

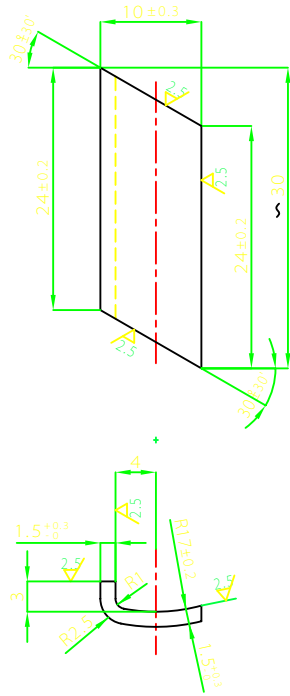
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	REV	DATE	ALTERED	KAILASH Sd/-	GMS No./	C.B.O.M. NO.	STATUS OF DRG
		CHECKED	04	03.05.12	CHECKED	B.P.SINGH Sd/-	00031305000		U
ZONE			ZONE			THIS DRAWING SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE. (STE-12 - F0191)			AGREED DEPT
						TTX			H.SINGH Sd/-
									08.10.68

GRADE OF UNTOL.DIM M/CG./CYM/F - AA023020 B WELDING A/A/D AA0621104 GAS CUTTING-T3 AA062101

SAND BLASTED
Rz20
THE REST



SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE.

C - 100 - 90

HW 9731305033

COBALT STELLITE



BHARAT HEAVY ELECTRICALS LTD.
RANIPUR, HARDWAR

DRN	K.M.SINGAL	Sd/-	21.08.1968	NO. OF VAR
CHD	N.B.MATHUR	Sd/-	23.08.1968	
APPD	J.N.KARAN	Sd/-	28.11.1968	

DEPT STE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
CODE 4011		2:1	0.004	31305000	—	—

TITLE :	CARD CODE	DRAWING NO.
STELLITE SHEET	7	31305027

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Ref. Drawing No.
1190883

Sign & Date

Inventory No.

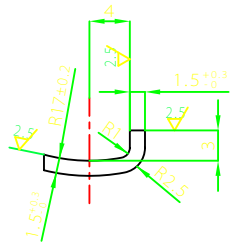
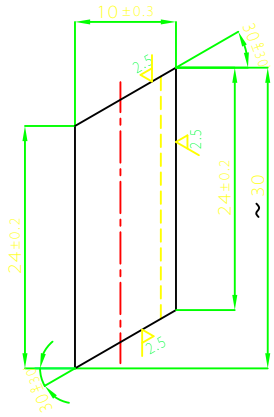
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

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REV	DATE	ALTERED	REV	DATE	ALTERED	GMS No./ C.B.O.M. NO.	STATUS OF DRG
		CHECKED	04	03.05.12	CHECKED	00031305000	U
ZONE			ZONE			AGREED DEPT	NAME
			THIS DRAWING SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE. (STE - 12 - F0191)			TTX	H.SINGH
						SIGN	DATE
						Sd/ -	08.10.68
GRADE OF UNTOL.DIM M/CG./CYM/F - AA023020 B WELDING A/A/D AA0621104 GAS CUTTING-T3 AA062101							

Rz20 SAND BLASTED
THE REST



SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE.

C - 100 - 90

HW 9731305041

COBALT STELLITE

Inventory No. Sign & Date Ref.Drawing No. 1190884



BHARAT HEAVY ELECTRICALS LTD.
RANIPUR, HARDWAR

DRN	K.M.SINGAL	Sd/ -	21.08.1968	NO. OF VAR
CHD	N.B.MATHUR	Sd/ -	23.08.1968	
APPD	J.N.KARAN	Sd/ -	28.11.1968	

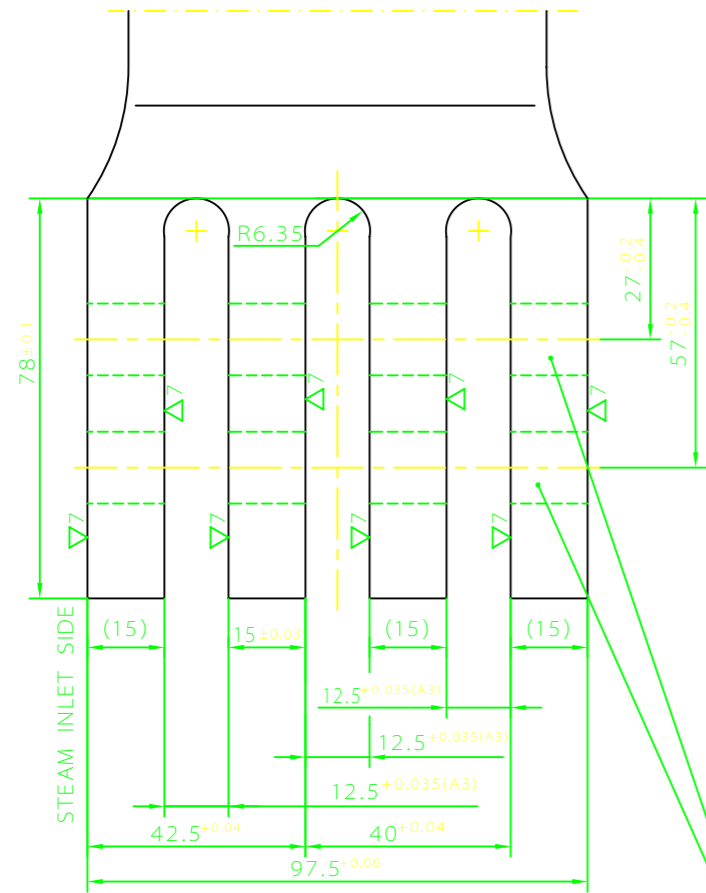
DEPT STE		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
CODE 4011		2:1	0.004	31305000	—	—
TITLE :				CARD CODE	DRAWING NO.	
STELLITE SHEET				7	31305028	
				SHEET No. 01	No. OF SHEETS 01	

