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2

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A

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KHATOON ABAD POWER PLANT
230KV SUBSTATION
CLAMP & FITTING LOCATION & DRAWING

REFERENCE DOCUMENT & DWG

LEGENDS

NOTES

KEY PLAN

D							
C							
B							
A	SECOND ISSUE	E.BARZEGAR	E.BARZEGAR	DEHGHAN	DEHGHAN	DEHGHAN	1405.02.20
O	FIRST ISSUE	NOORI	NOORI	DEHGHAN	DEHGHAN	DEHGHAN	1404.02.23
Rev.	DESCRIPTION	DRAWN	DESIGNED	CHKD.	HEAD	APPR.	DATE



PROJECT: KHATOON ABAD GAS POWER PLANT
230KV AIS SUBSTATION

TITLE:
CLAMP & FITTING LOCATION & DRAWING

OWNER'S DWG. NO. : MD1-RF-00-SS-E-01-NY0-817 REV. NO. : A

SCALE : AS SHOWN FORMAT : A3 FILE NO. : SHEET: 0 OF: 13

CONTRACT NO. : 01-BAA-12191-204-AE DESIGN TYPE : BASIC DESIGN ☐
DETAIL DESIGN ☒



E.BARZEGAR E.BARZEGAR DEHGHAN DEHGHAN DEHGHAN 1405.02.20

DRAWN DESIGNED CHKD. HEAD APPR. DATE

MAPNA'S DWG. NO. : MD1-RF-00-SS-E-01-NY0-817 REV. NO. : A

SUB-CONTRACTOR DWG. NO.:

XXXX IN-HOUSE REVISION

C						
B						
A	SECOND ISSUE	E.BARZEGAR	E.BARZEGAR	DEHGHAN	DEHGHAN	1405.02.20
O	FIRST ISSUE	NOORI	NOORI	DEHGHAN	DEHGHAN	1404.02.23
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Page	Description	Revision				
		0	A	B	C	D
0	COVER SHEET	✓	✓			
1	LIST OF CONTENTS	✓	✓			
2	GENERAL LAYOUT-SCOPE OF WORK	✓	✓			
3	SECTION A-A	✓	✓			
4	SECTION B-B	✓	✓			
5	SECTION C-C	✓	✓			
6	SECTION D-D & E-E	✓	✓			
7	SECTION F-F & G-G	✓	✓			
8	SECTION H-H	✓	✓			
9	SECTION I-I & J-J	✓	✓			
10	SECTION K-K	✓	✓			
11	TUBE CUTTING	✓	✓			
12	LIST OF CLAMP & FITTING	✓	✓			
13	LIST OF CLAMP & FITTING	✓	✓			

 NATIONAL IRANIAN COPPER INDUSTRIES COMPANY (N.I.C.I.)	SUB-CONTRACTOR'S LOGO	E							DWG./Doc. No. MD1-RF-00-SS-E-01-NYO-817			 Mapna Power Plants Construction & Development Co(MD-1)	NIROO TAVAN GOSTAR MOHAM SHARGH COMPANY  NIROO CONSULTING ENGINEERING CO.	
		C								DRAWING TITLE:	REV. NO. : A			
		B								LIST OF CONTENTS				
	SUB CONTRACTOR DWG. NO.:		A	SECOND ISSUE	BARZEGAR	BARZEGAR	DEHGHAN	DEHGHAN	1405.02.20					
MAPNA'S DWG. No. :	NIYAM'S LOGO	O	FIRST ISSUE	NOORI	NOORI	DEHGHAN	DEHGHAN	1404.02.23	DESIGN STAGE :	FILE No.	FORMAT : A3	PROJECT :	KHATOON ABAD GAS POWER PLANT 230KV AIS S/S	SCALE: —
		REV.	DESCRIPTION	DESN	DWN	CHKD	APPR	DATE						

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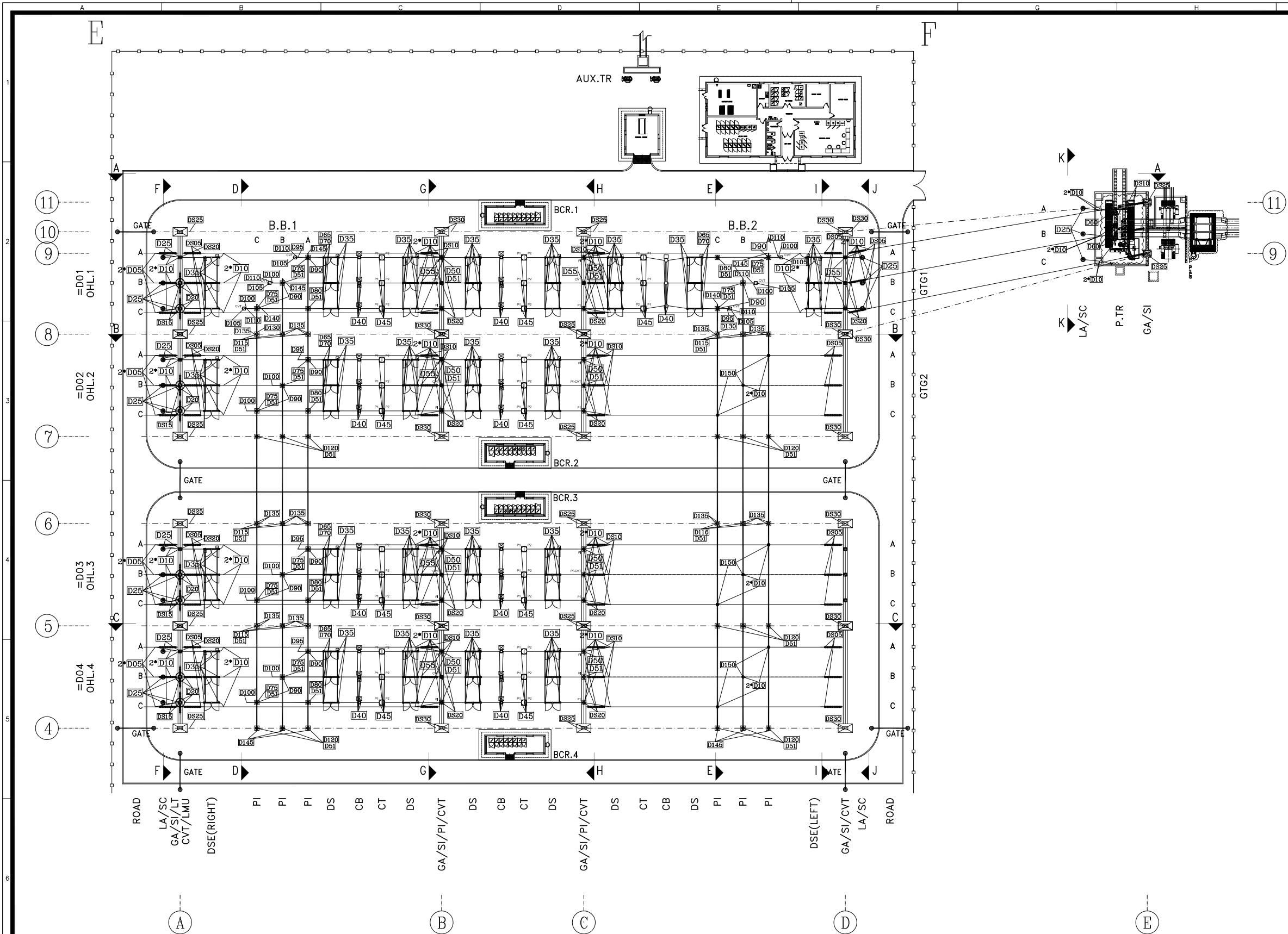


