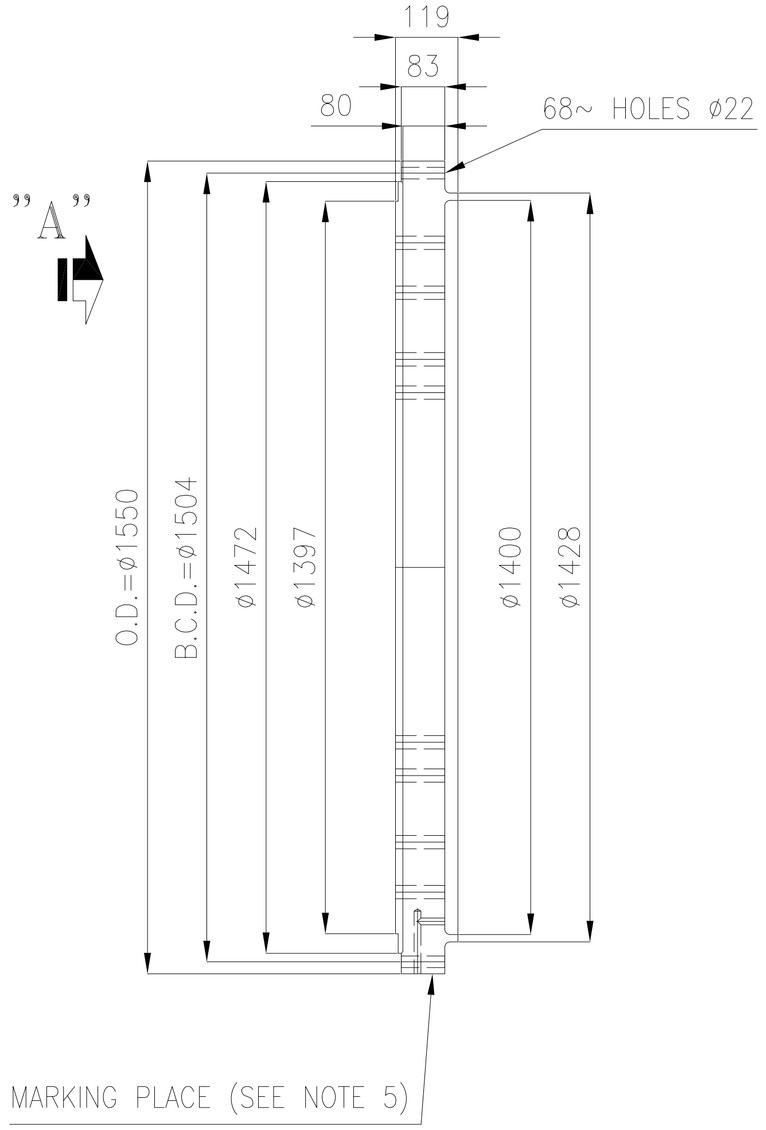
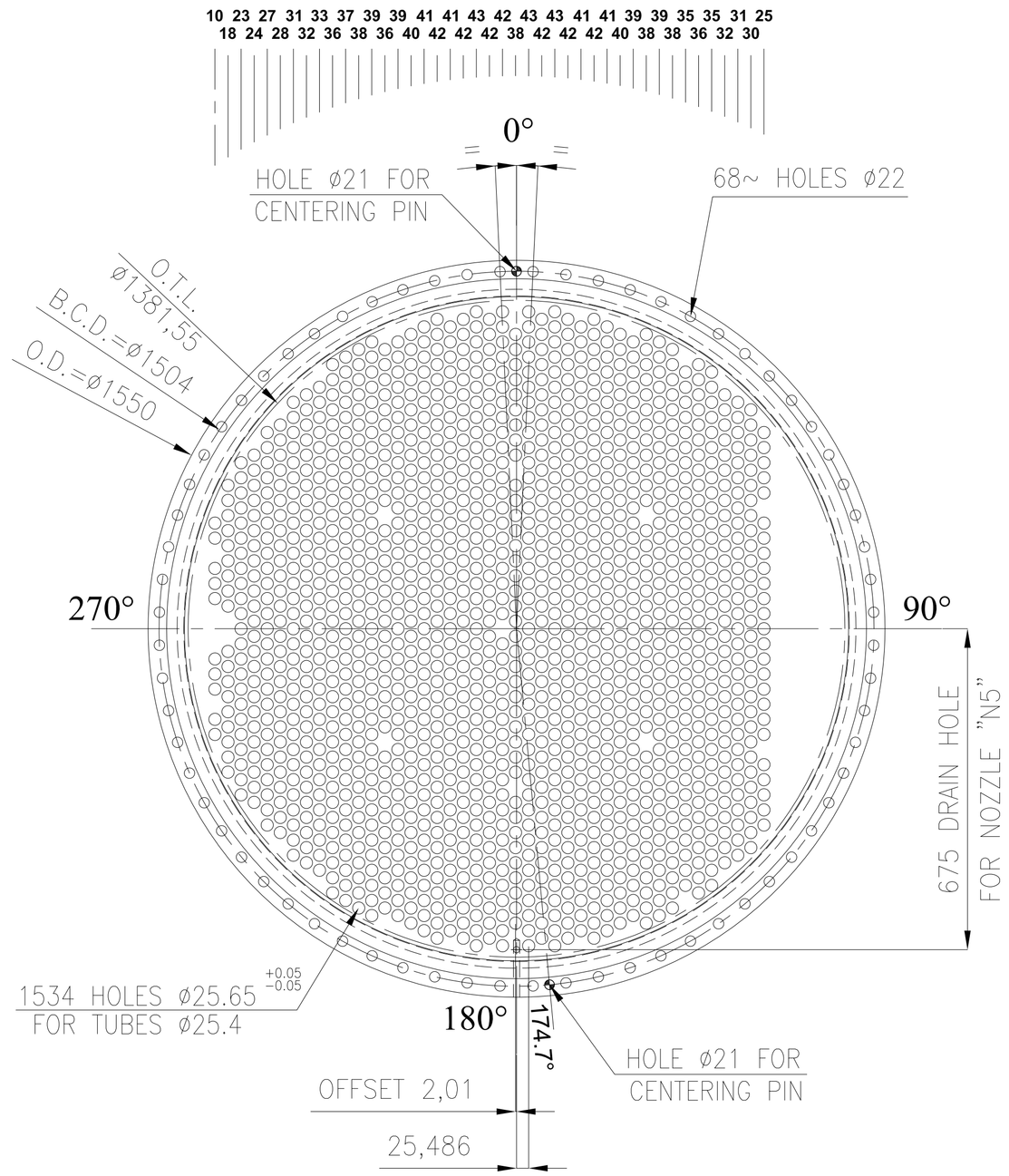
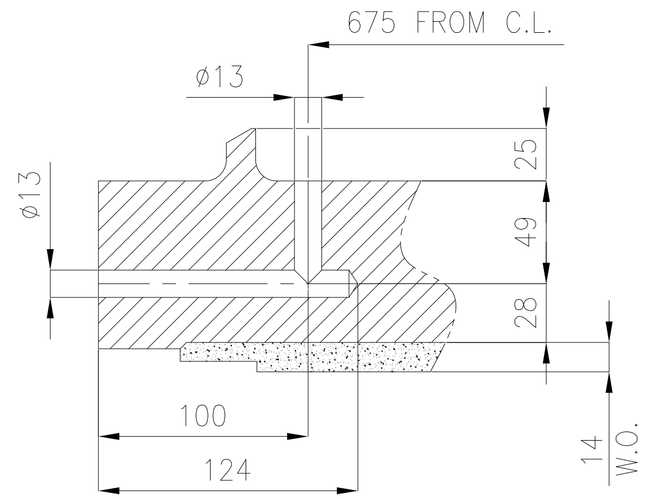
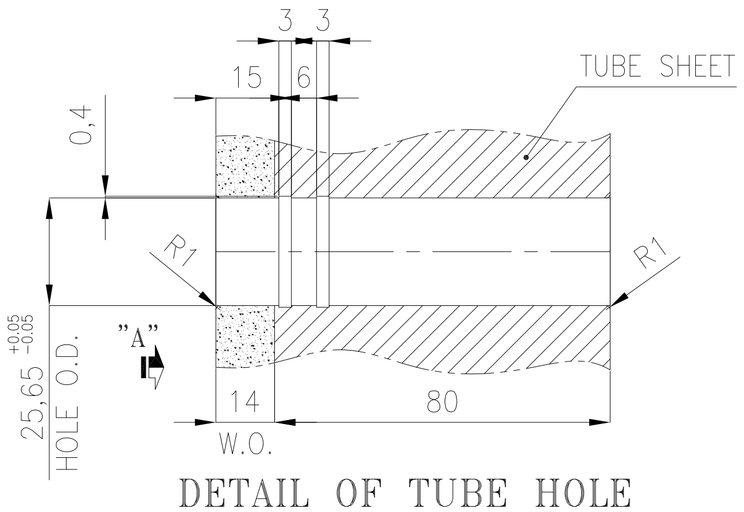




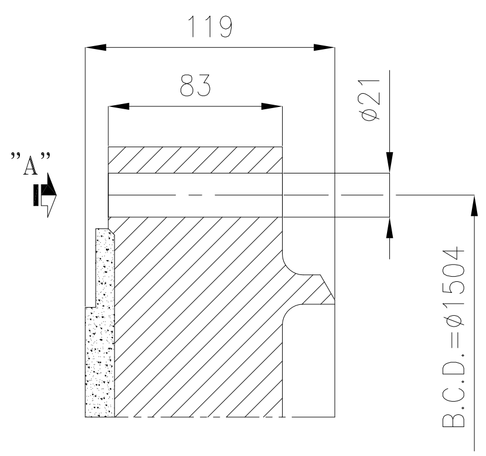
VIEW "A"
TUBE SHEET #1
SC: 1/2



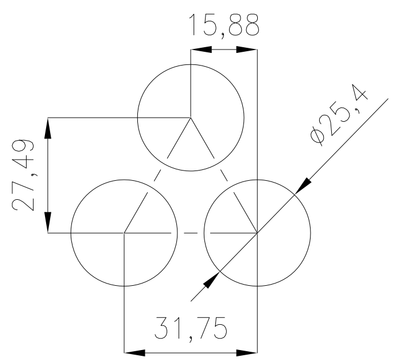
DRAIN HOLE FOR NOZZLE N5



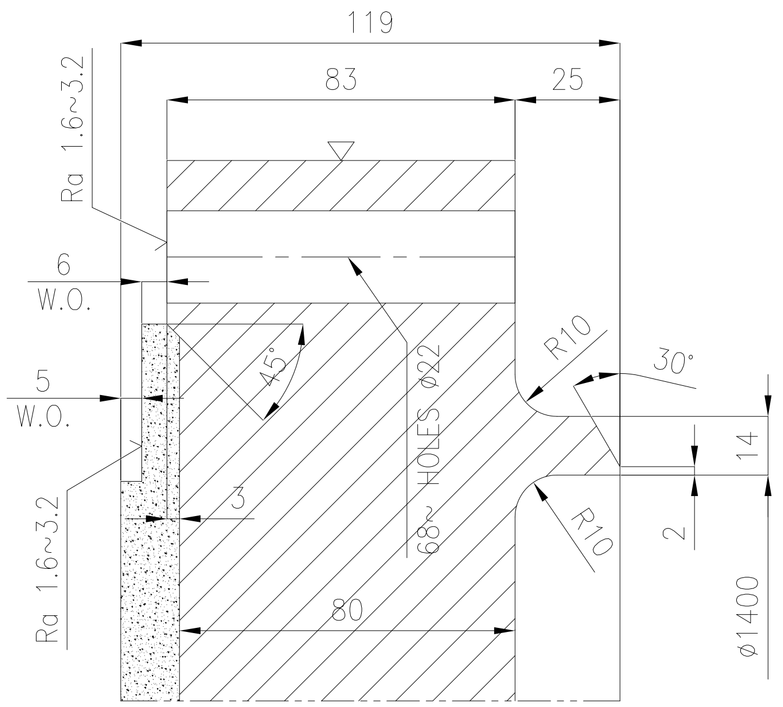
DETAIL OF TUBE HOLE



CENTERING HOLE DETAIL



TUBE PATTERN



TUBE SHEET DETAIL SECTIONAL

Notes :

1. GIRTH FLANGES AND TUBE SHEETS SEALING SURFACE SHALL HAVE SMOOTH FINISH WITH A CENTER LINE AVERAGE ROUGHNESS Ra=1.6~3.2 μm (63~125 μin) AARH PER ANSI/ASME B46.1.
2. ALL DIMENSIONS ARE IN m.m UNLESS OTHERWISE BE INDICATED.
3. DIMENSIONS WITHOUT TOLERANCES ACCORDING TO TEMA (R).
4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS1-2-E-4110 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
6. FOR WELD OVERLAY CHEMICAL COMPOSITION IS GUARANTEED FOR A THICKNESS OF 6mm ON GASKET SEATING FACE AND 3mm ON TUBE SHEET/OTHER FACE STARTING FROM THE FREE SURFACE AFTER FINAL MACHINING .