1E050E1E

DRAWING NO.

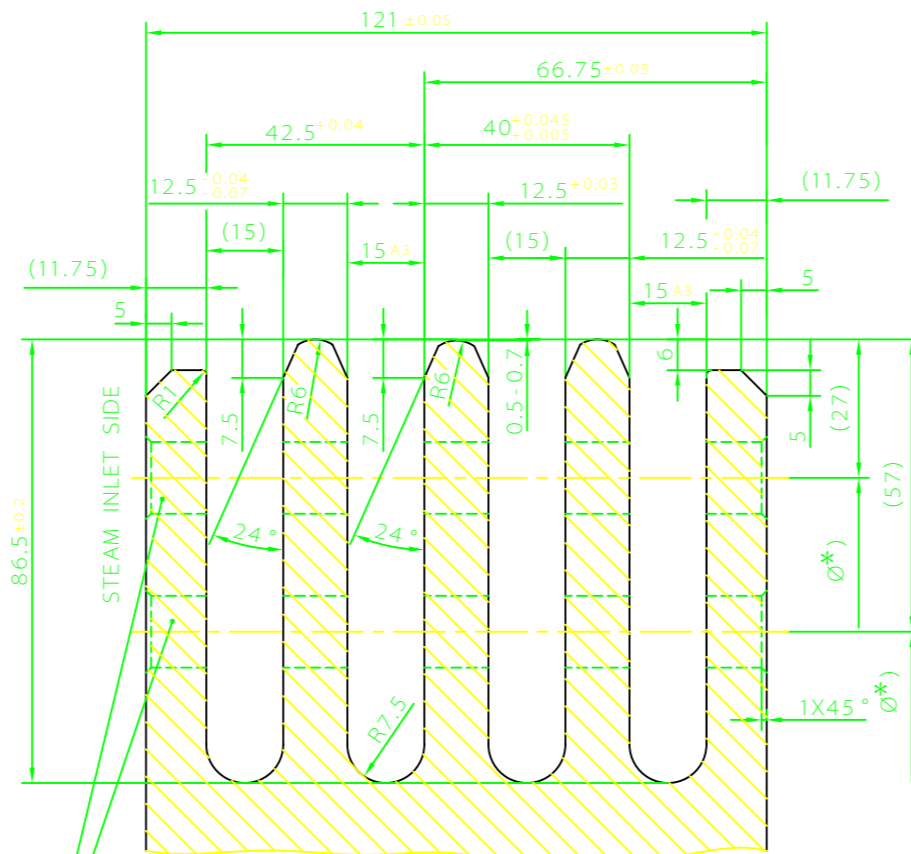
▽6 ALL OVER

▽6 REST



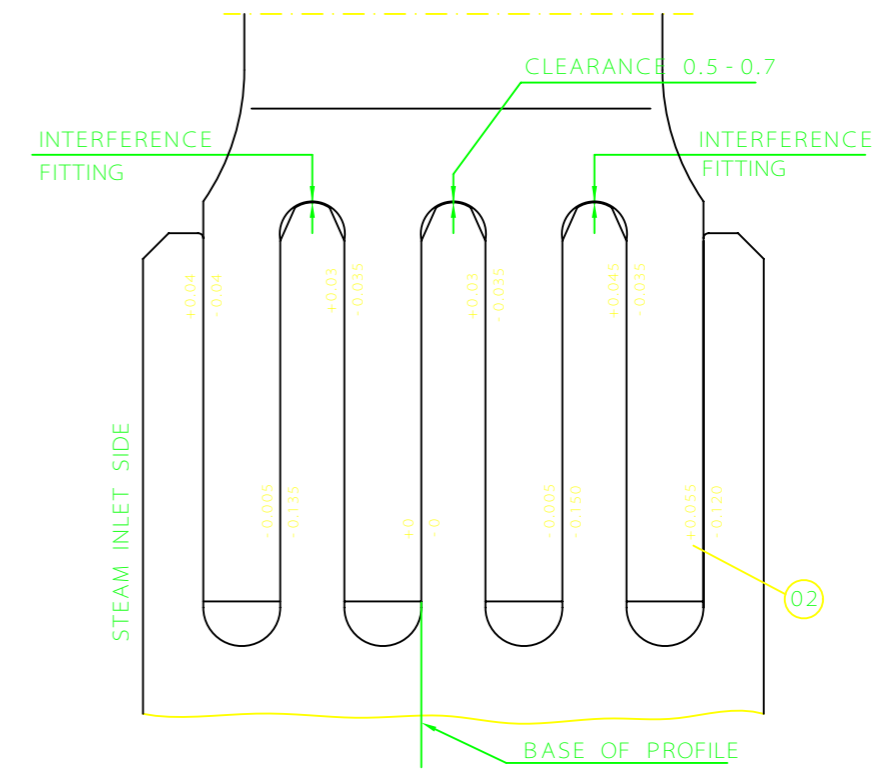
BLADE ROOT

FOR DIAMETER OF HOLE FOR RIVETS, SEE - DRAWING OF BLADE.



DISC

FOR DIAMETER OF HOLE FOR RIVET - SEE DRAWING OF DISC.



MATING OF BLADE ROOT AND DISC

(NOTATION + FILING, - CLEARANCE)

FITTING OF BLADE IN DISC

FIT THE BLADE EITHER BY FORCE OF HAND OR BY USE OF 800 gms. HAMMER.

TECHNICAL REQUIREMENTS: -

1. FOR ORIENTATION OF ROOT WITH RESPECT TO INLET EDGE OF BLADE, SEE DRAWING OF BLADE.
2. DIMENSIONS IN BRACKET ARE FOR REFERENCE ONLY.
3. *) FOR DIAMETERS AND ALLOWANCES - SEE CORRESPONDING DISC DRAWING.

SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE.

Inventory No. Sign & Date Ref. Drawing No. 1020324

REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED
