




GA drawing-Trench Material for 400kV Switchyard

S. NO.	DOC ID	DOC TITLE	BHEL submission	No. of pages
1.	IP-BHEL-PD-014-REV 00/01	TYPICAL DETAILS OF CABLE TRAYS AND ITS ACCESSORIES, CABLE TRAY FLEXIBLE SUPPORT SYSTEM AND WELDED TYPE RACK ASSEMBLY	00	23

First submission		00	15.12.2020
		REV	DATE
PROJECT	2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-I		
OWNER	TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)		
OWNER'S CONSULTANT	TATA CONSULTING ENGINEERS LIMITED BENGALURU		
CONTRACTOR	BHARAT HEAVY ELECTRICALS LIMITED		
SUPPLIER	INDUSTRIAL PERFORATION (I) PVT. LTD.		
DOC. ID.	TB-400-316-010-2		
NO. OF SHEETS ATTACHED	23		

PROJECT :**2X600 MW UDANGUDI TPP, STAGE-1****CUSTOMER :****TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD.****CONSULTANT :****TATA CONSULTING ENGINEERS LTD.****CONTRACTOR :****BHARAT HEAVY ELECTRICALS LTD., TBG, NOIDA.****MANUFACTURER:****INDUSTRIAL PERFORATION (I) PVT. LTD.****327, R.N. GUHA ROAD, DUM DUM,
KOLKATA - 700028, WEST BENGAL, INDIA****TITLE :****TYPICAL DETAILS OF CABLE TRAYS & ITS
ACCESSORIES, CABLE TRAY FLEXIBLE
SUPPORT SYSTEM AND WELDED TYPE RACK
ASSEMBLY****DEPT
CODE**

DESN

CHKD

APPD

NAME

P.D.

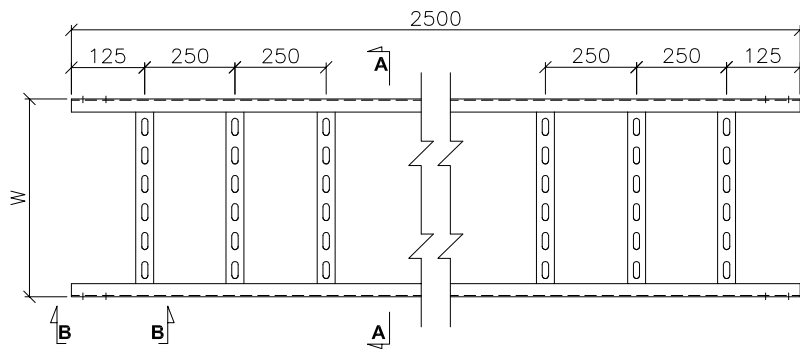
G.C.

SIGN**DATE**

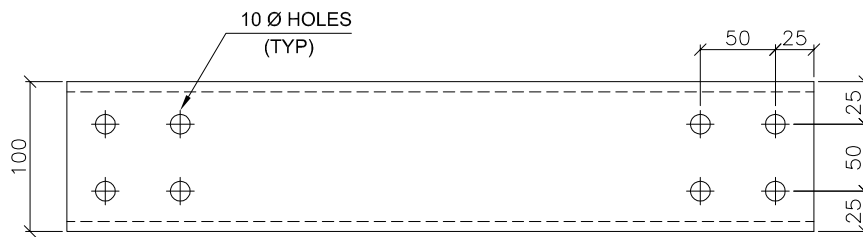
22-10-2020

22-10-2020

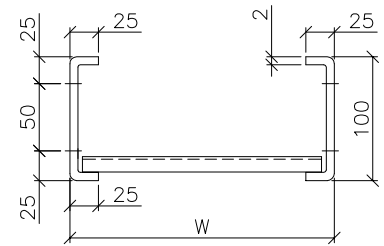
DOC. :**IPIPL DRG. NO. : IP-BHEL-PD-014 REV : 00/01****SHEET 1 OF 23**



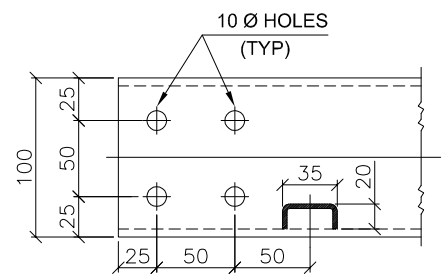
PLAN



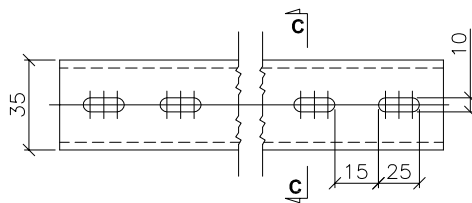
SIDE RUNNER



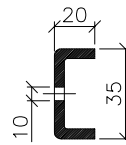
SEC - 'A'-'A'



VIEW AT 'B'-'B'



SLOTTED RUNG

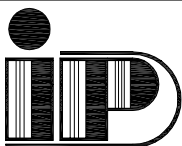


SEC - 'C'-'C'

NOTE :

FOR NOTES REFER SHEET 10 OF 23

TABLE		
WIDTH (W)	HEIGHT	THICKNESS
750	100	2.0
600	100	2.0
450	100	2.0
300	100	2.0
150	100	2.0

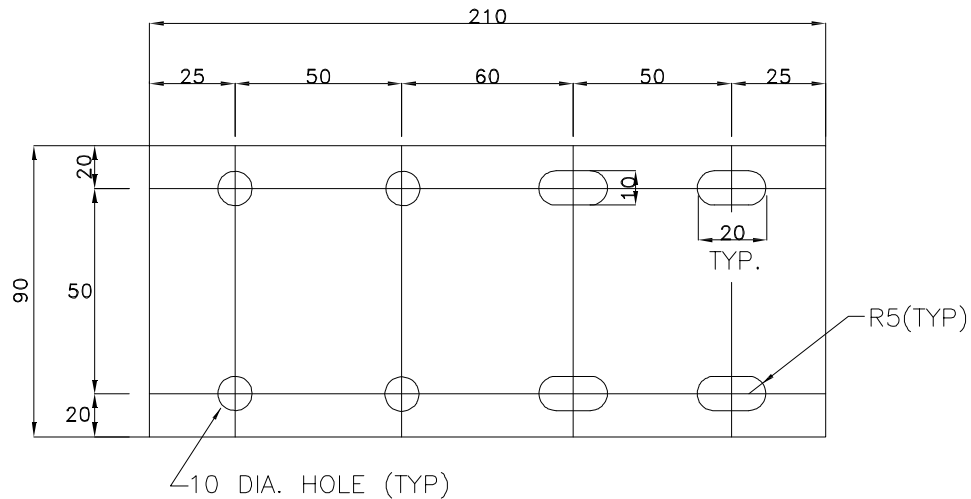


TITLE:
LADDER TYPE CABLE TRAY



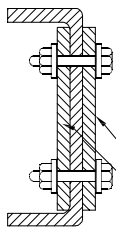
IPIPL DRG. NO. : IP-BHEL-PD-014

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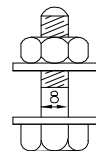


**SIDE COUPLER PLATE FOR
LADDER/PERFORATED TYPE TRAYS**
(750/600/450/300/150W TRAYS)

QTY. REQUIRED/TRAY SECTION : 4 NOS.

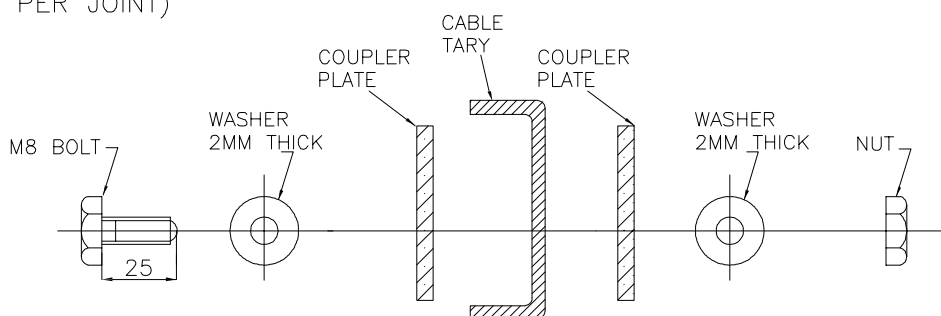


(2 NOS. COUPLER PLATES
OF 3 MM THICKNESS TO
BE SUPPLIED PER JOINT)



QTY. REQD/TRAY SECTION

- A) 16 NOS. M8 BOLTS
- B) 16 NOS. NUTS
- C) 32 NOS. WASHERS



SEQUENCE OF M8 BOLT, WASHER, NUT, COUPLER PLATE & CABLE TRAY
FOR TYPICAL CABLE TRAY JOINT

NOTE :