TABLE OF MIN. CLEARANCES (mm)
(REF. IEC 61936 & TAVANIR CODE 486)

BASIC DATA	RATED SYSTEM VOLTAGE (UN)	
	230 KV	
	RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE (LIWL)	
	1050KV	
	RATED SWITCHING IMPULSE WITHSTAND VOLTAGE (SIWL)	
	—	
	RATED POWER FREQUENCY WITHSTAND VOLTAGE (PFWL)	
	460KV	
A	MINIMUM PHASE TO EARTH CLEARANCE	2100
B	MINIMUM PHASE TO PHASE CLEARANCE	2100
C	BETWEEN GROUND & INSULATOR BASE (SAFETY ZONE)	2500
D	BETWEEN GROUND & LOWEST LIVE PART (SAFETY DISTANCE)	4600
E	TO NEAREST LIVE PART (VERTICAL WORKING ZONE)	3780
F	TO NEAREST LIVE PART (HORIZONTAL WORKING ZONE)	4280
G	SHIELD WIRE CLEARANCE OVER BUS CONDUCTOR	5000
H	HEIGHT OF ENERGIZED PARTS ABOVE MAIN ROADS	10000

LEGEND

REF. No.	DESCRIPTION
PI	POST INSULATOR
DS	DISCONNECTOR SWITCH
DS/E	DISCONNECTOR WITH EARTHING SWITCH
LA	LIGHTNING ARRESTER
CVT	CAPACITIVE VOLTAGE TRANSFORMER
CT	CURRENT TRANSFORMER
CB	CIRCUIT BREAKER
LT	LINE TRAP
AUX. TR.	AUXILIARY TRANSFORMER
GTG	230KV GAS UNIT MAIN TRANSFORMER

UTM

Point No	X	Y
E	343130.463	3329557.700
F	343271.243	3329549.825
G	343120.298	3329375.983
H	343261.078	3329368.108

NOTE: 1- ALL DIMENSIONS ARE IN m.



SUB-CONTRACTOR'S LOGO

SUB CONTRACTOR DWG. NO.:

NIYAM'S LOGO

E					
D					
C					
B					
A	SECOND ISSUE	BARZEGAR	BARZEGAR	DEHGHAN	DEHGHAN 1405.02.20
O	FIRST ISSUE	NOORI	NOORI	DEHGHAN	DEHGHAN 1404.02.23
REV.	DESCRIPTION	DES	DWN	CHKD	APPR DATE

DWG./Doc. No. MD1-RF-00-SS-E-01-NY0-817

DRAWING TITLE:
GENERAL LAYOUT-SCOPE OF WORK

DESIGN STAGE :

FILE No.

REV. NO. : A

SHEET:02OF:13

FORMAT : A3



Mapna Power Plants Construction & Development Co(MD-1)

