDICATOR, CONTROLLER OR OTHER DEVICES WITH OPERATOR ACCESS TO ADJUSTMENT.

ABBREVIATIONS

AE	ANALYZER SENSOR (GAS CHROMATOGRAPH)
AI	ANALYZER INDICATOR
AT	ANALYZER TRANSMITTER
FY	FLOW COMPUTER
FQI	FLOW TOTALIZER & INDICATOR
LG	LEVEL GAUGE
ZSH/ZSL	LIMIT SWITCHES (OPEN/CLOSE)
TI/TG	TEMPERATURE INDICATOR/ GAUGE
TE	TEMPERATURE ELEMENT
TW	THERMOWELL
DPI/DPG	DIFF. PRESSURE INDICATOR/ GAUGE
DPT	DIFF. PRESSURE TRANSMITTER
PI/PG	PRESSURE INDICATOR/ GAUGE
PT	PRESSURE TRANSMITTER
FC/FO	FAILURE TO CLOSE/OPEN
LO	LOCK OPEN
FIC/PIC	FLOW/PRESS. INDICATING CONTROLLER
I	INTERLOCK
XRL	LOCAL/REMOTE INDICATION
XSL	LOCAL/REMOTE SWITCH
HSH	HAND SWITCH HIGH
HSL	HAND SWITCH LOW
FT	FLOW TRANSMITTER
FE	FLOW ELEMENT
Q.O.E.C.	QUICK OPENING END CLOSURE

ABBREVIATIONS

TT	TEMP TRANSMITTER
FR	FLOW RECORDER
PIR	PRESSURE IND.RECORDER
TIR	TEMP. IND. RECORDER
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LAH	LEVEL ALARM HIGH
LAL	LEVEL ALARM LOW
D	CONDENSATE DRAIN
A1A/B1A	150#/300# RATING
C1A/D1A	400#/600# RATING
LX/PX	PNEUMATIC/ ELECTRIC SIGNAL TRANSMITTER
FB	FULL BORE
SP	SAMPLER
NG	NATURAL GAS
V	VENT
AS	AUTO SAMPLER
CP	CORROSION PROBE
CC	CORROSION COUPON
AV	ACTUATED VALVE
SDV	SHUT DOWN VALVE
LV	LEVEL CONTROL VALVE
PV/PCV	PRESSURE CONTROL VALVE
FCV	FLOW CONTROL VALVE

00”–FLUID–00–00–A1A/B1A/C1A/D1A/D4A

- MATERIAL SPEC.
- LINE NO.
- UNIT NO.
- (P–NATURAL GAS)
- LINE SIZE (NOMINAL)

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SECTION	OIL & GAS
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	DATE

NORTH EAST GAS GRID (PHASE–II P/L SECTION)

LEGEND / DRAWING SYMBOLS

SCALE : NTS | SHEET 1 OF 2 | REV 0

DRG. NO. MEC/23UU/05/28/M/000/0001

SECTION–14

REV	INST.
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SYMBOLS & ABBREVIATIONS

SYMBOLS

- SHUT-OFF VALVE, GENERAL
- SAFETY SHUT-OFF VALVE
- CONTINIUOUS-ACTION VALVE
- RIGHT-ANGLE SHUT-OFF VALVE, GENERAL
- THREE-WAY VALVE, GENERAL
- FOUR-WAY VALVE, GENERAL
- NEEDLE VALVE
- PUSHBUTTON VALVE
- CHECK VALVE (SPRING TYPE)
- NON RETURN VALVE (SWING TYPE)
- BUTTERFLY VALVE
- CONTINUOUSLY VARIABLE BORE BUTTERFLY VALVE
- LOUVRE
- SEPERATOR GENERAL
- 2 STAGE SEPERATOR
- CYCLONE SEPERATOR
- CONDENSATE TRAP
- FLOWMETER GENERAL
- METER GENERAL
- TURBINE METER
- VORTEX-SHEDDING FLOWMETER
- DIAPHRAGM METER
- MANUALLY OPERATED ACTUATOR, GENERAL
- DIAPHRAGM ACTUATOR
- PISTON ACTUATOR
- ELECTROMAGNETIC ACTUATOR
- HYDRAULIC OR PNEUMATIC ACTUATOR, GENERAL

SYMBOLS

- SPRING-OPERATED ACTUATOR
- AUTOMATICALLY OPERATED ACTUATOR, GENERAL
- ELECTRIC MOTOR-OPERATED ACTUATOR, GENERAL
- VALVE CLOSED ON FAILURE OF ACTUATING ENERGY
- VALVE OPENED ON FAILURE OF ACTUATING ENERGY
- VALVE RETAINS POSITION ON FAILURE OF ACTUATING ENERGY
- TURBINE, GENERAL
- COMPRESSOR, GENERAL
- ROTARY PISTON COMPRESSOR
- PISTON COMPRESSOR
- JET BOOSTER
- FAN, GENERAL
- HEAT EXCHANGER WITHOUT COUNTERFLOW
- COUNTERFLOW HEAT EXCHANGER
- PLATE HEAT EXCHANGER
- FINNED HEAT EXCHANGER WITH VENTILATOR
- BLIND PLATE
- "FIGURE 8" PLATE, BLIND PLATE IN FUNCTION
- "FIGURE 8" PLATE, GOGGLE PLATE IN FUNCTION
- ORIFICE PLATE
- INSULATING FLANGE
- INSULATING COUPLING
- STRAIGHTENING VANES
- RUPTURE DISK
- SIGHT GLASS. GENRAL
- EXPANSION JOINT
- SILENCER
- PULSATION DAMPENER
- MIXING NOZZLE
- CAP
- FLANGE CONNECTION

SYMBOLS

- FILTER, GENERAL
- GAS FILTER, GENERAL
- CARTRIDGE FILTER
- GAS SORPTION FILTER
- LIQUID FILTER, GENERAL
- "Y" TYPE STRAINER
- PRESSURE REDUCING VALVE, IN AUXILIARY AND CONTRAL FACILITIES
- PRESSURE CONTROL VALVE, GENERAL
- PROCESS PRIMARY LINE
- PROCESS SECONDARY LINE
- ELECTRIC LINE
- PNEUMATIC LINE
- CAPILLARY LINE
- INSTRUMENT LINE
- HEAT TRACING LINE
- JACKETED LINE
- JACKETED & HEATED LINE
- VENT STACK
- SCRAPPER TRAP
- LIQUID PUMP GENERAL
- CENTRIFUGAL PUMP
- LIQUID RING PUMP
- PISTON PUMP
- DIAPHRAGM PUMP
- CP — CORROSION PROBE
- CC — CORROSION COUPON

