



**Program Management Unit (PMU)
Municipal Services Delivery Program (MSDP)
P & D Department, Government of Sindh**

A & E Services for Jacobabad Water, Wastewater, and Solid Waste Infrastructure

CONTRACT PACKAGE EM-11

Procurement and Installation of E & M Works

BID DRAWINGS

VOLUME - III

MAY, 2016

Issued to: _____ Dated: _____

Funded by:

Joint Venture:

In Association with:



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BID DRAWINGS

BID DRAWINGS

GENERAL DRAWINGS

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PACKAGE # 11 PROCUREMENT AND INSTALLATION OF E & M WORKS			
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BID DRAWINGS			
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Approved By : M.B.L.			

GENERAL NOTES

1.

FOLLOWING NOTES SHALL IN GENERAL APPLY TO ALL ELECTRICAL DRAWINGS. THE INSTRUCTIONS IN THESE NOTES SHALL BE FOLLOWED UNLESS STATED OTHERWISE.
2.

THESE NOTES SHALL BE APPLICABLE TO THE ENTIRE ELECTRICAL WORKS. IF THE SITE CONDITIONS NECESSITATE ANY ALTERATIONS OR DEVIATIONS, THE DIRECTIONS OF THE ENGINEER SHALL BE OBSERVED AS FINAL INSTRUCTIONS.
3.

ALL ELECTRICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL DRAWINGS & ALL OTHER RELEVANT DETAILS.
4.

DIMENSIONS/MEASUREMENTS GIVEN IN LAYOUT AND DETAILED DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE TO CALCULATE THE ACTUAL DIMENSIONS/MEASUREMENTS ACCORDING TO STRUCTURAL AND ARCHITECTURAL DRAWINGS.
5.

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH ALL RELEVANT DETAILS TO THE ENGINEER FOR APPROVAL ACCORDING TO THE GENERAL CONDITIONS OF CONTRACT WELL IN TIME BEFORE COMMENCEMENT OF THAT WORK.
6.

PROPER CO-ORDINATION OF ELECTRICAL WORKS WITH OTHER SERVICES SHALL BE CARRIED OUT AT SITE.
7.

ALL NONCURRENT-CARRYING PARTS i.e. OUTER CASINGS OF EQUIPMENT SUCH AS HT & LT PANELS, DISTRIBUTION BOARDS, CABLE TRAYS, AUXILIARY CONSTRUCTIONS FOR EQUIPMENT ETC. SHALL BE CONNECTED TO THE GROUNDING/EARTHING SYSTEM AT REQUIRED NUMBER OF POINTS WITH SPECIFIED SIZES OF CONDUCTORS. WATER PIPES ALONG ELECTRICAL LINE SHALL BE BONDED TO THE EARTHING SYSTEM WITH 10 SQ. MM SINGLE CORE, COPPER CONDUCTOR PVC CABLE.
8.

ELECTRICAL POINTS FOR EQUIPMENT SHALL BE INSTALLED IN CO-ORDINATION WITH THE RELEVANT DRAWINGS OF OTHER SERVICES, SUCH AS COMMUNICATION SYSTEMS, HVAC, PLUMBING ETC. THE LOCATION ON ELECTRICAL DRAWINGS IS ONLY INDICATIVE.
9.

ARRANGEMENT OF ELECTRICAL EQUIPMENTS ON ELECTRICAL DRAWINGS ARE TENTATIVE. EXACT ARRANGEMENT OF EQUIPMENTS SHALL BE MADE IN VIEW OF ITS PHYSICAL DIMENSIONS AND EASE OF MAINTENANCE.
10.

LOADS ON ALL PHASES SHALL BE BALANCED AT THE TESTING/COMMISSIONING STAGE.
11.

CONDUIT/DUCT RUN UNDER FLOOR SHALL HAVE A MINIMUM COVER OF 50MM FROM TOP OF CONDUIT/DUCT TO FINISHED FLOOR LEVEL.
12.

RUN GREEN-YELLOW OR GREEN SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED SIZES AS PROTECTIVE EARTH CONDUCTOR (ECC) ALL ALONG LIGHT AND POWER WIRING. WHEREVER THE SIZE IS NOT SPECIFIED THE FOLLOWING CRITERIA SHALL BE OBSERVED TO DETERMINE MINIMUM CROSS SECTIONAL AREA OF EARTH CONTINUITY CONDUCTOR (ECC) IN RELATION TO THE AREA OF ITS PHASE CONDUCTORS. RUN SEPARATE ECC FOR EACH CIRCUIT.

- ECC & PHASE CONDUCTOR OF SAME SIZE FOR UPTO AND INCLUDING 16 SQ. MM CABLES.

- 16 SQ. MM ECC FOR PHASE CONDUCTOR OF 25 SQ. MM & 35 SQ. MM CABLES.

- FOR CABLES OF 50 SQ. MM AND ABOVE SIZES, ECC IS HALF SIZE OF PHASE CONDUCTOR.

- MAXIMUM SIZE OF ECC IS 70 SQ. MM.
13.

ALL WIRING TO LIGHT AND SOCKET CIRCUITS AND FOR CONTROLS SHALL BE CARRIED OUT WITH SINGLE CORE PVC INSULATED COPPER CONDUCTOR CABLE OF SPECIFIED VOLTAGE GRADE IN CONCEALED PVC CONDUIT OF SPECIFIED SIZE.
14.

CIRCUIT WIRING FROM DB TO LIGHT CIRCUIT SHALL BE CARRIED OUT WITH 2.5 SQ.MM CABLE AND TO 5/10/13/15A SOCKETS WITH 4.0 SQ. MM CABLE. WIRING FROM SWITCH TO LIGHT POINT AND FROM LIGHT POINT TO LIGHT POINT SHALL BE WITH 1.5 SQ. MM CABLE.GROUP CONTROLLED LIGHT SHALL BE WITH 2.5 SQ. MM CABLES.
15.

LIGHT CONTROL SWITCH BOARD SHALL BE INSTALLED 50 MM AWAY FROM THE SIDE OF DOOR IN ROOMS.
16.

BEFORE DETERMINING THE CUT LENGTHS OF CABLE, THE ACTUAL MEASUREMENT AT SITE SHALL BE MADE WITH PROVISION FOR SLACK AT LT PANELS/DISTRIBUTION BOARDS AND SPARE LENGTH FOR LOOPS AS REQUIRED.
17.

ALL UNDERGROUND PIPES AFTER INSTALLATION SHALL BE PLUGGED AND SEALED AT BOTH ENDS AND JOINTS TO AVOID INGRESS OF WATER INTO PIPES.
18.

THE NO. OF SINGLE CORE CABLES IN ANY CONDUIT SHALL BE DETERMINED SUCH THAT THE RATIO OF CABLE AREA INCLUDING PROTECTIVE EARTH CONDUCTOR TO CONDUIT AREA IS NOT MORE THAN 0.4:1.0. WHERE DIFFERENT SIZES OF CABLES RUN IN SAME CONDUIT, THE SIZE SHALL BE BASED ON ACTUAL CABLE AREA. WHEREVER CONDUIT SIZE IS NOT SPECIFIED, 20 mm DIA CONDUIT SHALL BE INSTALLED PROVIDED IT MEETS THE ABOVE CRITERIA.THE FOLLOWING TABLE IS GIVEN AS GENERAL GUIDELINE.

19.

NORMAL & EMERGENCY CIRCUITS SHALL RUN IN SEPARATE CONDUITS.
20.

THE WIRING SHALL BE CONTINUOUS LOOPING-IN TYPE AND NO JOINT IN WIRES SHALL BE ALLOWED.
21.

THE WIRING SYSTEM SHALL BE CARRIED OUT ONLY AFTER THE CONDUIT SYSTEM IS COMPLETELY INSTALLED AND ALL OUTLET BOXES ETC. ARE FIXED IN POSITION.
22.

MOUNTING HEIGHTS OF ELECTRICAL FITTINGS WHEN MEASURED FROM FINISHED FLOOR LEVEL (F.F.L) TO THE BOTTOM OF FITTINGS SHALL BE AS UNDER, UNLESS OTHERWISE SHOWN OR INSTRUCTED.

DISTRIBUTION BOARD1400mm

ON/OFF PUSH BUTTON STATION1400mm

LIGHT CONTROL SWITCH (ONE WAY/ TWO WAY)1400mm

5A SOCKET OUTLETS IN GENERAL AREAS300mm

15A SOCKET OUTLETS IN GENERAL AREAS300mm

15A SOCKET OUTLETS FOR EQUIPMENT TO BE CO-ORDINATED AT SITE WITH RESPECTIVE TRADE.
23.

ALL FLUORESCENT LIGHT FIXTURES ARE TO BE P,F CORRECTED.
24.

ALL FLUORESCENT LIGHT FIXTURES SHALL HAVE LOW LOSS BALLASTS.
25.

ALL FLUORESCENT LAMPS SHALL BE OF COLOR 84.
26.

MS STEEL CONDUIT SHALL BE USED FOR SURFACE WIRING & PVC CONDUITS SHALL BE USED FOR CONCEALED WIRING.