FOR NOTES REFER SHEET 10 OF 23

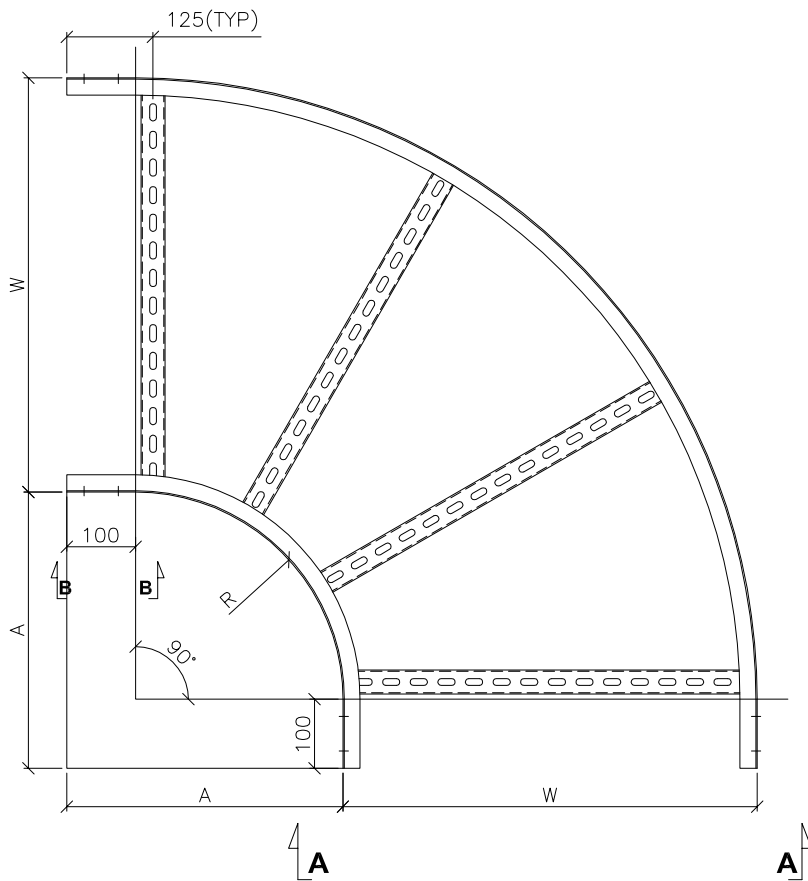


TITLE:
COUPLER PLATE WITH FASTNER

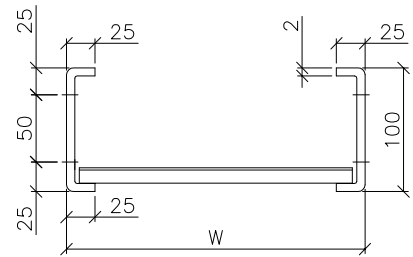


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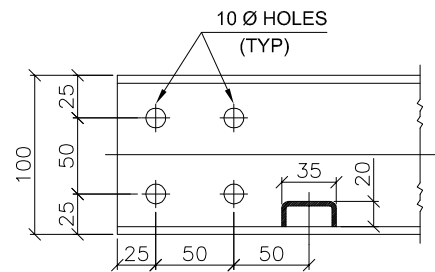
SH. 3 OF 23



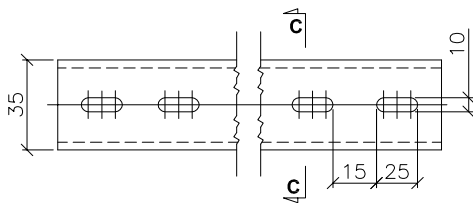
PLAN
90° HORIZONTAL ELBOW



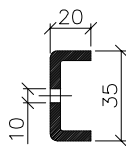
VIEW AT 'A'-'A'



VIEW AT 'B'-'B'



SLOTTED RUNG



SEC - 'C'-'C'

TABLE			
WIDTH (W)	RADIUS (R)	HEIGHT	"A"
750	600	100	700
600	600	100	700
450	600	100	700
300	600	100	700
150	600	100	700

NOTE :

FOR NOTES REFER SHEET 10 OF 23

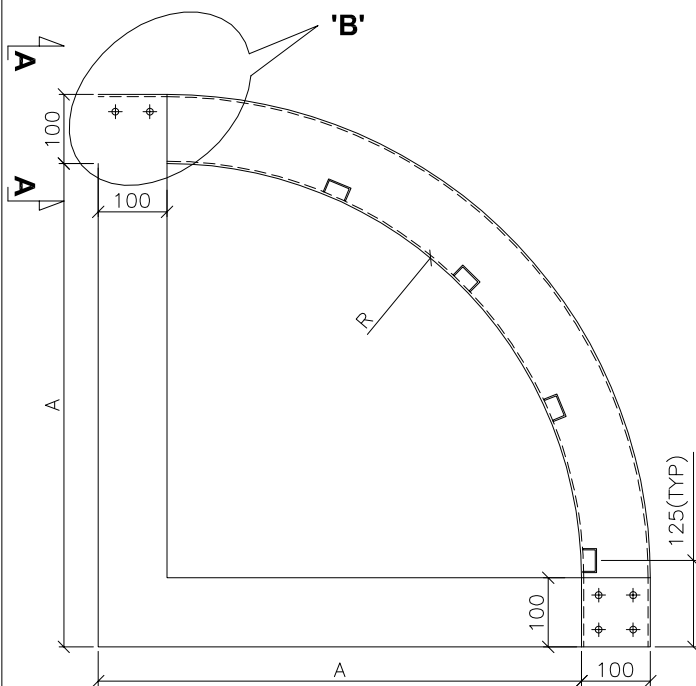


TITLE:
LADDER TYPE HORIZONTAL BEND - 90°
BENDING RADIUS 600MM

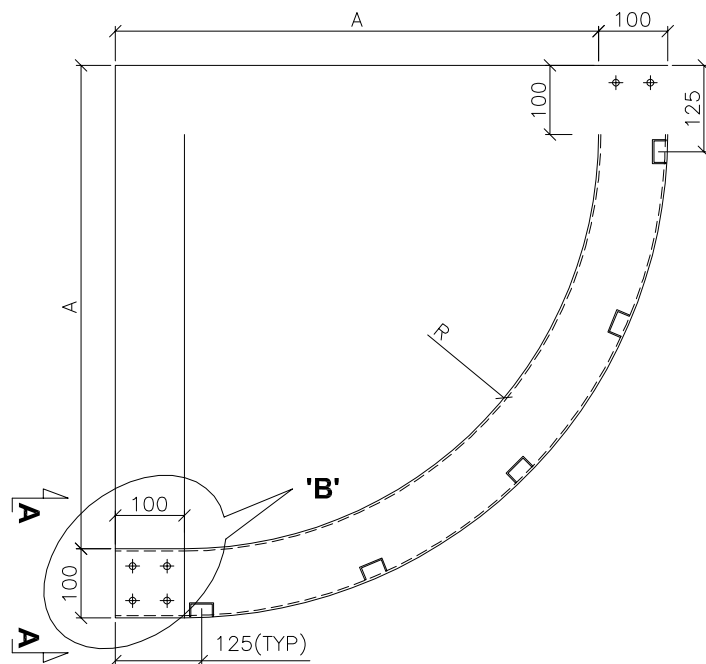


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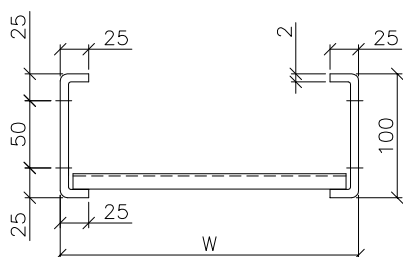
SH. 4 OF 23



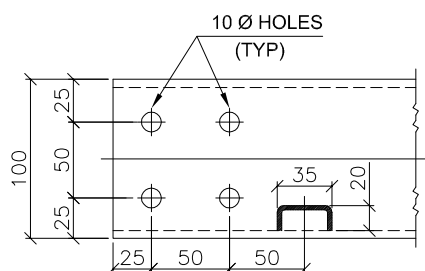
**ELEVATION
90° VERTICAL ELBOW
(OUT SIDE)**



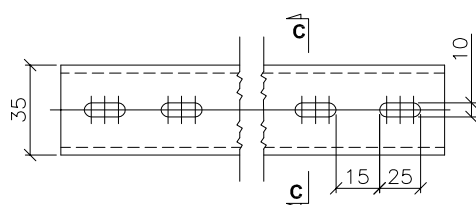
**ELEVATION
90° VERTICAL ELBOW
(IN SIDE)**



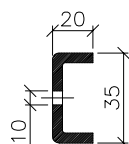
VIEW AT 'A'-'A'



DETAIL AT 'B'



SLOTTED RUNG



SEC - 'C'-'C'

TABLE			
WIDTH (W)	RADIUS (R)	HEIGHT	"A"
750	600	100	700
600	600	100	700
450	600	100	700
300	600	100	700
150	600	100	700

NOTE :