02	23.09.13	CHECKED B.P.SINGH Sd/-	01	26.07.10	CHECKED B.P.S. Sd/-												

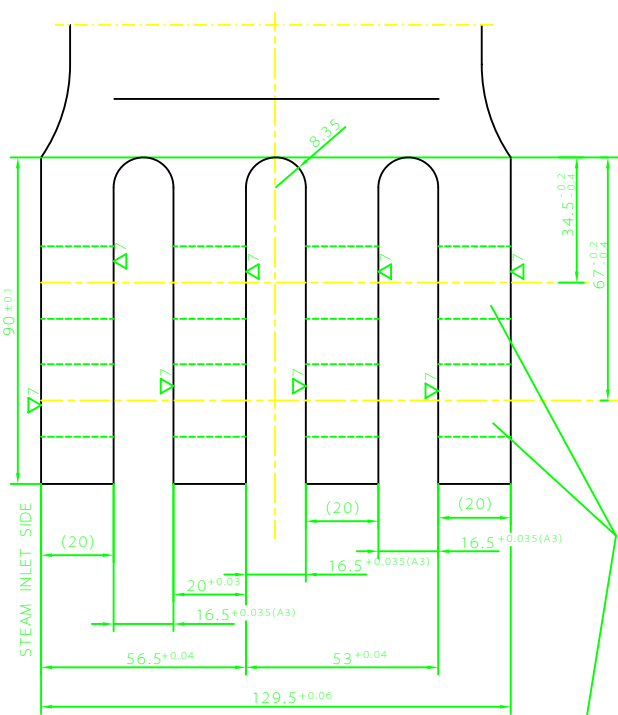
GMS No. / CBOM No. 00031305000		STATUS OF DRG U	
AGREED DEPT	NAME	SIGN	DATE
STT	H.SINGH	sd	08.10.68
GRADE OF UNTOL.DIM			
M/CG. - /C/M/F AA0230208			
WELDING - A/B /C/CAA0621104			
GAS CUTTING - 'T3'AA0621101			
IN VIEW OF MATING OF BLADE ROOT AND DISC TOLERANCE +0.055 WAS -0.055 (STE-13-F0316)		THIS DRAWING SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE, REVISED DRAWING DEPOSITED IN WRENCH SERVER. (STE-10-F0177)	

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		STEAM TURBINE OR C - 100 - 90	
DEPT STE		SCALE	WEIGHT (KG)
CODE 4011		1:1	-
TITLE : ROOT PROFILE NO.749 FOR ROOT OF WORKING BLADE & DISC		REF. TO ASSY. DRG.	ITEM No.
		31305000	-
DRAWING NO. 31305031		NO. OF SHEETS 01	