BID DRAWINGS

0	ISSUED FOR TENDER		May, 2016
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Project :

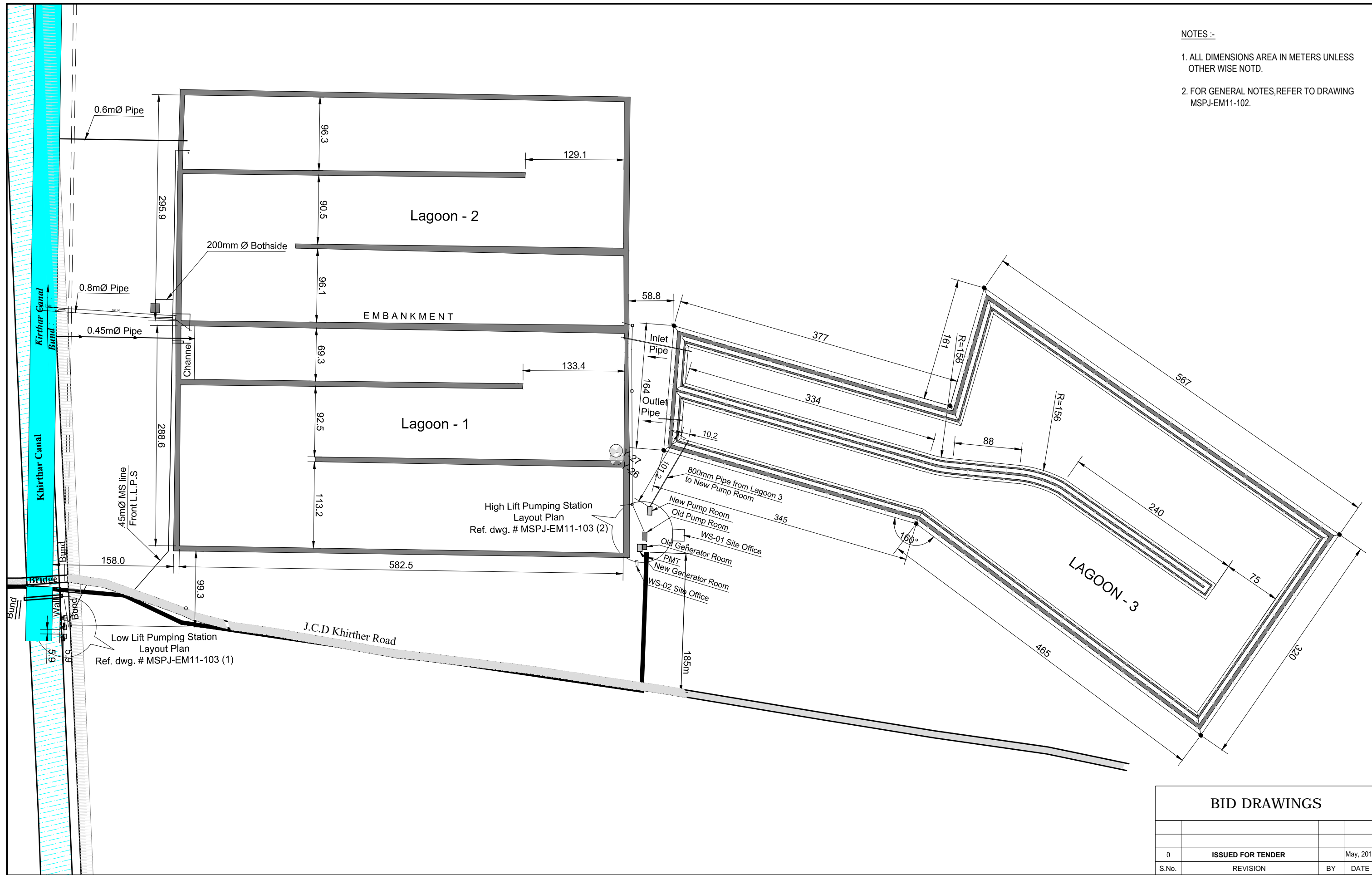
MUNICIPAL SERVICES PROGRAM (MSP)
WATER, WASTEWATER AND SOLID
WASTE INFRASTRUCTURE.
JACOBABAD

Drawing Title:

PROCUREMENT AND INSTALLATION OF E&M WORKS
GENERAL DRAWINGS
GENERAL NOTES

NOTES :-

1. ALL DIMENSIONS AREA IN METERS UNLESS OTHER WISE NOTD.
2. FOR GENERAL NOTES,REFER TO DRAWING MSPJ-EM11-102.



BID DRAWINGS

0	ISSUED FOR TENDER	May, 2016
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Joint Venture :



In Association With :



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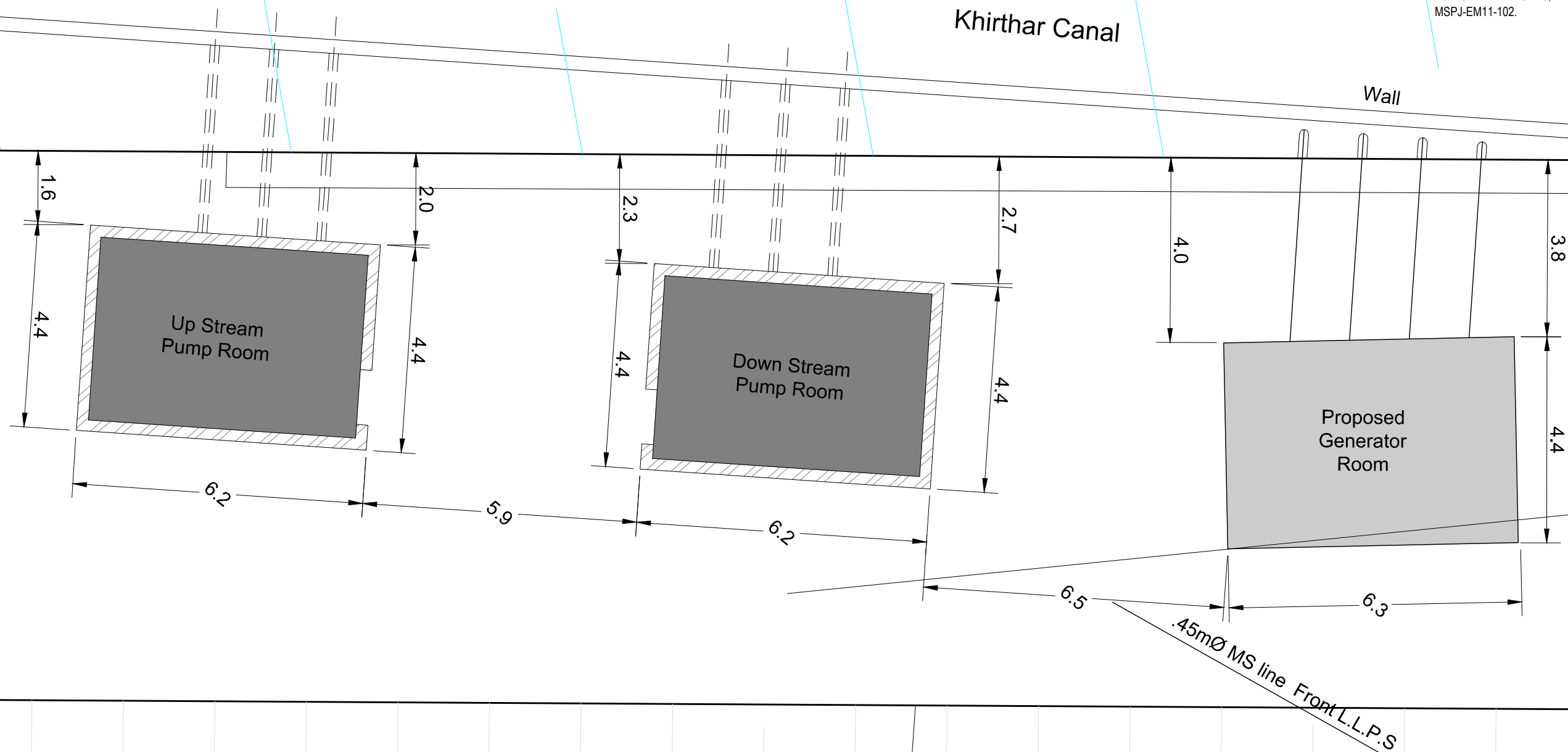
MUNICIPAL SERVICES PROGRAM (MSP)
Water, Wastewater and Solid Waste
Infrastructure. JACOBABAD

Drawing Title:

PROCUREMENT AND INSTALLATION OF E & M WORKS
GENERAL DRAWINGS
PROJECT LOCATION MAP

NOTES :-

1. ALL DIMENSIONS AREA IN METERS UNLESS OTHER WISE NOTD.
2. FOR GENERAL NOTES,REFER TO DRAWING MSPJ-EM11-102.



Low Lift Pumping Station (LLPS)
Layout Plan

BID DRAWINGS

0	ISSUED FOR TENDER	May, 2016
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Drawn By : RA.	Scale :	0
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Joint Venture :



In Association With :

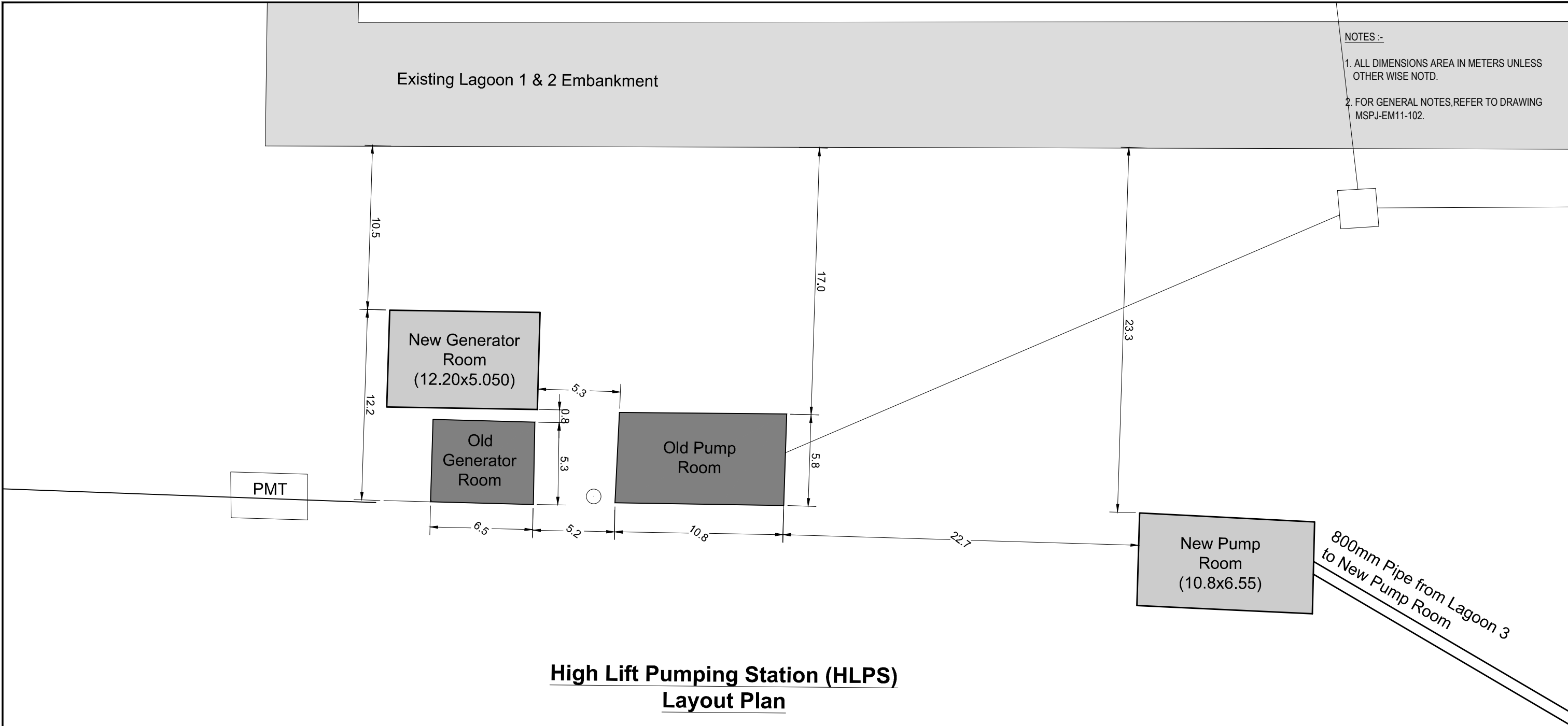


Project :