FOR NOTES REFER SHEET 10 OF 23

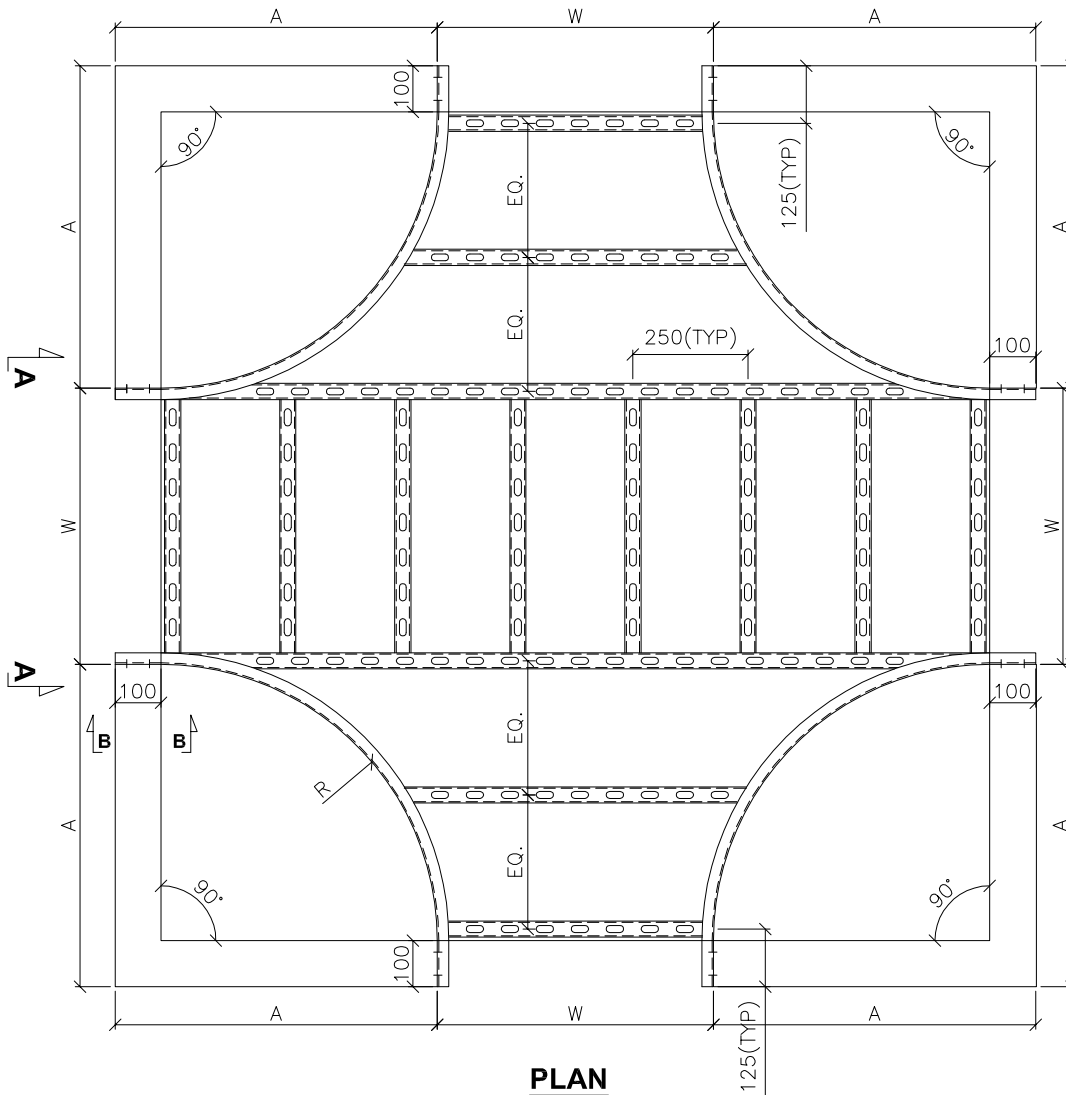


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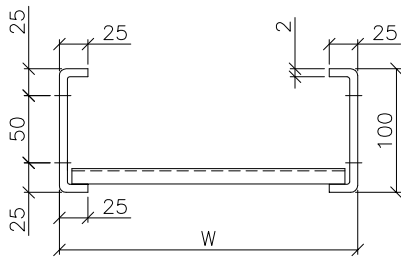
**LADDER TYPE VERTICAL INSIDE & OUTSIDE BEND
BENDING RADIUS 600MM**

IPIPL DRG. NO. : IP-BHEL-PD-014

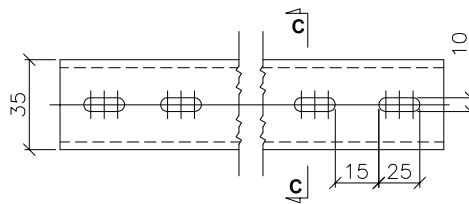
SH. 6 OF 23



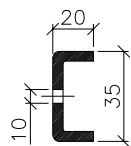
PLAN
90° HORIZONTAL 4 WAY



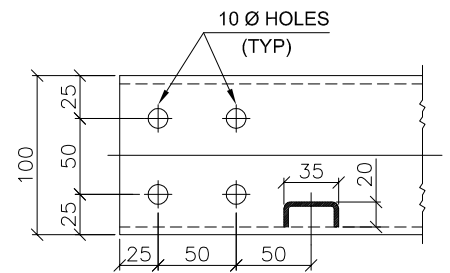
VIEW AT 'A'-'A'



SLOTTED RUNG



SEC - 'C'-'C'



VIEW AT 'B'-'B'

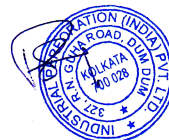
TABLE			
WIDTH (W)	RADIUS (R)	HEIGHT	"A"
600	600	100	700
450	600	100	700
300	600	100	700
150	600	100	700

NOTE :

FOR NOTES REFER SHEET 10 OF 23

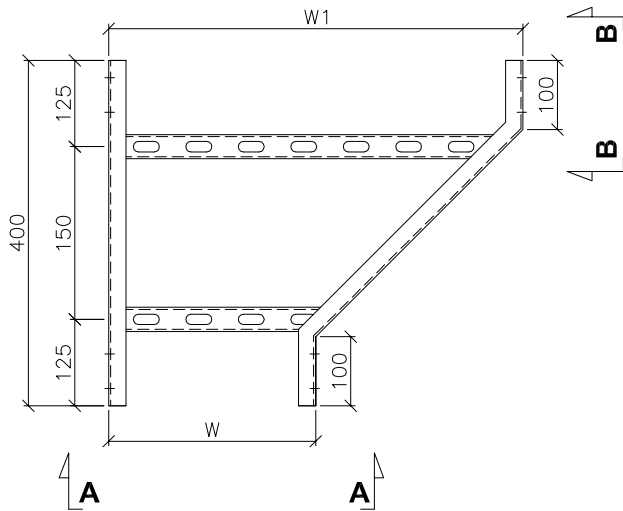


TITLE:
LADDER TYPE CROSS, RADIUS 600MM

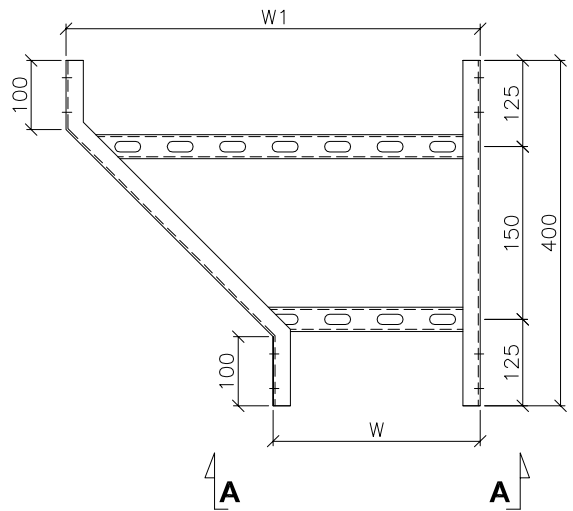


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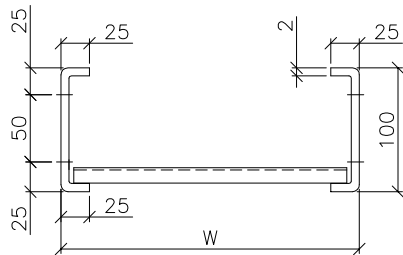
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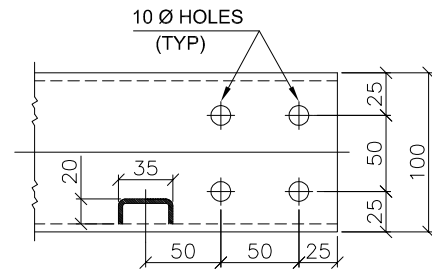
**ELEVATION
LEFT HAND REDUCER**



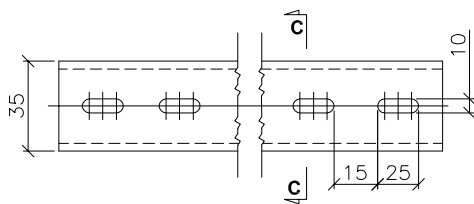
**ELEVATION
RIGHT HAND REDUCER**



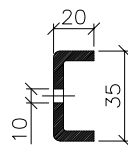
VIEW AT 'A'-'A'



VIEW AT 'B'-'B'



SLOTTED RUNG



SEC - 'C'-'C'

TABLE	
W1	W
750	600
600	450

NOTE :