ABBREVIATIONS

ESD	EMERGRNCY SHUT-DOWN
EW	DRAIN
GCV	GAS-OPERATED CONTROL VALVE
GOV	GAS-OVER OIL OPERATED VALVE
HOV	HYDRAULIC-OPERATED VALVE
LC	LOCKED CLOSED
LO	LOCKED OPEN
LP	LOCKED POSITION
LPT	LOW POINT
MCV	MOTOR CONTROL VALVE
MH	MANHOLE
MOV	MOTOR-OPERATED VALVE
SV	SOLENOID VALVE
PCV	PRESSURE CONTROL VALVE
SAV SSV	SAFETY SHUT-OFF VALVE
SBV PRV	PRESSURE RELIFE VALVE
SP	SETPOINT
TE	THERMOCOUPLE
TW	THERMOWELL
NRV	NON-RETURN VALVE
CV	CHECK VALVE
FCV	FLOW CONTROL VALVE
PGS	POWER GAS SUPPLY
IAS	INTRUMENT AIR SUPPLY
NC	NORMAL CLOSED
NO	NORMAL OPEN

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NORTH EAST GAS GRID (PHASE-II P/L SECTION)

LEGEND / DRAWING SYMBOLS

SCALE : NTS | SHEET | REV

DRG. NO. MEC/23UU/05/28/M/000/0001 | 2 OF 2 | 0

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SECTION-14

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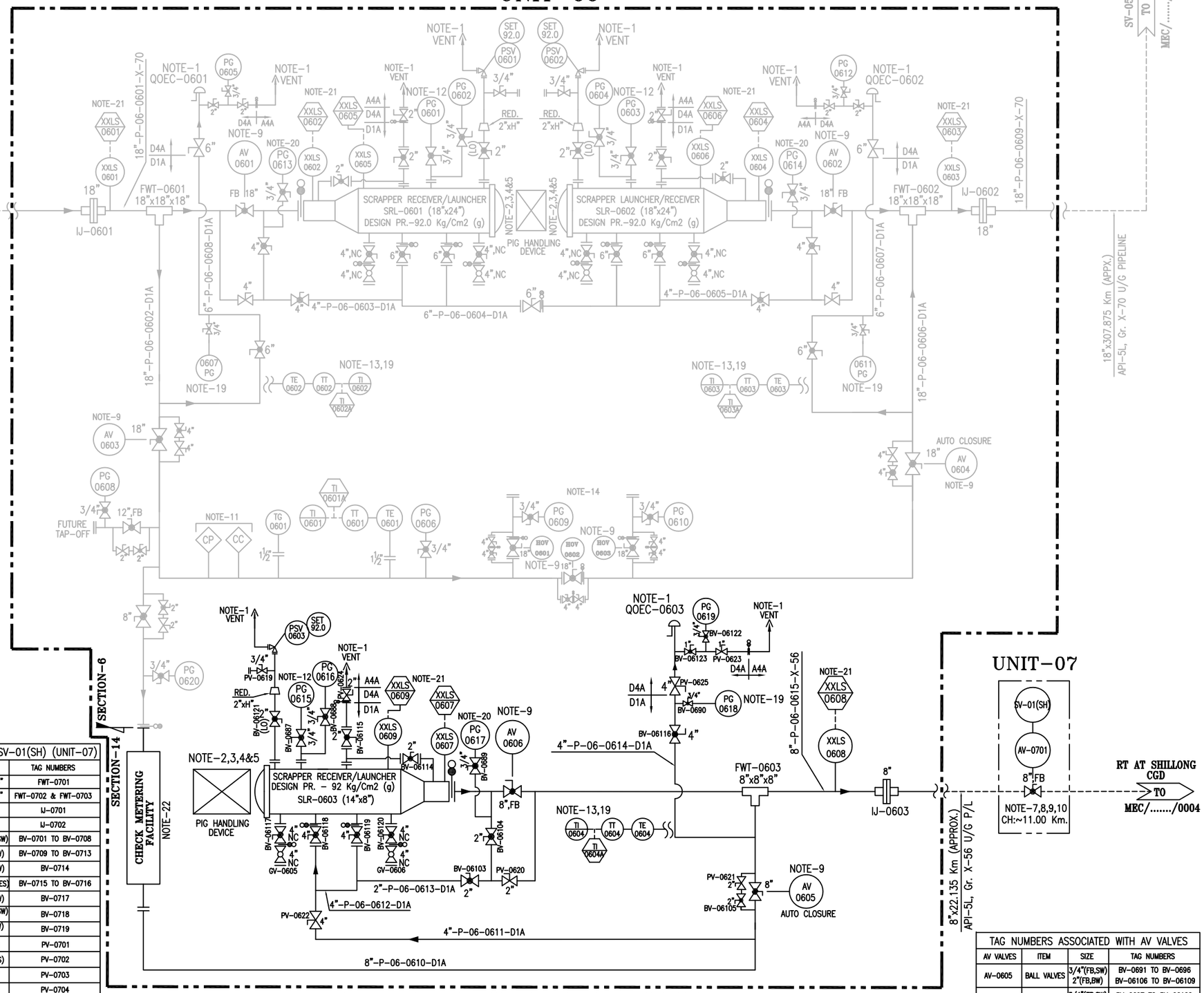
UNIT–06



INTERMEDIATE PIGGING STATION–1 CUM DT FOR SHILLONG CGD (CH. 97.30 KMS. (APPROX) FROM DT AT GUWAHATI)

TAG NOS. FOR SV–01(SH) (UNIT–07)		
ITEM	SIZE	TAG NUMBERS
FLOW TEE	8"X8"X8"	FWT–0701
FLOW TEE	8"X8"X6"	FWT–0702 & FWT–0703
IJ	8"	IJ–0701
IJ	4"	IJ–0702
BALL VALVE	3/4"(FB,SW)	BV–0701 TO BV–0708
BALL VALVE	2"(FB,BW)	BV–0709 TO BV–0713
BALL VALVE	4"(RB,BW)	BV–0714
BALL VALVE	4"(RB,BW,ES)	BV–0715 TO BV–0716
BALL VALVE	8"(FB,BW)	BV–0717
BALL VALVE	3/4"(FB,SW) LTCS	BV–0718
BALL VALVE	1"(FB,SW) LTCS	BV–0719
PLUG VALVE	2"(BW)	PV–0701
PLUG VALVE	4"(BW,ES)	PV–0702
PLUG VALVE	1"(SW) LTCS	PV–0703
PLUG VALVE	4"(SW) LTCS	PV–0704
QOEC	4" LTCS	QOEC–0701

TAG NUMBERS ASSOCIATED WITH AV VALVES			
AV VALVES	ITEM	SIZE	TAG NUMBERS
AV–0605	BALL VALVES	3/4"(FB,SW) 2"(FB,BW)	BV–0691 TO BV–0696 BV–06106 TO BV–06109
AV–0606	BALL VALVES	3/4"(FB,SW) 2"(FB,BW)	BV–0697 TO BV–06102 BV–06110 TO BV–06113