31305032

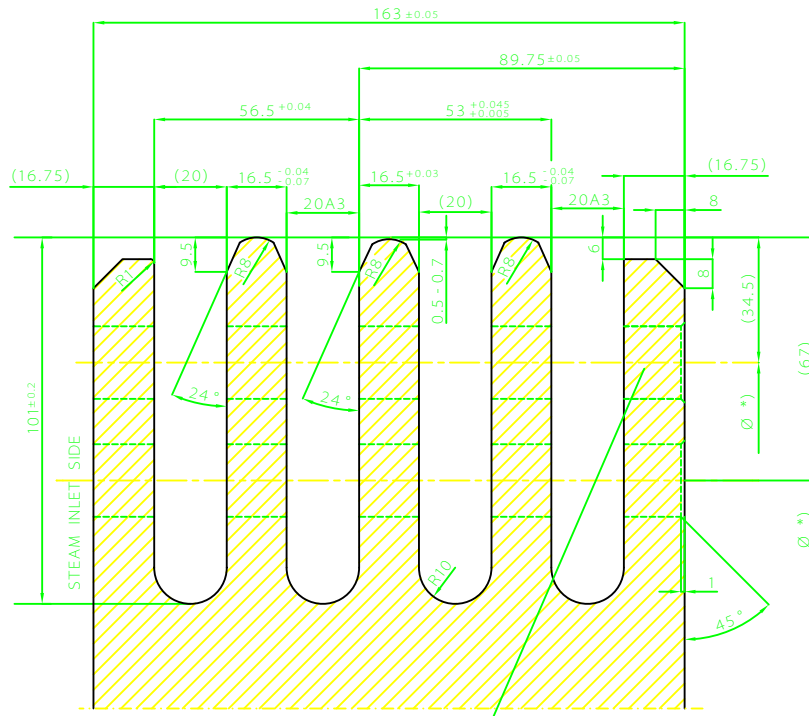
DRAWING NO.

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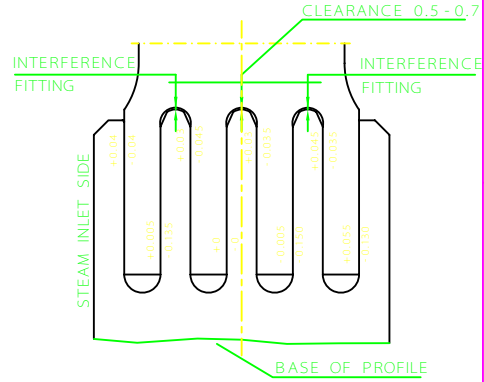
BLADE ROOT

FOR DIAMETER OF HOLE FOR RIVETS
SEE DRAWING OF BLADE



DISC

FOR DIAMETER OF HOLE FOR
RIVET - SEE DRAWING OF DISC



MATING OF BLADE ROOT AND DISC

SCALE 1:2
(NOTATION: +FILING; -CLEARANCE)

FITTING OF BLADE IN DISC

FIT THE BLADE EITHER BY FORCE OF HAND
OR BY USE OF 800 gms HAMMER

TECHNICAL REQUIREMENTS: -

1. FOR ORIENTATION OF ROOT W.R.T. WITH INLET EDGE OF BLADE - SEE DRG. OF BLADE.
2. DIMENSIONS IN BRACKET ARE FOR REFERENCE .
3. *) FOR DIAMETERS AND ALLOWANCES - SEE DRAWING OF DISC.

SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE.

Inventory No. Sign & Date Ref Drawing No. 1004769

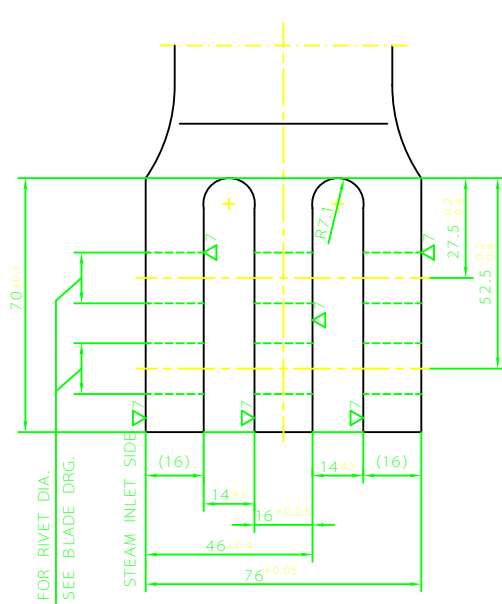
REV	DATE	ALTERED	CHECKED	REV	DATE	ALTERED	CHECKED	REV	DATE	ALTERED	CHECKED	REV	DATE	ALTERED	CHECKED

GMS No./ CBOM No. 00031305000		STATUS OF DRG (1)		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		STEAM TURBINE C - 100 - 90	
APPROVED	NAME	SIGN	DATE	DRN	NAME	SIGN	DATE
STT	H.SINGH	sd/-	8.10.68	CHD	N.B.MATHUR	sd/-	31.8.68
GRADE OF UNTOL.DIM				MAPPING			
M/CG. / / M/F AA0230208				APPD			
WELDING / / B / / AA0621104				J.N.KARAN			
GAS CUTTING - 'T3'AA0621104				sd/-			
				28.11.68			
DEPT STE		SCALE		WEIGHT (KG)		REF. TO ASSY. DRG.	
CODE 4011		1:1		-		31305000	
TITLE :		CARD CODE		DRAWING NO.		ITEM NO.	
ROOT PROFILE NO.746 FOR ROOT OF WORKING BLADE & DISC		31305032		31305032		75 73	
				SHEET No.01		No. OF SHEETS01	