FOR NOTES REFER SHEET 10 OF 23

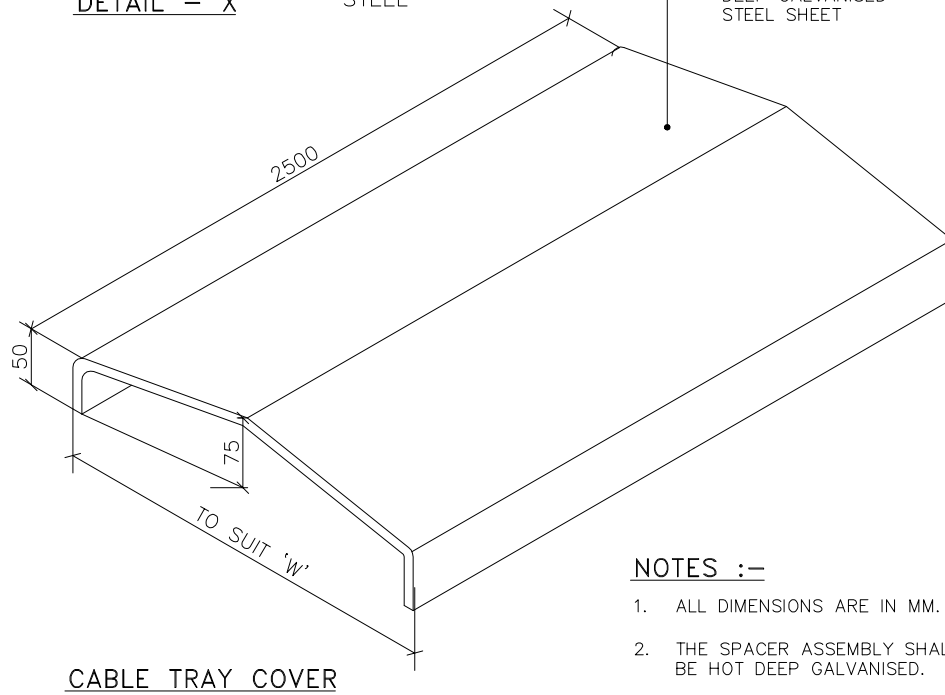
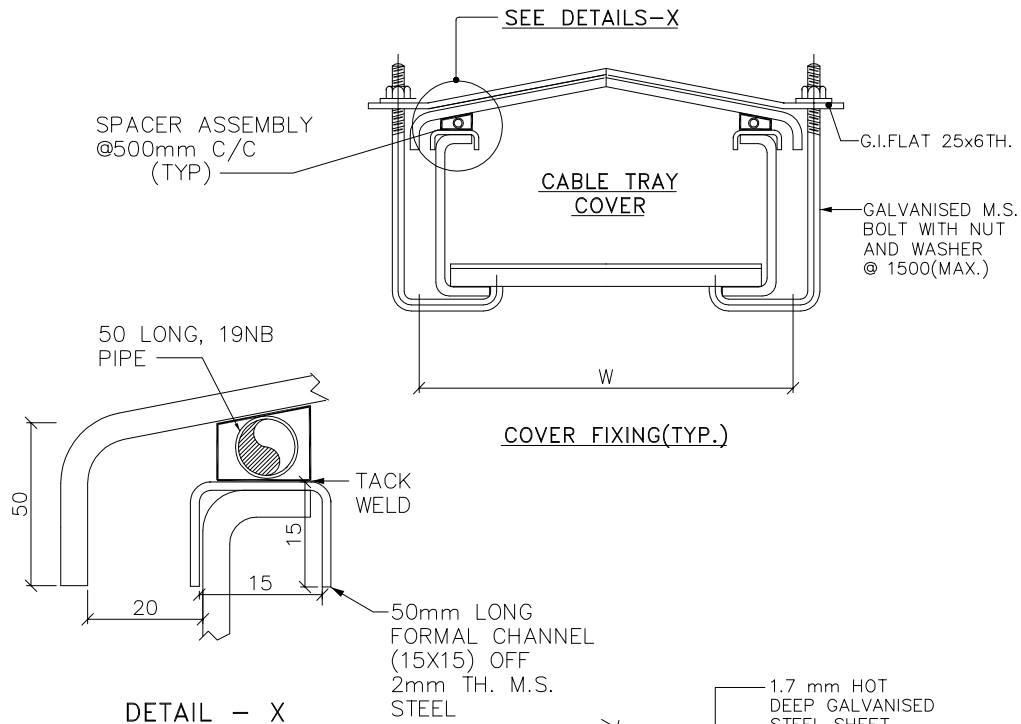


TITLE:
LADDER TYPE REDUCER



IPIPL DRG. NO. : IP-BHEL-PD-014

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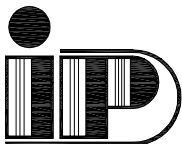
NOTES :-

1. ALL DIMENSIONS ARE IN MM.
2. THE SPACER ASSEMBLY SHALL BE HOT DEEP GALVANISED.

W	150	300	450	600	750
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NOTE :

FOR NOTES REFER SHEET 10 OF 23



TITLE:
CABLE TRAY COVER



IPIPL DRG. NO. : IP-BHEL-PD-014

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NOTE ::

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
- 2) CABLE TRAY, ACCESSORIES, COUPLER PLATE & TRAY COVER SHALL BE FABRICATED FROM 2.0MM, 2.0MM, 3.0MM & 1.7MM THICK RESPECTIVEL ROLLED MILD STEEL SHEET CONFORMING TO IS:1079 GR. 'O', IS:2062 GR.'A', IS:513, IS:10748, IS:5986 OR EQUIVALENT CODE.
- 3) TOLERANCE AS PER IS:1852.
- 4) SUITABLE RUNG SPACING TO BE CONSIDERED FOR LADDER TYPE ACCESSORIES DEPENDING ON THE JOB.
- 5) TO FACILITATE ASSEMBLY, ALL ACCESSORIES AT ENDS SHALL HAVE 100MM STRAIGHT PORTION.
- 6) CABLE TRAYS, TRAY ACCESSORIES AND COUPLER PLATES SHALL BE HOT DIP GALVANIZED AS PER IS:2629/2633/6745.
- 7) ALL NUT, BOLT & WASHERS SHALL BE HOT DIP GALVANIZED AS PER IS:1367 FOR SIZES ABOVE 12MM AND ELECTROPLATED / ELECTROGALVANIZED FROM SIZE BELOW 12MM.
- 8) THE CABLE TRAY & ACCESSORIES SHALL BE HOT DIP GALVANIZED AS PER IS: 2629. THE MASS OF ZINC COATING SHALL BE 610 GM/SQ.MTR. AND THICKNESS SHALL BE 75 MICRONS (MINIMUM).

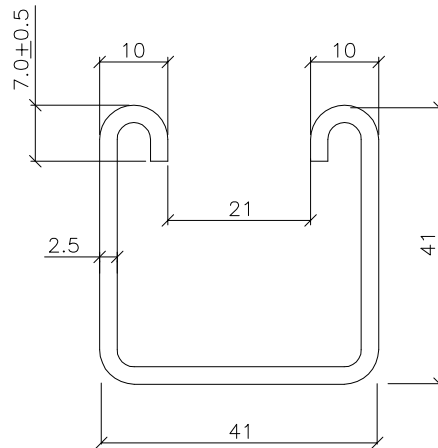


TITLE:
NOTE FOR CABLE TRAY & ACCESSORIES

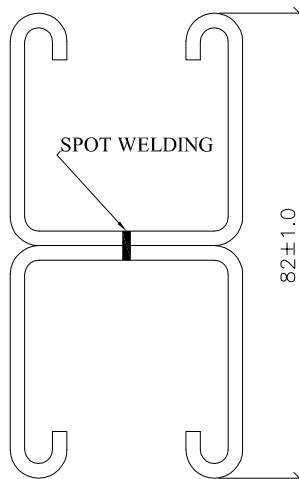


IPIPL DRG. NO. : IP-BHEL-PD-014

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SINGLE CHANNEL - C1



DOUBLE CHANNEL - C2
TWO LENGTH OF SINGLE CHANNEL
SPOT WELDED BACK TO BACK

NOTE:

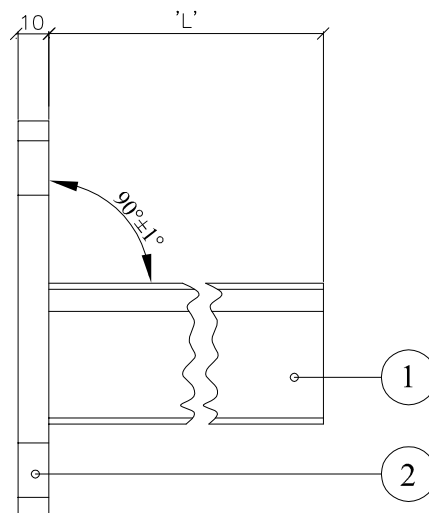
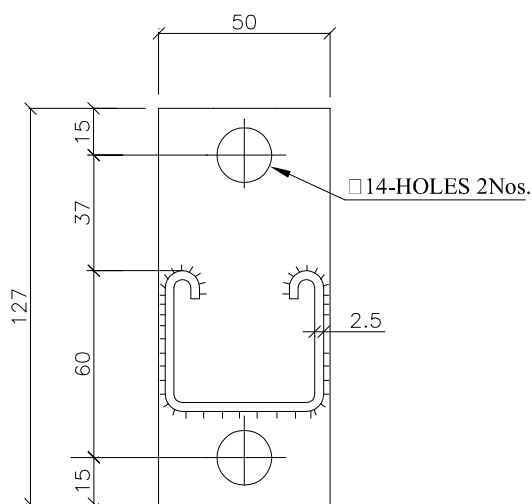
1. ALL DIMENSIONS ARE IN mm.
2. MATERIAL : M.S. SHEET AS PER RELEVANT IS.
3. FINISH : HOT DIP GALVANISED AS PER IS 2629
4. TOLERANCE ON THICKNESS IS AS PER IS 1852
5. PROFILE TOLERANCE ± 0.5 mm
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.



