

MTO

Project No.	: 120800-803	Ref.	: 120800-803/MTO/SRN-03
Client	: Dangote Oil Refining Company	Rev.	: 1
Consultant	: EIL	Date	: 13-04-2017
Eqpt. No.	: 133-RB-1003		

For Dimensions, refer sketch "120800-803-SRN03"

Notes :

- 1 Material : SA-336 Gr. F11 Cl.3
- 2 The material shall meet all the requirements of ASME Section II Part A Edition 2015.
- 3 Forgings shall meet all the requirements of API RP 934-C [Latest Edition].
- 4 The forging shall be supplied in normalized & tempered condition or in quenched & tempered condition. Minimum tempering temperature shall be 15°C greater than simulation PWHT temperature.
- 5 The forgings shall be fine grained & vacuum degassed
- 6 The following additional chemical requirements shall also be met by heat analysis.
 $X\text{-bar} = (10P + 5Sb + 4Sn + As) / 100 \leq 15 \text{ ppm}$, where P, Sb, Sn and As are in ppm.
 Additionally, C = 0.15 wt % max, P = 0.007 wt % max, S = 0.007 wt % max, Cu = 0.20 wt % max and Ni = 0.30 wt % max.
- 7 Product analysis shall be carried out and reported in the material test certificates.
- 8 Simulation heat treatment of test coupons of the forgings shall be carried out according to the cycle given below.
 Rate of Heating: 56°C/hr (maximum) above 300°C
 Temperature: 680 ± 10° C
 Holding Time:
 1.Min PWHT: 210 minutes
 2.Max PWHT: 630 minutes
 Rate of Cooling: 56°C/hr (maximum) upto 300°C
- 9 All the mechanical tests shall be reported for the following.
 1) As Supplied
 2) As Supplied + Minimum PWHT Condition
 3) As Supplied + Maximum PWHT Condition
- 10 All forgings shall be impact tested at -18°C as per ASME Sec VIII Div 1 [Edition 2015]. The minimum impact energy shall be 54 J average of three specimens and 27 J minimum for a single specimen.
 Number of test shall be carried out considering 1 set of 3 specimens per test condition.
 Test specimens shall be taken from normal to the direction of greatest elongation at 1/2 T location.
 Percentage shear fracture shall meet 25% minimum. Lateral expansion shall also be reported.
- 11 All forgings shall be ultrasonically examined with 100% scanning in accordance with paragraph 3.3.4 of ASME Sec VIII Div 2 [Edition 2015].
- 12 Entire surfaces of forgings including welding edges shall be magnetic particle examined in accordance with para 7.5.6 of ASME Sec VIII Div 2 [Edition 2015] after finish machining.
- 13 Room temperature Tensile test shall be performed. 2 test per forging (taken at 180° apart) of each size in each heat and heat treatment charge shall be performed. Test specimen shall be taken at 1/2T location in tangential direction. Acceptance criteria shall be as per SA-336 of ASME Sec II Part A [2015 Edition].
- 14 The hardness shall not exceed 200 BHN. Hardness test shall be performed on each tensile test specimen prior to tensile testing using Brinell, Vickers or Rockwell Methods.
- 15 Repair by welding is not permitted.
- 16 Forging shall be supplied in fully machined condition. Vendor shall submit forging sketches for Godrej approval. Manufacturing activities should start only after approval of sketches by Godrej.
- 17 Forgings shall be legibly stamped or stenciled showing grade no. and item no. with "low stress stamp". Certification and Marking shall be in accordance with SA-336 of ASME Section II Part A [Edition 2015].
- 18 Inspection: Material test reports shall be in accordance with EN 10204 Type 3.2 (Lloyds/TUV Nord/BV).