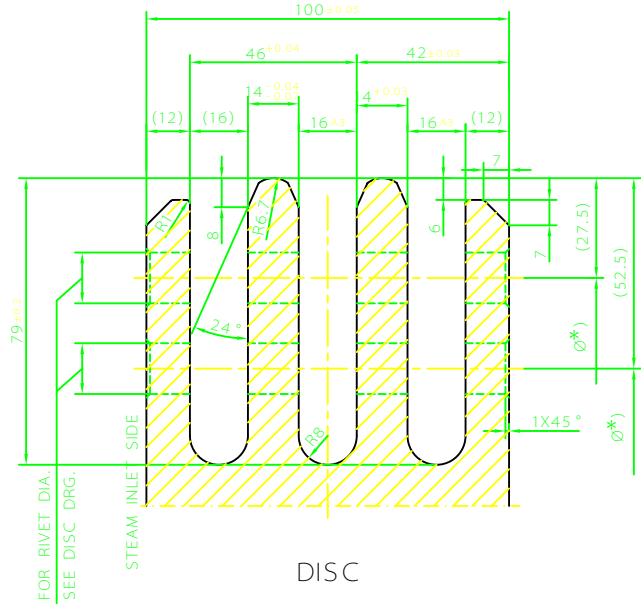
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DRAWING NO. 32304017

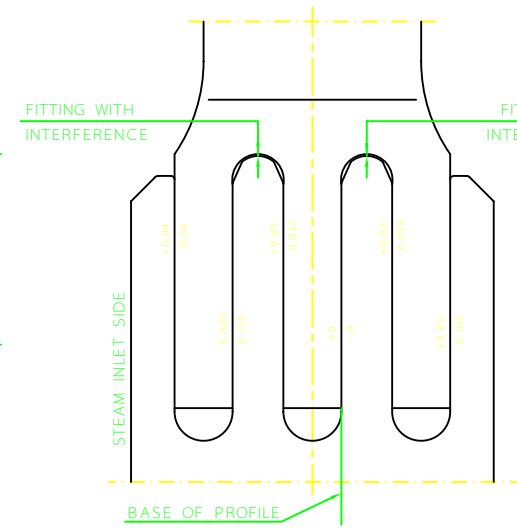
▽ THE REST



BLADE



DISC



MATING OF BLADE ROOT AND CREST OF DISC

SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE.

TECHNICAL REQUIREMENTS: -

1. THE BLADES ARE FITTED TIGHTLY ON DISC LIMITED TO FORCE OF HAND UPTO A HAMMER OF 500g.
2. FOR ORIENTATION OF ROOT WITH RESPECT TO INLET EDGE - SEE BLADE DRGS.
3. DIMENSIONS IN BRACKETS ARE FOR REFERENCE ONLY.
4. *) DIMENSIONS AND TOLERANCES - SEE CORRESPONDING DISC DRGS.

Sign & Date
Inventory No.

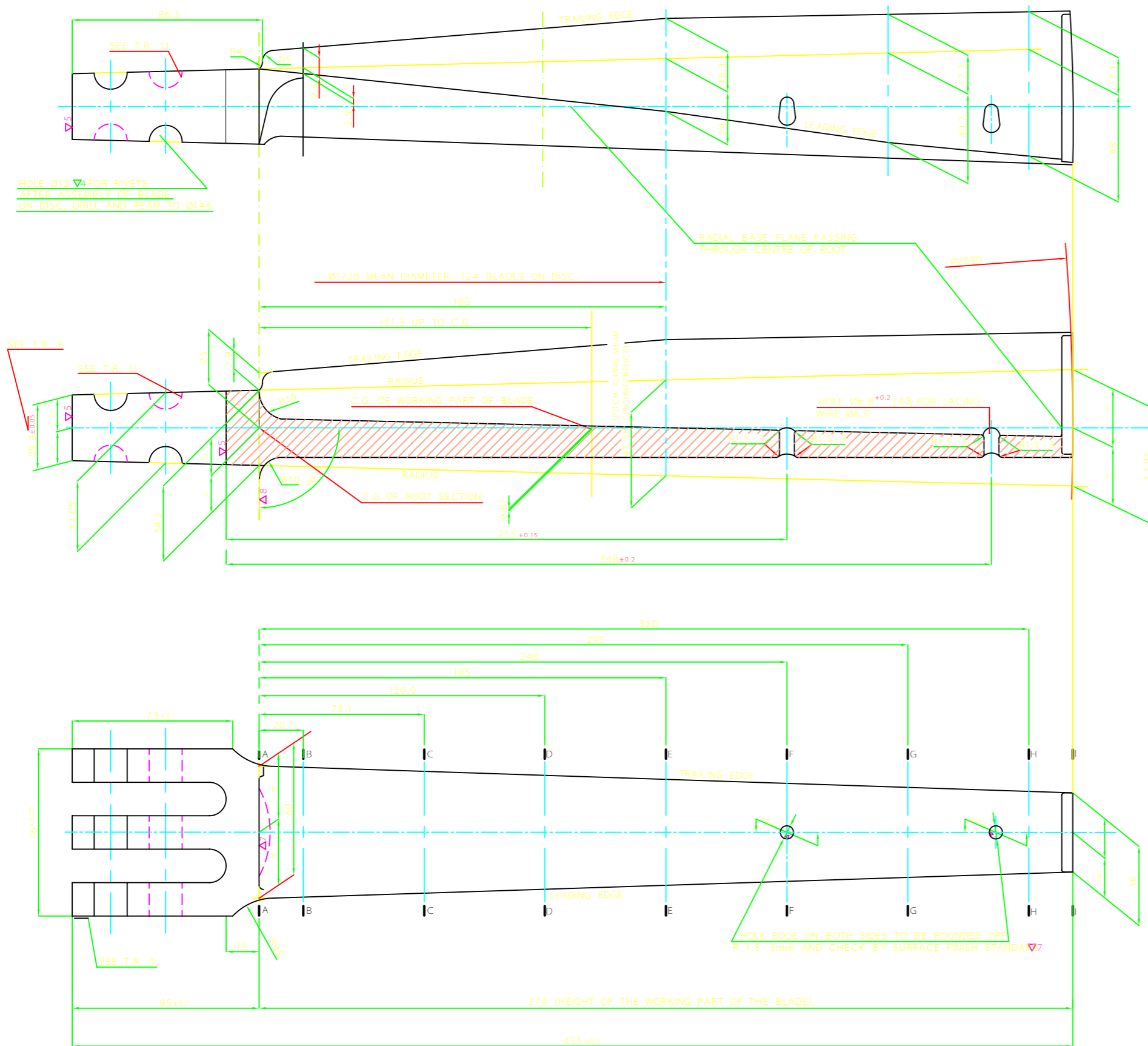
REV	DATE	ALTERED	CHECKED	REV	DATE	ALTERED	CHECKED	REV	DATE	ALTERED	CHECKED	REV	DATE	ALTERED	CHECKED