TITLE:
"C" - CHANNEL (SINGLE & DOUBLE 'C'-CHANNEL)

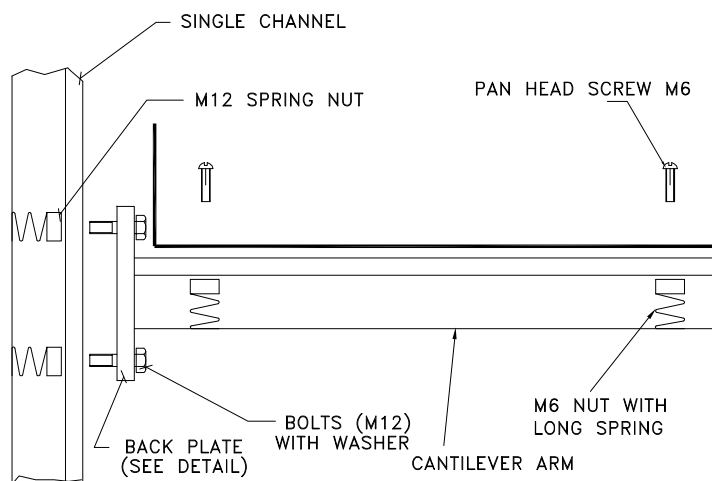
IPIPL DRG. NO. : IP-BHEL-PD-014

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CANTILEVER ARMS

TRAY WIDTH IN MM	CANTILEVER ARM LENGTH (L) IN MM
150	200
300	350
450	500
600	650
750	800



TYPICAL ASSEMBLY OF CHANNEL SUPPORTS AND CABLE TRAY

M12 HEX BOLT & WASHER-2NOs.
M12 SPRING NUTS-2NOs.
M6 PAN HEAD SCREWS & WASHER-2NOs.
M6 SPRING NUTS-2NOs.

NOTES :

1. ALL DIMENSIONS ARE IN mm.
2. ITEM NO.1 MATERIAL : HOT/ COLD ROLLED M.S. AS PER RELEVANT IS.
3. ITEM NO.2 MATERIAL : M.S AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS:2629
5. TOLERANCE ON THICKNESS IS AS PER IS:1852
6. ALL FABRICATION TOLERANCES ARE $\pm 1.0\text{mm}$
7. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

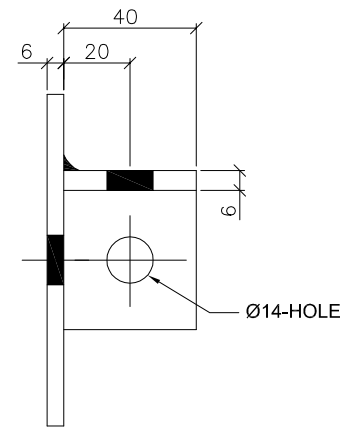
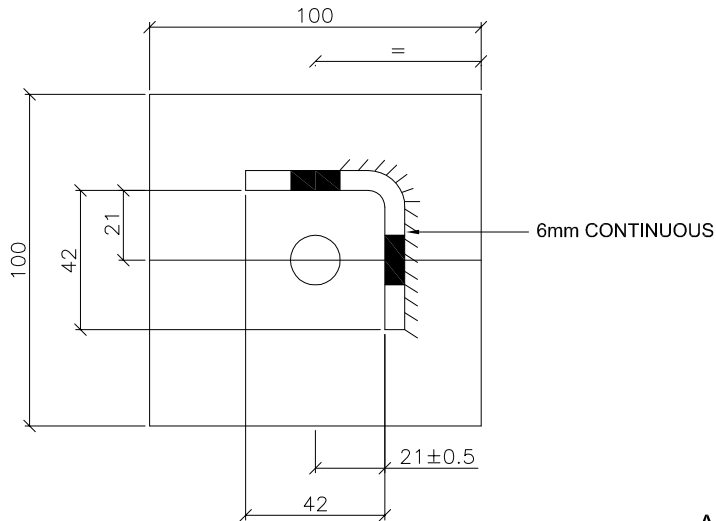
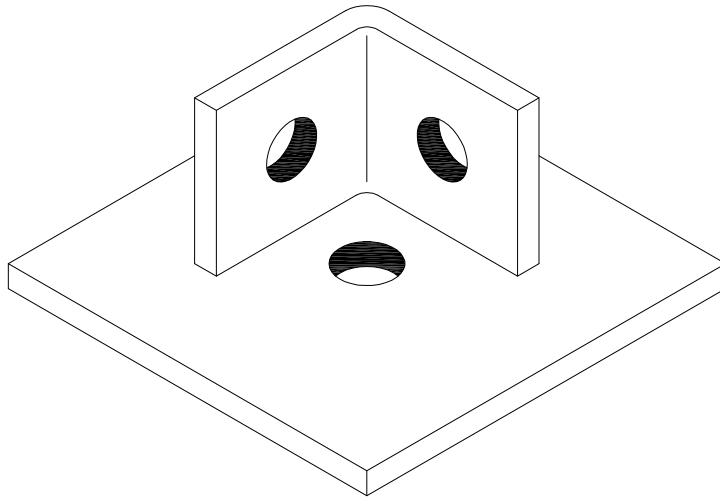


TITLE:
CANTILEVER ARM



IPIPL DRG. NO. : IP-BHEL-PD-014

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ANCHOR FASTNER - 1 NO.
SPRING NUT & WASHER - 1 NO.

BASE PLATE FOR SINGLE CHANNEL BP1

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE $\pm 1.0\text{mm}$.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

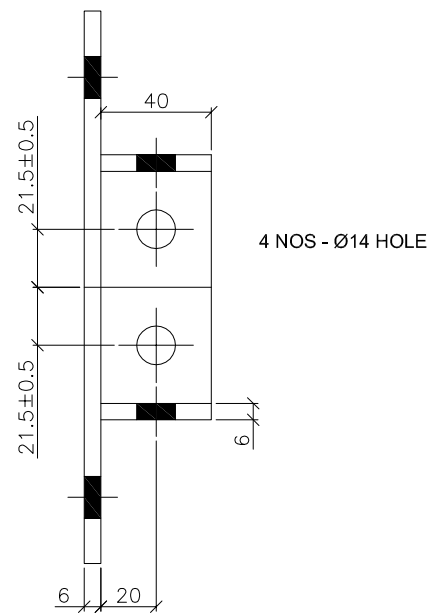
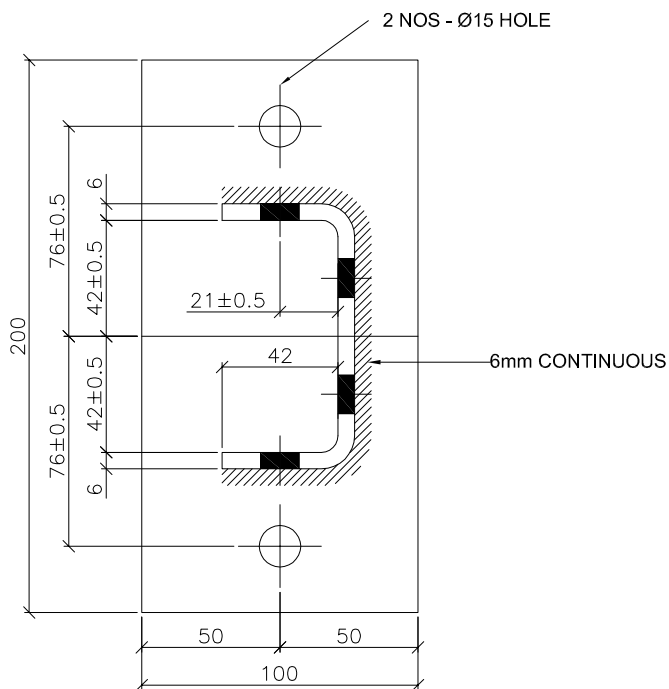
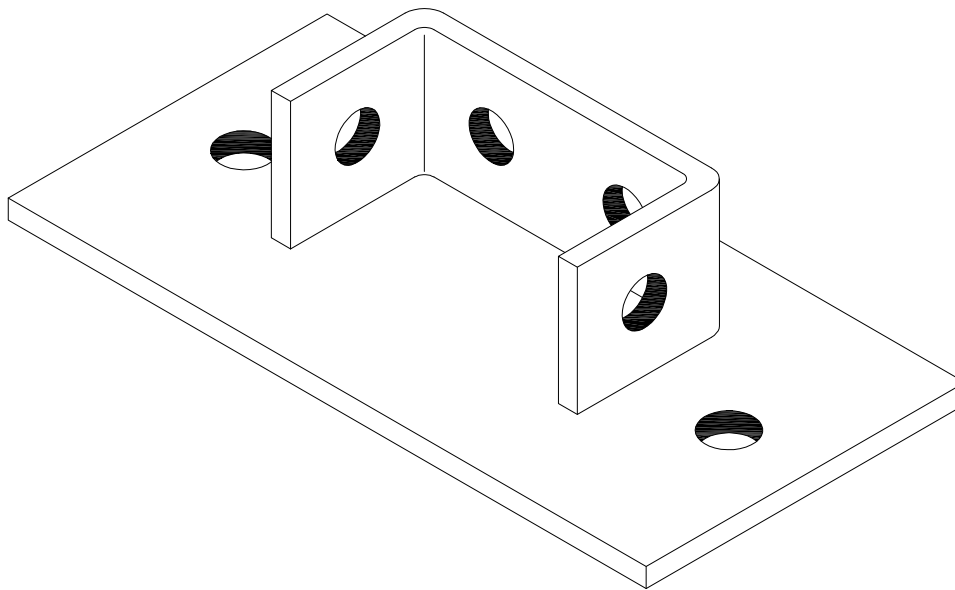