NOTES:

1. ALL VENTS SHALL BE LOCATED MIN. HEIGHT OF 3 MTR. ABOVE THE HIGHEST OPERATING LEVEL.
2. SCRAPPER LAUNCHER/RECEIVER SHALL HAVE SCRAPPER HANDLING FACILITY.
3. SCRAPPER LAUNCHER/RECEIVER SHALL BE SUITABLE FOR HANDLING INTELLIGENT PIGS.
4. SCRAPPER LAUNCHER/RECEIVER SHALL HAVE QUICK OPPENING CLOSURE.
5. SCRAPPER DOOR MECHANISM TO BE CONSTRUCTED SUCH THAT THE DOOR CAN NOT BE OPENED UNLESS SCRAPPER TRAP IS FULLY DEPRESSURISED.
6. GAS DETECTORS TO BE PROVIDED NEAR FILTERS, FLOW METERS & SCRAPPER TRAPS. SIGNAL FROM GAS DETECTOR TO BE TAKEN IN CONTROL ROOM.
7. ALL SV ARE EXTENDED STEM, BUTT WELDED END WITH FULLY WELDED BODY & FULL BORE BALL VALVE.
8. BURRIED VALVE SHALL BE PROVIDED WITH CORROSION PROTECTION COATING.
9. FOR SV, HOV & AV DETAIL REFER DRG. NO. MEC/23UU/05/28/M/002/0016, /0017.
10. LOCATION OF SV STATIONS AND THEIR CHAINAGES ARE AS PER PIPELINE SCHEMATIC ROUTE DIAGRAM. HOWEVER LOCATIONS OF SV MAY GET SLIGHTLY CHANGED AS PER AVAILABILITY OF PLOT TO M/s IGGL.
11. NOTE DELETED.
12. PG–0615 SHALL HAVE A RANGE OF 0–1 KG/CM2(g) WITH A GAUGE SAVER.
13. DIRECT SURFACE CONTACT TYPE.
14. NOTE DELETED.
15. ALL BALL VALVES WITH BUTT WELDED END SHALL HAVE FULLY WELDED BODY.
16. ALL HIGHEST POINT & LOWEST POINT OF THE STATION PIPING SHALL BE PROVIDED WITH VENT & DRAIN FACILITY & SAME SHALL BE TAKEN CARE DURING PREPARATION OF GAD.
17. NOTE DELETED.
18. SUPPORT SHALL BE PROVIDED BEFORE & AFTER MAINLINE IJ.
19. DEPRESSURIZATION VALVE SHALL BE LOCATED IN SUCH A WAY THAT PG–0618 & TI–0604 CAN BE READ DURING VENTING. 1" VALVE ON VENT LINE OF THE QOEC LINE SHALL BE APPROCHABLE FOR OPERATION.
20. PG–0617 SHALL HAVE A RANGE OF 0–5 KG/CM2(G) WITH A GAUGE SAVER & LEAST COUNT OF 0.1 KG/CM2(G).
21. ALL PIG SIGNALLER SHALL BE OF NON–INTRUSIVE TYPE.
22. CHECK METERING P&ID SHALL BE PROVIDED SEPARATELY. SAME SHALL BE BI–DIRECTIONAL.

PROCESS DATA

FLUID: NATURAL GAS(DRY)/RLNG
FLOW: – MMSCMD (APPX.)
OPER. PRESS.: – KG/CM2(G)
DESIGN PRESS.: 92 KG/CM2(G)
DESIGN CLASS: 600#

TEMPERATURE
WORKING : 0°–55° C
DESIGN : –29 TO 65°C

LINE LEGEND

- PROPOSED LINE A/G
- PROPOSED LINE U/G
- LINE A/G (OTHER'S SCOPE)
- LINE U/G (OTHER'S SCOPE)

18"–P–06–0601–D1A
8"–P–06–0601–D1A
- MATERIAL SPEC.
- LINE NO.
- UNIT NO.
- PROCESS FLUID (NG/RLNG)
- LINE SIZE (NOMINAL)

VALVE LEGEND

- BALL VALVE FLANGE END
- BALL VALVE BW END/UPTO 1 1/2" SW END.
- PLUG VALVE BW END/UPTO 1 1/2" SW END.
- PLUG VALVE FLANGE END
- GLOBE VALVE.

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REV	DATE	ZONE	DESCRIPTION	BY	VERIFIED		
2	18.12.20		GENERAL REVISION	UMAR	AKB		
1	18.03.20		AS PER REVISED SCHEMATIC/ GENERAL REVISION	RASHMI	AKB	PIPELINE SCHEMATIC ROUTE DIAGRAM	MEC/23UU/05/28/M/000/0021 , REV – 2, SHEET 14 OF 14
0	26.08.19		AS PER REVISED SCHEMATIC/ GENERAL REVISION	UMAR	AKB	REFERENCES	DRG.NO.
A	20.06.19		FOR COMMENT PURPOSE	UMAR	AKB		

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	INST.					
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SECTION–14

SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	UMAR
DRAWN	UMAR
CHECKED AND VERIFIED	AKB
APPROVED	SIG A. GANGAL
	DATE 18.12.20

NORTH EAST GAS GRID (PHASE–II P/L SECTION)