2-E-4110

MATERIAL	
SA 765 Gr.II +S.S.304L WELD OVERLAY	
WEIGHT	QTY.
780 KG	1

REV.	DATE	DESCRIPTION	DRAWN	PRE'D.	CHK'D.	APP'D.
2	11.May.2022	ISSUE FOR CONSTRUCTION	M.R.KH.	V.M	V.M.	V.A.
1	19.DEC.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: KERMANSHAH PETROCHEMICAL INDUSTRIES CO. (K.P.I.C)

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

VENDOR: P.G.E.I (REACTORSAZ)

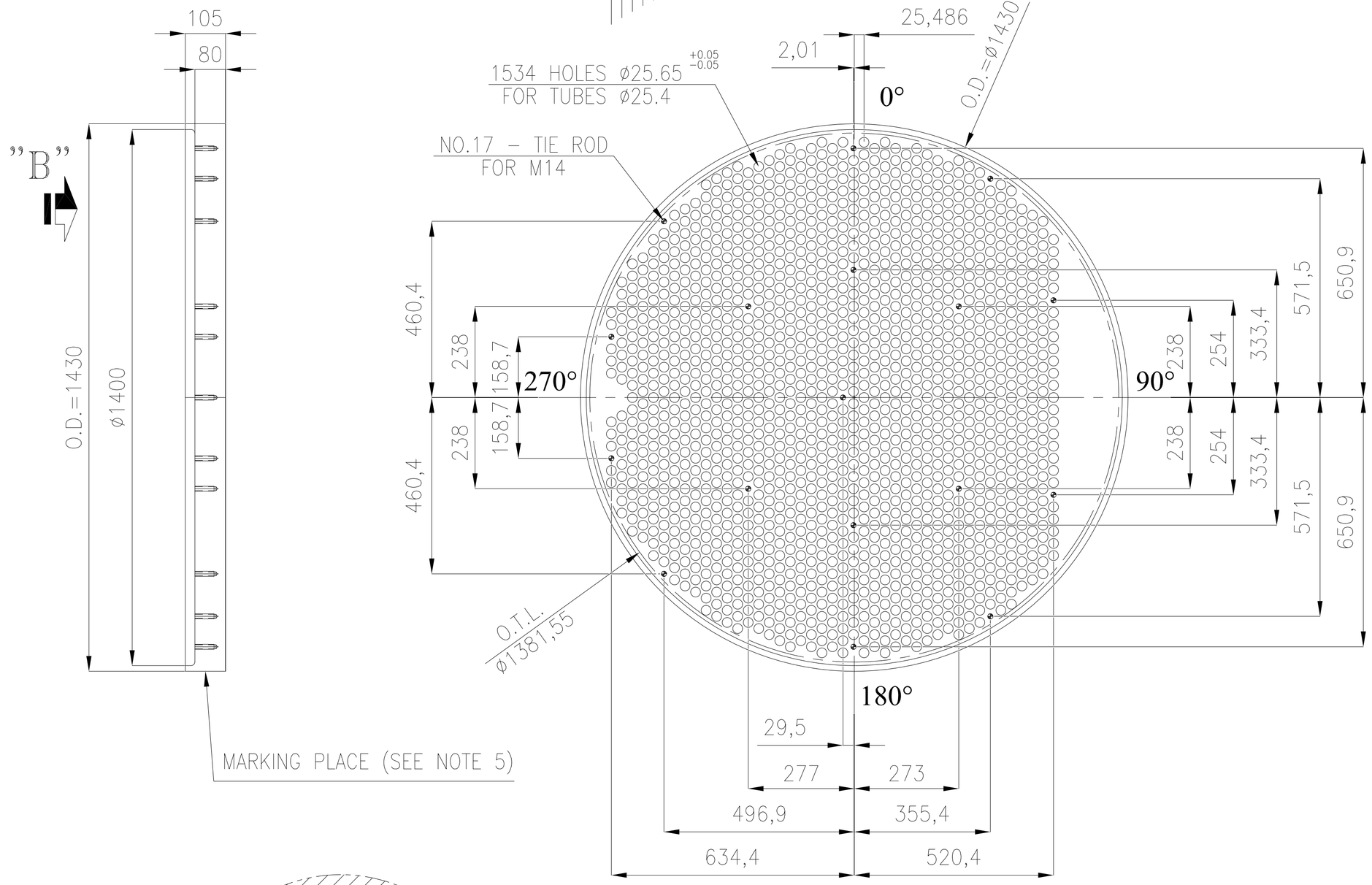
PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT–KERMANSHAH

DRWG.TITLE: TUBE SHEET FOR PACK 1

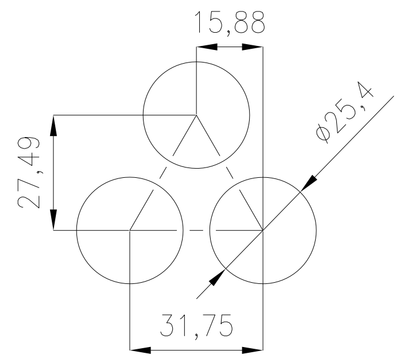
DWG.NO. : R128–EN–MTO–010–01	1 OF 1	SC: AS SHOWN	SIZE: A3

2-E-4110

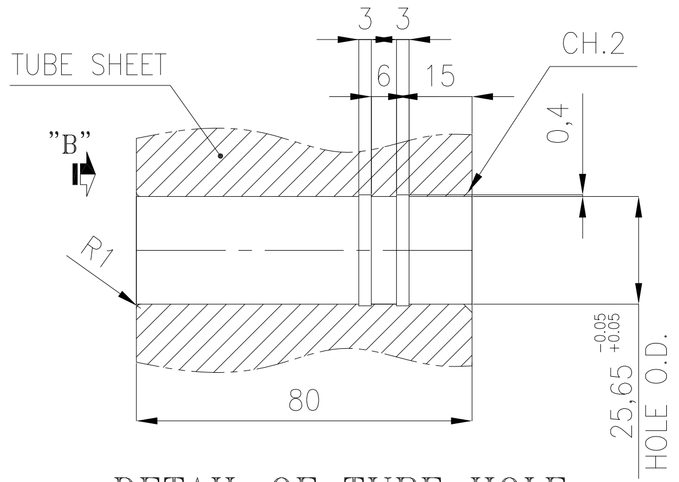
MATERIAL	
SA 965 Gr.F 304L	
WEIGHT	QTY.
525 KG	1



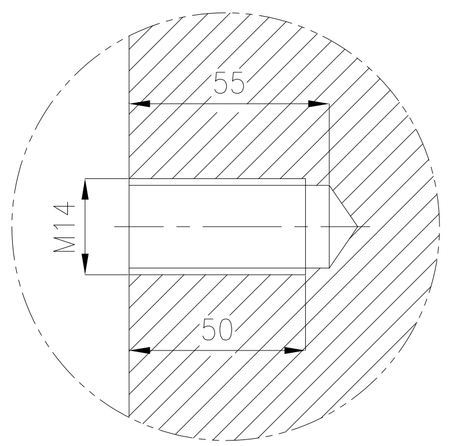
VIEW "B"
TUBE SHEET #2
SC: 1/2



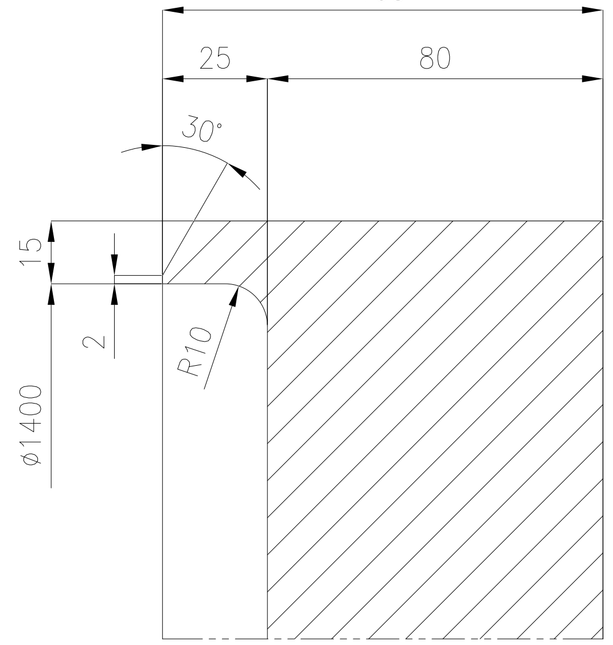
TUBE PATTERN



DETAIL OF TUBE HOLE



DETAIL OF TIE ROD HOLE



TUBE SHEET DETAIL SECTIONAL

Notes :

1. GIRTH FLANGES AND TUBE SHEETS SEALING SURFACE SHALL HAVE SMOOTH FINISH WITH A CENTER LINE AVERAGE ROUGHNESS Ra=1.6~3.2 μm (63~125 μin) AARH PER ANSI/ASME B46.1.
2. ALL DIMENSIONS ARE IN m.m UNLESS OTHERWISE BE INDICATED.
3. DIMENSIONS WITHOUT TOLERANCES ACCORDING TO TEMA (R).
4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS2-2-E-4110 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
6. FOR WELD OVERLAY CHEMICAL COMPOSITION IS GUARANTEED FOR A THICKNESS OF 6mm ON GASKET SEATING FACE AND 3mm ON TUBE SHEET/OTHER FACE STARTING FROM THE FREE SURFACE AFTER FINAL MACHINING .