TITLE:
BASE PLATE FOR C1



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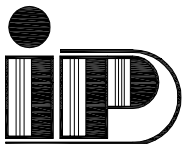


BASE PLATE FOR DOUBLE CHANNEL BP2

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE $\pm 1.0\text{mm}$.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

ANCHOR FASTNER - 2 NOS.
SPRING NUT & WASHER - 2 NOS.

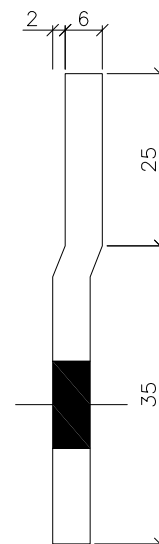
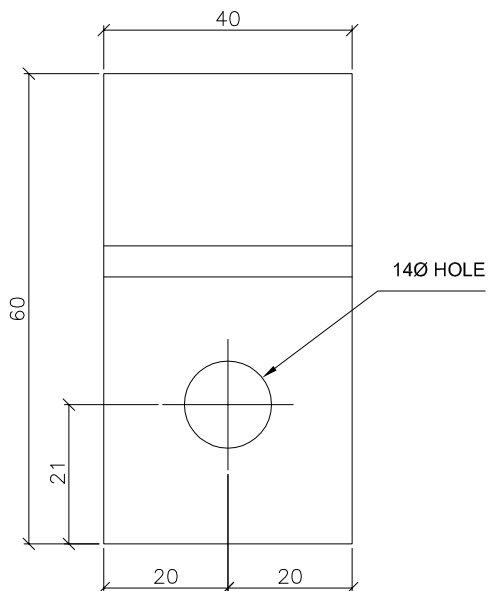
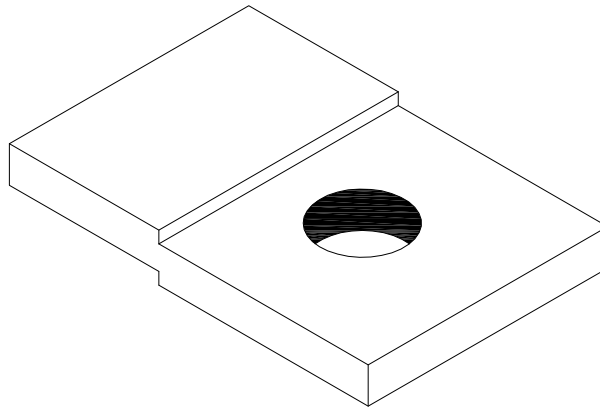


TITLE:
BASE PLATE FOR C2



IPIPL DRG. NO. : IP-BHEL-PD-014

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TRAY FIXING CLAMP (TC1)

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE ± 0.5 mm.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

SPRING NUT & WASHER - 1 NO.

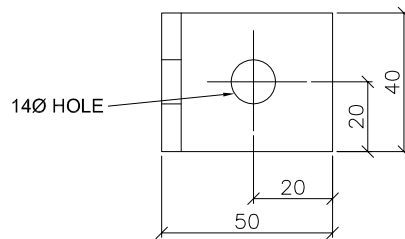
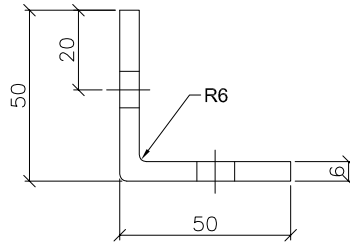


TITLE:
TRAY FIXING CLAMP (TC1)



IPIPL DRG. NO. : IP-BHEL-PD-014

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SPRING NUT & WASHER-2NOs.

90 DEG. ANGLE FITTING (LA1)

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE ± 1.0 mm.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

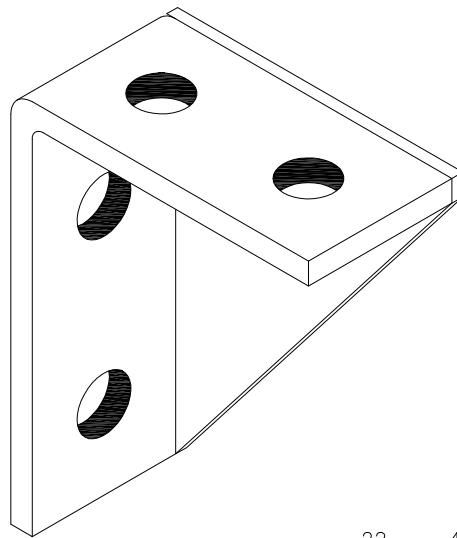


TITLE:
90 DEG. ANGLE FITTING (LA1)

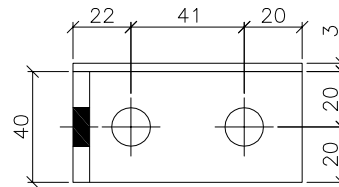


IPIPL DRG. NO. : IP-BHEL-PD-014

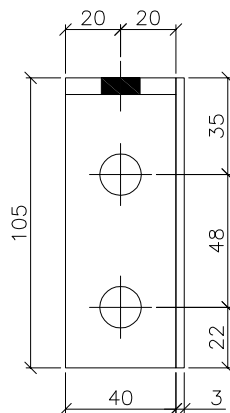
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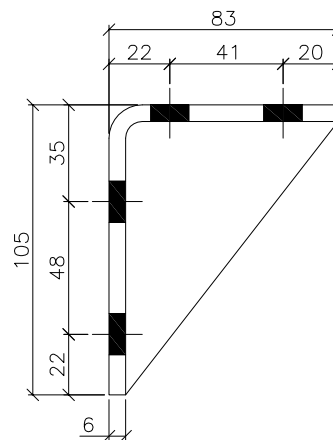
6mm CONTINUOUS WELD
ONLY OUTSIDE



2 NOS - Ø14 HOLE



2 NOS - Ø15 HOLE

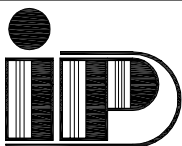


90 DEG. ANGLE FITTING (HL1)

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE ± 1.0 mm.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

ANCHOR FASTNER - 2 NOS.
SPRING NUT & WASHER - 2 NOS.