GMS No./ CBOM No. 00032304000		STATUS OF DRG (1)		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT				STEAM TURBINE C - 200 - 130																					
APPROVED STT	NAME T.S.MANCHANDA	SGN sd/-	DATE 06.01.72	GRADE OF UNTOL.DIM M/CG. / / M/F AA0230208		WELDING / / B / / AA0621104		GAS CUTTING - 'T3'AA0621104		BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NAME</th> <th>SIGN</th> <th>DATE</th> <th>NO. OF VAR</th> </tr> <tr> <td>DRN K.M.SINGHAL</td> <td>sd/-</td> <td>16.11.71</td> <td>-</td> </tr> <tr> <td>CHD N.B.MATHUR</td> <td>sd/-</td> <td>10.01.72</td> <td>-</td> </tr> <tr> <td>APPE J.N.KARAN</td> <td>sd/-</td> <td>24.01.72</td> <td>73 - 74</td> </tr> </table>		NAME	SIGN	DATE	NO. OF VAR	DRN K.M.SINGHAL	sd/-	16.11.71	-	CHD N.B.MATHUR	sd/-	10.01.72	-	APPE J.N.KARAN	sd/-	24.01.72	73 - 74
NAME	SIGN	DATE	NO. OF VAR																										
DRN K.M.SINGHAL	sd/-	16.11.71	-																										
CHD N.B.MATHUR	sd/-	10.01.72	-																										
APPE J.N.KARAN	sd/-	24.01.72	73 - 74																										
REV 01	DATE 24.07.10	ALTERED V.K.S	Sd/-	DEPT STE	SCALE 1:1	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEMS																				
		CHECKED B.P.SINGH	Sd/-	CODE 4011		-	32304000	-	75 73																				
THIS DRAWING SUPERSEDES OLD DRG UNDER THE SAME NUMBER. REVISED DRG. DEPOSITED IN WRENCH SERVER (STE - 10 - F0180)				TITLE : PROFILE NO.551 FOR ROOTS OF WORKING BLADES & CREST OF DISC		CARD CODE		DRAWING NO. 32304017																					
						SHEET No.01		No. OF SHEETS 01																					

10050EZE ON DRG. NO. 32305001

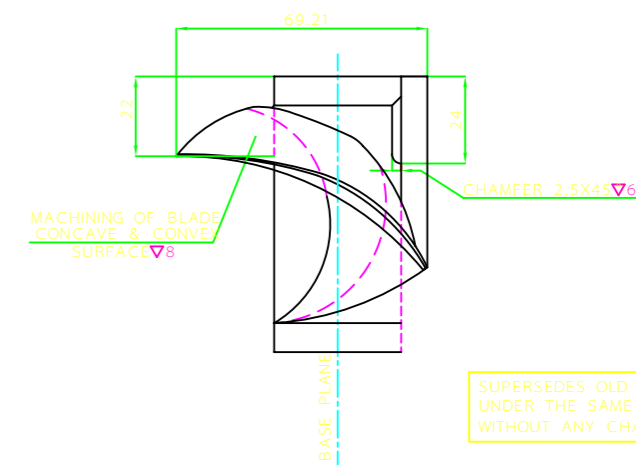
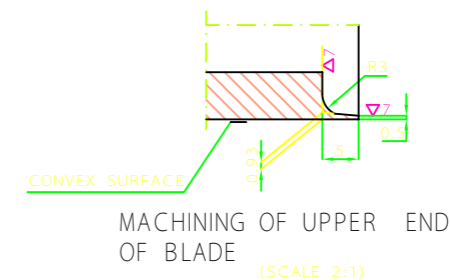
CHECKING DIMENSIONS ALONG ROUNDED EDGES.