REV.	DATE	DESCRIPTION	DRAWN	PRE'D.	CHK'D.	APP'D.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: KERMANSHAH PETROCHEMICAL INDUSTRIES CO. (K.P.I.C)

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

VENDOR: P.G.E.I (REACTORSAZ)

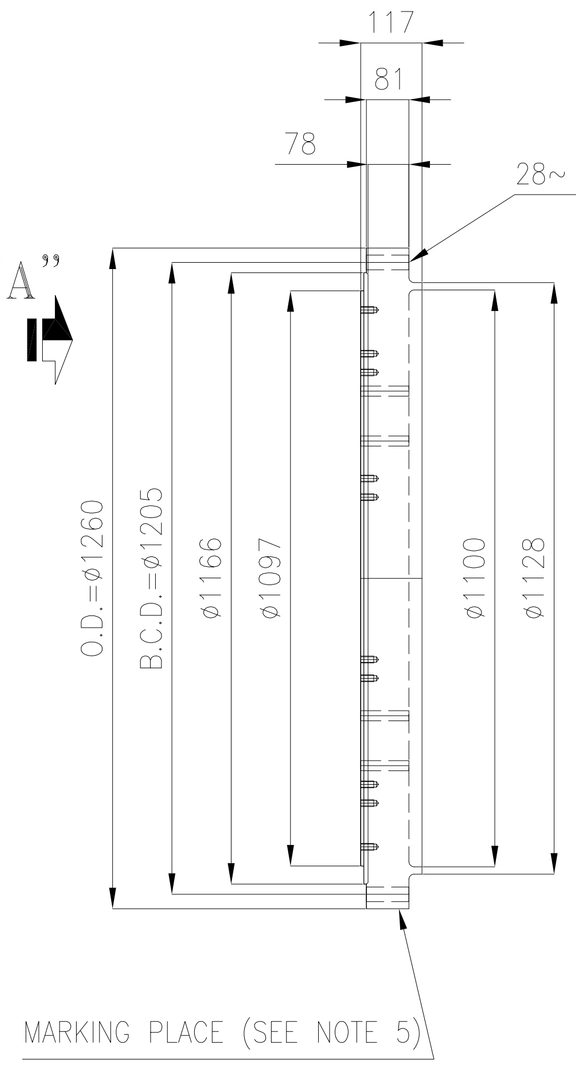
PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT–KERMANSHAH

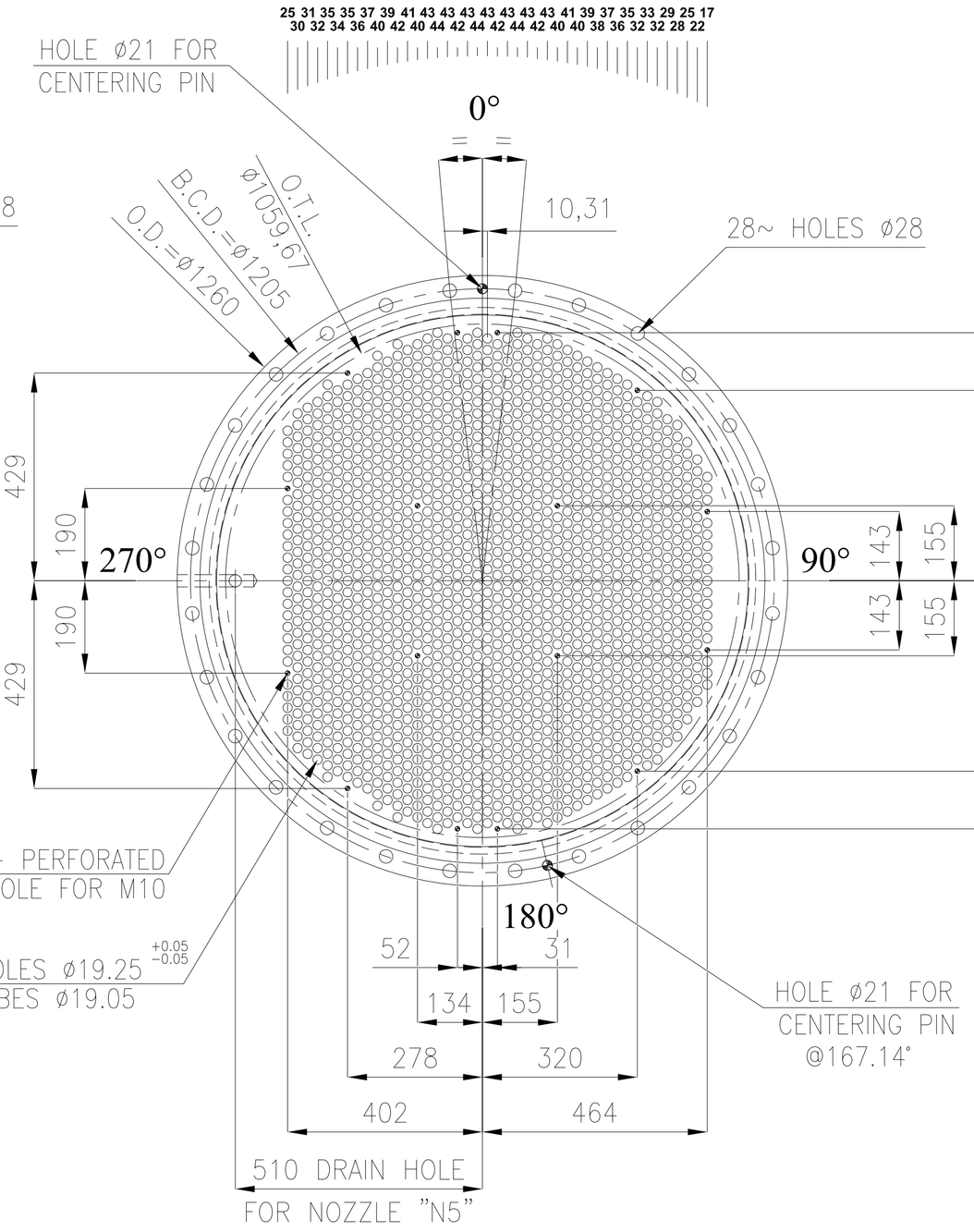
DRWG.TITLE: TUBE SHEET FOR PACK 1

DWG.NO. : R128–EN–MTO–010–02	1 OF 1	SC: AS SHOWN	SIZE: A3

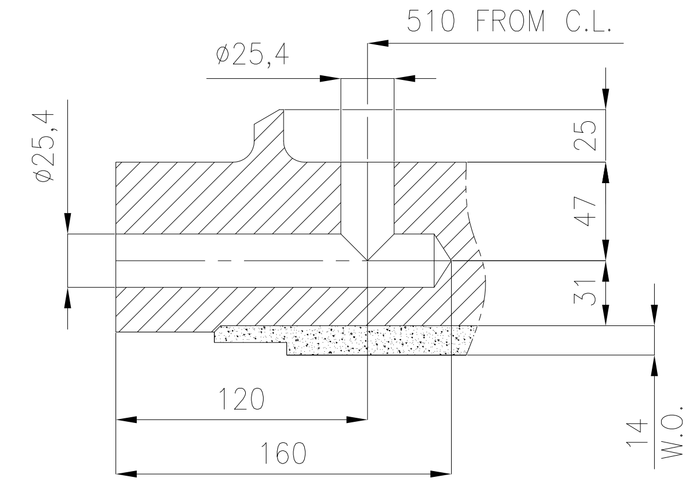
2-E-4106

MATERIAL	
SA 765 Gr.II +S.S.316L WELD OVERLAY	
WEIGHT	QTY.
480 KG	1

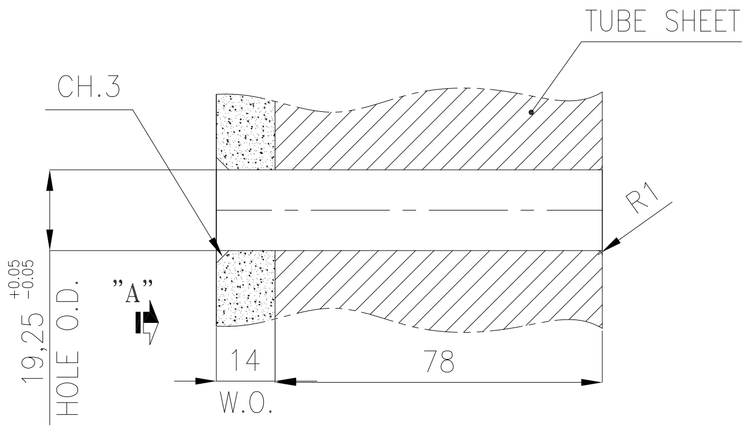




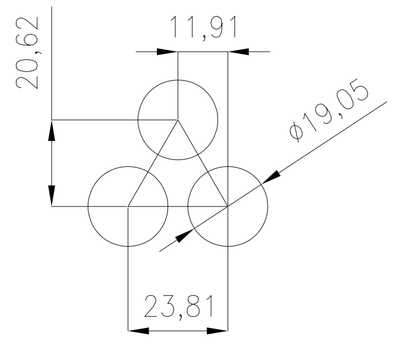
VIEW "A"
TUBE SHEET #1
SC: 1/2



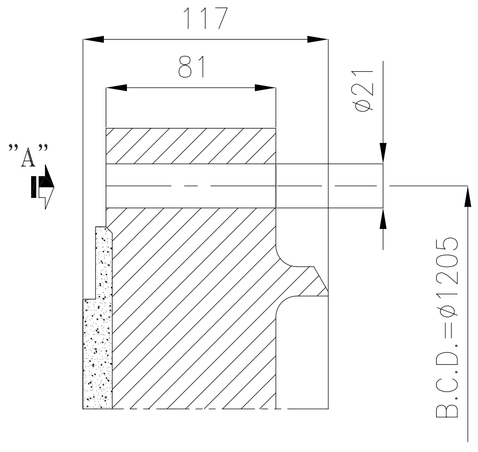
DRAIN HOLE FOR NOZZLE N5



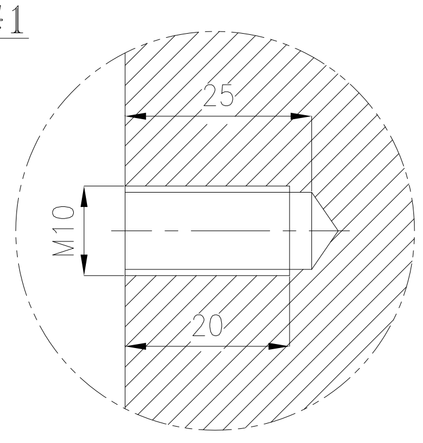
DETAIL OF TUBE HOLE



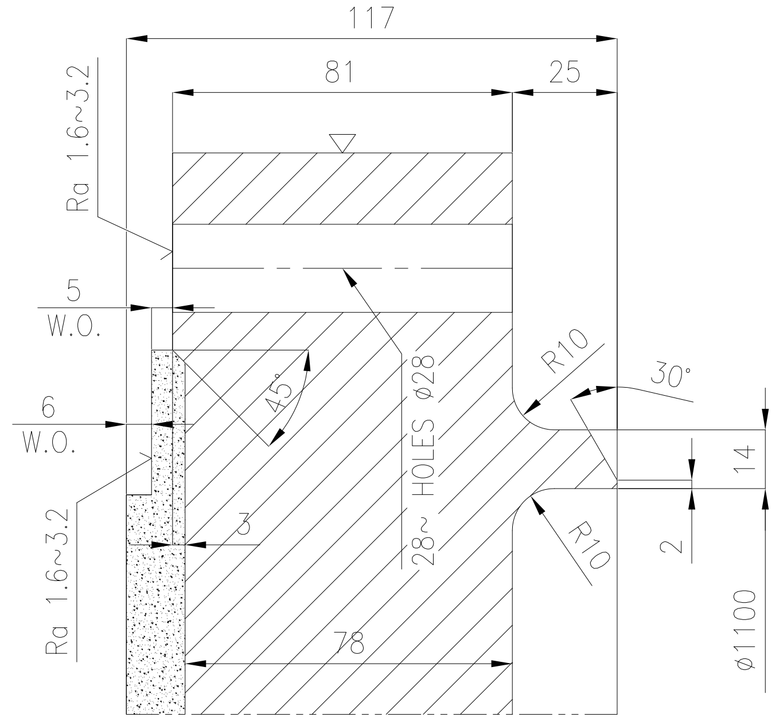
TUBE PATTERN



CENTERING HOLE DETAIL



DETAIL OF TIE ROD HOLE



TUBE SHEET DETAIL SECTIONAL

Notes :

1. GIRTH FLANGES AND TUBE SHEETS SEALING SURFACE SHALL HAVE SMOOTH FINISH WITH A CENTER LINE AVERAGE ROUGHNESS Ra=1.6~3.2 μm (63~125 μin) AARH PER ANSI/ASME B46.1.
2. ALL DIMENSIONS ARE IN m.m UNLESS OTHERWISE BE INDICATED.
3. DIMENSIONS WITHOUT TOLERANCES ACCORDING TO TEMA (R).
4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS1-2-E-4106 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
6. FOR WELD OVERLAY CHEMICAL COMPOSITION IS GUARANTEED FOR A THICKNESS OF 6mm ON GASKET SEATING FACE AND 3mm ON TUBE SHEET/OTHER FACE STARTING FROM THE FREE SURFACE AFTER FINAL MACHINING .