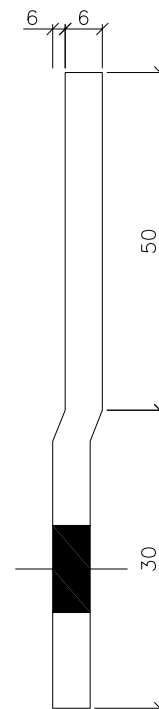
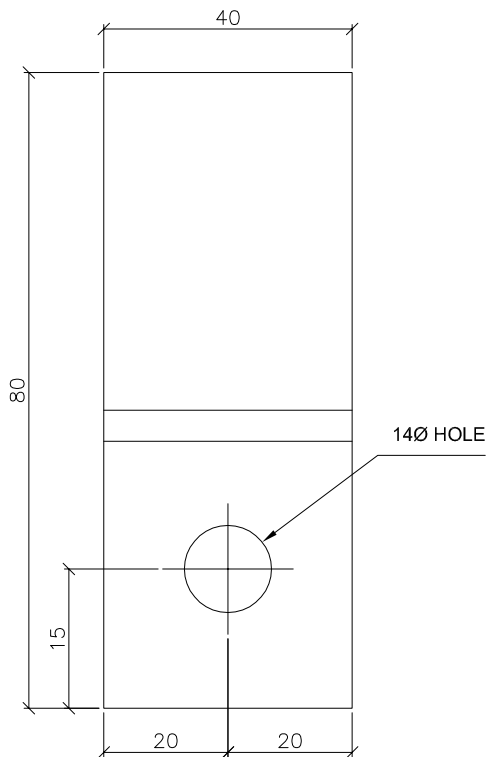
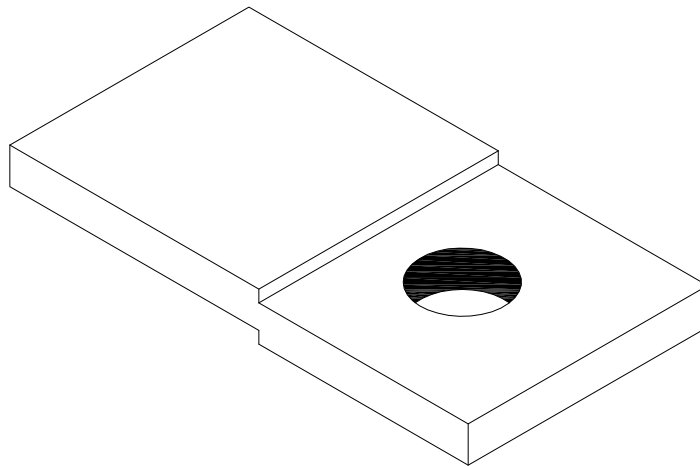


TITLE:
HEAVY DUTY BRACKET L-TYPE



IPIPL DRG. NO. : IP-BHEL-PD-014

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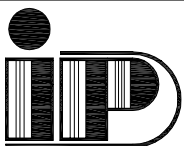


SPRING NUT & WASHER - 1 NO.

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE $\pm 0.5\text{mm}$.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

EARTH FLAT FIXING CLAMP (Z)

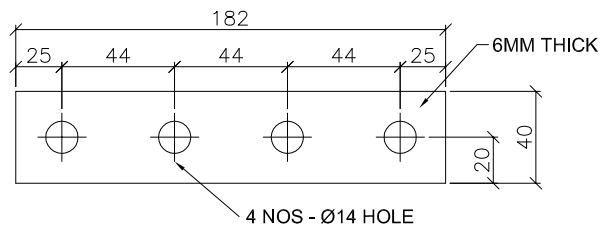


TITLE:
Z CLAMP FOR EARTH FLAT FIXING



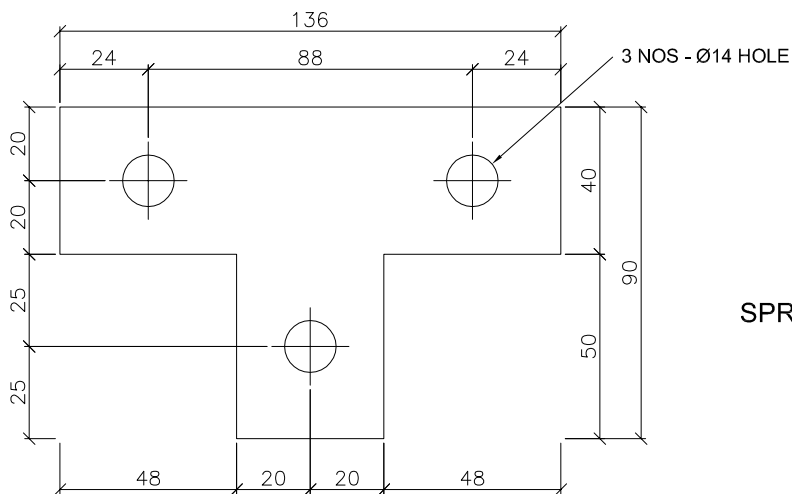
IPIPL DRG. NO. : IP-BHEL-PD-014

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SPRING NUT & WASHER - 4 NOS.

FLAT PLATE STRAIGHT FITTING (PF2)



SPRING NUT & WASHER - 3 NOS.

FLAT PLATE TEE FITTING (PF1)

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE ± 0.5 mm.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

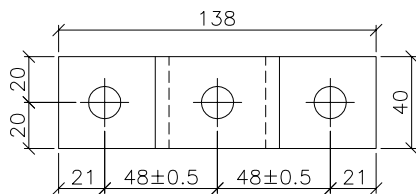
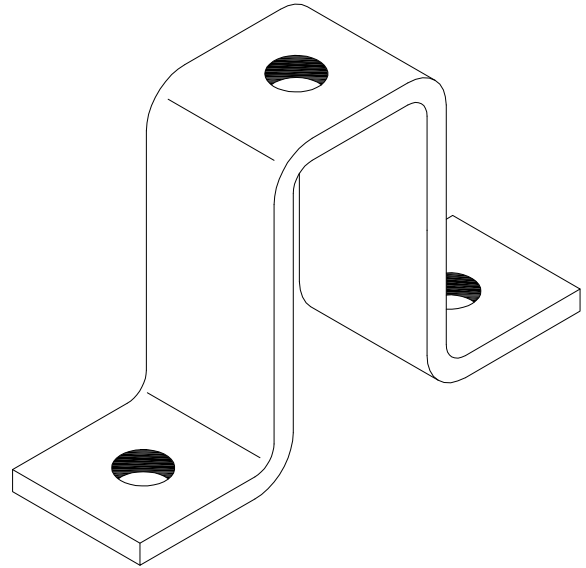
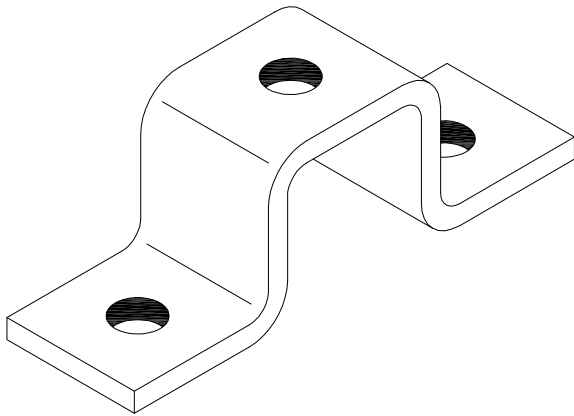


TITLE:
STRAIGHT FITTING & TEE FITTING

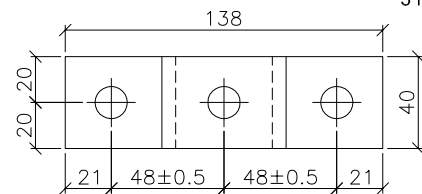


IPIPL DRG. NO. : IP-BHEL-PD-014

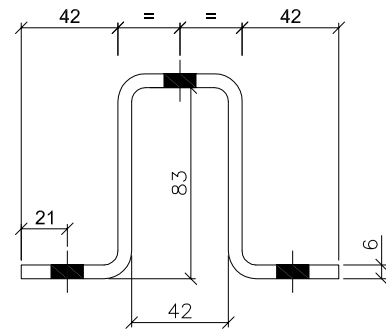
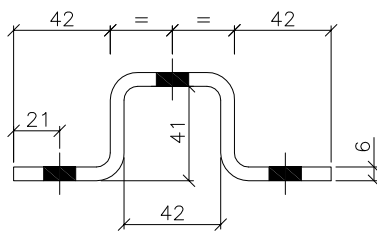
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3 NOS - Ø14 HOLE



3 NOS - Ø14 HOLE



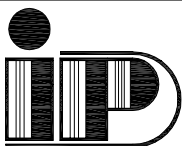
CLAMP FOR SINGLE CHANNEL (CC1)

CLAMP FOR DOUBLE CHANNEL (CC2)

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE ± 1.0 mm.
3. MATERIAL : MILD STEEL AS PER IS-2062
4. FINISH : HOT DIP GALVANISED AS PER IS 2629
5. TOLERANCE ON THICKNESS IS AS PER IS 1852
6. ZINC COATING SHALL BE MIN. 75 MICRONS / 610 GM/SQ.MTR.

ANCHOR FASTNER - 2 NOS.
SPRING NUT & WASHER - 1 NO.