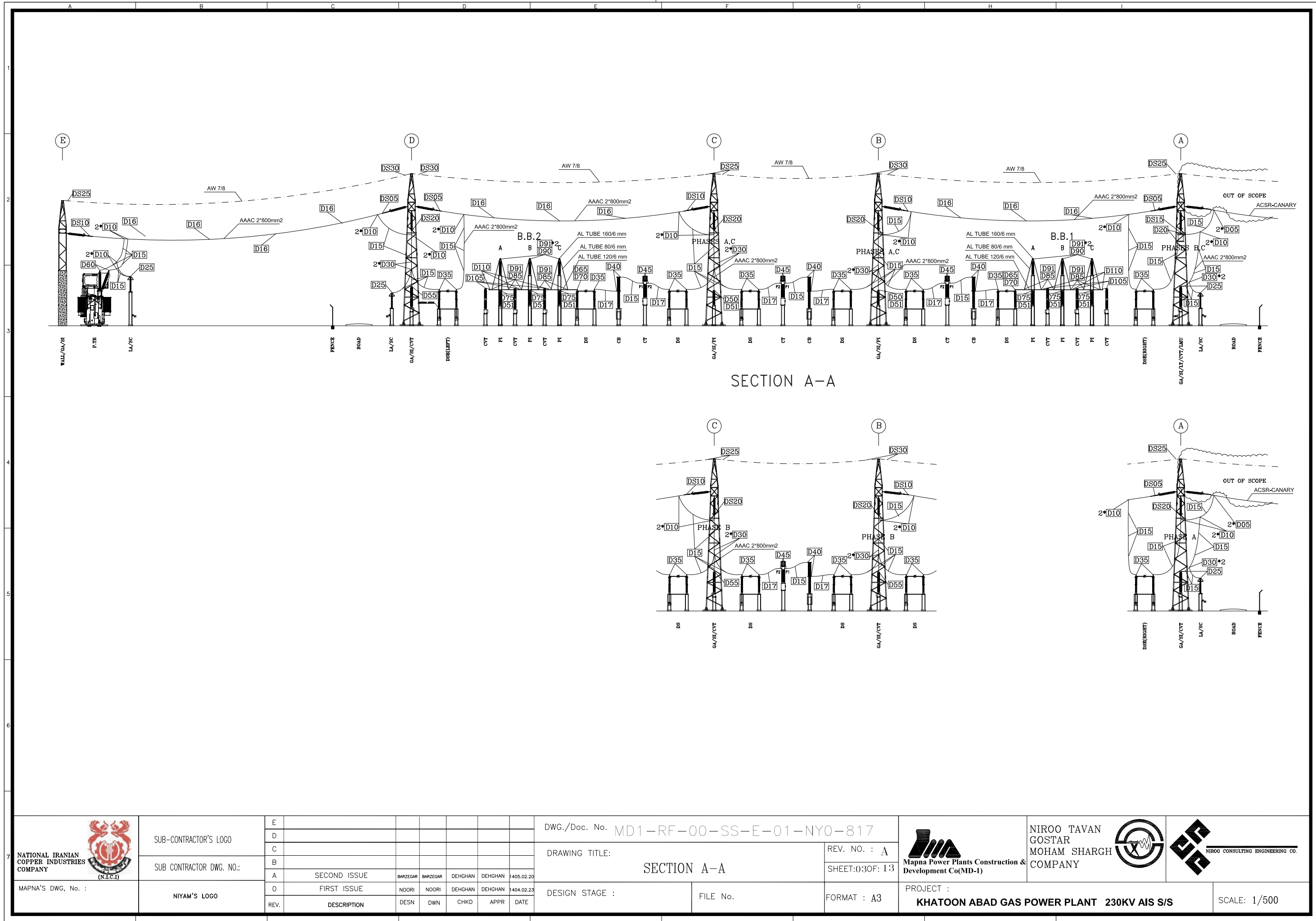
NIROO TAVAN
GOSTAR
MOHAM SHARGH
COMPANY



PROJECT :
KHATOON ABAD GAS POWER PLANT 230KV AIS S/S

SCALE: 1/700

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SECTION B-B

SECTION B-B

DRAWING TITLE:

REV. NO. : A

SHEET:04OF:13

DESIGN STAGE :

FILE No.

FORMAT : A3



**Mapna Power Plants Construction &
Development Co(MD-1)**

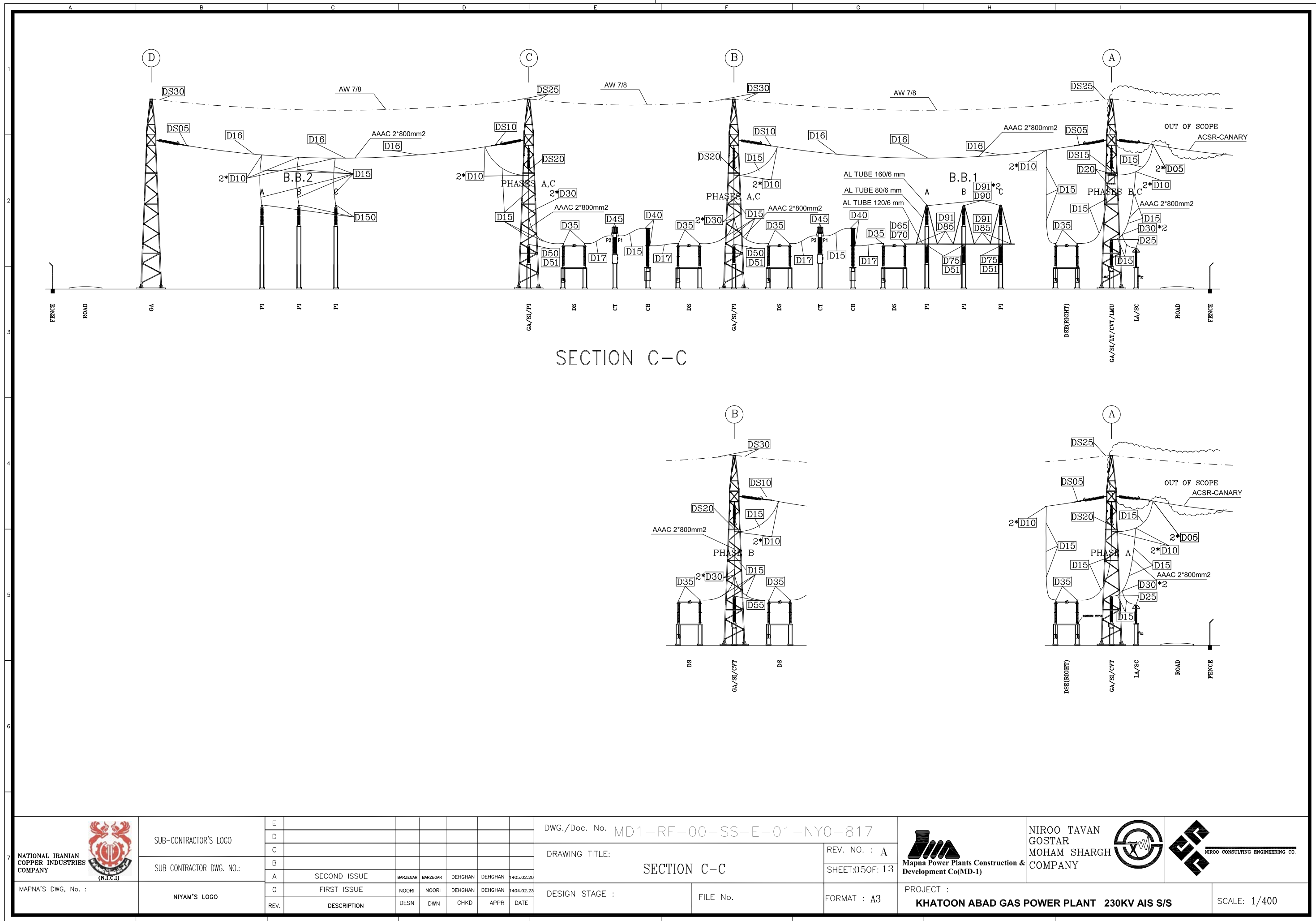
NIROO TAVAN
GOSTAR
MOHAM SHARGH
& COMPANY



PROJECT : **KHATOON ABAD GAS POWER PLANT 230KV AIS S/S**

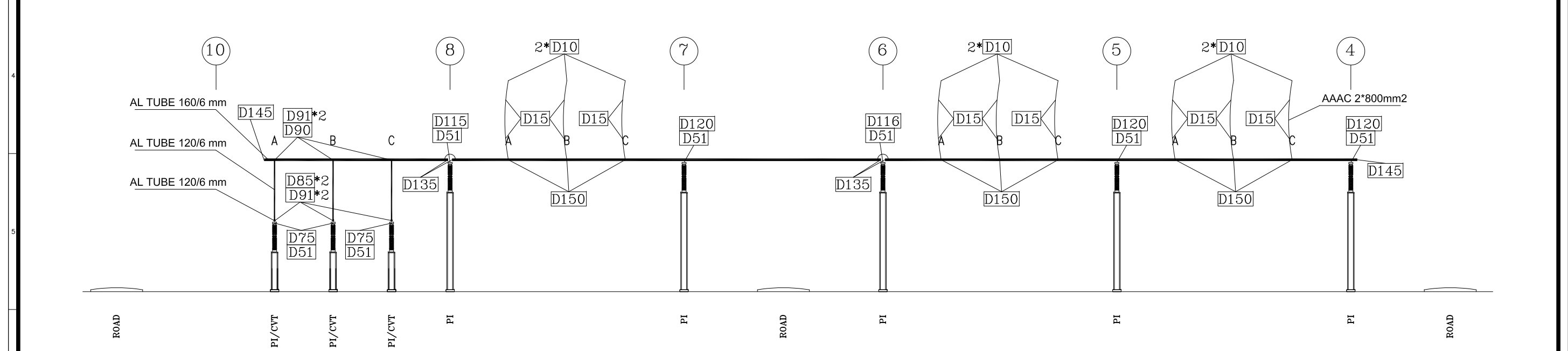
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SECTION D-D(B.B.1)