REV.	DATE	DESCRIPTION	DRAWN	PRE'D.	CHK'D.	APP'D.
2	11.MAY.2022	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.
1	19.DEC.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: KERMANSHAH PETROCHEMICAL INDUSTRIES CO. (K.P.I.C)

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

VENDOR: P.G.E.I (REACTORSAZ)

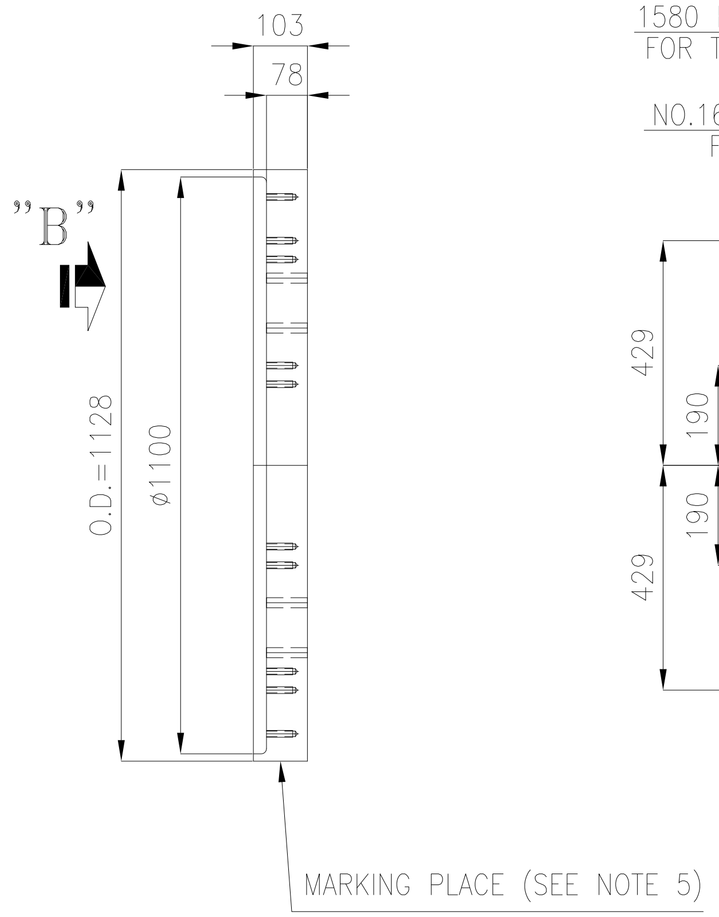
PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT–KERMANSHAH

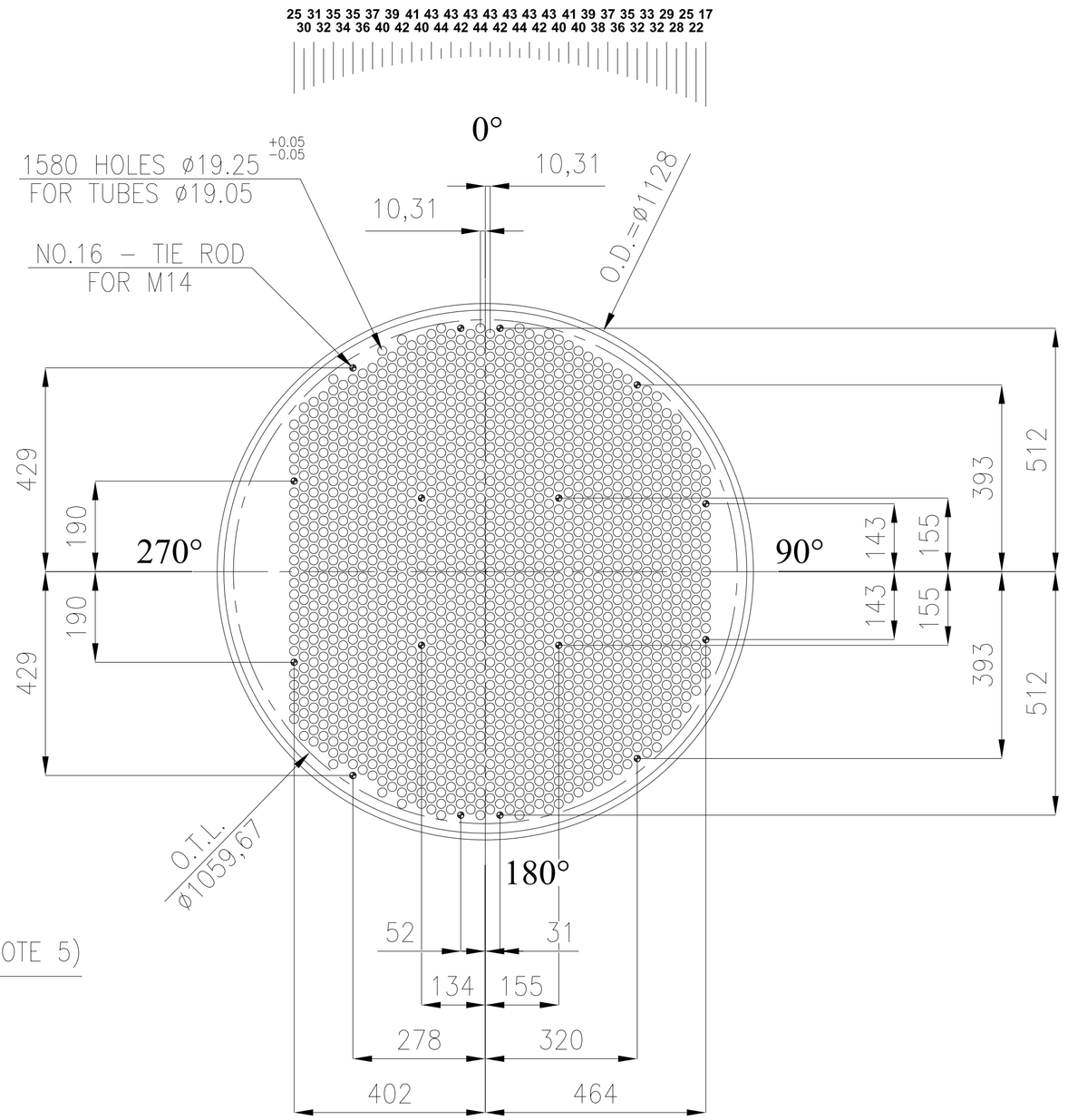
DRWG.TITLE: TUBE SHEET FOR PACK 2

DWG.NO. : R128–EN–MTO–010–03 | 1 OF 1 | SC: AS SHOWN | SIZE: A3

2-E-4106

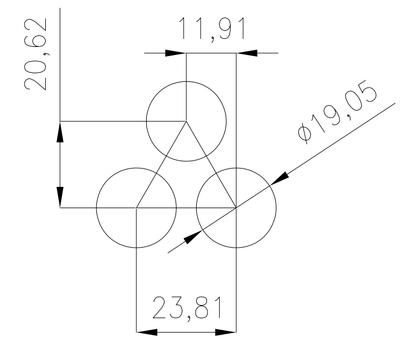
MATERIAL	
SA 965 Gr. F 316L	
WEIGHT	QTY.
310 KG	1



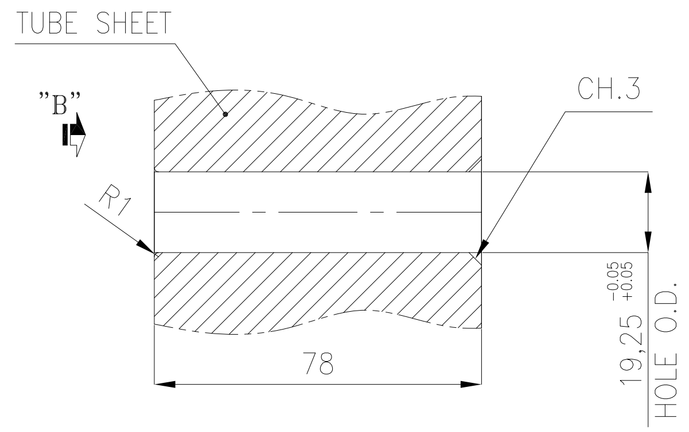


VIEW "B"
TUBE SHEET #2
SC: 1/2

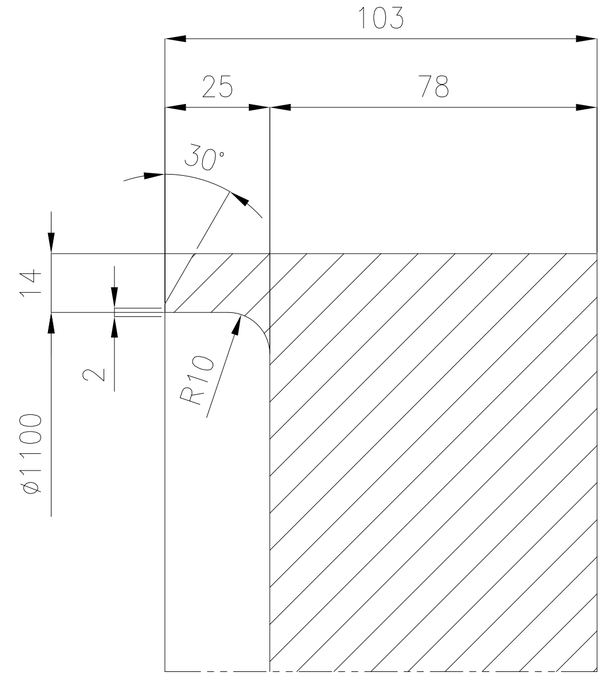
DETAIL OF TIE ROD HOLE



TUBE PATTERN



DETAIL OF TUBE HOLE



TUBE SHEET DETAIL SECTIONAL

Notes :

1. GIRTH FLANGES AND TUBE SHEETS SEALING SURFACE SHALL HAVE SMOOTH FINISH WITH A CENTER LINE AVERAGE ROUGHNESS Ra=1.6~3.2 μm (63~125 μin) AARH PER ANSI/ASME B46.1.
2. ALL DIMENSIONS ARE IN m.m UNLESS OTHERWISE BE INDICATED.
3. DIMENSIONS WITHOUT TOLERANCES ACCORDING TO TEMA (R).
4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS2-2-E-4106 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
6. FOR WELD OVERLAY CHEMICAL COMPOSITION IS GUARANTEED FOR A THICKNESS OF 6mm ON GASKET SEATING FACE AND 3mm ON TUBE SHEET/OTHER FACE STARTING FROM THE FREE SURFACE AFTER FINAL MACHINING .