MUNICIPAL SERVICES PROGRAM (MSP)
Water, Wastewater and Solid Waste
Infrastructure. JACOBABAD

Drawing Title:

PROCUREMENT AND INSTALLATION OF E & M WORKS
GENERAL DRAWINGS
LOW LIFT PUMPING STATION (LAYOUT PLAN)



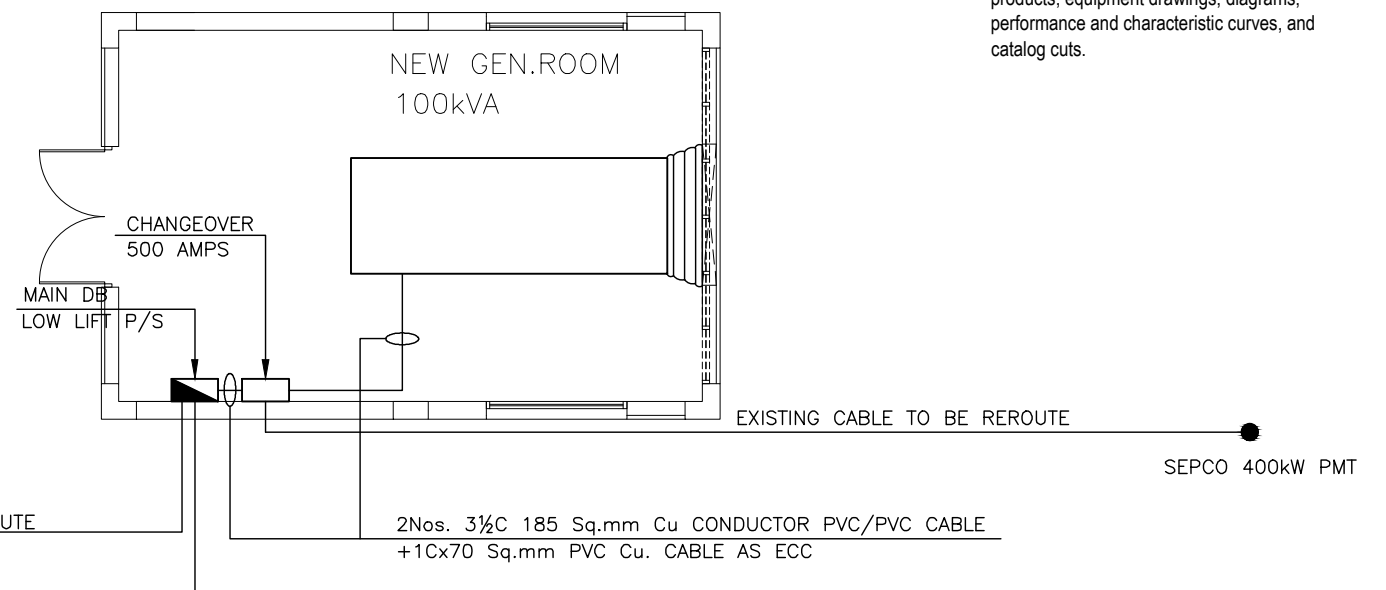
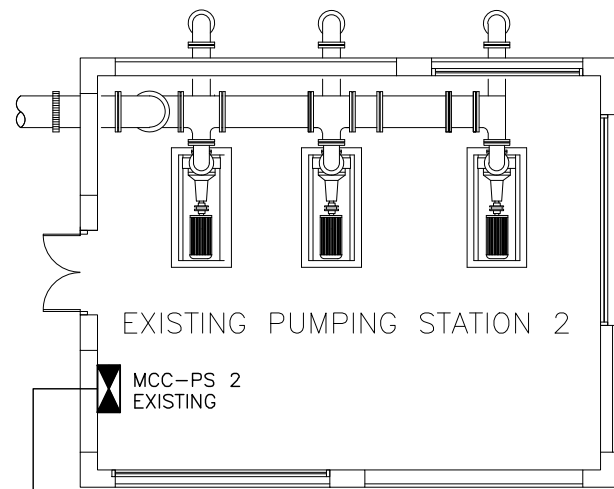
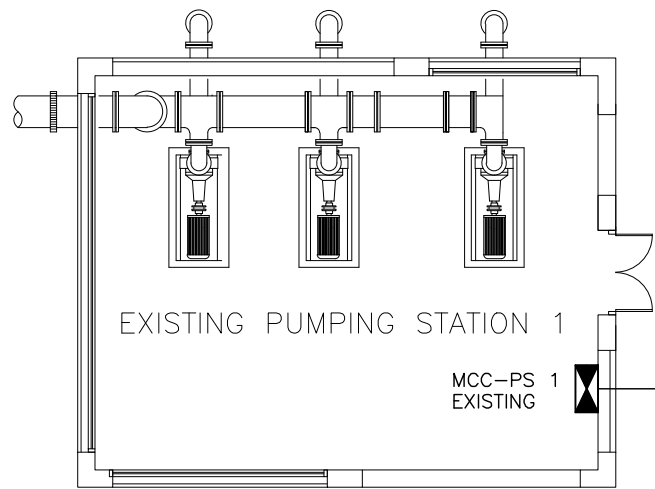
- NOTES :-
- 1. ALL DIMENSIONS AREA IN METERS UNLESS OTHER WISE NOTD.
 - 2. FOR GENERAL NOTES,REFER TO DRAWING MSPJ-EM11-102.

High Lift Pumping Station (HLPS)
Layout Plan

BID DRAWINGS			
0	ISSUED FOR TENDER		May, 2016
S.No.	REVISION	BY	DATE

BID DRAWINGS

LOW LIFT PUMPING STATION



NOTES :-

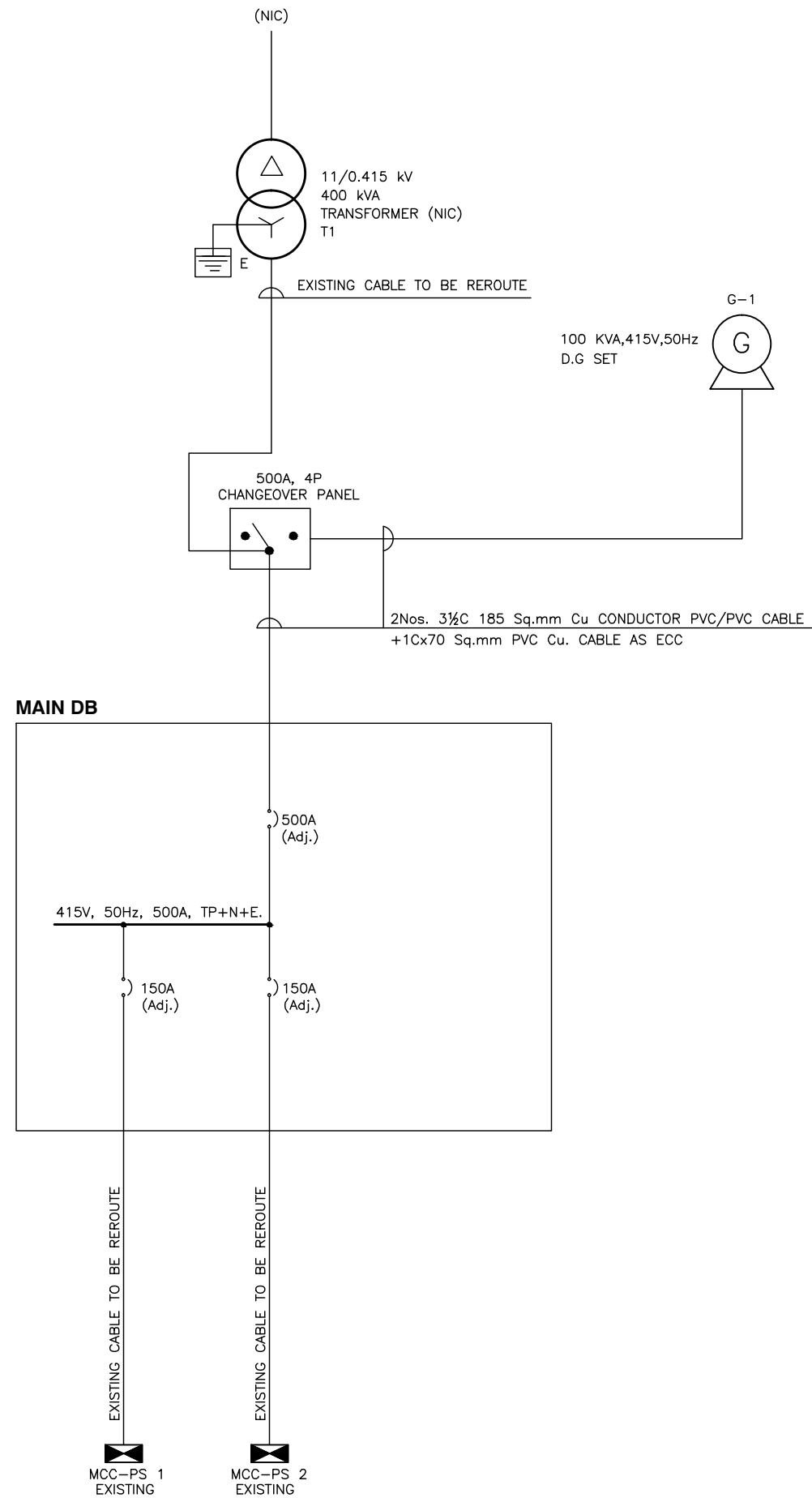
- For general notes, refer to drawing MSPJ-EM11-102.
- Contract must submit the following for approval of the Engineer before execution:
 - Shop drawings including wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation.
 - Manufacturer's data for each manufactured item including descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

LEGEND

SYMBOL	DESCRIPTION
	MOTOR CONTROL CENTRE(MCC)
	POWER DISTRIBUTION BOARD(DB)
	TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS) ADJ-INDICATES ADJUSTABLE
	AUTOMATIC STAR DELTA STARTER C YΔ
	SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
	POLE MOUNTED TRANSFORMER (RATING INDICATED ON THE DRAWING)
	415 VOLTS, 3 PHASE, 50 Hz, DIESEL GENERATOR SET (RATING INDICATED ON THE DRAWING)
	THREE Nos. SINGLE PHASE CURRENT TRANSFORMERS (TRANSFORMATION RATIOS INDICATED ON DRAWINGS)
	VSS - VOLTMETER SELECTOR SWITCH
	ASS - AMMETER SELECTOR SWITCH
	AC AMMETER (MEASURING RANGE INDICATED ON DRAWING)
	AC VOLTMETER (MEASURING RANGE INDICATED ON DRAWING)
	PUSH BUTTON (ON/OFF)
	INDICATION LAMPS R - RED , Y - YELLOW , B - BLUE

BID DRAWINGS

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NOTES :-
1. FOR GENERAL NOTES,REFER TO DRAWING MSPJ-EM11-102.