6 SECTION E-E(B.B.2)

[illegible]

10 8 7 6 5 4

A B C A B C A B C A B C

DS15 DS20 2*D10 D20 D15 D25 GA CVT CVT/LMU GA CVT CVT/LMU GA CVT CVT/LMU GA CVT CVT/LMU GA

ROAD ROAD ROAD ROAD ROAD ROAD ROAD ROAD

SECTION F-F

10 8 7 6 5 4

A B C A B C A B C A B C

DS20 DS20 D15 2*D10 D15 D50 D55 D50 DS20 DS20 D15 2*D10 D15 D50 D55 D50 DS20 DS20 D15 2*D10 D15 D50 D55 D50 DS20 DS20 D15 2*D10 D15 D50 D55 D50

ROAD ROAD ROAD ROAD ROAD ROAD ROAD ROAD

SECTION G-G

 NATIONAL IRANIAN COPPER INDUSTRIES COMPANY MAPNA'S DWG. No. :	SUB-CONTRACTOR'S LOGO	E							DWG./Doc. No. MD1-RF-00-SS-E-01-NYO-817 DRAWING TITLE: SECTION F-F & G-G DESIGN STAGE : FILE No.	REV. NO. : A SHEET:07OF: 13 FORMAT : A3	 Mapna Power Plants Construction & Development Co(MD-1)	NIROO TAVAN GOSTAR MOHAM SHARGH COMPANY  NIROO CONSULTING ENGINEERING CO.	 NIROO CONSULTING ENGINEERING CO.
		SUB CONTRACTOR DWG. NO.:											
	SECOND ISSUE												
	FIRST ISSUE												
	REV. DESCRIPTION												
	DESN DWN CHKD APPR DATE												
	NOORI NOORI DEGHAN DEGHAN 1405.02.20												
SUB CONTRACTOR DWG. NO.:	NIYAM'S LOGO	NOORI NOORI DEGHAN DEGHAN 1404.02.23							DESIGN STAGE :	FILE No.	FORMAT : A3	PROJECT : KHATOON ABAD GAS POWER PLANT 230KV AIS S/S	SCALE: 1/350
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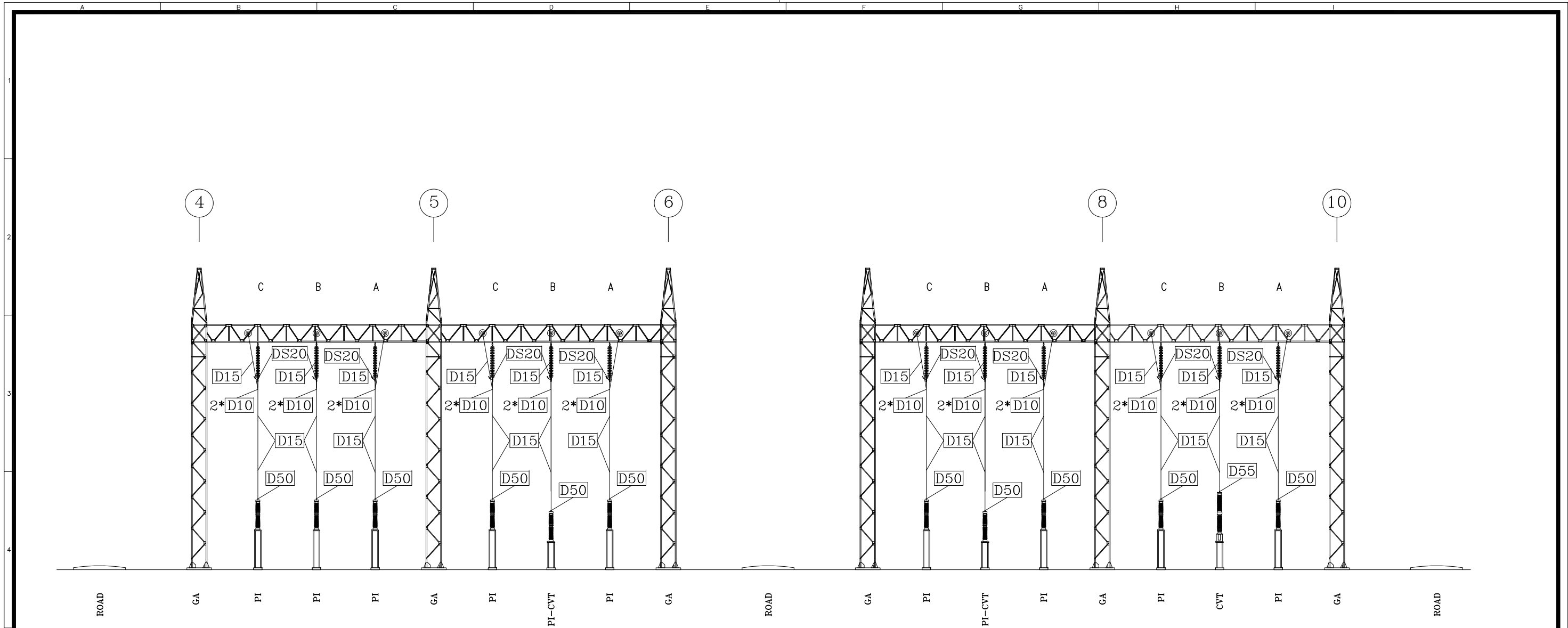
SUB-CONTRACTOR'S LOGO
SUB CONTRACTOR DWG. NO.:
NIYAM'S LOGO

E						
D						
C						
B						
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REV.	DESCRIPTION	DESN	DWN	CHKD	APPR	DATE

DWG./Doc. No. MD1-RF-00-SS-E-01-NYO-817		
DRAWING TITLE: SECTION F-F & G-G		REV. NO. : A
		SHEET:07OF:13
DESIGN STAGE :	FILE No.	FORMAT : A3

 Mapna Power Plants Construction & Development Co(MD-1)	NIROO TAVAN GOSTAR MOHAM SHARGH COMPANY 	 NIROO CONSULTING ENGINEERING CO.
PROJECT : KHATOON ABAD GAS POWER PLANT 230KV AIS S/S		SCALE: 1/350