REV.	DATE	DESCRIPTION	DRAWN	PRE'D.	CHK'D.	APP'D.
1	11.May.2022	ISSUE FOR CONSTRUCTION	M.R.KH.	V.M	V.M.	V.A.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: KERMANSHAH PETROCHEMICAL INDUSTRIES CO. (K.P.I.C)

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

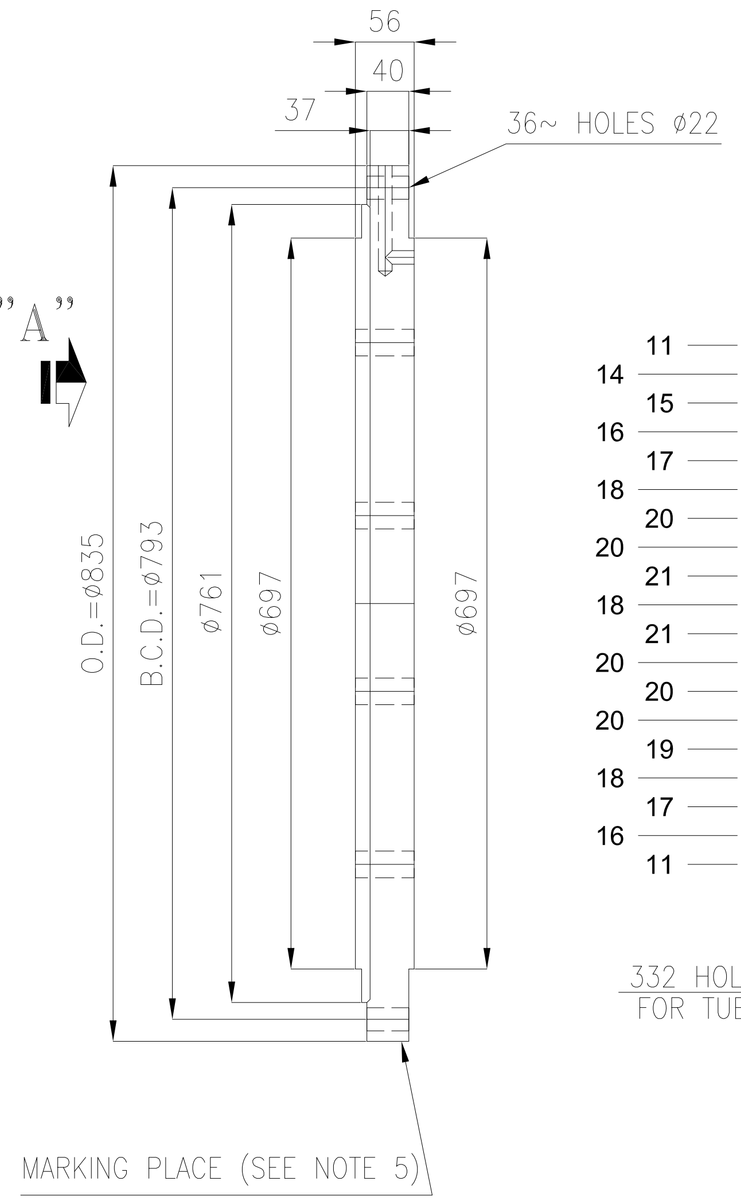
CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

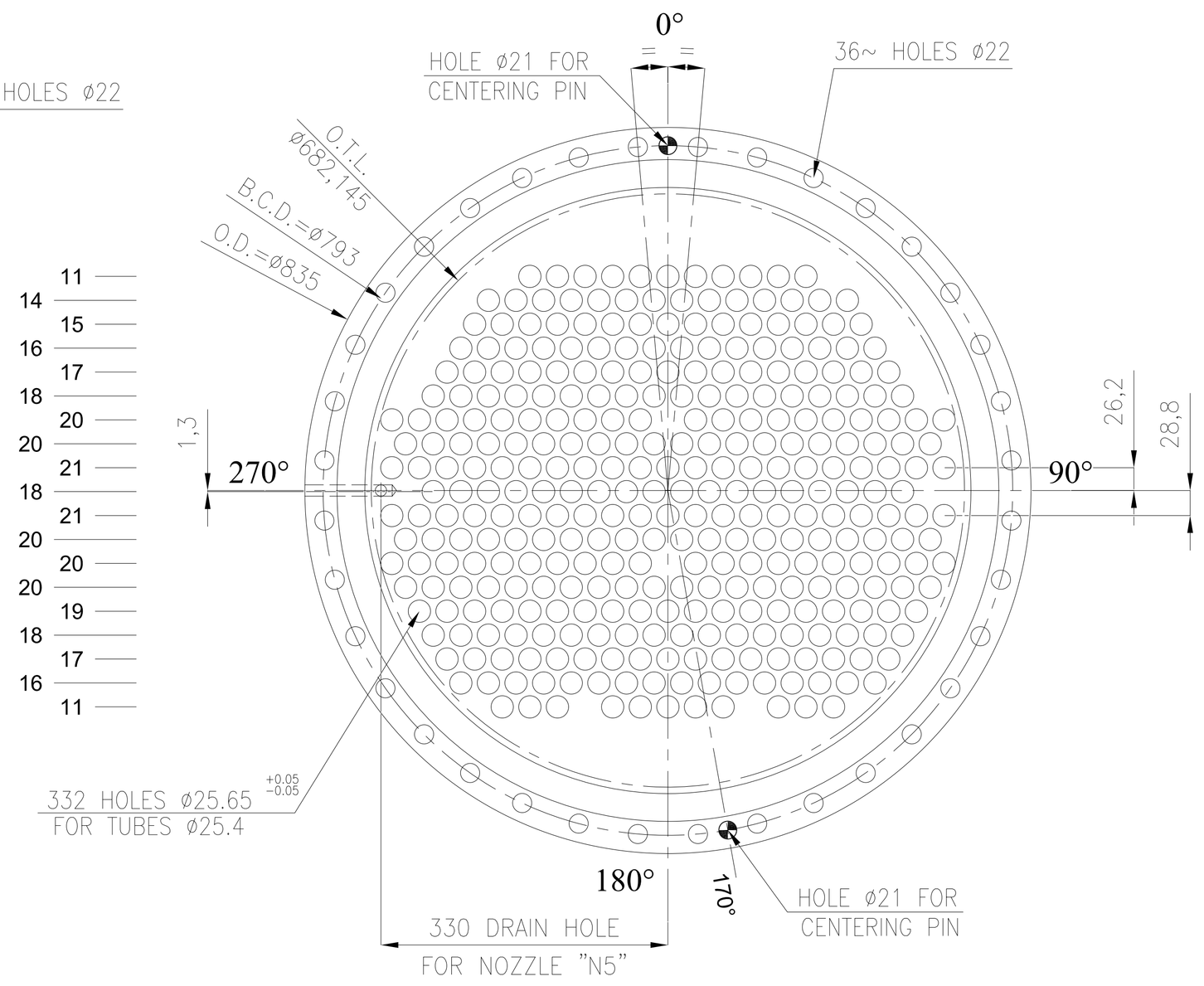
VENDOR: P.G.E.I (REACTORSAZ)

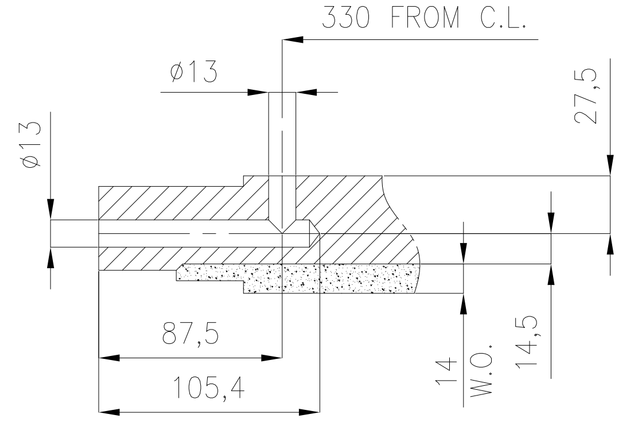
PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT–KERMANSHAH

DRWG.TITLE: TUBE SHEET FOR PACK 2

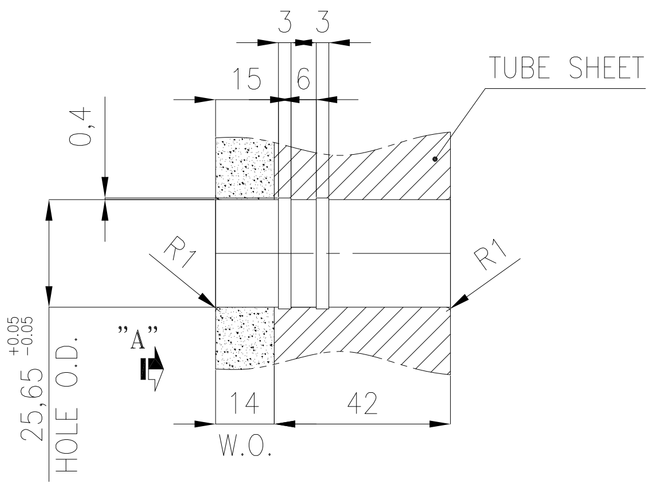
DWG.NO. : R128–EN–MTO–010–04	1 OF 1	SC: AS SHOWN	SIZE: A3





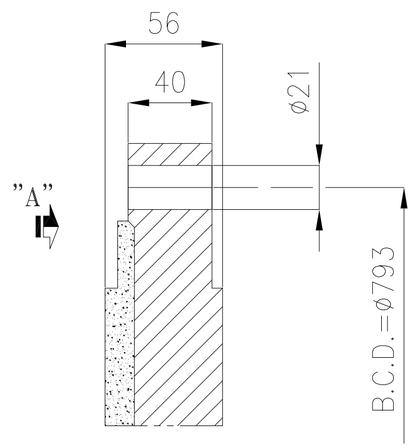


DRAIN HOLE FOR NOZZLE N5

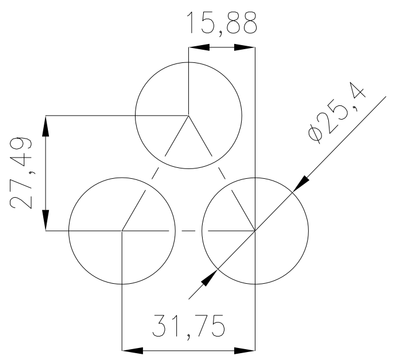


DETAIL OF TUBE HOLE

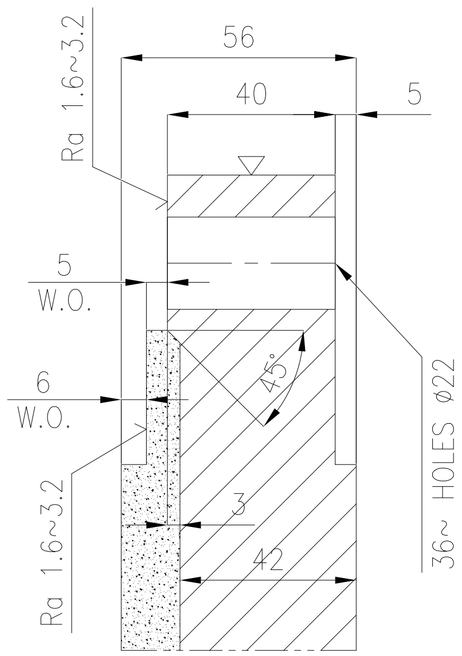
VIEW "A"
TUBE SHEET #1
SC: 1/1



CENTERING HOLE DETAIL



TUBE PATTERN



TUBE SHEET DETAIL SECTIONAL

Notes :

1. GIRTH FLANGES AND TUBE SHEETS SEALING SURFACE SHALL HAVE SMOOTH FINISH WITH A CENTER LINE AVERAGE ROUGHNESS Ra=1.6~3.2 μm (63~125 μin) AARH PER ANSI/ASME B46.1.
2. ALL DIMENSIONS ARE IN m.m UNLESS OTHERWISE BE INDICATED.
3. DIMENSIONS WITHOUT TOLERANCES ACCORDING TO TEMA (R).
4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS1-2-E-4211 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
6. FOR WELD OVERLAY CHEMICAL COMPOSITION IS GUARANTEED FOR A THICKNESS OF 6mm ON GASKET SEATING FACE AND 3mm ON TUBE SHEET/OTHER FACE STARTING FROM THE FREE SURFACE AFTER FINAL MACHINING .