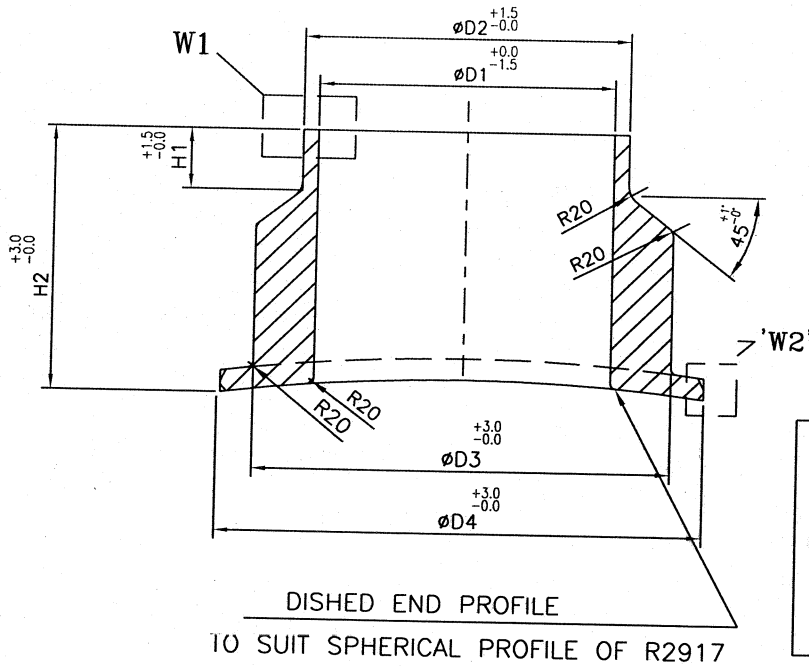
Rev 1: Sketch revised as marked

ASME**MASTER COPY**

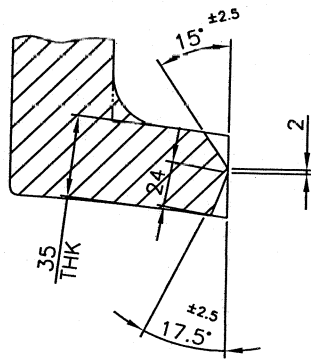
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NOTES:-

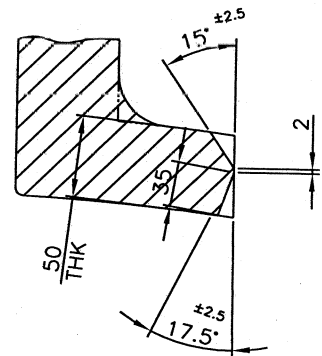
- 1) ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
- 2) FOR GENERAL NOTES, REFER DOC. 120800-803/MTO/SRN-03



DETAIL 'W1'		
AS FOLLOWS		
FLANGES	FIG	ASME
<24"	8/9	B 16.5
>24"	1	B 16.47



DETAIL 'W2'
FOR SERIAL NO.1



DETAIL 'W2'
FOR SERIAL NO. 2 & 3

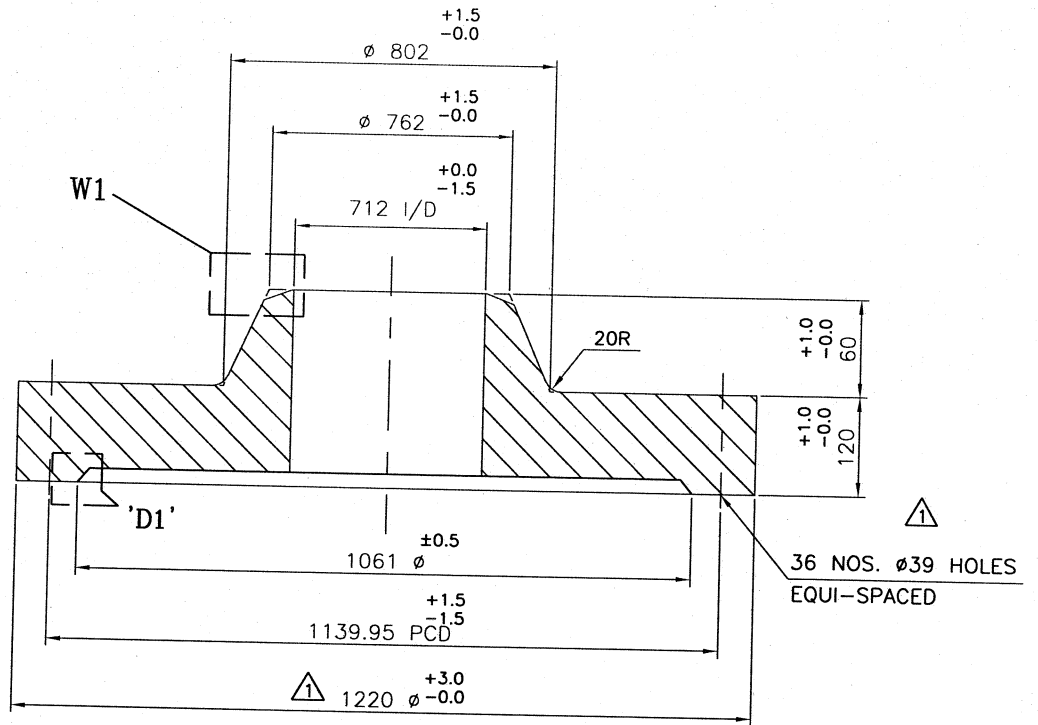
3	N2	712	762	912	1012	50	335	SRN03	1
2	M1	926	994	1146	1246	74	380	SRN02	1
1	N3 A-D	193.68	219.08	324	424	50	230	SRN01	4
SR. No.	NOZZLE MARK	D1	D2	D3	D4	H1	H2	ITEM CODE	QTY.