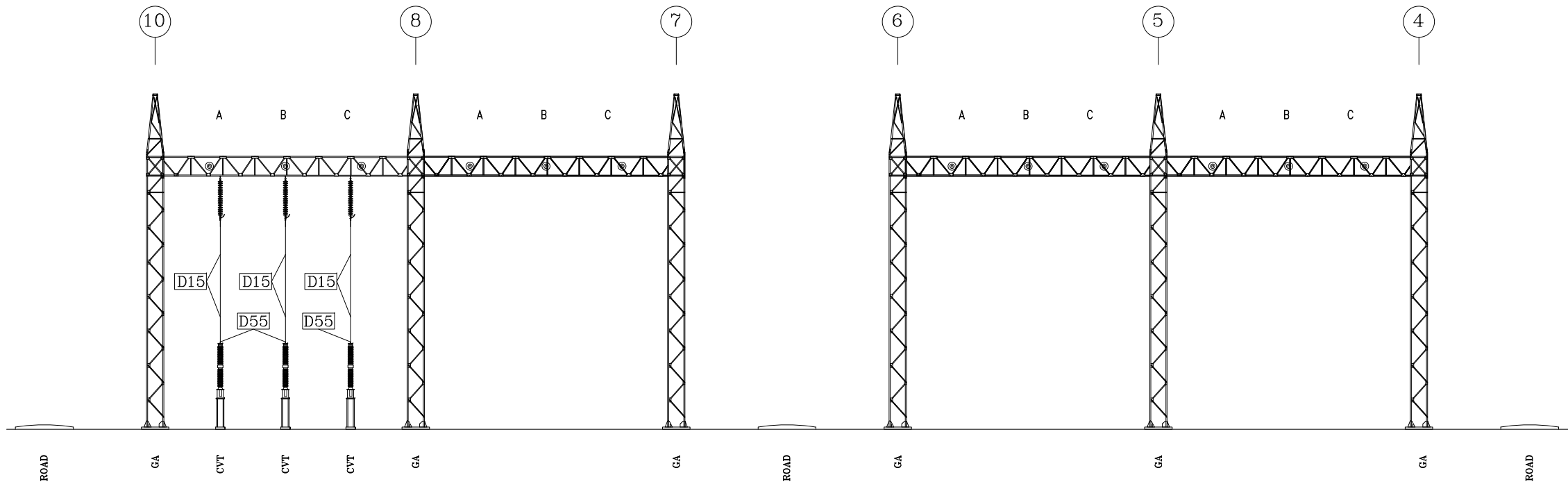
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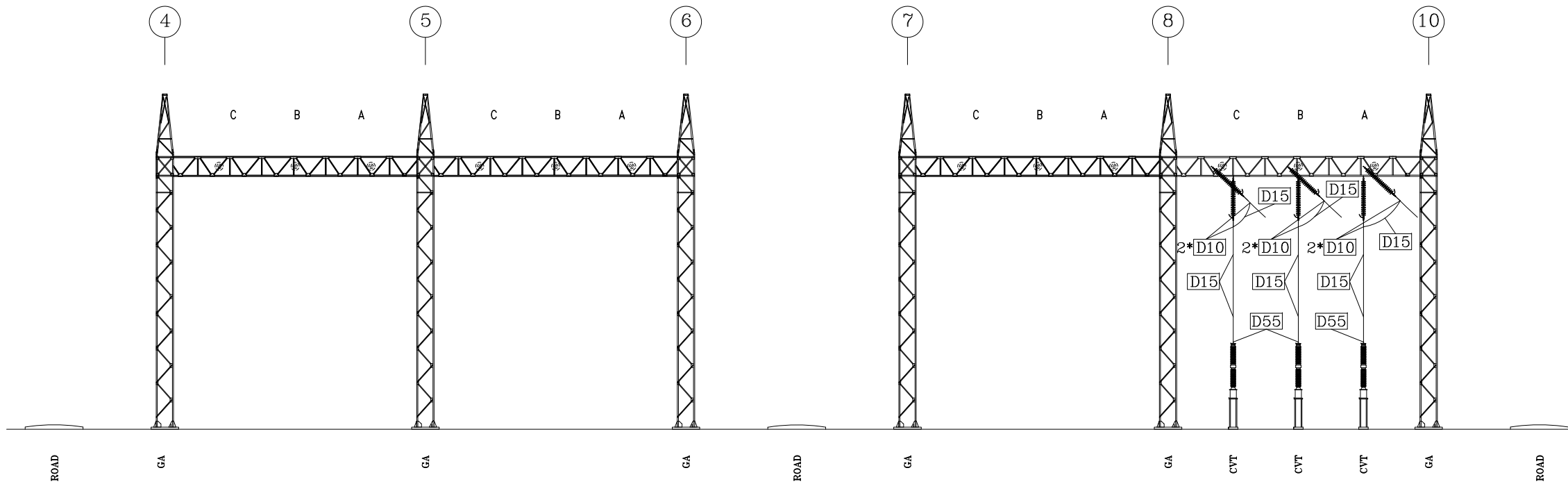
SECTION H-H

 NATIONAL IRANIAN COPPER INDUSTRIES COMPANY (N.I.C.I)	SUB-CONTRACTOR'S LOGO	E							DWG./Doc. No. MD1-RF-00-SS-E-01-NYO-817			 Mapna Power Plants Construction & Development Co(MD-1)	NIROO TAVAN GOSTAR MOHAM SHARGH COMPANY  NIROO CONSULTING ENGINEERING CO.			
		D														
		C														
	SUB CONTRACTOR DWG. NO.:		B						DRAWING TITLE: SECTION H-H						REV. NO. : A	
	A	SECOND ISSUE	BARZEGAR	BARZEGAR	DEHGHAN	DEHGHAN	1405.02.20	SHEET:08 OF: 13								
	MAPNA'S DWG. No. :	NIYAM'S LOGO	O	FIRST ISSUE	NOORI	NOORI	DEHGHAN	DEHGHAN	1404.02.23	DESIGN STAGE :		FILE No.	FORMAT : A3	PROJECT :	KHATOON ABAD GAS POWER PLANT 230KV AIS S/S	SCALE: 1/300
			REV.	DESCRIPTION	DESN	DWN	CHKD	APPR	DATE							