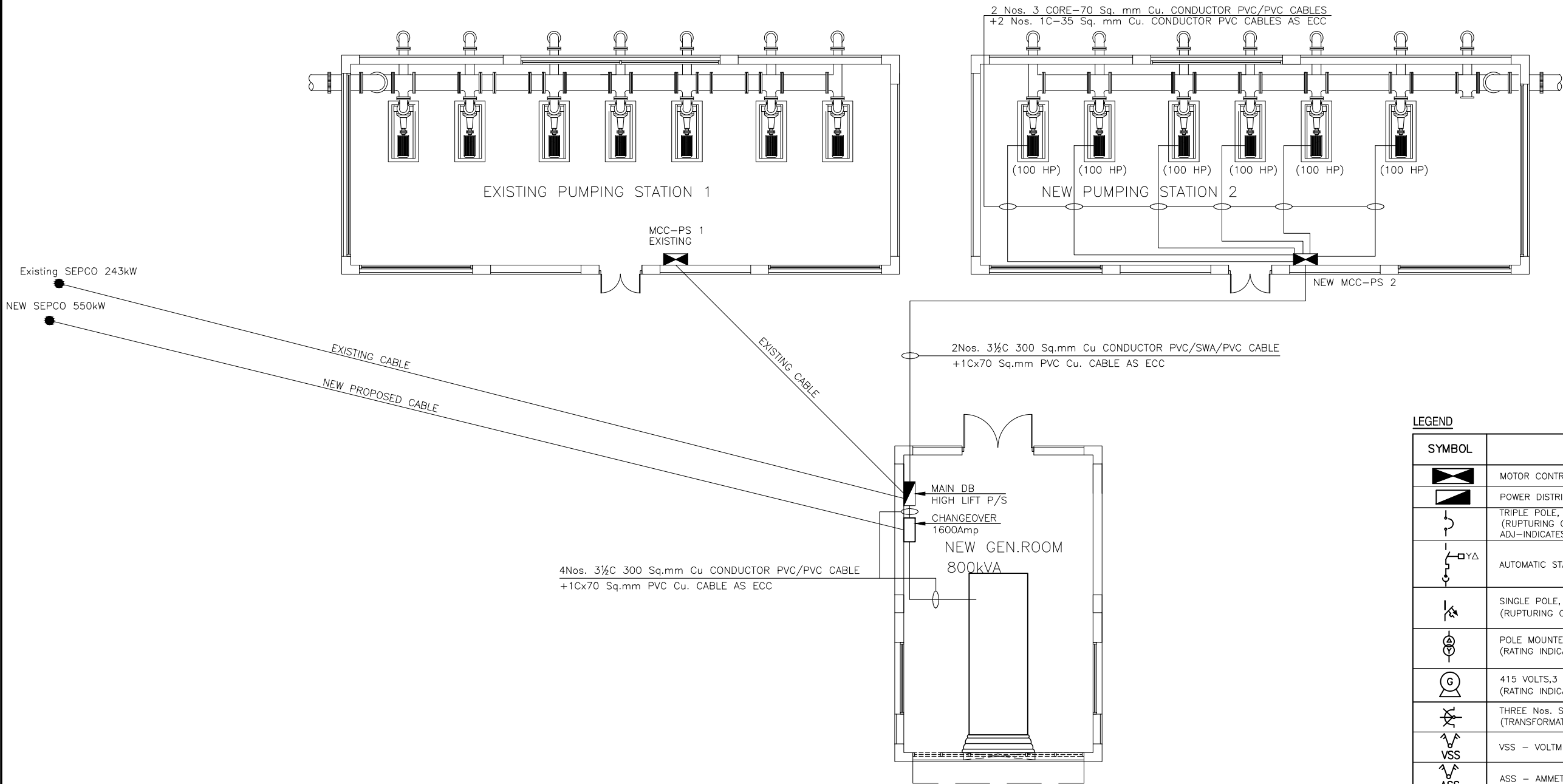
SYMBOL	DESCRIPTION
	MOTOR CONTROL CENTRE(MCC)
	POWER DISTRIBUTION BOARD(DB)
	TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS) ADJ-INDICATES ADJUSTABLE
	AUTOMATIC STAR DELTA STARTERC YΔ
	SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
	POLE MOUNTED TRANSFORMER (RATING INDICATED ON THE DRAWING)
	415 VOLTS,3 PHASE, 50 Hz, DIESEL GENERATOR SET (RATING INDICATED ON THE DRAWING)
	THREE Nos. SINGLE PHASE CURRENT TRANSFORMERS (TRANSFORMATION RATIOS INDICATED ON DRAWINGS)
	VSS - VOLTMETER SELECTOR SWITCH
	ASS - AMMETER SELECTOR SWITCH
	AC AMMETER (MEASURING RANGE INDICATED ON DRAWING)
	AC VOLTMETER (MEASURING RANGE INDICATED ON DRAWING)
	PUSH BUTTON (ON/OFF)
	INDICATION LAMPS R - RED , Y - YELLOW , B - BLUE

BID DRAWINGS			
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Approved By : MBL.			

BID DRAWINGS

HIGH LIFT PUMPING STATION

- NOTES :-
- For general notes, refer to drawing MSPJ-EM11-102.
 - Contract must submit the following for approval of the Engineer before execution:
 - Shop drawings including wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation.
 - Manufacturer's data for each manufactured item including descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.



SYMBOL	DESCRIPTION
	MOTOR CONTROL CENTRE(MCC)
	POWER DISTRIBUTION BOARD(DB)
	TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS) ADJ-INDICATES ADJUSTABLE
	AUTOMATIC STAR DELTA STARTER C YΔ
	SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
	POLE MOUNTED TRANSFORMER (RATING INDICATED ON THE DRAWING)
	415 VOLTS, 3 PHASE, 50 Hz, DIESEL GENERATOR SET (RATING INDICATED ON THE DRAWING)
	THREE Nos. SINGLE PHASE CURRENT TRANSFORMERS (TRANSFORMATION RATIOS INDICATED ON DRAWINGS)
	VSS - VOLTMETER SELECTOR SWITCH
	ASS - AMMETER SELECTOR SWITCH
	AC AMMETER (MEASURING RANGE INDICATED ON DRAWING)
	AC VOLTMETER (MEASURING RANGE INDICATED ON DRAWING)
	PUSH BUTTON (ON/OFF)
	INDICATION LAMPS R - RED , Y - YELLOW , B - BLUE

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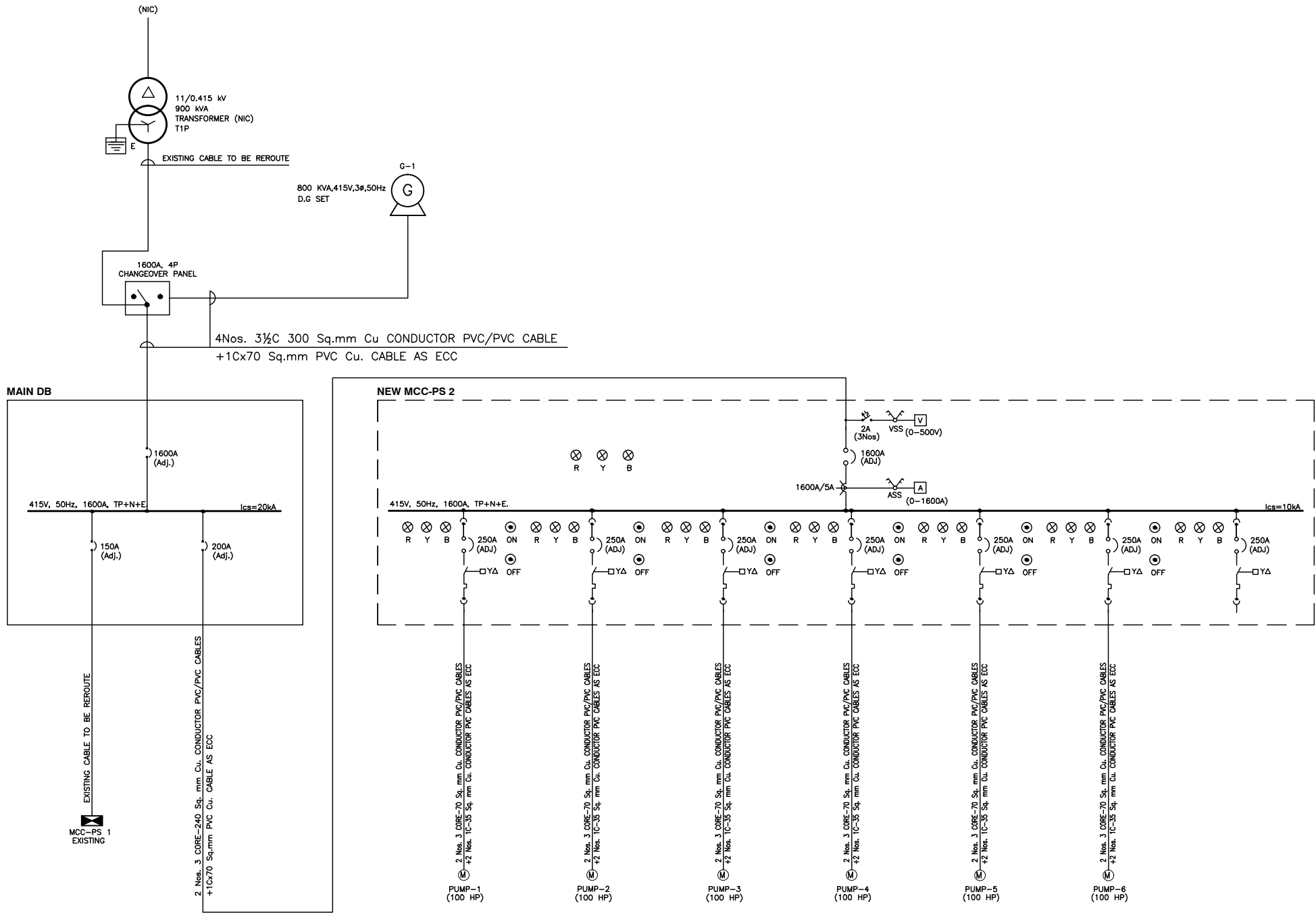