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SCALE: NTS	TITLE: DETAILS OF SRN EQUIPMENT NO: 133-RB-1003	MATERIAL SA 336 GR F11 CL3	QUANTITY REFER TABLE				
CLIENT: DANGOTE OIL REFINING COMPANY		PROJECT NO.: 120803					
 Godrej & Boyce Mfg. Co. Ltd. Process Equipment Division		DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
		MK	08/03/17	SPK	08/03/17	MP	08/03/17
		DRG. NO.:120800-803-SRN03		SHT. 1 OF 7		REV.0	

REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.	REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.
1	13/04/17	SKETCH REVISED AS MARKED	MK	PPK	MP						

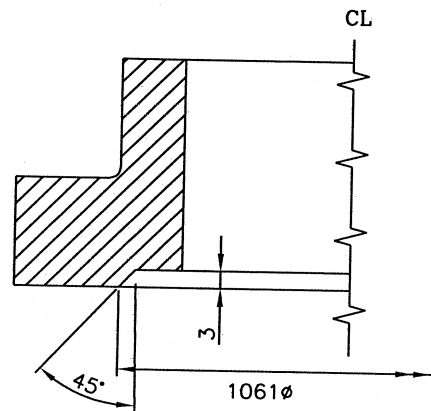
- NOTES:**
- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
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DETAIL OF NOZZLE M1 REDUCING FLANGE

DETAIL 'W1'
SHALL BE AS PER
FIG 1 OF ASME 16.47

WELD DETAIL 'D1'



SR NO: 04
ITEM CODE: SRN04R1

SCALE: NTS
TITLE: DETAILS OF SRN
EQUIPMENT NO: 133-RB-1003

MATERIAL: SA 336 GR F11 CL3
QUANTITY: 1

CLIENT: DANGOTE OIL REFINING COMPANY

PROJECT NO.: 120803

Godrej
Godrej & Boyce Mfg. Co. Ltd.
Process Equipment Division

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
MK	08/03/17	PPK	08/03/17	MP	08/03/17

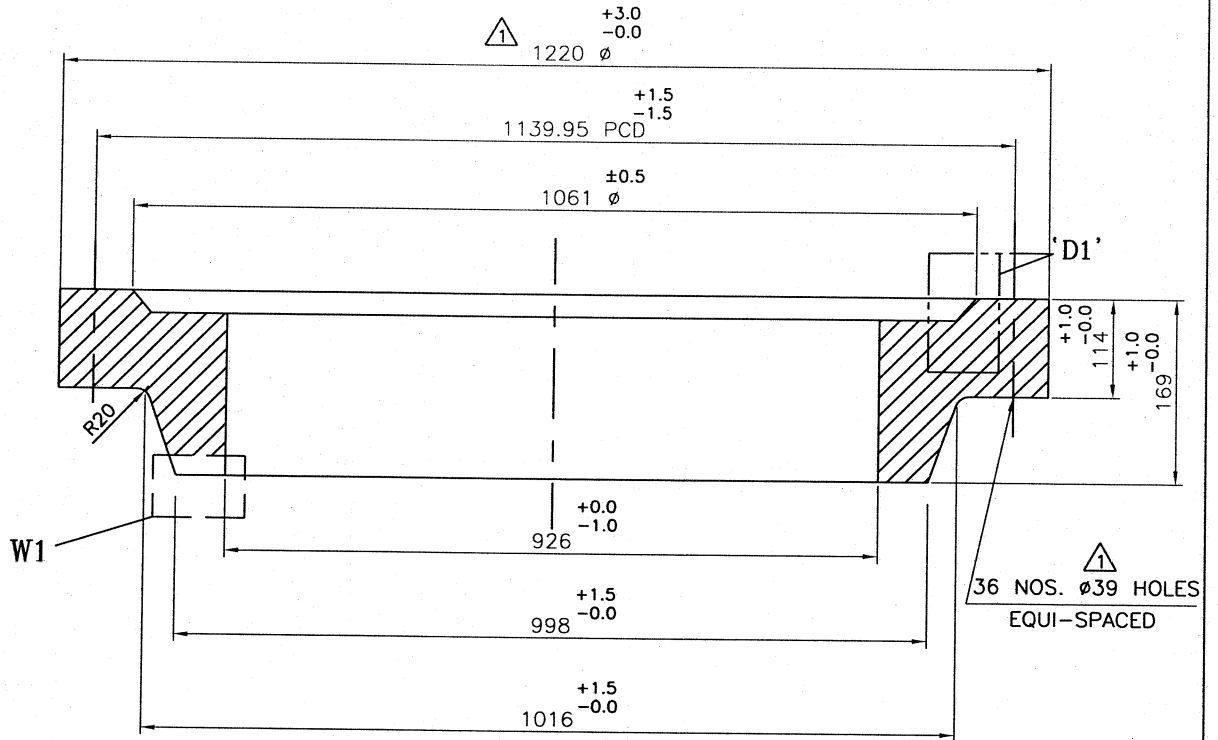
DRG. NO.:120800-803-SRN03 SHT. 2 OF 7 REV.1