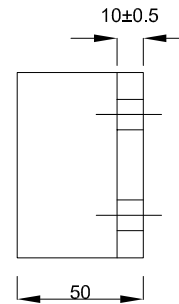
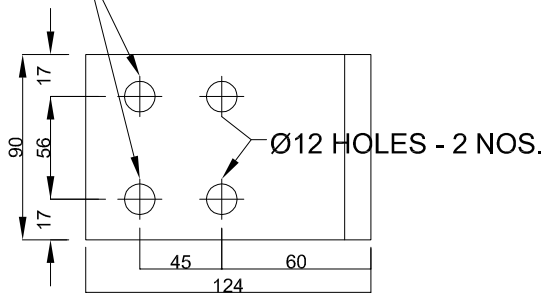
TITLE:
C1 & C2 CHANNEL CLAMP



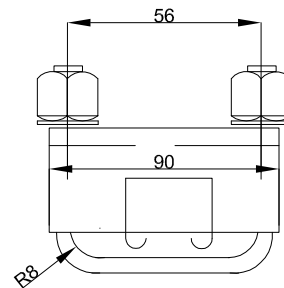
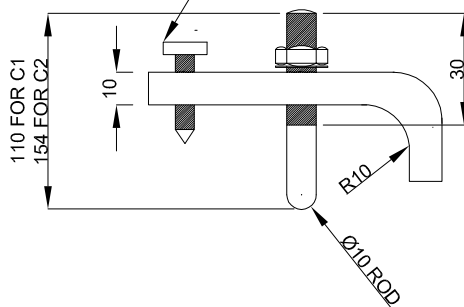
IPIPL DRG. NO. : IP-BHEL-PD-014

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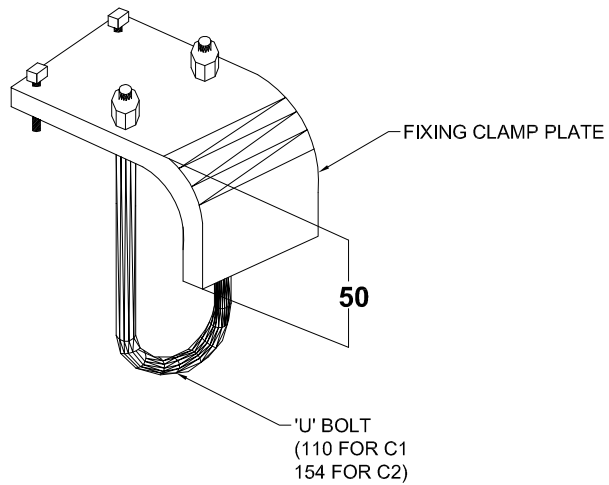
M-10 TAPPED HOLES - 2 NOS.



**2 NOS. SET SCREW
M10X40**



**M10 U-BOLT WITH 2 NOS.
PLAIN WASHERS & NUTS**

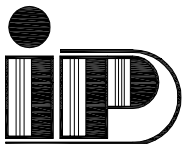


**M-10 U-BOLT WITH
2 NOS. PLAIN WASHERS & NUTS
110 MM FOR SC1
154 MM FOR DC1
2 NOS. SET SCREWS M10X40**

NOTE :

1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL : M.S AS PER IS:2062 GR.'A'.
3. FINISH : HOT DIP GALVANISED AS PER IS:2629
4. TOLERANCE ON THICKNESS IS AS PER IS:1852
5. ALL FABRICATION TOLERANCES ARE ±1.0 MM.
6. ZINC COATING SHALL BE MIN. 75 MICRON / 610 GM/SQ.MTR.

BEAM CLAMP BC1

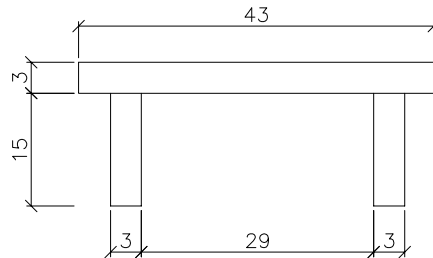
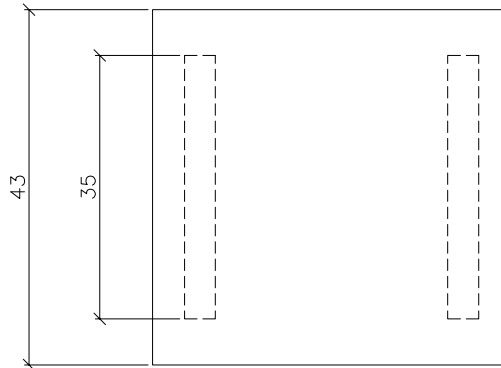


TITLE:
BEAM CLAMP BC1



IPIPL DRG. NO. : IP-BHEL-PD-014

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PVC END CAP

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. ALL FABRICATION TOLERANCE ± 0.5 mm.
3. MATERIAL : PVC



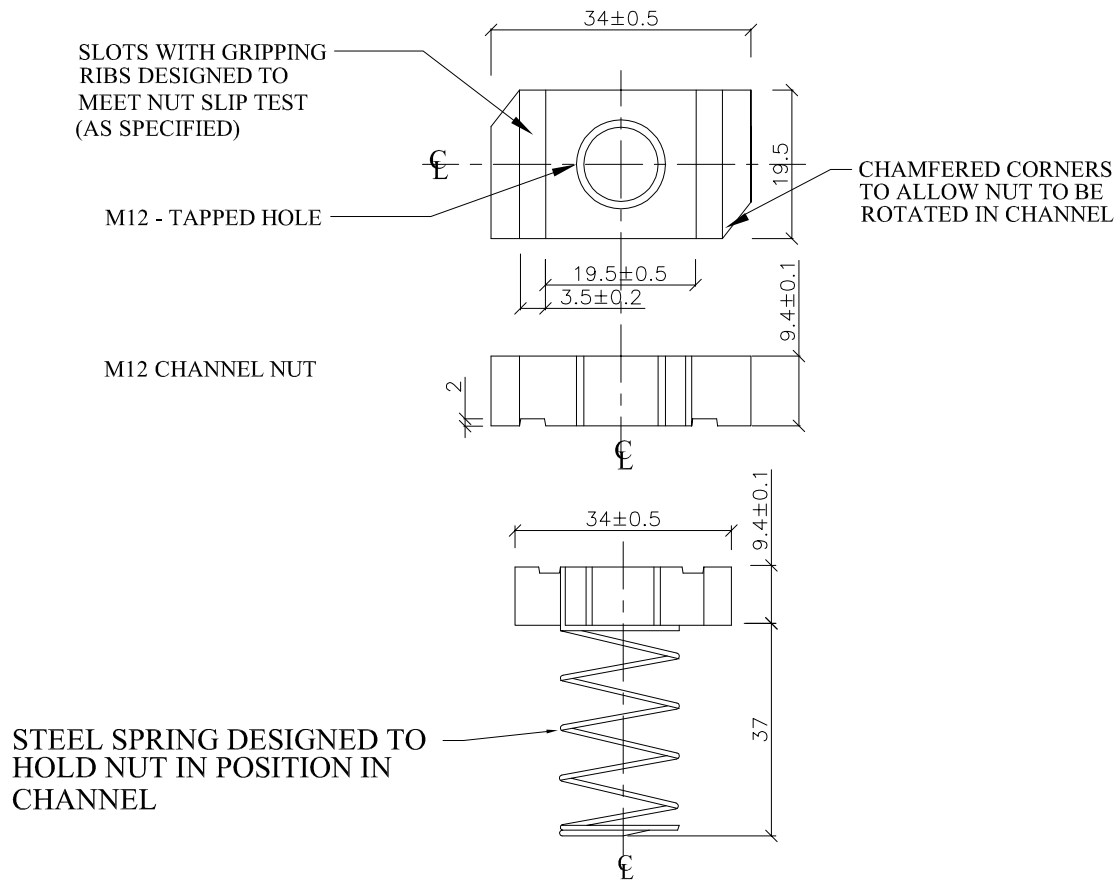
TITLE:

PVC END CAP

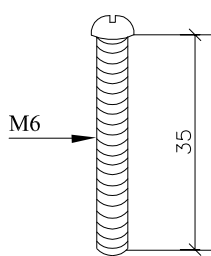


IPIPL DRG. NO. : IP-BHEL-PD-014

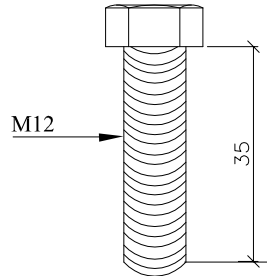
SH. 22 OF 23



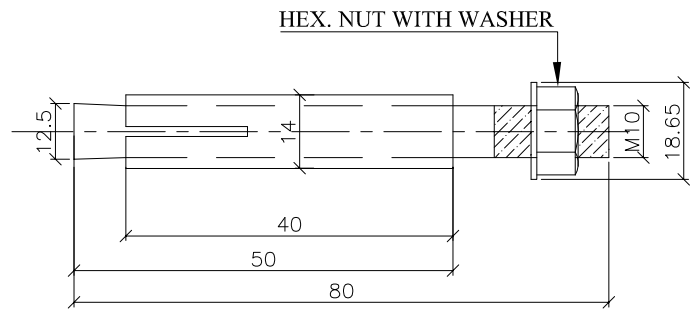
SPRING NUT ASSEMBLY



PAN HEAD SCREW



HEX BOLT



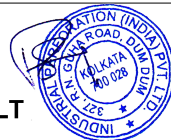
ANCHOR BOLT M10

NOTES:

1. MATERIAL - MS AS PER IS - 2062.
2. M6 CHANNEL NUT DIMENSIONAL SIMILAR TO M12.
EXCEPT HOLE DRILLED AND TAPPED TO M6 PAN HEAD SCREWS.
3. TAPPED HOLE THREADING TO MATCH WITH THREADING OF BOLTS.
4. SURFACE PROTECTION ELECTROGALVANISED / CADMIUM PLATED.
5. ALL DIMENSIONS ARE IN MM.



TITLE:
SPRING NUT ASSEMBLY WITH ANCHOR BOLT



IPIPL DRG. NO. : IP-BHEL-PD-014

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