Project :
MUNICIPAL SERVICES PROGRAM (MSP)
Water, Wastewater and Solid Waste
Infrastructure. JACOBABAD

Drawing Title:
PROCUREMENT AND INSTALLATION OF E&M WORKS
HIGH LIFT PUMPING STATION
ELECTRICAL LAYOUT PLAN

NOTES :-

1. FOR GENERAL NOTES,REFER TO DRAWING MSPJ-EM11-102.



LEGEND

SYMBOL	DESCRIPTION
	MOTOR CONTROL CENTRE(MCC)
	POWER DISTRIBUTION BOARD(DB)
	TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS) ADJ-INDICATES ADJUSTABLE
	AUTOMATIC STAR DELTA STARTER C YΔ
	SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
	POLE MOUNTED TRANSFORMER (RATING INDICATED ON THE DRAWING)
	415 VOLTS, 3 PHASE, 50 Hz, DIESEL GENERATOR SET (RATING INDICATED ON THE DRAWING)
	THREE Nos. SINGLE PHASE CURRENT TRANSFORMERS (TRANSFORMATION RATIOS INDICATED ON DRAWINGS)
	VSS - VOLTMETER SELECTOR SWITCH
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	AC AMMETER (MEASURING RANGE INDICATED ON DRAWING)
	AC VOLTMETER (MEASURING RANGE INDICATED ON DRAWING)
	PUSH BUTTON (ON/OFF)
	INDICATION LAMPS R - RED , Y - YELLOW , B - BLUE

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Joint Venture :



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Project :

MUNICIPAL SERVICES PROGRAM (MSP)
Water, Wastewater and Solid Waste
Infrastructure. JACOBABAD

Drawing Title:

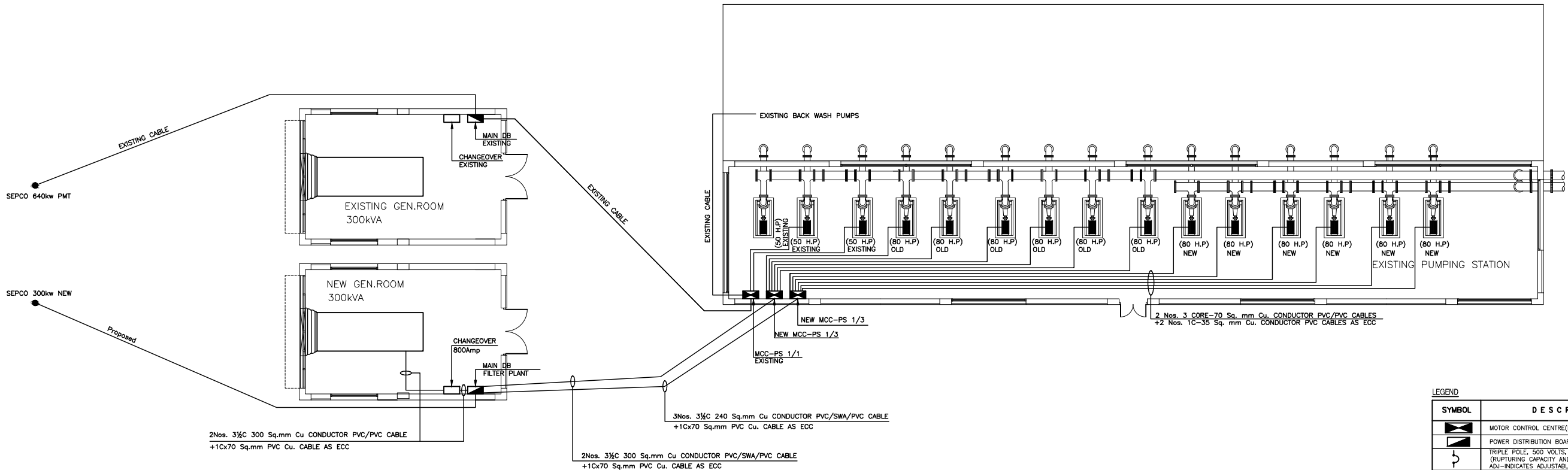
PROCUREMENT AND INSTALLATION OF E&M WORKS
HIGH LIFT PUMPING STATION
SINGLE LINE DIAGRAM

BID DRAWINGS

WATER FILTRATION PLANT

NOTES :-

- For general notes, refer to drawing MSPJ-EM11-102.
- Contract must submit the following for approval of the Engineer before execution:
 - Shop drawings including wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation.
 - Manufacturer's data for each manufactured item including descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.



LEGEND	
SYMBOL	DESCRIPTION
	MOTOR CONTROL CENTRE(MCC)
	POWER DISTRIBUTION BOARD(DB)
	TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
	AUTOMATIC STAR DELTA STARTER SC
	SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
	POLE MOUNTED TRANSFORMER (RATING INDICATED ON THE DRAWING)
	415 VOLTS, 3 PHASE, 50 HZ, DIESEL GENERATOR SET (RATING INDICATED ON THE DRAWING)
	THREE NOS. SINGLE PHASE CURRENT TRANSFORMERS (TRANSFORMATION RATIOS INDICATED ON DRAWINGS)
	VSS - VOLTMETER SELECTOR SWITCH
	ASS - AMMETER SELECTOR SWITCH
	AC AMMETER (MEASURING RANGE INDICATED ON DRAWING)
	AC VOLTMETER (MEASURING RANGE INDICATED ON DRAWING)
	PUSH BUTTON (ON/OFF)
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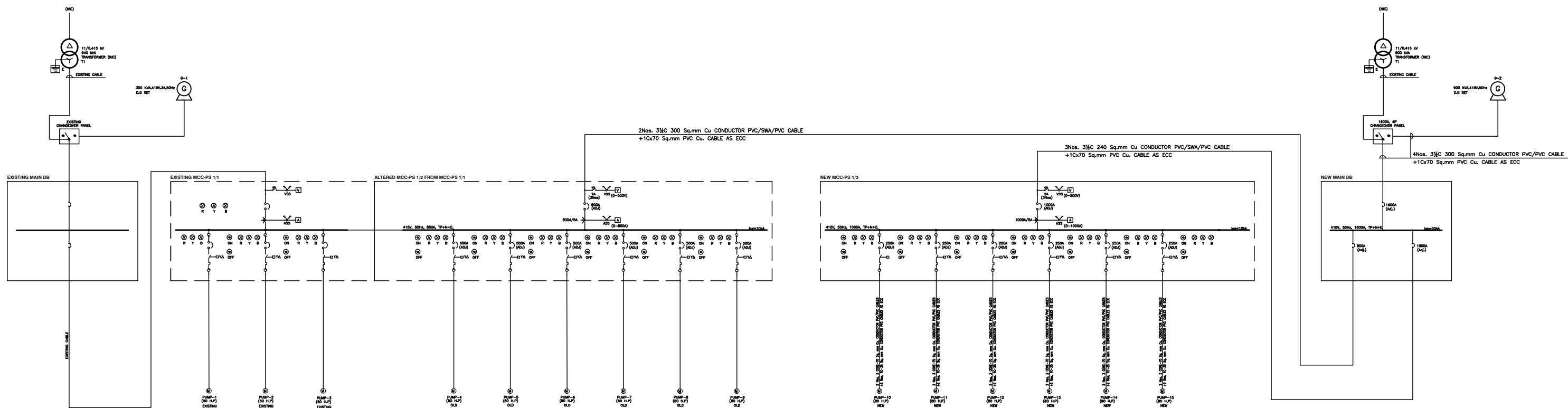


Project :
MUNICIPAL SERVICES PROGRAM (MSP)
Water, Wastewater and Solid Waste
Infrastructure. JACOBABAD

Drawing Title:
PROCUREMENT AND INSTALLATION OF E&M WORKS
WATER FILTRATION PLANT
ELECTRICAL LAYOUT PLAN

NOTES :-

1. FOR GENERAL NOTES,REFER TO DRAWING MSPJ-EM11-102.



LEGEND

SYMBOL	DESCRIPTION
	MOTOR CONTROL CENTRE(MCC)
	POWER DISTRIBUTION BOARD(DB)
	TRIPLE POLE, 500 VOLTS, MOULDED CASE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS) ADJ-INDICATES ADJUSTABLE
	AUTOMATIC STAR DELTA STARTER C YΔ
	SINGLE POLE, 250 VOLTS, MINIATURE CIRCUIT BREAKER (RUPTURING CAPACITY AND RATING INDICATED ON THE DRAWINGS)
	POLE MOUNTED TRANSFORMER (RATING INDICATED ON THE DRAWING)
	415 VOLTS, 3 PHASE, 50 HZ, DIESEL GENERATOR SET (RATING INDICATED ON THE DRAWING)
	THREE Nos. SINGLE PHASE CURRENT TRANSFORMERS (TRANSFORMATION RATIOS INDICATED ON DRAWINGS)
	VSS - VOLT METER SELECTOR SWITCH
	ASS - AMMETER SELECTOR SWITCH
	AC AMMETER (MEASURING RANGE INDICATED ON DRAWING)
	AC VOLT METER (MEASURING RANGE INDICATED ON DRAWING)
	PUSH BUTTON (ON/OFF)
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Project :