P&ID FOR SV–01(SH) & DISPATCH FACILITY FOR 8"x22.135 KMS. P/L TO SHILLONG CGD AT INTERMEDIATE PIGGING STATION–1

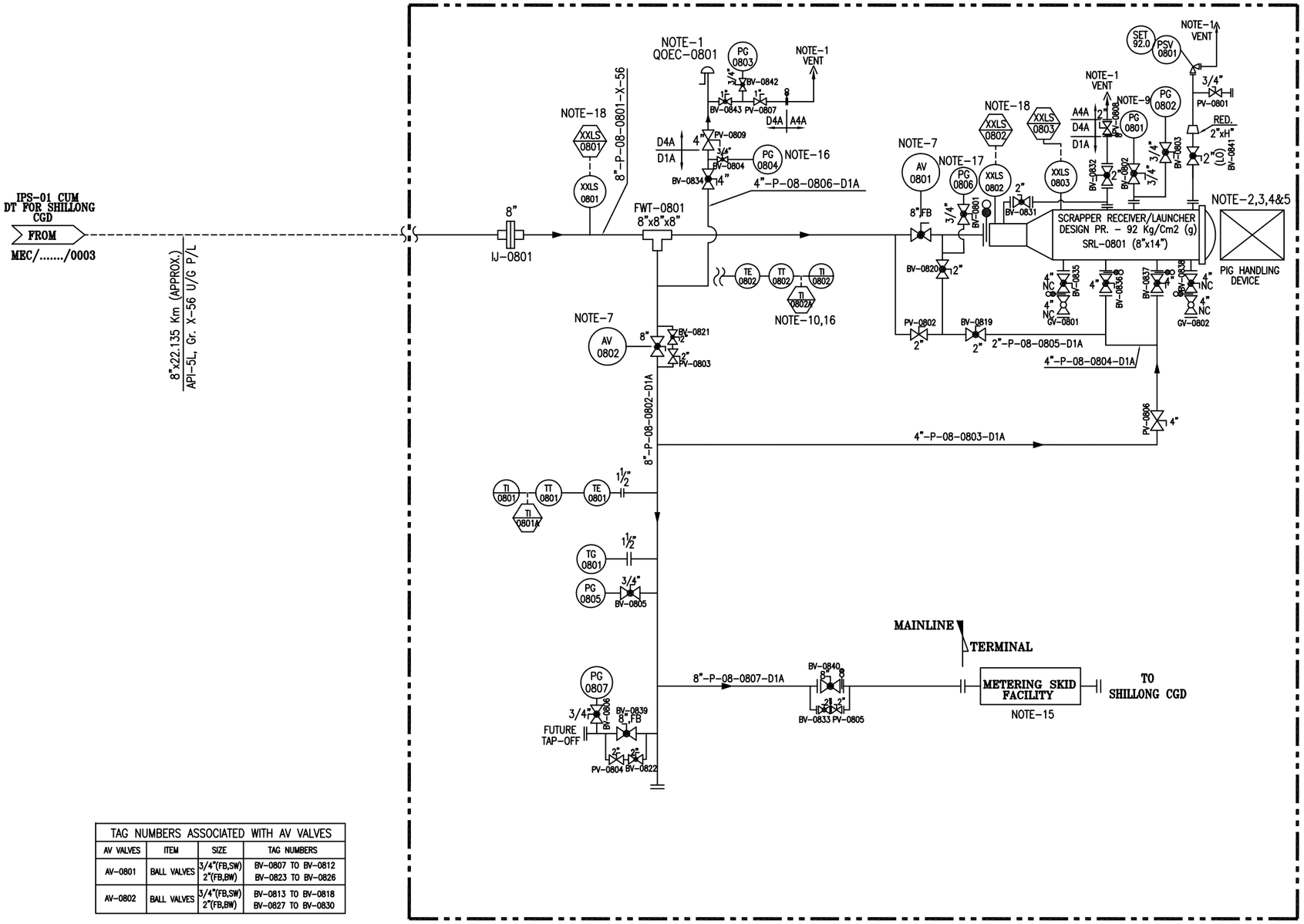
SCALE : NTS

DRG. NO. MEC/23UU/05/28/M/002/0003

REV 2

DRG. NO. MEC/23UU/05/28/M/002/0004

UNIT-08



RECEIVING TERMINAL AT SHILLONG CGD
(CH. ~22.135 KMS. FROM IPS-01 CUM DT FOR SHILLONG CGD)

TAG NUMBERS ASSOCIATED WITH AV VALVES			
AV VALVES	ITEM	SIZE	TAG NUMBERS
AV-0801	BALL VALVES	3/4"(FB,SW) 2"(FB,BW)	BV-0807 TO BV-0812 BV-0823 TO BV-0826
AV-0802	BALL VALVES	3/4"(FB,SW) 2"(FB,BW)	BV-0813 TO BV-0818 BV-0827 TO BV-0830

NOTES:

1. ALL VENTS SHALL BE LOCATED MIN. HEIGHT OF 3 MTR. ABOVE THE HIGHEST OPERATING LEVEL.
2. SCRAPPER LAUNCHER/RECEIVER SHALL HAVE SCRAPPER HANDLING FACILITY.
3. SCRAPPER LAUNCHER/RECEIVER SHALL BE SUITABLE FOR HANDLING INTELLIGENT PIGS.
4. SCRAPPER LAUNCHER/RECEIVER SHALL HAVE QUICK OPPENING CLOSURE.
5. SCRAPPER DOOR MECHANISM TO BE CONSTRUCTED SUCH THAT THE DOOR CAN NOT BE OPENED UNLESS SCRAPPER TRAP IS FULLY DEPRESSURISED.
6. GAS DETECTORS TO BE PROVIDED NEAR FILTERS, FLOW METERS & SCRAPPER TRAPS. SIGNAL FROM GAS DETECTOR TO BE TAKEN IN CONTROL ROOM.
7. FOR SV, HOV & AV DETAIL REFER DRG. NO. MEC/23UU/05/28/M/002/0016, /0017.
8. NOTE DELETED.
9. PG-0801 SHALL HAVE A RANGE OF 0-1 KG/CM2(g) WITH A GAUGE SAVER.
10. DIRECT SURFACE CONTACT TYPE.
11. ALL BALL VALVES WITH BUTT WELDED END SHALL HAVE FULLY WELDED BODY.
12. ALL HIGHEST POINT & LOWEST POINT OF THE STATION PIPING SHALL BE PROVIDED WITH VENT & DRAIN FACILITY & SAME SHALL BE TAKEN CARE DURING PREPARATION OF GAD.
13. NOTE DELETED.
14. SUPPORT SHALL BE PROVIDED BEFORE & AFTER MAINLINE IJ.
15. CUSTODY TRANSFER METERING SKID P&ID SHALL BE PROVIDED SEPARATELY.
16. DEPRESSURIZATION VALVE SHALL BE LOCATED IN SUCH A WAY THAT PG-0804 & TI-0802 CAN BE READ DURING VENTING. 1" VALVE ON VENT LINE OF THE QOEC LINE SHALL BE APPROCHABLE FOR OPERATION.
17. PG-0806 SHALL HAVE A RANGE OF 0-5 KG/CM2(G) WITH A GAUGE SAVER & LEAST COUNT OF 0.1 KG/CM2(G).
18. ALL PIG SIGNALLER SHALL BE OF NON-INTRUSIVE TYPE.

PROCESS DATA

FLUID: NATURAL GAS(DRY)/RLNG
FLOW: - MMSCMD (APPX.)
OPER. PRESS.: - KG/CM2(G)
DESIGN PRESS.: 92 KG/CM2(G)
DESIGN CLASS: 600#

TEMPERATURE
WORKING : 0°-55° C
DESIGN : -29 TO 65°C

LINE LEGEND

PROPOSED LINE A/G
PROPOSED LINE U/G

8"-P-08-0801-D1A
- MATERIAL SPEC.
- LINE NO.
- UNIT NO.
- PROCESS FLUID (NG/RLNG)
- LINE SIZE (NOMINAL)

VALVE LEGEND

BALL VALVE FLANGE END
BALL VALVE BW END/UPTO 1½" SW END.
PLUG VALVE BW END/UPTO 1½" SW END.
PLUG VALVE FLANGE END
GLOBE VALVE.