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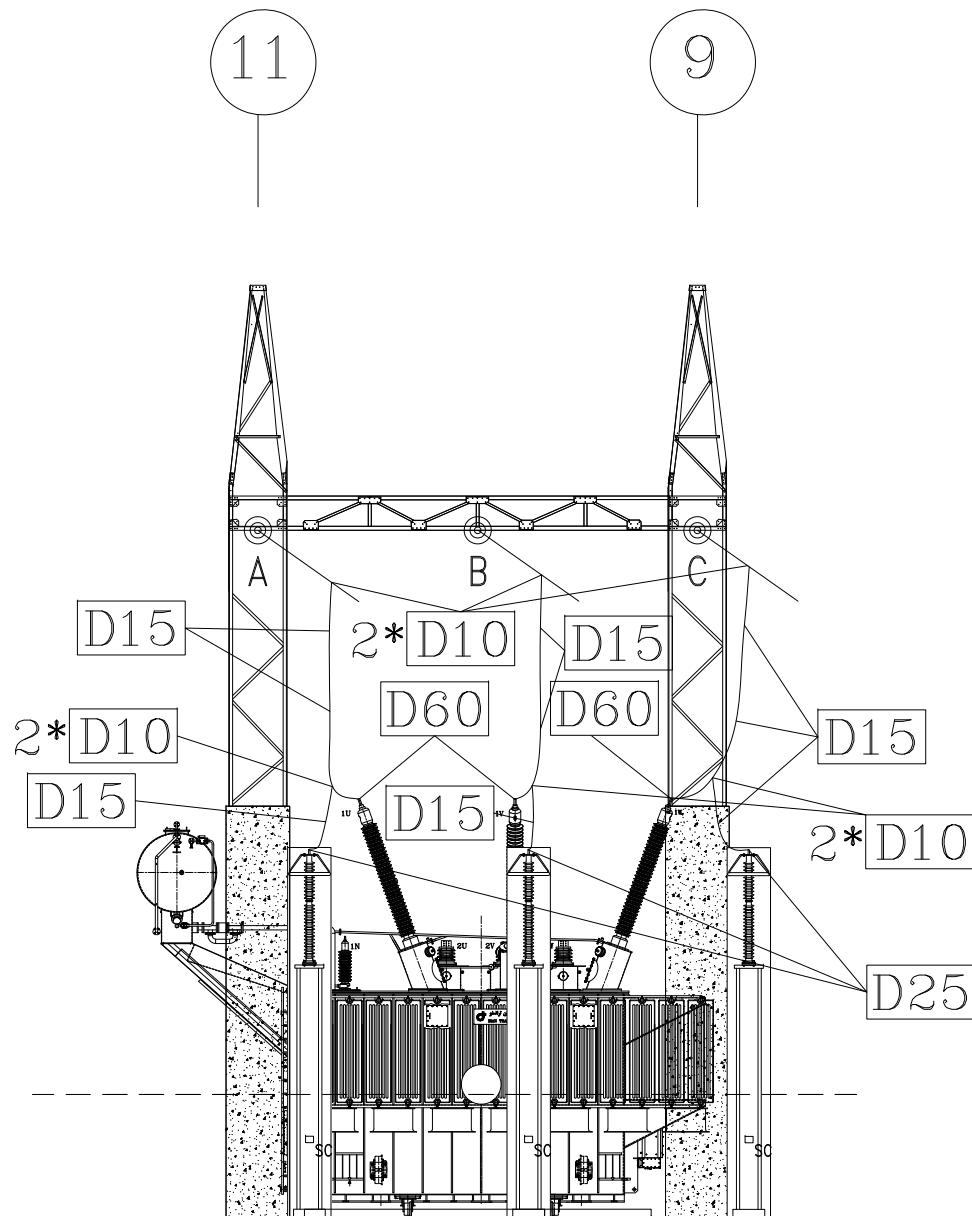
SECTION I-I



SECTION J-J

 NATIONAL IRANIAN COPPER INDUSTRIES COMPANY (N.I.C.I.) MAPNA'S DWG. No. :	SUB-CONTRACTOR'S LOGO	E						DWG./Doc. No. MD1-RF-00-SS-E-01-NYO-817			 Mapna Power Plants Construction & Development Co(MD-1)	NIROO TAVAN GOSTAR MOHAM SHARGH COMPANY	 NIROO CONSULTING ENGINEERING CO.										
		D							DRAWING TITLE:					REV. NO. : A									
		C							SECTION I-I & J-J					SHEET:09OF: 13									
	SUB CONTRACTOR DWG. NO.:	B							DESIGN STAGE :			FILE No.			FORMAT : A3			PROJECT : KHATOON ABAD GAS POWER PLANT 230KV AIS S/S			SCALE: 1/350		
		A	SECOND ISSUE	BARZEGAR	BARZEGAR	DEHGHAN	DEHGHAN	1405.02.20															
		O	FIRST ISSUE	NOORI	NOORI	DEHGHAN	DEHGHAN	1404.02.23															
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LA/SC