2-E-4211

MATERIAL	
SA 765 Gr.II +S.S.316L WELD OVERLAY	
WEIGHT	QTY.
140 KG	1

REV.	DATE	DESCRIPTION	DRAWN	PRE'D.	CHK'D.	APP'D.
2	11.MAY.2022	ISSUE FOR CONSTRUCTION	M.R.KH.	V.M	V.M.	V.A.
1	19.DEC.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: KERMANSHAH PETROCHEMICAL INDUSTRIES CO.

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

VENDOR: P.G.E.I (REACTORSAZ)

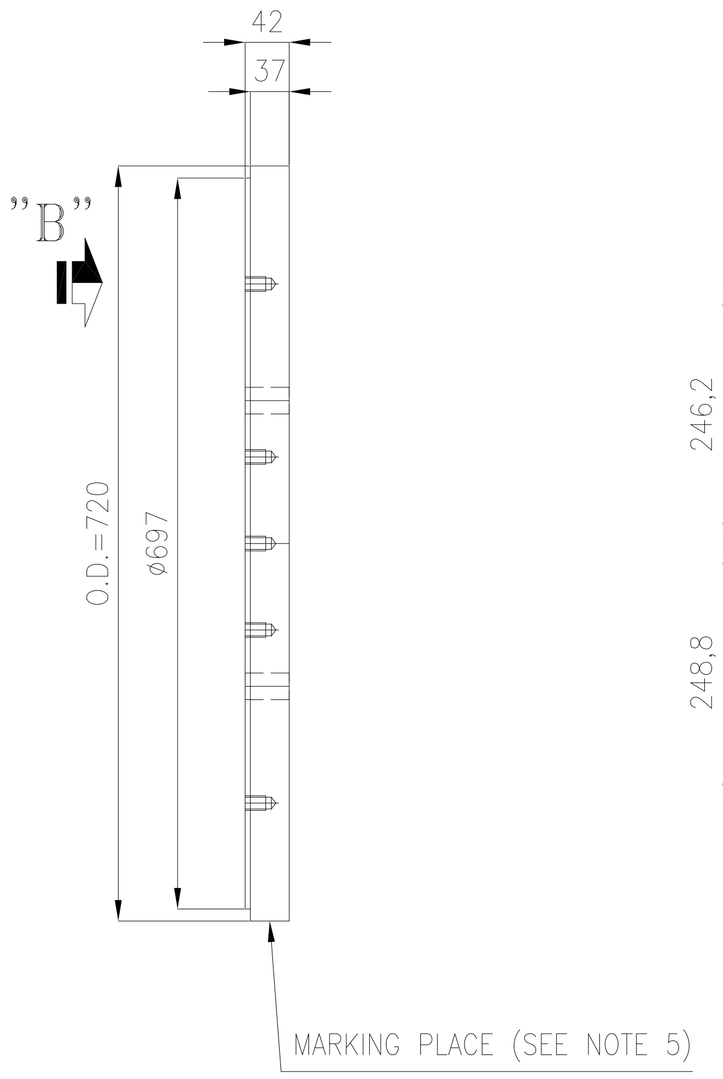
PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT–KERMANSHAH

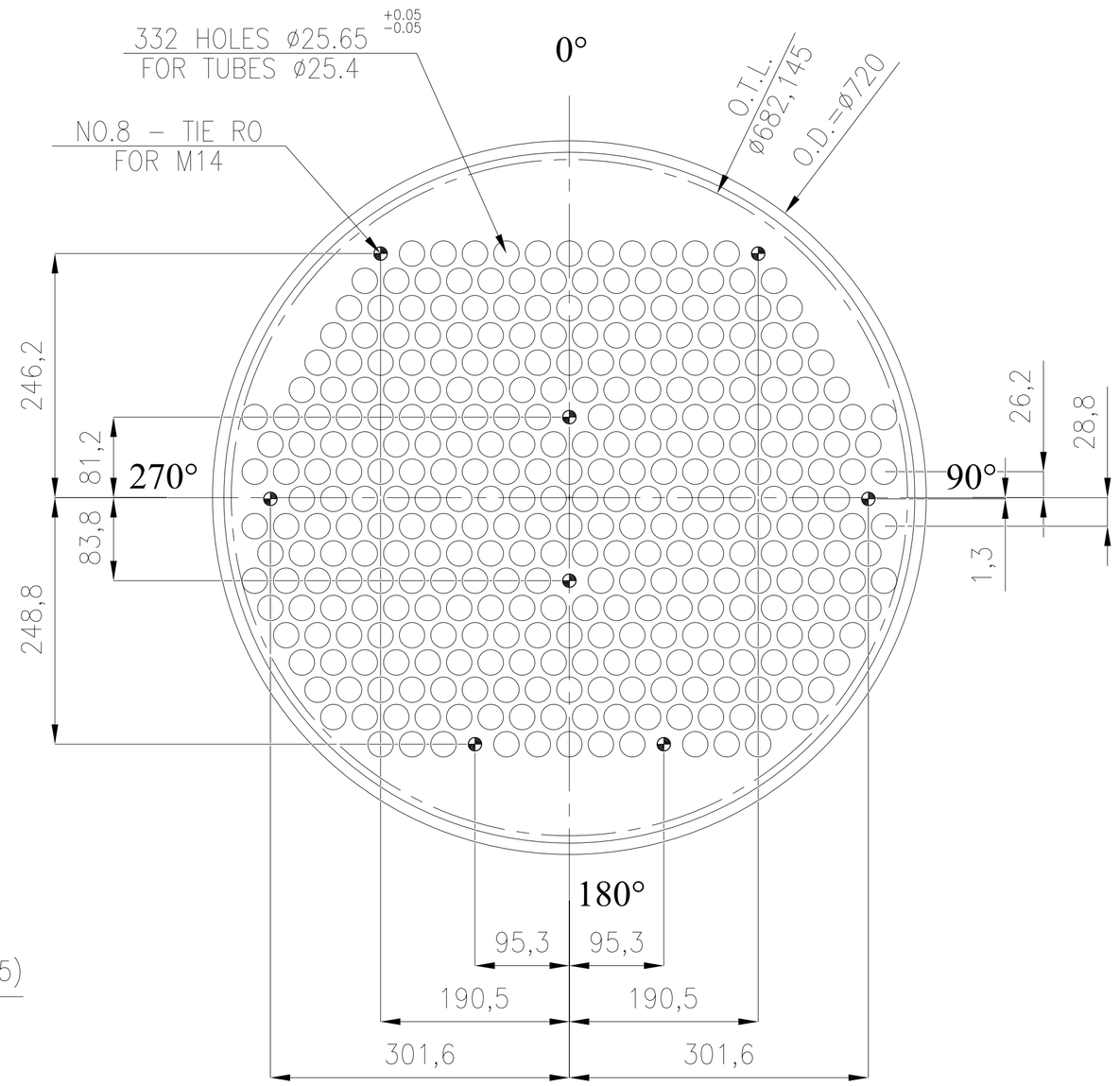
DRWG.TITLE: TUBE SHEET FOR PACK 3

DWG.NO. : R128–EN–MTO–010–05 | 1 OF 1 | SC: AS SHOWN | SIZE: A3

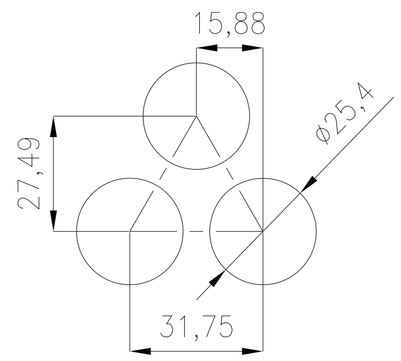
2-E-4211

MATERIAL	
SA 965 Gr.F 316L	
WEIGHT	QTY.
85 KG	1

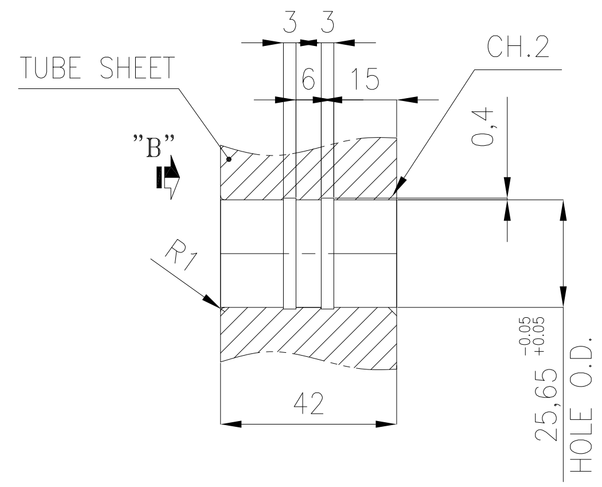




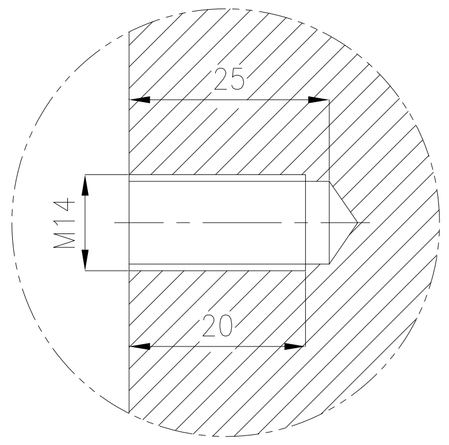
VIEW "B"
TUBE SHEET #2
SC: 1/1



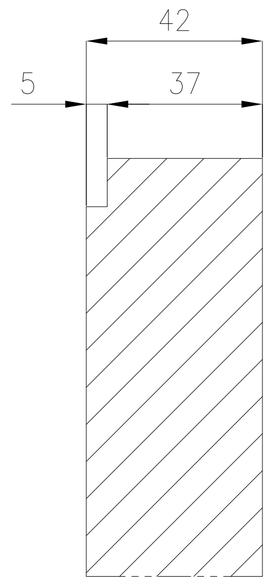
TUBE PATTERN



DETAIL OF TUBE HOLE



DETAIL OF TIE ROD HOLE



TUBE SHEET DETAIL SECTIONAL

Notes :

1. GIRTH FLANGES AND TUBE SHEETS SEALING SURFACE SHALL HAVE SMOOTH FINISH WITH A CENTER LINE AVERAGE ROUGHNESS Ra=1.6~3.2 μm (63~125 μin) AARH PER ANSI/ASME B46.1.
2. ALL DIMENSIONS ARE IN m.m UNLESS OTHERWISE BE INDICATED.
3. DIMENSIONS WITHOUT TOLERANCES ACCORDING TO TEMA (R).
4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS2-2-E-4211 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
6. FOR WELD OVERLAY CHEMICAL COMPOSITION IS GUARANTEED FOR A THICKNESS OF 6mm ON GASKET SEATING FACE AND 3mm ON TUBE SHEET/OTHER FACE STARTING FROM THE FREE SURFACE AFTER FINAL MACHINING .

REV.	DATE	DESCRIPTION	DRAWN	PRE'D.	CHK'D.	APP'D.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: K.P.I.C — KERMANSHAH PETROCHEMICAL INDUSTRIES CO.