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2	18.12.20		GENERAL REVISION	UMAR	AKB
1	18.03.20		AS PER REVISED SCHEMATIC/ GENERAL REVISION	RASHMI	AKB
0	26.08.19		AS PER REVISED SCHEMATIC/ GENERAL REVISION	UMAR	AKB
A	20.06.19		FOR COMMENT PURPOSE	UMAR	AKB

REFERENCES	DRG.NO.
PIPELINE SCHEMATIC ROUTE DIAGRAM	MEC/23UU/05/28/M/000/0021 , REV - 2, SHEET 14 OF 14

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LOCATION	DELHI
DESIGNED	UMAR
DRAWN	UMAR
CHECKED AND VERIFIED	AKB
APPROVED	SIG A. GANGAL
DATE	18.12.20

NORTH EAST GAS GRID (PHASE-II P/L SECTION)

P&ID FOR RECEIVING TERMINAL FOR 8"NBx22.135 KMS. P/L AT SHILLONG CGD

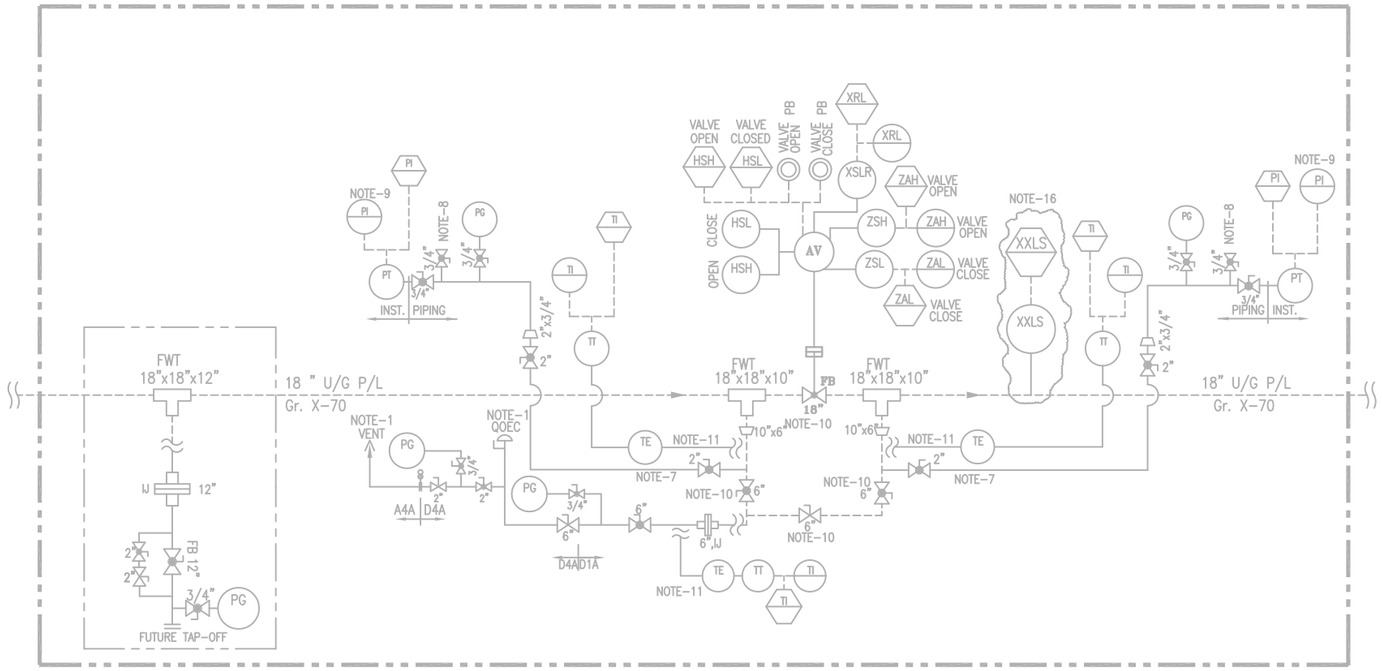
SCALE : NTS
DRG. NO. MEC/23UU/05/28/M/002/0004
REV 2

REV / SEC	PIPING	ELEC.	INST.

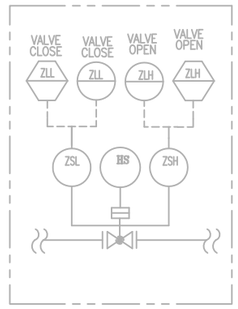
CONCURRED BY

SECTION-14

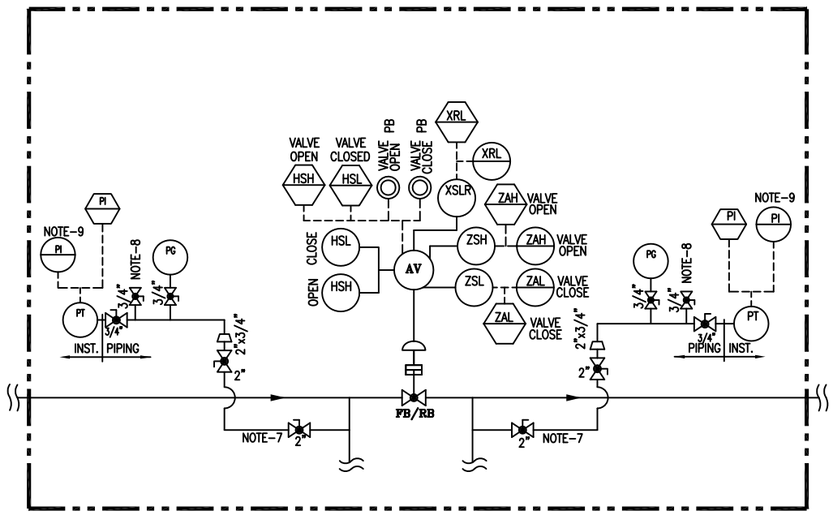
DRG. NO. MEC/23UU/05/28/M/002/0016



TYPICAL ARRANGEMENT FOR 18" SV (REMOTE OPERATED)



TYPICAL HOV ARRANGEMENT



TYPICAL ARRANGEMENT FOR AV

NOTE:-

1. NOTE DELETED.
2. NOTE DELETED.
3. ALL AV (ACTUATED VALVES) SHALL BE FAILED TO STAY PUT TYPE VALVE.
4. NOTE DELETED.
5. NOTE DELETED.
6. NOTE DELETED.
7. ALL PG, PT CONNECTION SHALL BE TAKEN FROM 2" TWO ISOLATION VALVES AND THEN AFTER IT SHOULD BE CONVERTED TO REQUIRE NPT CONNECTION.
8. GAS TAPPING FOR VALVE ACTUATOR.
9. FOR PG & PT DETAIL REFER MECON STANDARD DRG.
10. NOTE DELETED.
11. NOTE DELETED.
12. ALL BALL VALVES WITH BUTT WELDED END SHALL HAVE FULLY WELDED BODY.
13. ALL HIGHEST POINT & LOWEST POINT OF THE STATION PIPING SHALL BE PROVIDED WITH VENT & DRAIN FACILITY & SAME SHALL BE TAKEN CARE DURING PREPARATION OF GAD.
14. NOTE DELETED.
15. NOTE DELETED.
16. NOTE DELETED.