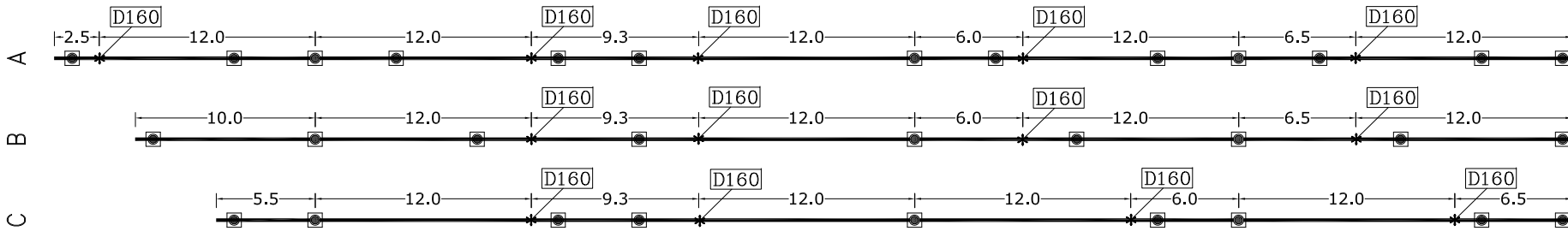
WALL/GA/SI
LA/SC

SECTION K-K

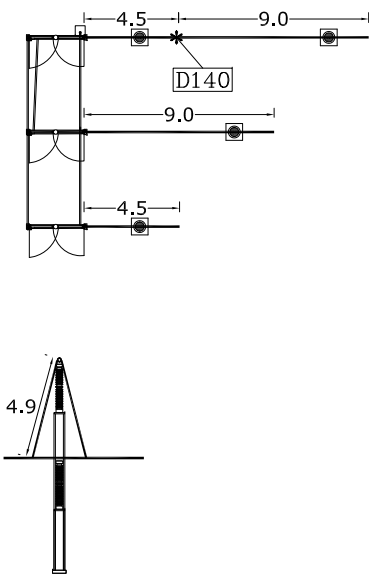
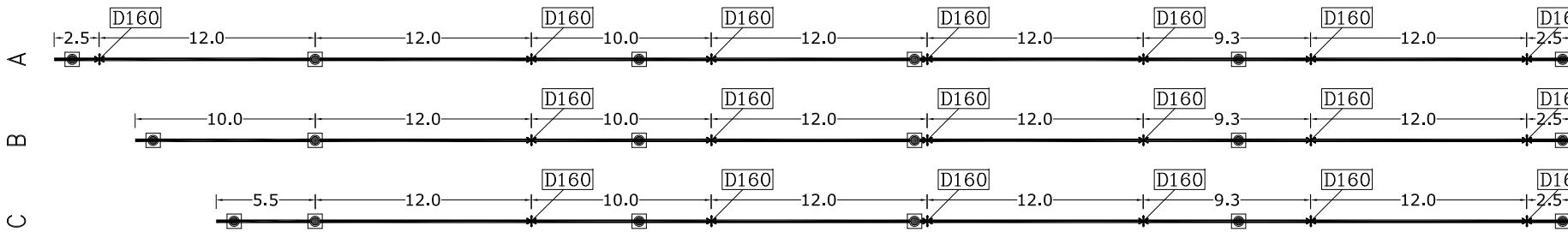
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NIYAM'S LOGO		O	FIRST ISSUE	NOORI	NOORI	DEGHAN	DEGHAN	1404.02.23	PROJECT : KHATOON ABAD GAS POWER PLANT 230KV AIS S/S	SCALE: 1/150			
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B.B.1



B.B.2



TUBE CUTTING TABLE		
TYPE	LENGTH	QTY
160/6	12 m	26
	10 m	5
	9.3 m	6
	6.5 m	4
	6 m	2
	5.5 m	2
	2.5 m	5

TUBE CUTTING TABLE		
TYPE	LENGTH	QTY
120/6	9 m	10
	4.9 m	30
	4.5 m	10

NOTE:1- THE LENGTH OF DAMPING WIRE IS (2/3 TUBE LENGTH) OF ONE SIDE
2- THE LENGTH OF DAMPING WIRE for FOR BUSBAR IS (2/3 TUBE LENGTH) OF BOTH SIDE

 NATIONAL IRANIAN COPPER INDUSTRIES COMPANY	SUB-CONTRACTOR'S LOGO	E							DWG./Doc. No. MD1-RF-00-SS-E-01-NYO-817			 Mapna Power Plants Construction & Development Co(MD-1)	NIROO TAVAN GOSTAR MOHAM SHARGH COMPANY  NIROO CONSULTING ENGINEERING CO.		
		D								DRAWING TITLE:				REV. NO. : A	
		C								TUBE CUTTING				SHEET:11 OF: 13	
	B														
	SUB CONTRACTOR DWG. NO.:		A	SECOND ISSUE	BARZEGAR	BARZEGAR	DEHGHAN	DEHGHAN	1405.02.20						
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SQ	CLAMP TYPE	CLAMP CODE	SYMBOL	DATA A	DATA B	QUANTITY
1	ASSEMBLY OF T-CONNECTOR (WIRE TO WIRE)	D05		AL:1*800mm ² Ø=36.8mm	CANARY Ø=29.52mm	24
2	ASSEMBLY OF T-CONNECTOR (WIRE TO WIRE)	D10		AL:1*800mm ² Ø=36.8mm	AL:1*800mm ² Ø=36.8mm	200
3	ASSEMBLY OF SPACER (WIRE TO WIRE)	D15		AL:1*800mm ² Ø=36.8mm	—	309
4	ASSEMBLY OF SPACER (WIRE TO WIRE)	D16		AL:1*800mm ² Ø=36.8mm	—	84
5	ASSEMBLY OF EARTHING POINT	D17		AL:1*800mm ² Ø=36.8mm	—	54
6	ASSEMBLY OF FLAT TERMINAL 90' (2 WIRES TO FLAT)	D20		FLAT AL PLATE 120*120 mm ² 9 Ø 14 distance 40mm	AL:2*800mm ² Ø=36.8mm	16
6	ASSEMBLY OF SINGLE DUPLEX ELBOW (2 WIRES TO STUD)	D25		STUD: AL Ø=30mm	AL:2*800mm ² Ø=36.8mm	30
8	ASSEMBLY OF PARALLEL CLAMP (WIRE TO WIRE)	D30		AL:2*800mm ² Ø=36.8mm	—	114
9	ASSEMBLY OF SINGLE DUPLEX ELBOW (2 WIRES TO STUD)	D35		STUD: AL Ø=60mm	AL:2*800mm ² Ø=36.8mm	123
10	ASSEMBLY OF FLAT TERMINAL (2 WIRES TO FLAT)	D40		FLAT AL PLATE 125*125 mm ² 9 Ø 14.5 distance 40mm	AL:2*800mm ² Ø=36.8mm	54
11	ASSEMBLY OF FLAT TERMINAL (2 WIRES TO FLAT)	D45		FLAT AL PLATE 125*125 mm ² 9 Ø 14 distance 40mm	AL:2*800mm ² Ø=36.8mm	54
12	ASSEMBLY OF DOUBLE VERTICAL CABLE SUPPORT	D50		AL:2*800mm ² Ø=36.8mm	8 Ø 18 AT Ø225	19
13	ASSEMBLY OF CORONA RING FOR PI	D51		—	8 Ø 18 AT Ø225	69
14	ASSEMBLY OF ASSEMBLY OF STRAIGHT COUPLER (STUD TO 2 WIRES)	D55		STUD: AL Ø=30mm	AL:2*800mm ² Ø=36.8mm	8
15	ASSEMBLY OF SINGLE DUPLEX ELBOW (2 WIRES TO STUD)	D60		HOLD	AL:2*800mm ² Ø=36.8mm	3
16	ASSEMBLY OF EXPENSION COUPLER	D65		STUD: AL Ø=60mm	TUBE: AL Ø=120/6mm	15
17	ASSEMBLY OF STOPPER	D70		—	—	15
18	ASSEMBLY OF BUSBAR SUPPORT FOR PI (FIX)	D75		TUBE: AL Ø=120/6mm	8 Ø 18 AT Ø225	15
19	ASSEMBLY OF BUSBAR SUPPORT FOR PI (SLIDE)	D80		TUBE: AL Ø=120/6mm	8 Ø 18 AT Ø225	5
20	ASSEMBLY OF LOWER A-FRAME	D85		TUBE: AL Ø=120/6mm	TUBE: AL Ø=120/6mm	30
21	ASSEMBLY OF UPPER A-FRAME	D90		TUBE: AL Ø=160/6mm	TUBE: AL Ø=120/6mm	15



SUB-CONTRACTOR'S LOGO

SUB CONTRACTOR DWG. NO.:

MAPNA'S DWG. No. :

NIYAM'S LOGO

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A	SECOND ISSUE	BARZEGAR	BARZEGAR	DEHGHAN	DEHGHAN	1405.02.20	
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DRAWING TITLE:
LIST OF CLAMP & FITTING

DESIGN STAGE :

FILE No.