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REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.	REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.
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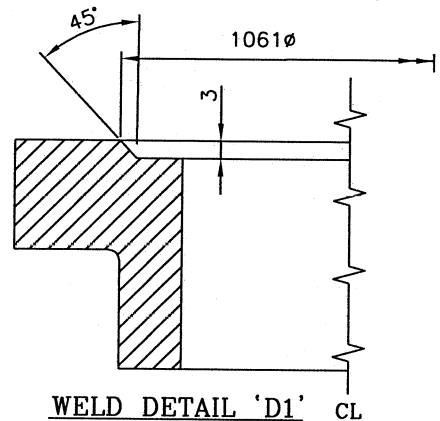
NOTES: -

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DETAIL OF NOZZLES M1

DETAIL 'W1'
SHALL BE AS PER
FIG 1 OF ASME 16.47



SR NO : 05
ITEM CODE: SRN05R1

SCALE: NTS	TITLE: DETAILS OF SRN EQUIPMENT NO: 133-RB-1003	MATERIAL SA 336 GR F11 CL3	QUANTITY 1
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CLIENT: DANGOTE OIL REFINING COMPANY				PROJECT NO.: 120803			
 Godrej & Boyce Mfg. Co. Ltd. Process Equipment Division		DRAWN	DATE	CHKD.	DATE	APPROVED	DATE
		MK	08/03/17	PPK	08/03/17	MP	08/03/17
		DRG. NO.:120800-803-SRN03			SHT. 3 OF 7		REV.1