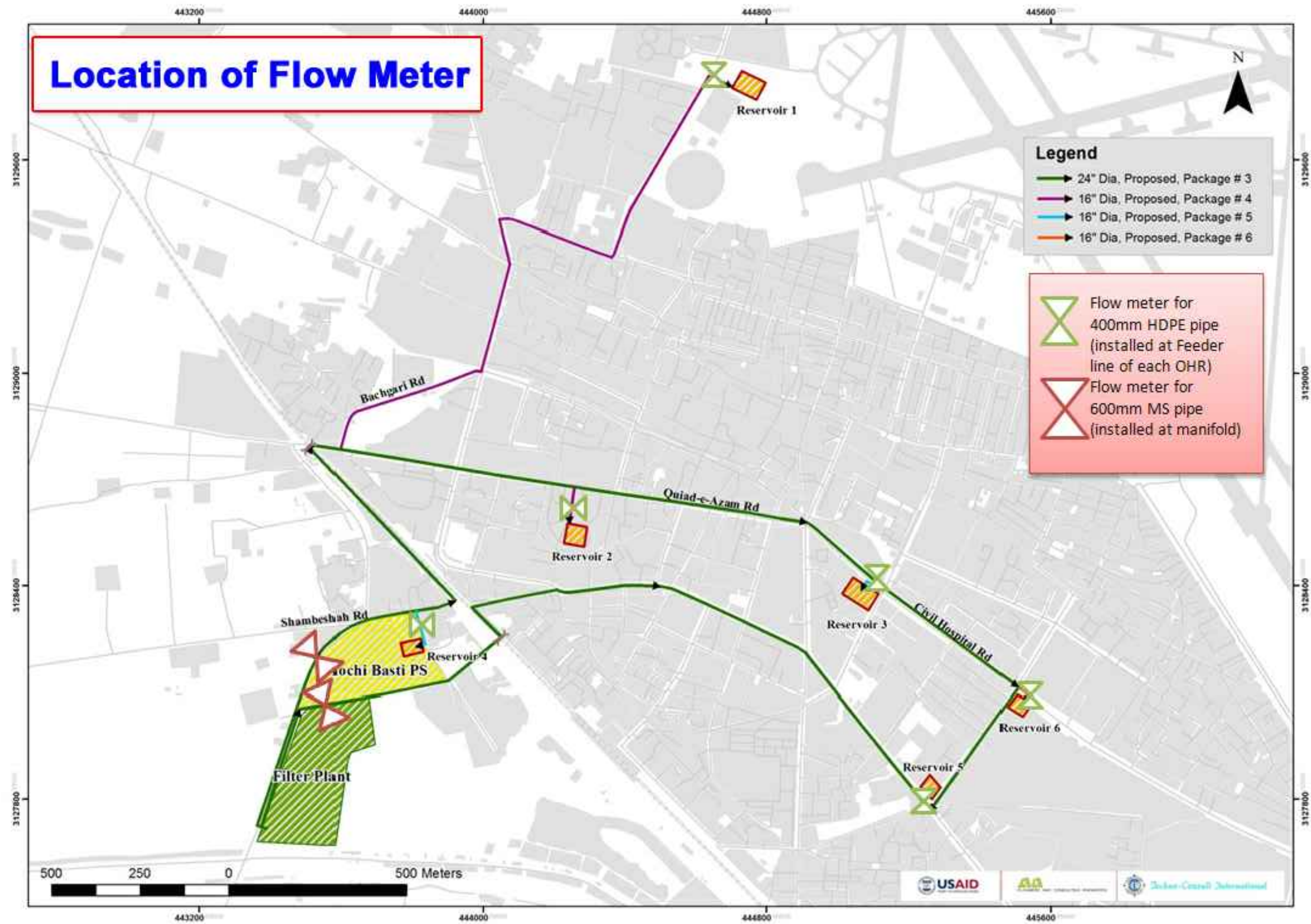
MUNICIPAL SERVICES PROGRAM (MSP) WATER, WASTEWATER AND SOLID WASTE INFRASTRUCTURE. JACOBABAD

Drawing Title:

PROCUREMENT AND INSTALLATION OF E&M WORKS WATER FILTRATION PLANT SINGLE LINE DIAGRAM

NOTES :-

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Joint Venture :



In Association With :



Project :

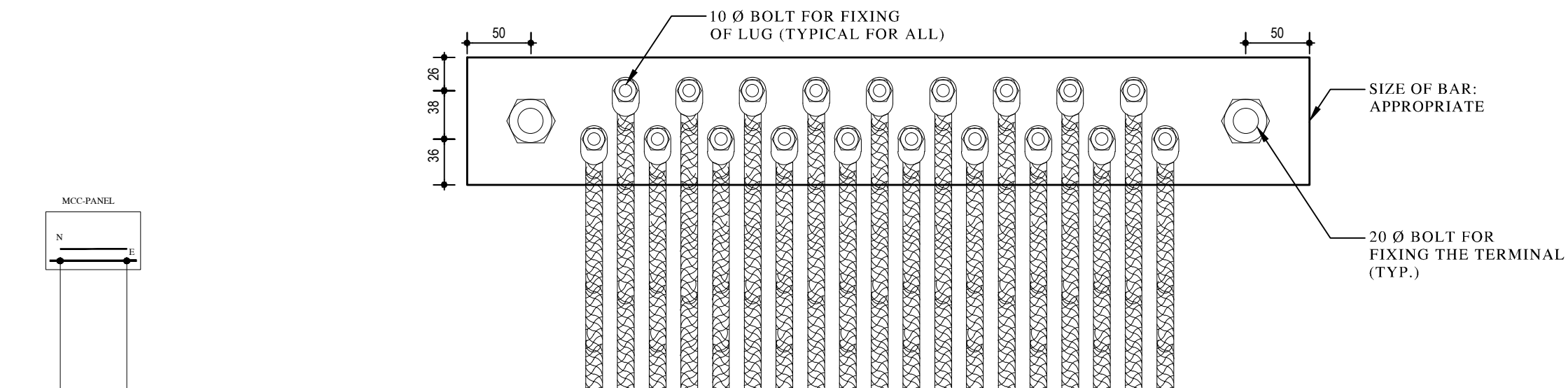
MUNICIPAL SERVICES PROGRAM (MSP)
Water, Wastewater and Solid Waste
Infrastructure. JACOBABAD

Drawing Title:

PROCUREMENT AND INSTALLATION OF E&M WORKS
WATER FILTRATION PLANT
PROPOSED LOCATION FOR FLOW METERS

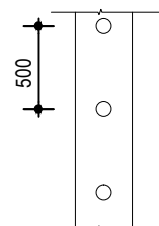
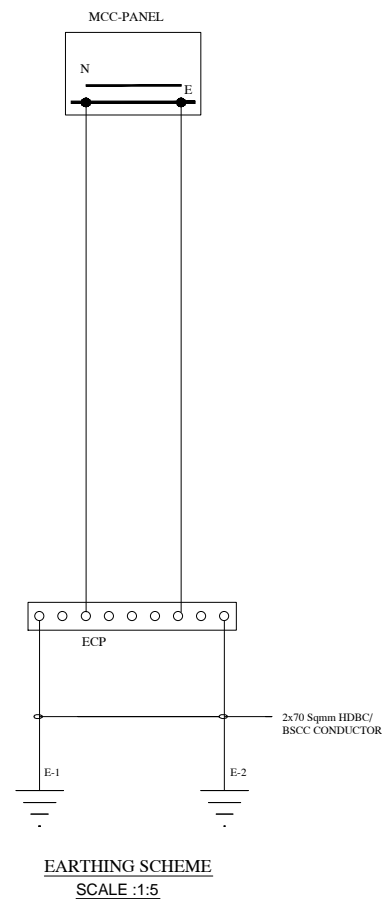
BID DRAWINGS

MISCELLANEOUS DRAWINGS



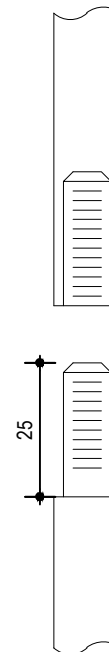
EARTH CONNECTING POINT (ECP)

SCALE 1:2



DETAIL-A

SCALE 1:1



DETAIL-B

SCALE 1:2

HDBC: HARD DRAWN BARE COPPER CONDUCTOR

BSCC: BARE STRANDED COPPER CONDUCTOR

BID DRAWINGS

0	ISSUED FOR TENDER	May, 2016
S.No.	REVISION	BY DATE
Designed By : KM.	Date : May, 2016	Revision
Drawn By : AL.	Scale : As Shown	0
Checked By : KM.	Drg.No : MSPJ-EM11-501	
Approved By : IUH.		

Funded by :



Joint Venture :



In Association With :



Project :

MUNICIPAL SERVICES PROGRAM (MSP)
WATER, WASTEWATER AND SOLID
WASTE INFRASTRUCTURE.
JACOBABAD

Drawing Title:

PROCUREMENT AND INSTALLATION OF E&M WORKS
MISCELLANEOUS DRAWINGS
EARTHING SCHEME (SHEET 1 of 2)