LINE LEGEND

- PROPOSED LINE A/G
- PROPOSED LINE U/G
- LINE A/G (OTHER'S SCOPE)
- LINE U/G (OTHER'S SCOPE)

VALVE LEGEND

- BALL VALVE FLANGE END
- BALL VALVE BW END/UPTO 1½" SW END.
- PLUG VALVE BW END/UPTO 1½" SW END.
- PLUG VALVE FLANGE END
- GLOBE VALVE.

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1	18.12.20		GENERAL REVISION	UMAR	AKB
0	26.08.19		AS PER REVISED SCHEMATIC/ GENERAL REVISION	UMAR	AKB
A	20.06.19		FOR COMMENT PURPOSE	UMAR	AKB

REVISION

REFERENCES	DRG.NO.
PIPELINE SCHEMATIC ROUTE DIAGRAM	MEC/23UU/05/28/M/000/0021 , REV – 2, SHEET 14 OF 14

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LOCATION	DELHI
DESIGNED	UMAR
DRAWN	UMAR
CHECKED AND VERIFIED	AKB
APPROVED	SIG A. GANGAL
DATE	18.12.20

NORTH EAST GAS GRID (PHASE-II P/L SECTION)

TYPICAL ARRANGEMENT FOR AV

SCALE : NTS

DRG. NO. MEC/23UU/05/28/M/002/0016

REV 1

REV / SEC	PIPING	ELEC.	INST.	CONCURRED BY

SECTION-14

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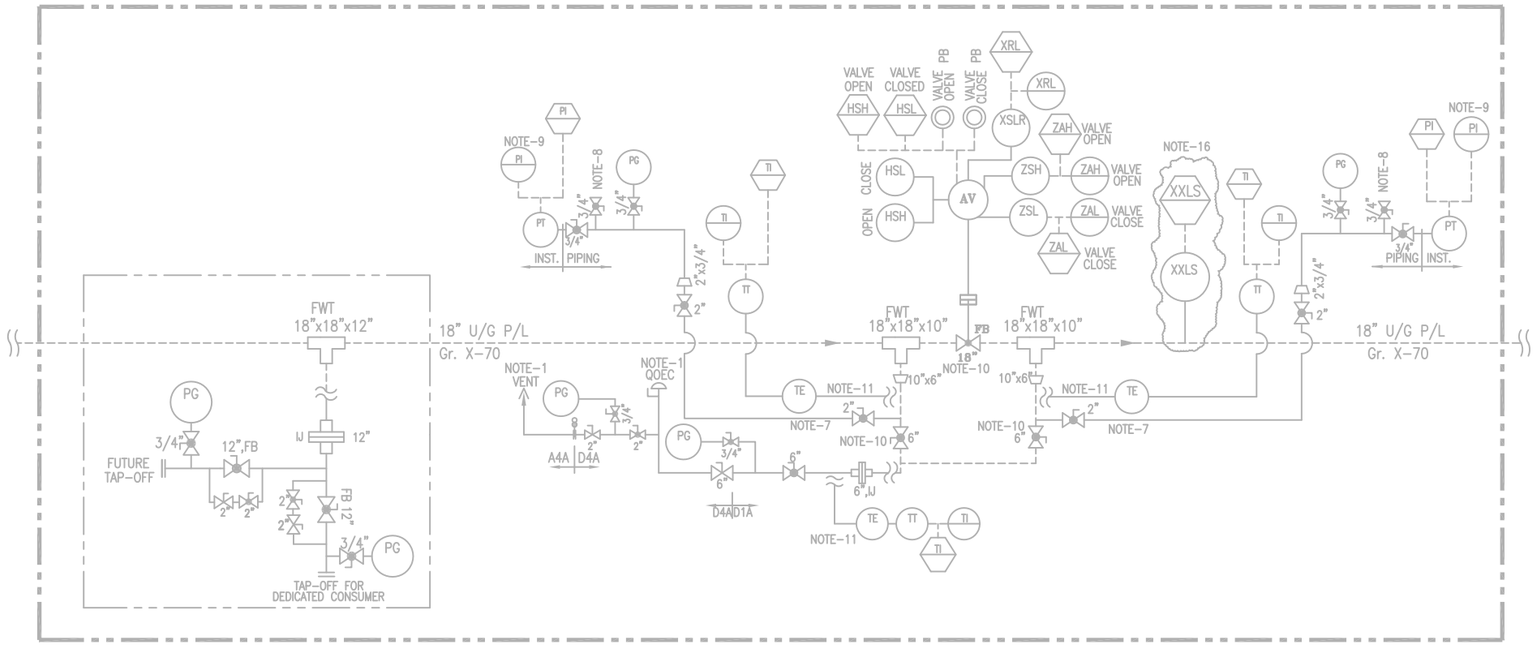
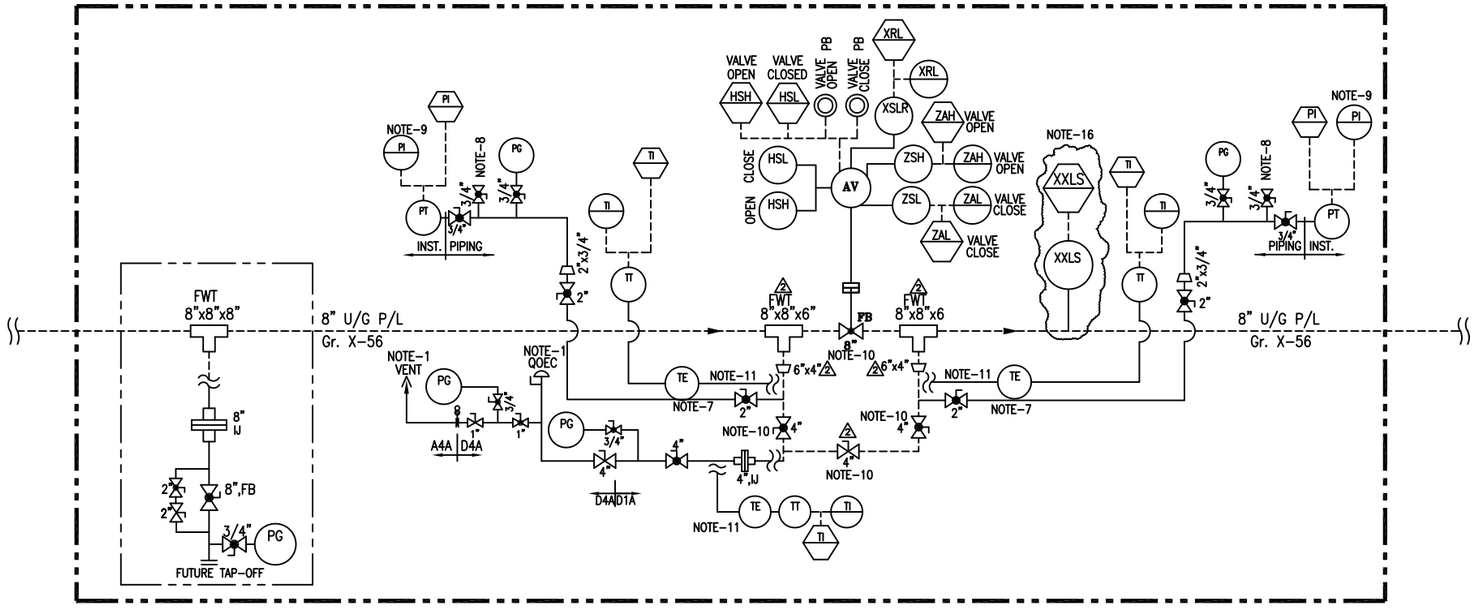