▽6 THE REST



TECHNICAL REQUIREMENTS:

1. SECTIONS B-B, C-C, D-D, E-E, F-F, G-G, H-H ARE CONTROLLING ONES.
2. FOR BLADE SECTIONS. SEE DRG. NO. 32305026 (6-1138417).
3. FOR ROUNDING OFF EDGES-SEE BLADE PROFILE DRG.
4. FOR PERMISSIBLE DEVIATION FROM THEORETICAL PROFILE CLEARANCE ALONG BLADE CONCAVE AND CONVEX SURFACES - SEE DRG. OF SECTIONS.
5. PERMISSIBLE DEVIATION FROM STRAIGHTNESS ALONG GENERATING LINES (BETWEEN CONTROL SECTIONS) WITH TEMPLATE LENGTH 40mm - 0.1mm.
6. PERMISSIBLE DEVIATION FROM TEMPLATE NOT TO EXCEED ±0.2mm.
7. RADIAL ANGLE TO BE MAINTAINED ACCORDING TO GAUGE WITH CLEARANCE 0.05 (FROM THEORETICAL ANGLE).
8. WHILE MANUFACTURING, 10% OF THE BLADES SHOULD BE MANUFACTURED WITH PITCH TOLERANCE +0.1.
9. LEADING EDGE OF WORKING PART OF BLADE TO BE ORIENTED w.r.t. SIDE SURFACE OF THE ROOT.
PERMISSIBLE DEVIATION UPTO 0.2mm. AT UPPER CONTROL DIMENSION.
10. AFTER FINAL MACHINING; BLADE UNDERGO:-
(i) TESTING BY MAGNAFLUX METHOD.
(ii) VIBRATION TESTING OF BLADES IN VICES ACCORDING TO INSTRUCTIONS OF STEAM TURBINE LABORATORY.
(iii) MOMENT WEIGHING IN ACCORDANCE WITH INSTRUCTIONS NO. 1310-65.
(iv) WEIGHING IN COMMERCIAL BALANCES. WEIGHT OF BLADE 2.56±0.060 Kg.
11. IN 50% BLADES OF A STAGE, HOLES FOR RIVETS ARE TO BE MADE ON OPPOSITE SIDE AS SHOWN WITH DOTTED LINES.



ROOT PROFILE NO. 551
DRG. No. 32304017(A-316244).

20Cr13
Cs50-0500.706
2x13 WHMT Y -1-187-67

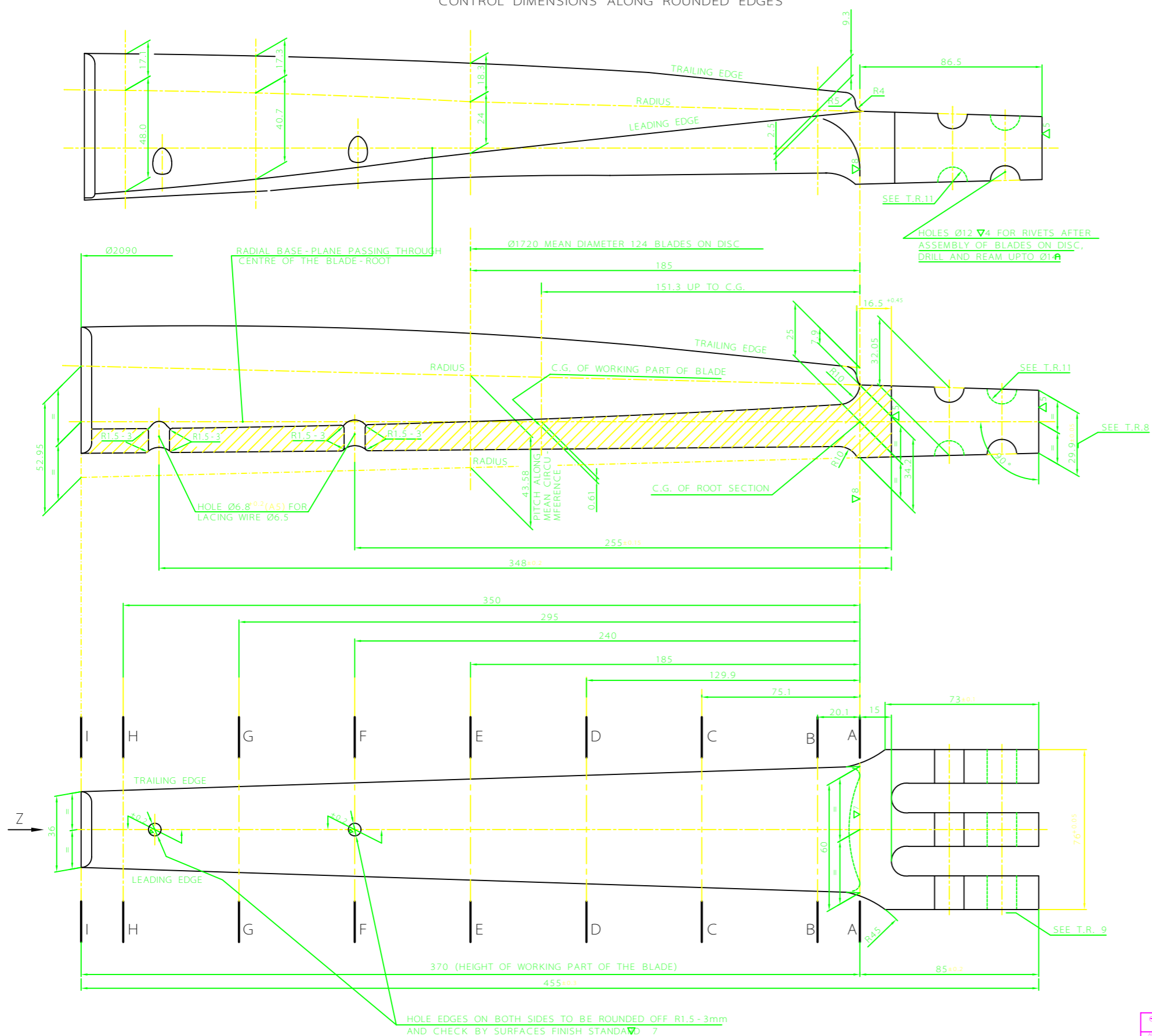
CMS No / C.B.O.M. NO. 00032305000 STATUS OF DRG. U		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT STEAM TURBINE	
GRADE OF UNTOL.DIM M/C.G.-E/M/F AA0230208 WELDING-A/B/C/D/A0621104 GAS CUTTING-T3/AA0621101		BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR	
DEPT STE CODE 4011	SCALE NTS	WEIGHT (KG) 2.56	REF. TO ASSY. DRG. 32305000
TITLE : BLADE 24 th STAGE (PROFILE NO.1178)		CARD CODE	DRAWING NO. 32305001
(STE-11-F0373)		SHEET No. 01	No. OF SHEETS 01