REV. NO. : A

SHEET:12OF:13

FORMAT : A3



Mapna Power Plants Construction &
Development Co(MD-1)

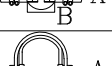
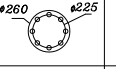
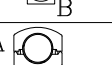
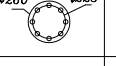
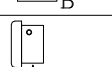
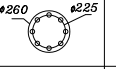
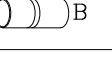
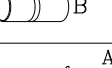
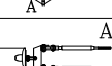
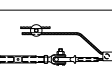
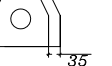
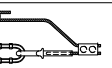
PROJECT :
KHATOON ABAD GAS POWER PLANT 230KV AIS S/S

NIROO TAVAN
GOSTAR
MOHAM SHARGH
COMPANY



SCALE: —

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SQ	CLAMP TYPE	CLAMP CODE	SYMBOL	DATA A	DATA B	QUANTITY
22	ASSEMBLY OF INTERNAL END CAP WITHOUT DAMPING WIRE	D91		TUBE: AL $\phi=120/6mm$	—	60
23	ASSEMBLY OF CORONA BELL WITHOUT DAMPING WIRE	D95		TUBE: AL $\phi=120/6mm$	—	5
24	ASSEMBLY OF CORONA BELL WITH DAMPING WIRE (300mm ² AL)	D100		TUBE: AL $\phi=120/6mm$	—	10
25	ASSEMBLY OF SINGLE DUPLEX T-CONNECTOR (2 WIRES TO STUD)	D105		STUD: AL $\phi=30mm$	AL: 2*800mm ² $\phi=36.8mm$	6
26	ASSEMBLY OF PARALLEL CLAMP (TUBE TO 2 WIRES)	D110		TUBE: AL $\phi=120/6mm$	AL: 2*800mm ² $\phi=36.8mm$	6
27	ASSEMBLY OF EXPANSION COUPLER WITH SUPPORT (SLIDE)	D115		TUBE: AL $\phi=160/6mm$	8 $\phi 18$ AT $\phi 225$ 	12
28	ASSEMBLY OF EXPANSION COUPLER WITH SUPPORT (FIX)	D116		TUBE: AL $\phi=160/6mm$	8 $\phi 18$ AT $\phi 225$ 	3
29	ASSEMBLY OF BUSBAR SUPPORT FOR PI (SLIDE)	D120		TUBE: AL $\phi=160/6mm$	8 $\phi 18$ AT $\phi 225$ 	15
30	ASSEMBLY OF INTERNAL END CAP WITHOUT DAMPING WIRE	D130		TUBE: AL $\phi=160/6mm$	—	2
31	ASSEMBLY OF INTERNAL END CAP WITH DAMPING WIRE (500mm ² AL)	D135		TUBE: AL $\phi=160/6mm$	—	28
32	ASSEMBLY OF CORONA BELL WITHOUT DAMPING WIRE	D140		TUBE: AL $\phi=160/6mm$	—	2
33	ASSEMBLY OF CORONA BELL WITH DAMPING WIRE (500mm ² AL)	D145		TUBE: AL $\phi=160/6mm$	—	10
34	ASSEMBLY OF DOUBLE T-CONNECTOR (TUBE TO 2 WIRES)	D150		TUBE: AL $\phi=160/6mm$	AL: 2*800mm ² $\phi=36.8mm$	9
35	ASSEMBLY OF WELDING JOINT FOR TUBE 120/6	D155		TUBE: AL $\phi=120/6mm$	TUBE: AL $\phi=120/6mm$	5
36	ASSEMBLY OF WELDING JOINT FOR TUBE 160/6	D160		TUBE: AL $\phi=160/6mm$	TUBE: AL $\phi=160/6mm$	32
37	230KV TENSION SET INSULATOR WITH TURNBUCKLE 15 unit 160KN(CREEPAGE DISTANCE FOR EACH UNIT:525mm)-ZINC SLEEVE with length 170mm (wire distance 200mm)	DS05		AL: 2*800mm ² $\phi=36.8mm$	—	27
38	230KV TENSION SET INSULATOR WITH OUT TURNBUCKLE 15 unit 160KN(CREEPAGE DISTANCE FOR EACH UNIT:525mm)-ZINC SLEEVE with length 170mm (wire distance 200mm)	DS10		AL: 2*800mm ² $\phi=36.8mm$	—	27
39	230KV V TYPE SUSPENSION SET INSULATOR 15 unit 160KN(CREEPAGE DISTANCE FOR EACH UNIT:525mm)-ZINC SLEEVE with length 170mm (for LT installing)	DS15			—	8
40	230KV SUSPENSION SET INSULATOR 15 unit 160KN(CREEPAGE DISTANCE FOR EACH UNIT:525mm)-ZINC SLEEVE with length 170mm (wire distance 100mm)	DS20		AL: 2*800mm ² $\phi=36.8mm$	—	31
41	CLAMP FOR GUARD WITH TURNBACKEL	DS25		AW 7 NO 8	—	20
42	CLAMP FOR GUARD WITHOUT TURNBACKEL	DS30		AW 7 NO 8	—	20

 NATIONAL IRANIAN COPPER INDUSTRIES COMPANY (N.I.C.I)	SUB-CONTRACTOR'S LOGO	E							DWG./Doc. No. MD1-RF-00-SS-E-01-NY0-817			 Mapna Power Plants Construction & Development Co(MD-1)	NIROO TAVAN GOSTAR MOHAM SHARGH COMPANY  NIROO CONSULTING ENGINEERING CO.	
	SUB CONTRACTOR DWG. NO.:	B							DRAWING TITLE:		REV. NO. : A			
		A	SECOND ISSUE	BARZEGAR	BARZEGAR	DEHGHAN	DEHGHAN	1405.02.20	LIST OF CLAMP & FITTING		SHEET:13OF:13			
		O	FIRST ISSUE	NOORI	NOORI	DEHGHAN	DEHGHAN	1404.02.23	DESIGN STAGE :		FILE No.			FORMAT : A3
MAPNA'S DWG. No. :	NIYAM'S LOGO	REV.	DESCRIPTION	DESN	DWN	CHKD	APPR	DATE				PROJECT : KHATOON ABAD GAS POWER PLANT 230KV AIS S/S		SCALE: —