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

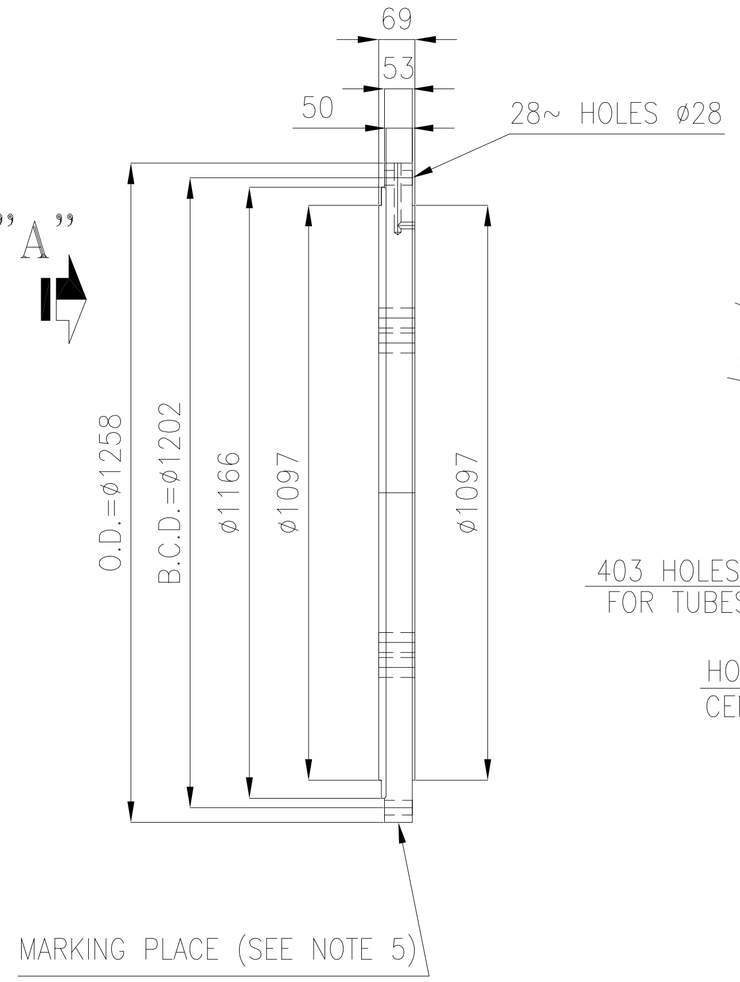
CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

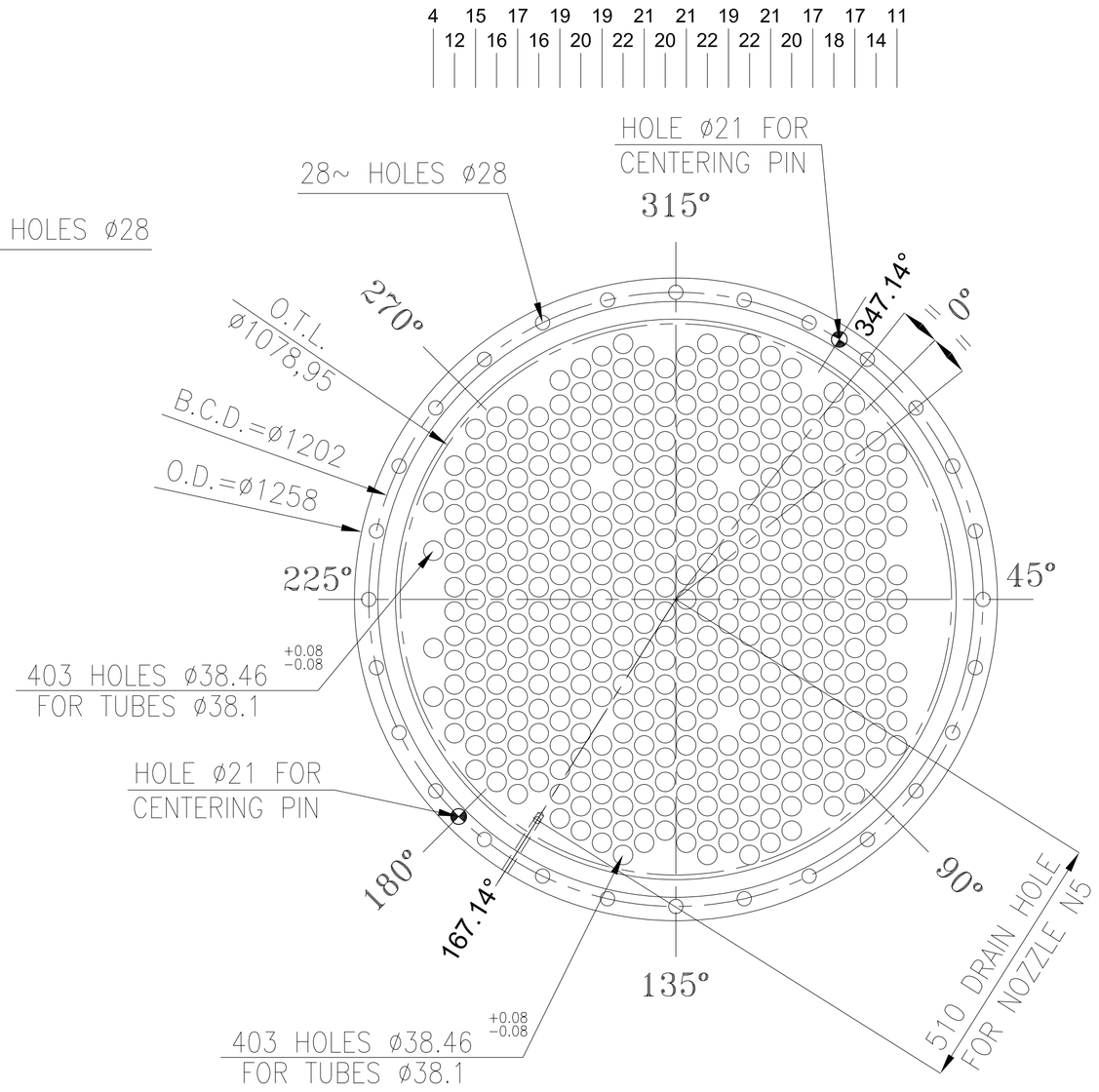
VENDOR: REACTORSAZ — P.G.E.I (REACTORSAZ)

PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT–KERMANSHAH

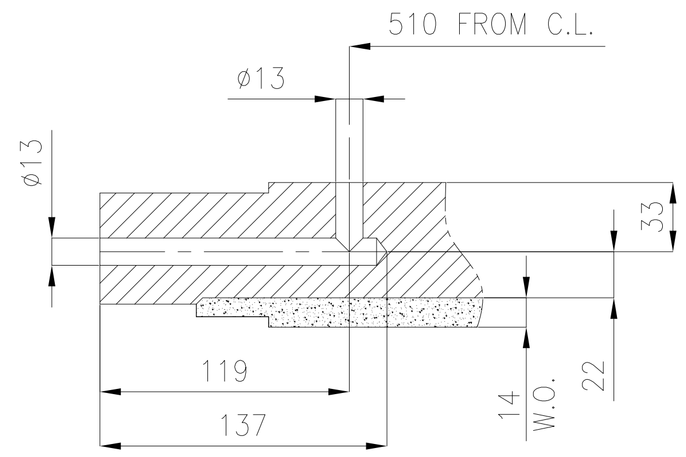
DRWG.TITLE: TUBE SHEET FOR PACK 3

DWG.NO. : R128–EN–MTO–010–06 | 1 OF 1 | SC: AS SHOWN | SIZE: A3

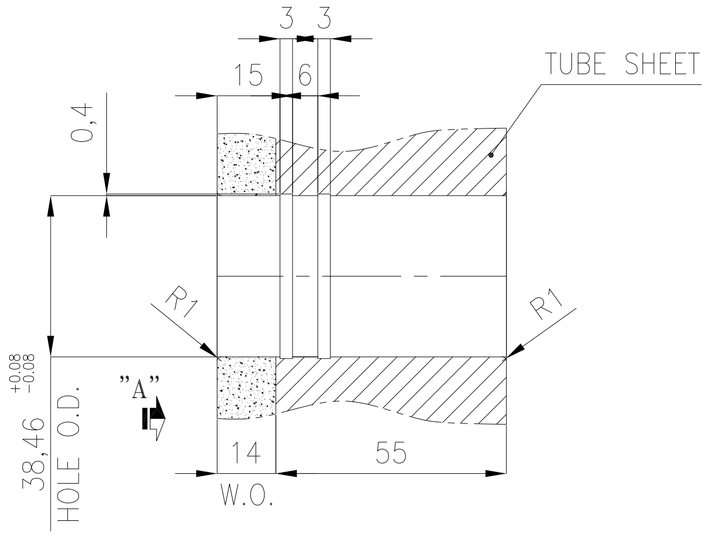




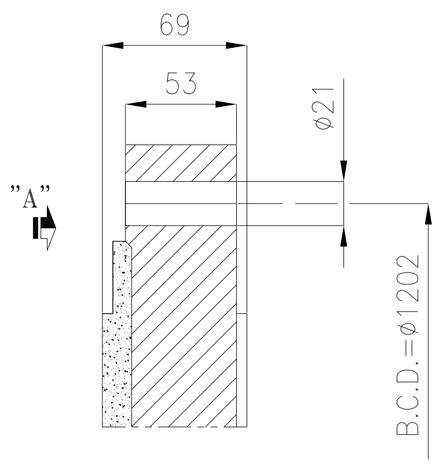
VIEW "A"
TUBE SHEET #1
SC: 1/2



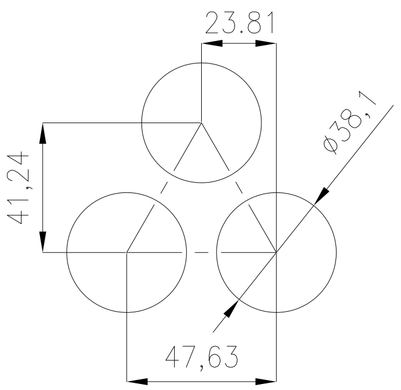
DRAIN HOLE FOR NOZZLE N5



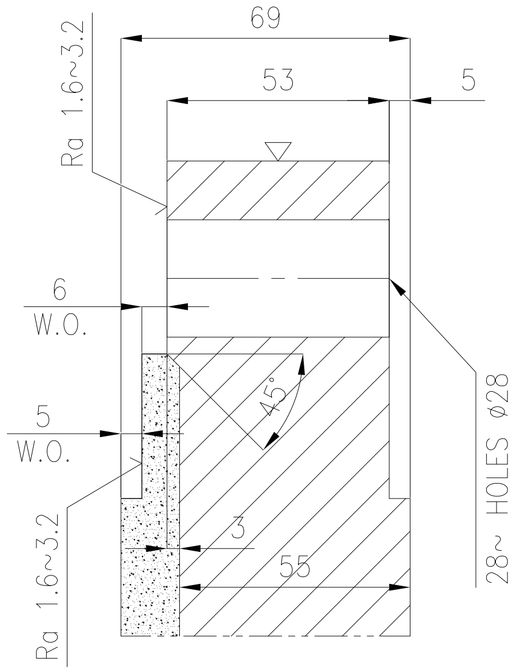
DETAIL OF TUBE HOLE



CENTERING HOLE DETAIL



TUBE PATTERN



TUBE SHEET DETAIL SECTIONAL

Notes :

1. GIRTH FLANGES AND TUBE SHEETS SEALING SURFACE SHALL HAVE SMOOTH FINISH WITH A CENTER LINE AVERAGE ROUGHNESS Ra=1.6~3.2 μm (63~125 μin) AARH PER ANSI/ASME B46.1.
2. ALL DIMENSIONS ARE IN m.m UNLESS OTHERWISE BE INDICATED.
3. DIMENSIONS WITHOUT TOLERANCES ACCORDING TO TEMA (R).
4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS1-2-E-4114 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
6. FOR WELD OVERLAY CHEMICAL COMPOSITION IS GUARANTEED FOR A THICKNESS OF 6mm ON GASKET SEATING FACE AND 3mm ON TUBE SHEET/OTHER FACE STARTING FROM THE FREE SURFACE AFTER FINAL MACHINING .