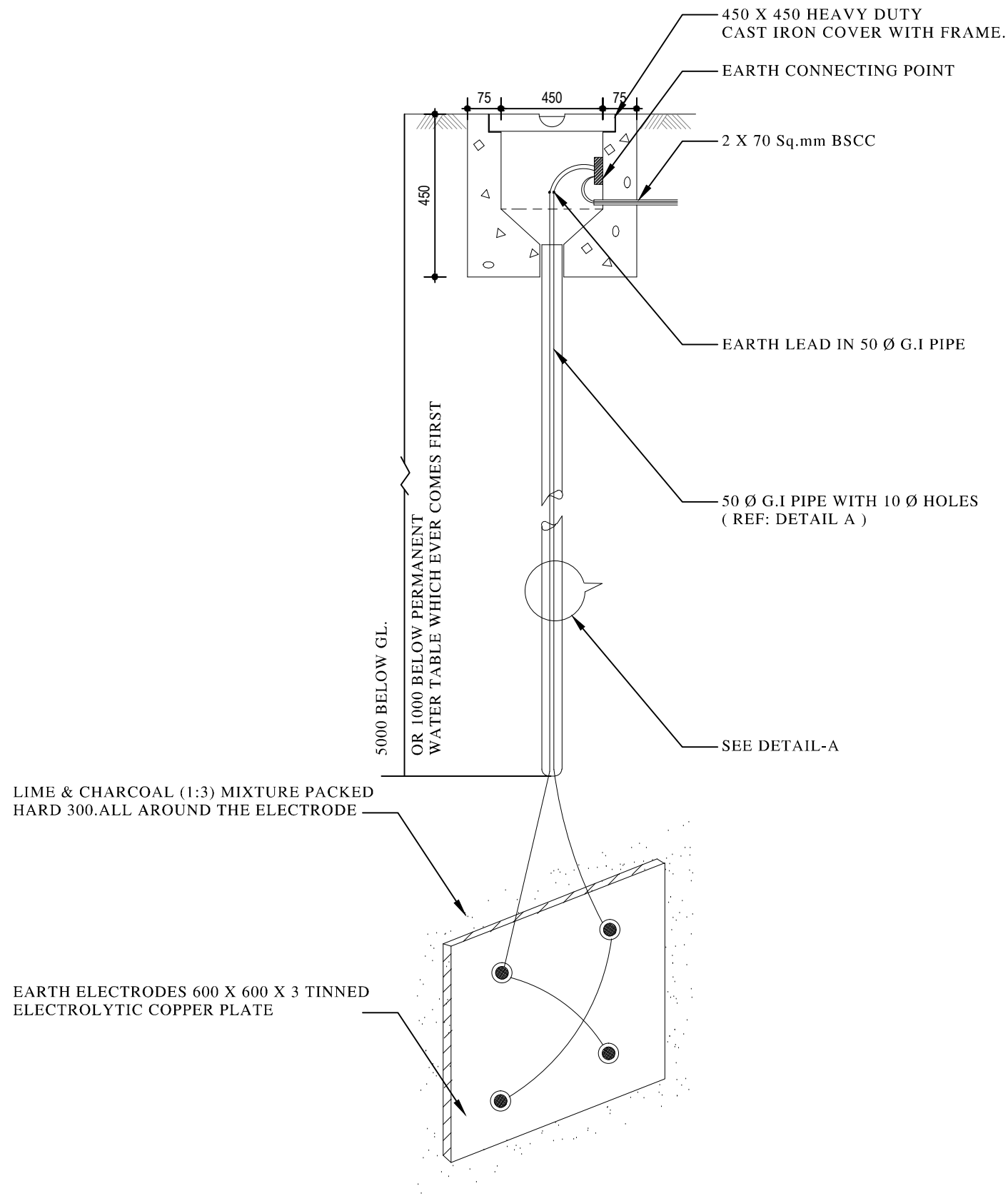
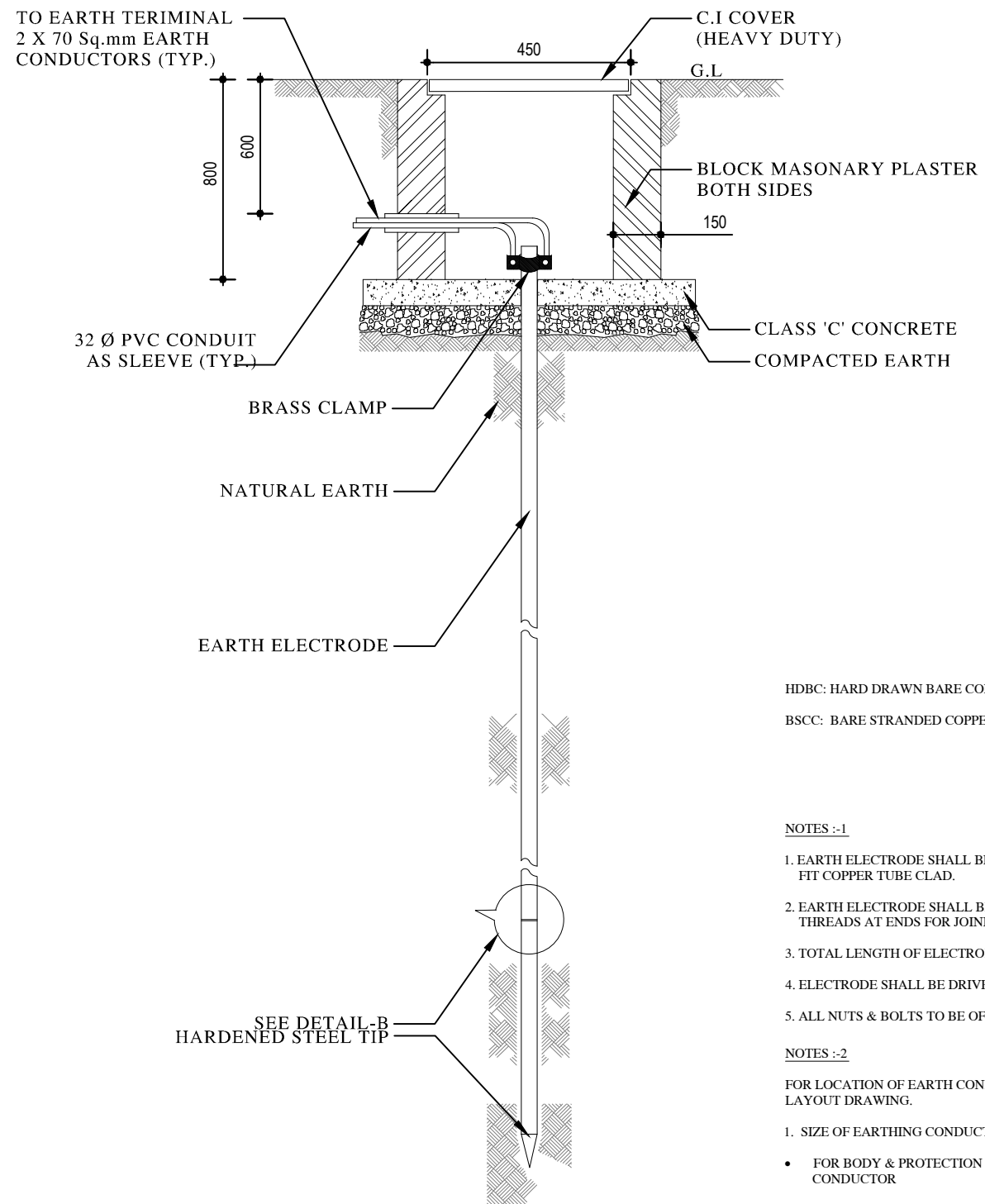


PLATE TYPE EARTH ELECTRODE
SCALE 1:2



ROD TYPE EARTH ELECTRODE
SCALE 1:2

HDBC: HARD DRAWN BARE COPPER CONDUCTOR
BSCC: BARE STRANDED COPPER CONDUCTOR

NOTES :-1

1. EARTH ELECTRODE SHALL BE OF A 20mm DIA. STEEL ROD WITH A TIGHT FIT COPPER TUBE CLAD.
2. EARTH ELECTRODE SHALL BE IN SECTIONS OF 1000mm LENGTH HAVING THREADS AT ENDS FOR JOINING.
3. TOTAL LENGTH OF ELECTRODE : 5000mm
4. ELECTRODE SHALL BE DRIVEN IN GROUND THROUGH HAMMERING.
5. ALL NUTS & BOLTS TO BE OF STAINLESS STEEL.

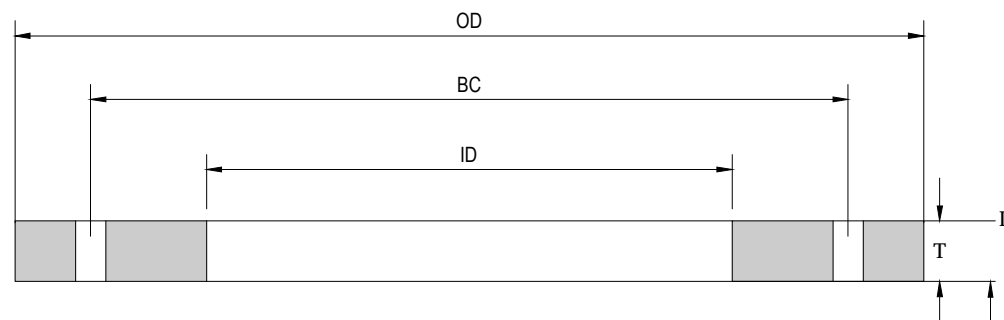
NOTES :-2

- FOR LOCATION OF EARTH CONNECTING POINTS, REFER TO SERVICE ROUTE LAYOUT DRAWING.
1. SIZE OF EARTHING CONDUCTORS TO BE AS BELOW:
 - FOR BODY & PROTECTION EARTHING : 70 Sq.mm STRANDED HDBC CONDUCTOR
 2. EARTH TERMINAL TO BE OF 96% PURE (OR HIGHER) COPPER.
 3. ALL NUTS & BOLTS TO BE OF STAINESS STEEL.

BID DRAWINGS

0	ISSUED FOR TENDER	May, 2016
S.No.	REVISION	BY DATE
Designed By : KM.	Date : May, 2016	Revision
Drawn By : AL.	Scale : As Shown	0
Checked By : KM.	Drg.No : MSPJ-EM11-502	
Approved By : IUH.		