TYPICAL ARRANGEMENT FOR 18" SV WITH AN ADDITIONAL TAP-OFF POINT FOR DEDICATED CONSUMER (REMOTE OPERATED)



TYPICAL ARRANGEMENT FOR 8"SV (REMOTE OPERATED)

NOTE:-

1. ALL VENT SHALL BE LOCATED MIN. HEIGHT OF 3 MTR. ABOVE THE HIGHEST OPERATING LEVEL.
2. NOTE DELETED.
3. ALL AV (ACTUATED VALVES) SHALL BE FAILED TO STAY PUT TYPE VALVE.
4. NOTE DELETED.
5. NOTE DELETED.
6. NOTE DELETED.
7. ALL PG, PT CONNECTION SHALL BE TAKEN FROM 2" TWO ISOLATION VALVES AND THEN AFTER IT SHOULD BE CONVERTED TO REQUIRE NPT CONNECTION.
8. GAS TAPPING FOR VALVE ACTUATOR.
9. FOR PG & PT DETAIL REFER MECON STANDARD DRG.
10. EXTENDED STEM VALVE.
11. DIRECT SURFACE CONTACT TYPE.
12. ALL BALL VALVES WITH BUTT WELDED END SHALL HAVE FULLY WELDED BODY.
13. ALL HIGHEST POINT & LOWEST POINT OF THE STATION PIPING SHALL BE PROVIDED WITH VENT & DRAIN FACILITY & SAME SHALL BE TAKEN CARE DURING PREPARATION OF GAD.
14. STRIP TEST FOR MAINLINE VALVES MAY BE INCLUDED IN BALL VALVE TENDER.
15. SUPPORT SHALL BE PROVIDED BEFORE & AFTER MAINLINE IJ.
16. NON-INTRUSIVE TYPE PIG SIGNALLER TO BE INSTALLED AT FIRST & LAST SV STATION BEFORE EACH INTERMEDIATE PIGGING STATION/RECEIVING STATION.

LINE LEGEND

- PROPOSED LINE A/G
- PROPOSED LINE U/G
- LINE A/G (OTHER'S SCOPE)
- LINE U/G (OTHER'S SCOPE)

VALVE LEGEND

- BALL VALVE FLANGE END
- BALL VALVE BW END/UPTO 1½" SW END.
- PLUG VALVE BW END/UPTO 1½" SW END.
- PLUG VALVE FLANGE END
- GLOBE VALVE.

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REV	DATE	ZONE	DESCRIPTION	BY	VERIFIED
2	18.12.20		AS PER REQUIREMENT	UMAR	AKB
1	18.03.20		AS PER REVISED SCHEMATIC/ GENERAL REVISION	RASHMI	AKB
0	26.08.19		AS PER REVISED SCHEMATIC/ GENERAL REVISION	UMAR	AKB
A	20.06.19		FOR COMMENT PURPOSE	UMAR	AKB

REVISION

REFERENCES	DRG.NO.
PIPELINE SCHEMATIC ROUTE DIAGRAM	MEC/23UU/05/28/M/000/0021 , REV – 2, SHEET 14 OF 14

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SECTION	OIL & GAS
LOCATION	DELHI
DESIGNED	UMAR
DRAWN	UMAR
CHECKED AND VERIFIED	AKB
APPROVED	SIG A. GANGAL
DATE	18.12.20

NORTH EAST GAS GRID (PHASE-II P/L SECTION)

TYPICAL ARRANGEMENT FOR 8" SV STATION (REMOTE OPERATED)

SCALE : NTS

DRG. NO. MEC/23UU/05/28/M/002/0017

REV 2

REV / SEC	PIPING	ELEC.	INST.
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SYMBOLS & ABBREVIATIONS

SYMBOLS

- VP–PLUG VALVE
- VB–BALL VALVE WELDED END
- VB–BALL VALVE FLANGED END
- GATE VALVE
- GV–GLOBE VALVE
- PRESSURE RELIEF OR SAFETY VALVE (PSV)
- PRESSURE REGULATING VALVE (PCV) (SELF ACTUATING TYPE)
- NON RETURN VALVE
- CONTROL VALVE WITH SLAM SHUT–OFF VALVE
- SOLENOID VALVE
- GAS ACTUATED ISOLATION VALVE
- GAS ACTUATED ISOLATION VALVE WITH HANDWHEEL
- REDUCER
- FLANGE
- FLAME ARRESTOR (FA)
- RTU — REMOTE TERMINAL UNIT
- DIAPHRAM
- XXLS — PIG SIGNALLER
- VENT
- SPECTACLE BLIND

SYMBOLS

- PD METER
- TURBINE METER
- INSULATION JOINT (IJ)
- FLOW TEE (FWT)
- FIELD MOUNTED INSTRUMENT
- CONTROL PANEL MOUNTED INSTRUMENT
- ULTRASONIC METER
- SCADA INDICATOR, CONTROLLER OR OTHER DEVICES WITH OPERATOR ACCESS TO ADJUSTMENT.