2-E-4114

MATERIAL	
SA 765 Gr.II +S.S.316L WELD OVERLAY	
WEIGHT	QTY.
395 KG	1

REV.	DATE	DESCRIPTION	DRAWN	PRE'D.	CHK'D.	APP'D.
2	11.May.2022	ISSUE FOR CONSTRUCTION	M.R.KH.	V.M	V.M.	V.A.
1	19.Dec.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: KERMANSHAH PETROCHEMICAL INDUSTRIES CO. (K.P.I.C)

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

VENDOR: P.G.E.I (REACTORSAZ)

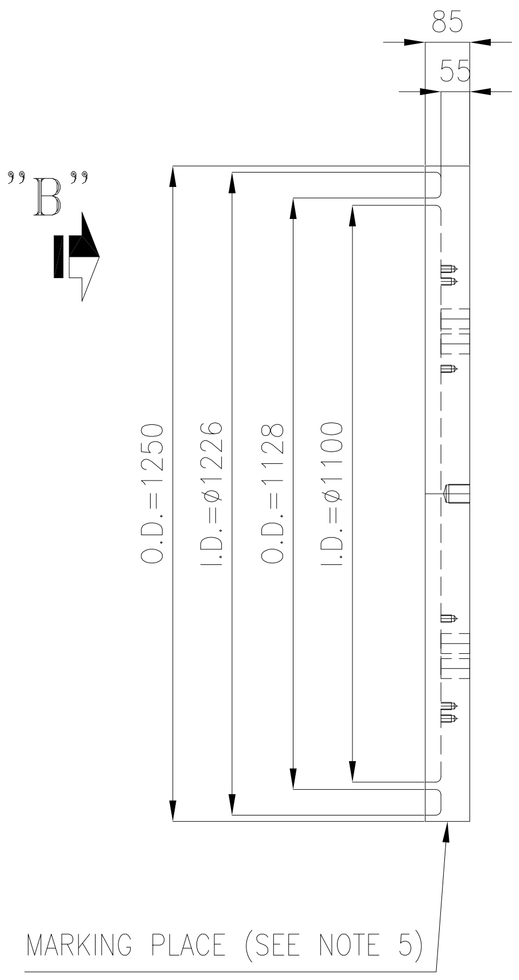
PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT-KERMANSHAH

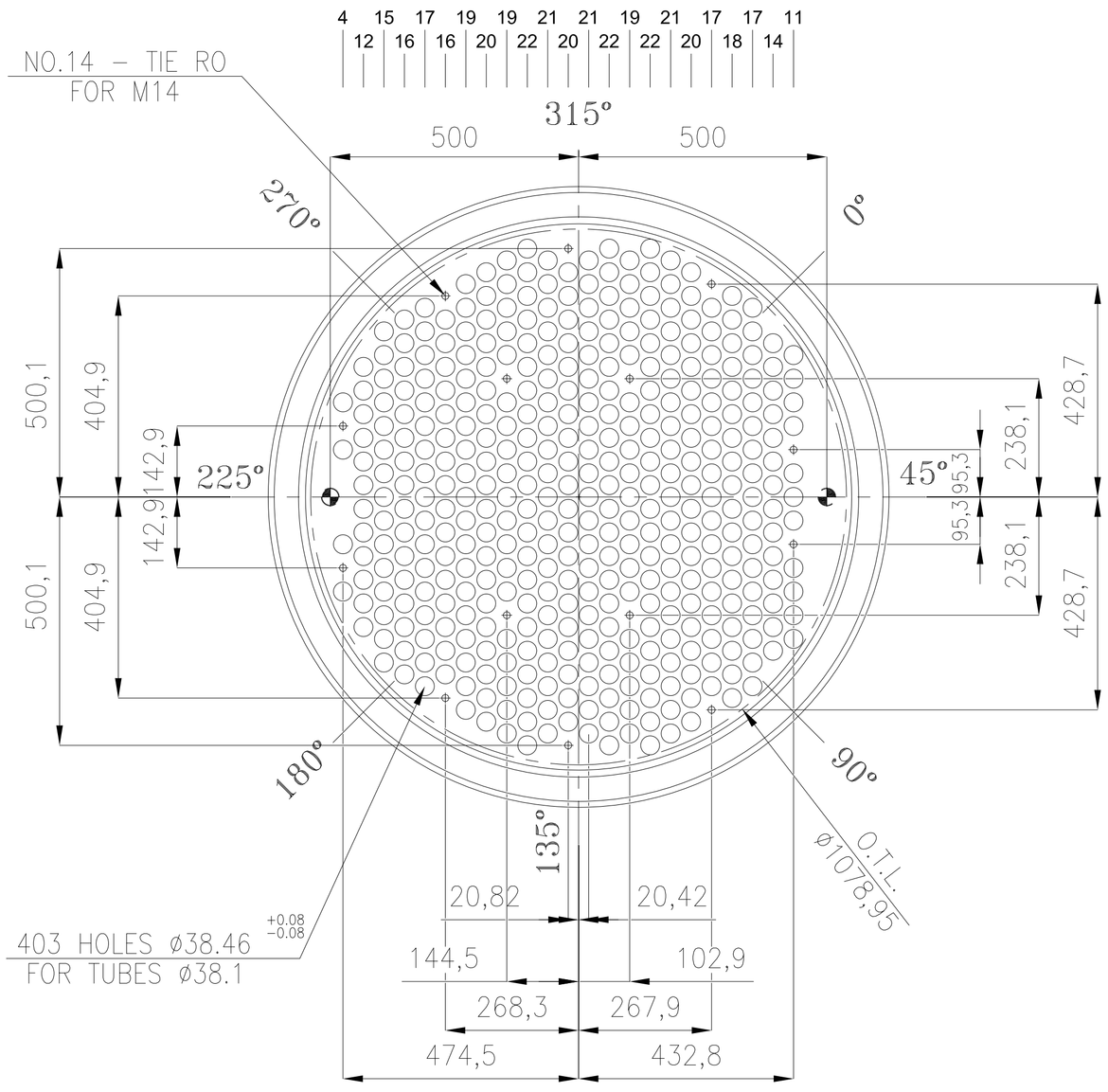
DRWG.TITLE: TUBE SHEET FOR PACK 4

DWG.NO. : R128-EN-MTO-010-07	1 OF 1	SC: AS SHOWN	SIZE: A3

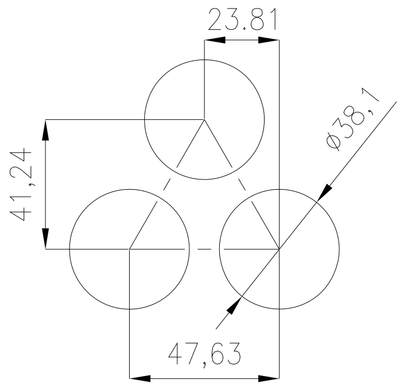
2-E-4114

MATERIAL	
SA 965 Gr. F 316L	
WEIGHT	QTY.
340 KG	1

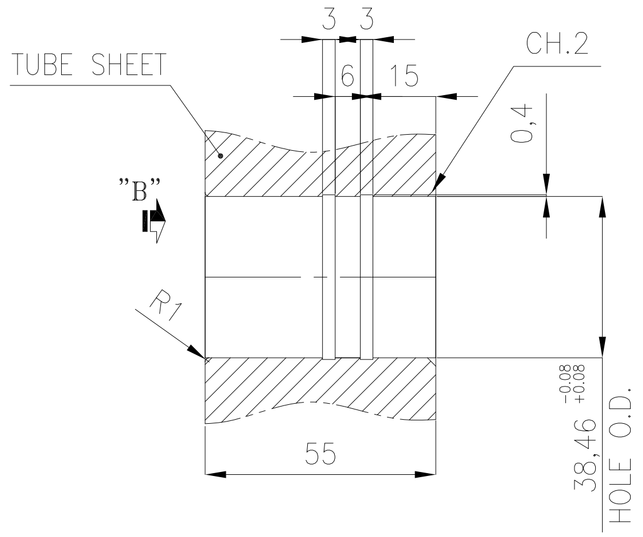




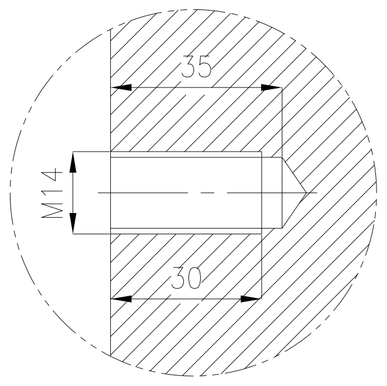
VIEW "B"
TUBE SHEET #2
SC: 1/2



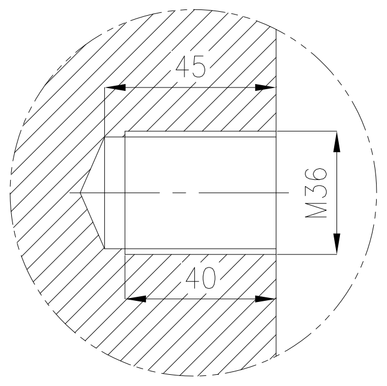
TUBE PATTERN



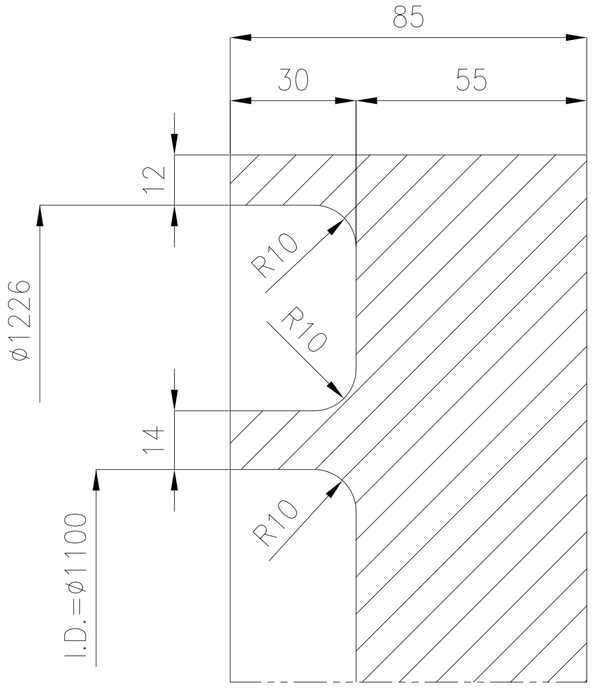
DETAIL OF TUBE HOLE



DETAIL OF TIE
ROD HOLE



DETAIL OF EYE
BOLT HOLE



TUBE SHEET DETAIL SECTIONAL

Notes :

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4. BOLT HOLES SHALL BE STRADDLE OF MAIN AXIS.
5. " TS2-2-E-4114 " NO. SHALL BE MARKED ON OUTSIDE SURFACE OF TUBE SHEETS AFTER MACHINING & DRILLING.
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1	11.May.2022	ISSUE FOR CONSTRUCTION	M.R.KH.	V.M	V.M.	V.A.
0	31.JUL.2021	ISSUE FOR CONSTRUCTION	M.R.KH.	R.N.	V.M.	V.A.

OWNER: KERMANSHAH PETROCHEMICAL INDUSTRIES CO. (K.P.I.C)

PROJECT MANAGING CONTRACT: NAMAVARAN DELVAR ENGINEERING AND CONSTRUCTION CO.

CONTRACTOR: SAZEH CONSULTANTS ENGINEERING AND CONSTRUCTION

VENDOR: P.G.E.I (REACTORSAZ)

PROJECT TITLE : 2ND AMMONIA AND UREA PROJECT–KERMANSHAH

DRWG.TITLE: TUBE SHEET FOR PACK 4

DWG.NO. : R128–EN–MTO–010–08 | 1 OF 1 | SC: AS SHOWN | SIZE: A3