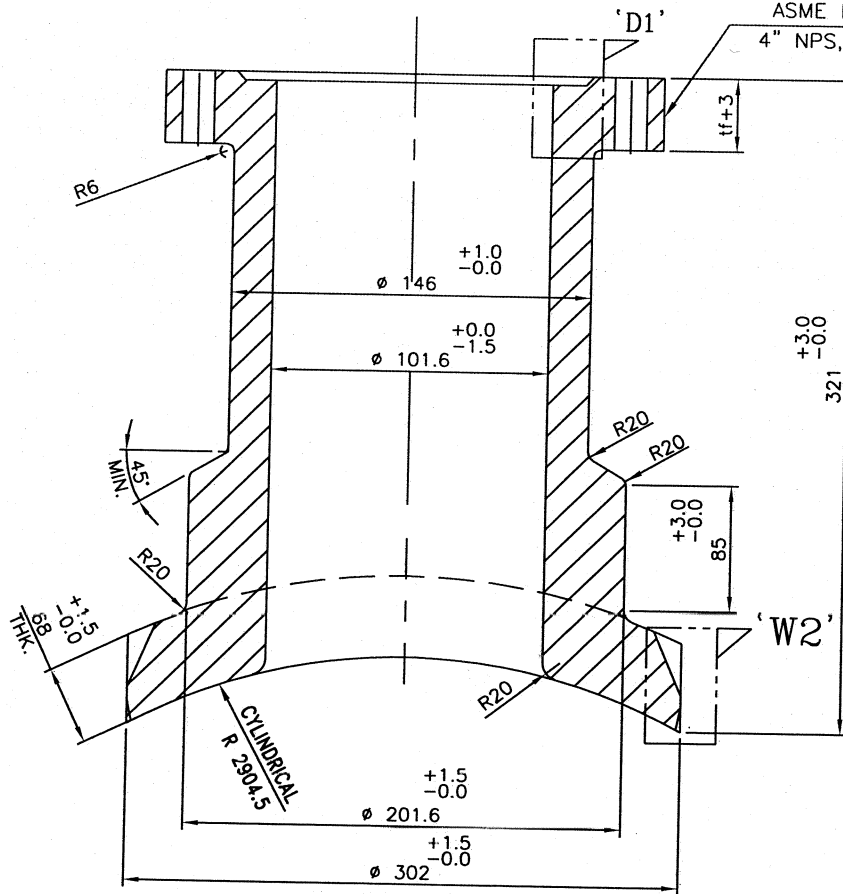
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REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.	REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.
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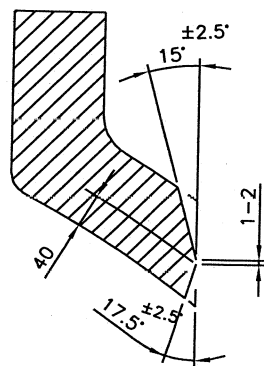
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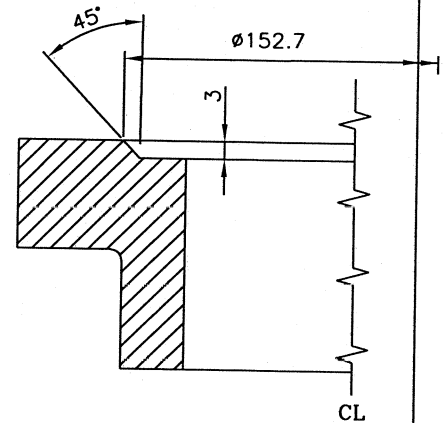
FLANGE DETAIL AS PER
ASME B16.5, ED 2013,
4" NPS, LWNFF, CL.300.



DETAIL OF NOZZLES N7 \triangle



WELD DETAIL 'W2'



WELD DETAIL 'D1'

\triangle SR NO : 06
ITEM CODE: SRN06R1

SCALE: NTS
TITLE: DETAILS OF SRN
EQUIPMENT NO: 133-RB-1003

MATERIAL: SA 336 GR F11 CL3
QUANTITY: REFER TABLE

CLIENT: DANGOTE OIL REFINING COMPANY

PROJECT NO.: 120803

Godrej
Godrej & Boyce Mfg. Co. Ltd.
Process Equipment Division

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
MK	08/03/17	PPK	08/03/17	MP	08/03/17
DRG. NO.:120800-803-SRN03			SHT. 4 OF 7		REV.1

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REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.	REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.
1	13/04/17	SKETCH DELETED	MK	PPK	MP						


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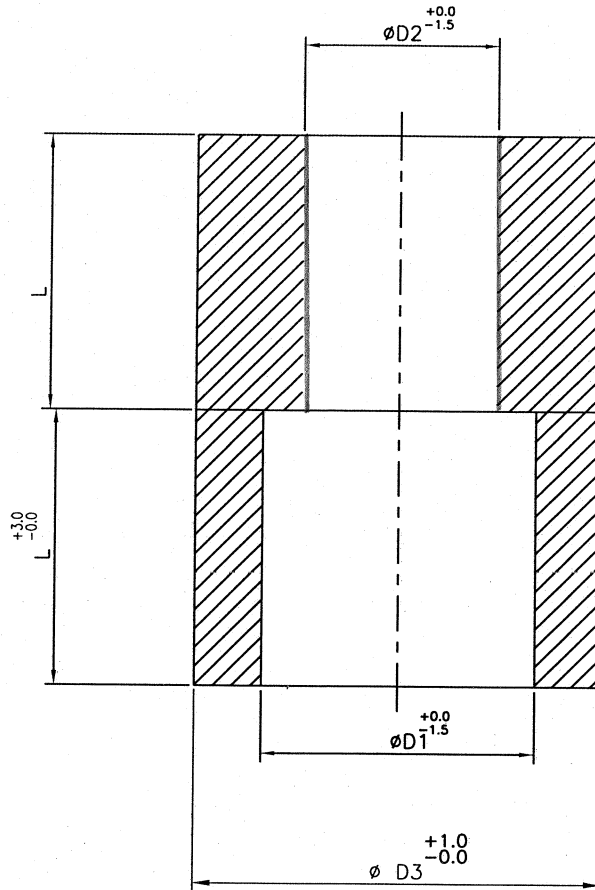
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ITEM CODE: SRN07R1