ABBREVIATIONS

AE	ANALYZER SENSOR (GAS CHROMATOGRAPH)
AI	ANALYZER INDICATOR
AT	ANALYZER TRANSMITTER
FY	FLOW COMPUTER
FQI	FLOW TOTALIZER & INDICATOR
LG	LEVEL GAUGE
ZSH/ZSL	LIMIT SWITCHES (OPEN/CLOSE)
TI/TG	TEMPERATURE INDICATOR/ GAUGE
TE	TEMPERATURE ELEMENT
TW	THERMOWELL
DPI/DPG	DIFF. PRESSURE INDICATOR/ GAUGE
DPT	DIFF. PRESSURE TRANSMITTER
PI/PG	PRESSURE INDICATOR/ GAUGE
PT	PRESSURE TRANSMITTER
FC/FO	FAILURE TO CLOSE/OPEN
LO	LOCK OPEN
FIC/PIC	FLOW/PRESS. INDICATING CONTROLLER
I	INTERLOCK
XRL	LOCAL/REMOTE INDICATION
XSL	LOCAL/REMOTE SWITCH
HSH	HAND SWITCH HIGH
HSL	HAND SWITCH LOW
FT	FLOW TRANSMITTER
FE	FLOW ELEMENT
Q.O.E.C.	QUICK OPENING END CLOSURE

ABBREVIATIONS

TT	TEMP TRANSMITTER
FR	FLOW RECORDER
PIR	PRESSURE IND.RECORDER
TIR	TEMP. IND. RECORDER
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LAH	LEVEL ALARM HIGH
LAL	LEVEL ALARM LOW
D	CONDENSATE DRAIN
A1A/B1A	150#/300# RATING
C1A/D1A	400#/600# RATING
LX/PX	PNEUMATIC/ ELECTRIC SIGNAL TRANSMITTER
FB	FULL BORE
SP	SAMPLER
NG	NATURAL GAS
V	VENT
AS	AUTO SAMPLER
CP	CORROSION PROBE
CC	CORROSION COUPON
AV	ACTUATED VALVE
SDV	SHUT DOWN VALVE
LV	LEVEL CONTROL VALVE
PV/PCV	PRESSURE CONTROL VALVE
FCV	FLOW CONTROL VALVE

00”–FLUID–00–00–A1A/B1A/C1A/D1A/D4A

- MATERIAL SPEC.
- LINE NO.
- UNIT NO.
- (P–NATURAL GAS)
- LINE SIZE (NOMINAL)

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NORTH EAST GAS GRID (PHASE–II P/L SECTION)

LEGEND / DRAWING SYMBOLS

SCALE : NTS | SHEET 1 OF 2 | REV 0

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SYMBOLS & ABBREVIATIONS

SYMBOLS

- SHUT-OFF VALVE, GENERAL
- SAFETY SHUT-OFF VALVE
- CONTINIUOUS-ACTION VALVE
- RIGHT-ANGLE SHUT-OFF VALVE, GENERAL
- THREE-WAY VALVE, GENERAL
- FOUR-WAY VALVE, GENERAL
- NEEDLE VALVE
- PUSHBUTTON VALVE
- CHECK VALVE (SPRING TYPE)
- NON RETURN VALVE (SWING TYPE)
- BUTTERFLY VALVE
- CONTINUOUSLY VARIABLE BORE BUTTERFLY VALVE
- LOUVRE
- SEPERATOR GENERAL
- 2 STAGE SEPERATOR
- CYCLONE SEPERATOR
- CONDENSATE TRAP
- FLOWMETER GENERAL
- METER GENERAL
- TURBINE METER
- VORTEX-SHEDDING FLOWMETER
- DIAPHRAGM METER
- MANUALLY OPERATED ACTUATOR, GENERAL
- DIAPHRAGM ACTUATOR
- PISTON ACTUATOR
- ELECTROMAGNETIC ACTUATOR
- HYDRAULIC OR PNEUMATIC ACTUATOR, GENERAL

SYMBOLS

- SPRING-OPERATED ACTUATOR
- AUTOMATICALLY OPERATED ACTUATOR, GENERAL
- ELECTRIC MOTOR-OPERATED ACTUATOR, GENERAL
- VALVE CLOSED ON FAILURE OF ACTUATING ENERGY
- VALVE OPENED ON FAILURE OF ACTUATING ENERGY
- VALVE RETAINS POSITION ON FAILURE OF ACTUATING ENERGY
- TURBINE, GENERAL
- COMPRESSOR, GENERAL
- ROTARY PISTON COMPRESSOR
- PISTON COMPRESSOR
- JET BOOSTER
- FAN, GENERAL
- HEAT EXCHANGER WITHOUT COUNTERFLOW
- COUNTERFLOW HEAT EXCHANGER
- PLATE HEAT EXCHANGER
- FINNED HEAT EXCHANGER WITH VENTILATOR
- BLIND PLATE
- "FIGURE 8" PLATE, BLIND PLATE IN FUNCTION
- "FIGURE 8" PLATE, GOGGLE PLATE IN FUNCTION
- ORIFICE PLATE
- INSULATING FLANGE
- INSULATING COUPLING
- STRAIGHTENING VANES
- RUPTURE DISK
- SIGHT GLASS. GENRAL
- EXPANSION JOINT
- SILENCER
- PULSATION DAMPENER
- MIXING NOZZLE
- CAP
- FLANGE CONNECTION

SYMBOLS

- FILTER, GENERAL
- GAS FILTER, GENERAL
- CARTRIDGE FILTER
- GAS SORPTION FILTER
- LIQUID FILTER, GENERAL
- "Y" TYPE STRAINER
- PRESSURE REDUCING VALVE, IN AUXILIARY AND CONTRAL FACILITIES
- PRESSURE CONTROL VALVE, GENERAL
- PROCESS PRIMARY LINE
- PROCESS SECONDARY LINE
- ELECTRIC LINE
- PNEUMATIC LINE
- CAPILLARY LINE
- INSTRUMENT LINE
- HEAT TRACING LINE
- JACKETED LINE
- JACKETED & HEATED LINE
- VENT STACK
- SCRAPPER TRAP
- LIQUID PUMP GENERAL
- CENTRIFUGAL PUMP
- LIQUID RING PUMP
- PISTON PUMP
- DIAPHRAGM PUMP
- CORROSION PROBE
- CORROSION COUPON

ABBREVIATIONS

ESD	EMERGRNCY SHUT-DOWN
EW	DRAIN
GCV	GAS-OPERATED CONTROL VALVE
GOV	GAS-OVER OIL OPERATED VALVE
HOV	HYDRAULIC-OPERATED VALVE
LC	LOCKED CLOSED
LO	LOCKED OPEN
LP	LOCKED POSITION
LPT	LOW POINT
MCV	MOTOR CONTROL VALVE
MH	MANHOLE
MOV	MOTOR-OPERATED VALVE
SV	SOLENOID VALVE
PCV	PRESSURE CONTROL VALVE
SAV SSV	SAFETY SHUT-OFF VALVE
SBV PRV	PRESSURE RELIFE VALVE
SP	SETPOINT
TE	THERMOCOUPLE
TW	THERMOWELL
NRV	NON-RETURN VALVE
CV	CHECK VALVE
FCV	FLOW CONTROL VALVE
PGS	POWER GAS SUPPLY
IAS	INTRUMENT AIR SUPPLY
NC	NORMAL CLOSED
NO	NORMAL OPEN

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SECTION	OIL & GAS
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NORTH EAST GAS GRID (PHASE-II P/L SECTION)

LEGEND / DRAWING SYMBOLS

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