1. All dimensions are in millimeters unless noted otherwise.
2. Length of pipe to finalized after joint survey at site.



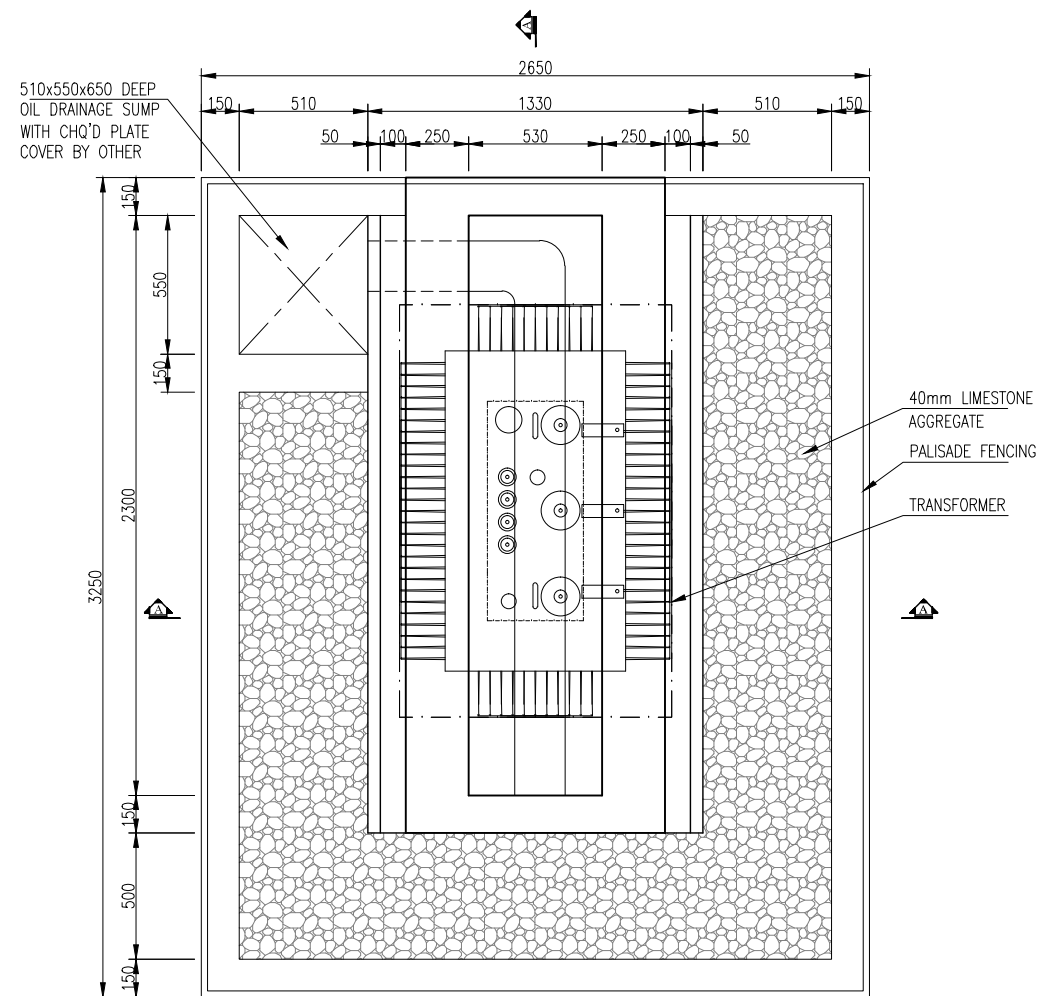
Dimensions of M.S Pipe Flanges According to Awwa C207-07 Class D Pressure Rating 175-150 PSI (10.0 bar to 12 bars)

Detail of Flange

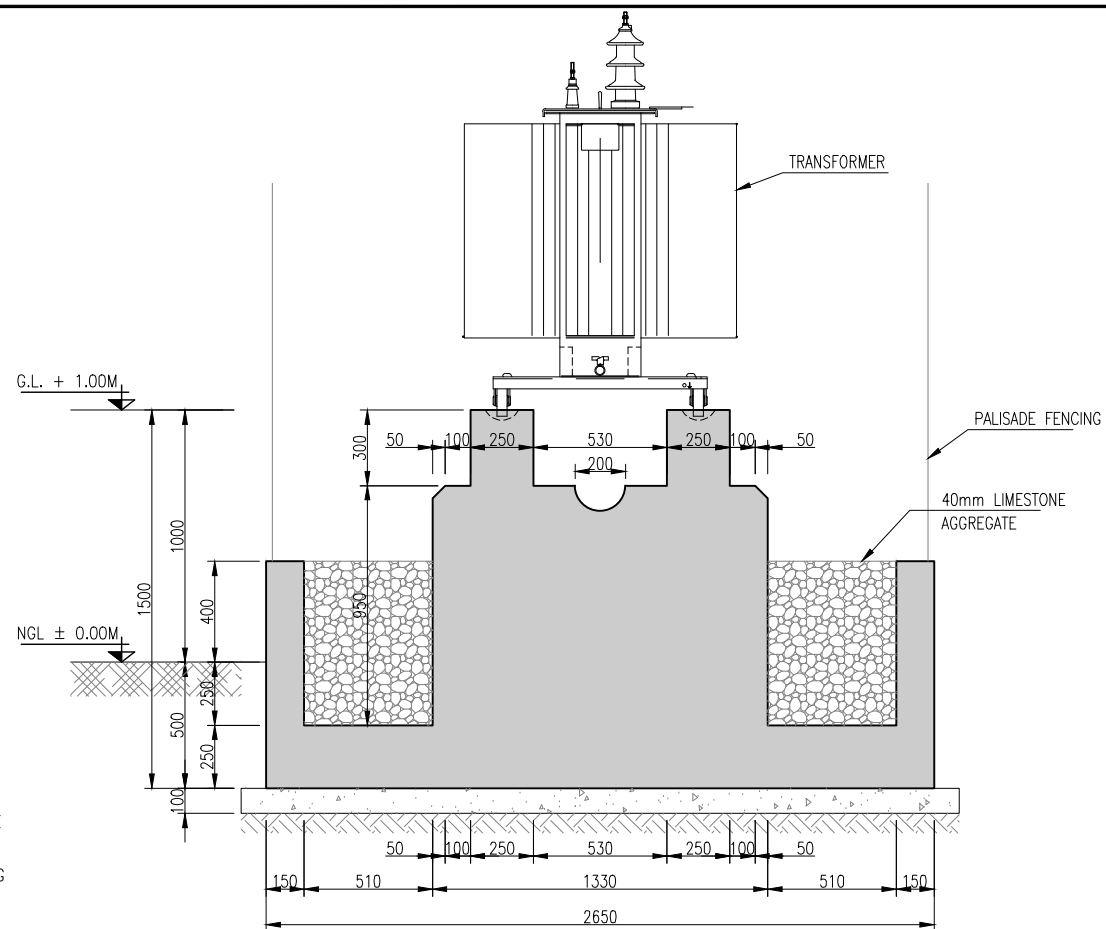
Nominal Size		Out side Diameter (OD)		Slip-on Bore (ID)		No of Bolt Holes	Diameter of Holes		Bolt Circle (BC)		Bolt Diameter +		Flanges Dimensions Class D	
												T		
Inches	Millimeter	Inches	Millimeter	Inches	Millimeter		Inches	Millimeter	Inches	Millimeter	Inches	Millimeter	Inches	Millimeter
24	600	32.00	813	24.19	614	20	1.375	34.92	29.50	749.30	1.250	31.75	1.250	31.75

BID DRAWING			
0	ISSUED FOR TENDER		May, 2016
S.No.	REVISION	BY	DATE
Designed By : HT.		Date : May, 2016	Revision
Drawn By : RA.		Scale : N.T.S.	0
Checked By : ASD.		Drg.No : MSPJ-EM11-503	
Approved By : MBL.			

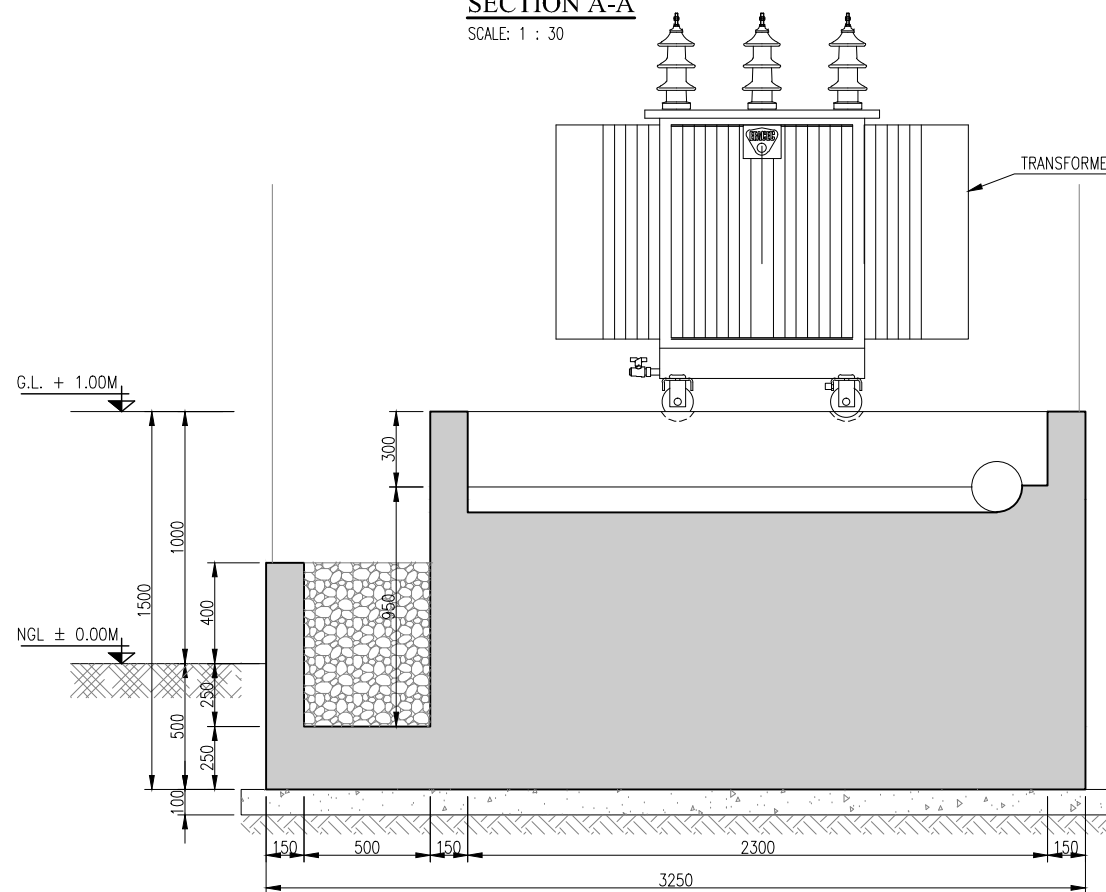
- NOTES :-
1. All dimensions are in millimeters unless noted otherwise. levels and elevations are given in meters.
 2. For general notes refer dwg # MSPJ-EM11-102.



TRANSFORMER FOUNDATION PAD
SCALE: 1 : 30



SECTION A-A
SCALE: 1 : 30



SECTION B-B
SCALE: 1 : 30

BID DRAWING

0	ISSUED FOR TENDER	May, 2016
S.No.	REVISION	BY DATE
Designed By : SM.	Date : May, 2016	Revision
Drawn By : RA.	Scale : AS SHOWN	0
Checked By : ASD.	Drg.No : MSPJ-EM11-504	
Approved By : MBL.		



Project :
MUNICIPAL SERVICES PROGRAM (MSP)
Water, Wastewater and Solid Waste
Infrastructure. JACOBABAD

Drawing Title:
PROCUREMENT AND INSTALLATION OF E&M WORKS
MISCELLANEOUS DRAWINGS
TRANSFORMER FOUNDATION PLAN & DETAILS