SCALE: NTS	TITLE: DETAILS OF SRN EQUIPMENT NO: 133-RB-1003	MATERIAL SA336 GR F11 CL3	QUANTITY REFER TABLE					
CLIENT: DANGOTE OIL REFINING COMPANY		PROJECT NO.: 120803						
 Godrej & Boyce Mfg. Co. Ltd. Process Equipment Division		DRAWN	DATE	CHKD.	DATE	APPROVED	DATE	
		MK	08/03/17	PPK	08/03/17	MP	08/03/17	
		DRG. NO.:120800-803-SRN03			SHT. 5 OF 7		REV.1	

REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.	REV.	DATE	DESCRIPTION	ALTD	CHKD.	APPD.

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08	N1-VERTICAL SPOOL 1	712	706	762	175	SRN08	1
SR. NO.	NOZZLE MARK	D1	D2	D3	L	ITEM CODE	QTY.

SCALE: NTS	TITLE: DETAILS OF SRN EQUIPMENT NO: 133-RB-1003	MATERIAL SA336 GR F11 CL3	QUANTITY REFER TABLE
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CLIENT: DANGOTE OIL REFINING COMPANY PROJECT NO.: 120803

Godrej
Godrej & Boyce Mfg. Co. Ltd.
Process Equipment Division

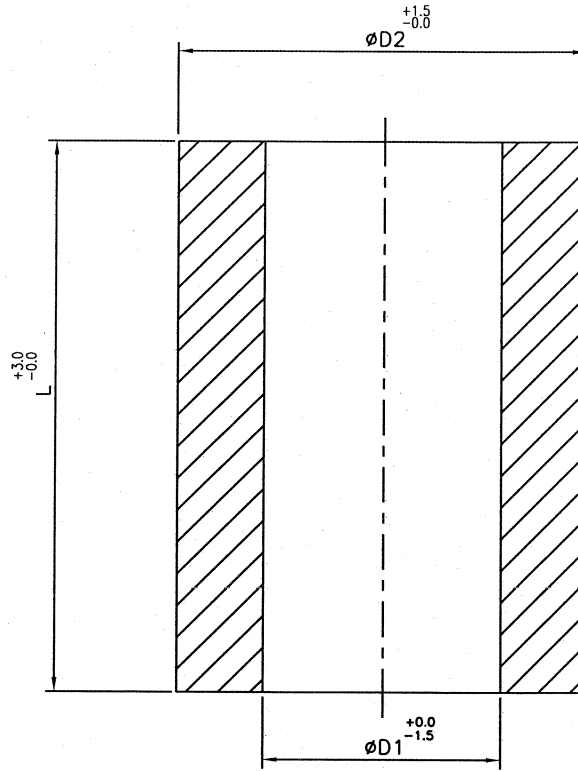
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DRG. NO.:120800-803-SRN03			SHT. 6 OF 7		REV.0

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14	N6, N7 NECK	66.64	88.9	275	SRN14	2
13	N3A-D - SPOOL 2	193.68	219.08	745	SRN13	4
12	N3A-D - SPOOL 1	193.68	219.08	830	SRN12	4
11	N2-HORIZONTAL SPOOL	712	762	785	SRN11	3
10	N2-VERTICAL SPOOL	712	762	275	SRN10	1
09	N1-HORIZONTAL SPOOL	706	762	410	SRN09	1
SR. NO.	NOZZLE MARK	D1	D2	L	ITEM CODE	QTY.

SCALE: NTS	TITLE: DETAILS OF SRN EQUIPMENT NO: 133-RB-1003	MATERIAL SA336 GR F11 CL3	QUANTITY REFER TABLE					
CLIENT: DANGOTE OIL REFINING COMPANY		PROJECT NO.: 120803						
 Godrej & Boyce Mfg. Co. Ltd. Process Equipment Division		DRAWN	DATE	CHECKED	DATE	APPROVED	DATE	
		MK	08/03/17	PPK	08/03/17	MP	08/03/17	08/03/17
		DRG. NO.:120800-803-SRN03		SHT. 7 OF 7		REV.0		

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