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INVENTORY NO. SIGN. AND DATE
1138416

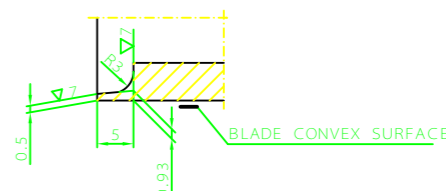
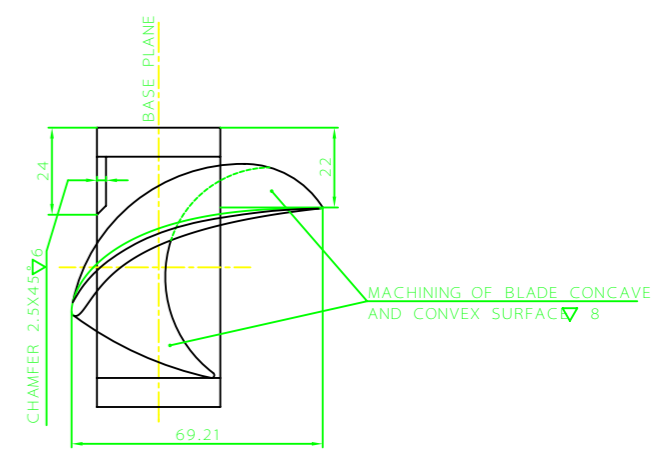
CONTROL DIMENSIONS ALONG ROUNDED EDGES

▽6 THE REST



TECHNICAL REQUIREMENTS:

1. SECTIONS B-B, C-C, D-D, E-E, F-F, G-G, H-H ARE CONTROLLING ONES.
2. FOR BLADE SECTIONS, SEE DRG. NO. 32305026 (6-1138417).
3. FOR ROUNDING OFF EDGES- SEE BLADE PROFILE DRAWING.
4. FOR PERMISSIBLE DEVIATION FROM THEORETICAL PROFILE CLEARANCE ALONG BLADE- CONCAVE AND CONVEX SURFACES- SEE DRG. OF SECTIONS.
5. PERMISSIBLE DEVIATION FROM STRAIGHTNESS ALONG GENERATING LINES (BETWEEN CONTROL SECTIONS) WITH TEMPLATE LENGTH 40mm-0.1mm.
6. PERMISSIBLE DEVIATION FROM TEMPLATE NOT TO EXCEED ±0.2mm.
7. RADIAL ANGLE TO BE MAINTAINED ACCORDING TO GAUGE WITH CLEARANCE 0.05 (FROM THEORETICAL ANGLE).
8. WHILE MANUFACTURING, 10% OF THE BLADES SHOULD BE MANUFACTURED WITH PITCH TOLERANCE ±0.1.
9. LEADING EDGE OF WORKING PART OF BLADE TO BE ORIENTED w.r.t. SIDE SURFACE OF ROOT. PERMISSIBLE DEVIATION UP TO 0.2mm AT UPPER CONTROL DIMENSION.
10. AFTER FINAL MACHINING; BLADES UNDERGO :-
(i) TESTING BY MAGANFLUX METHOD.
(ii) VIBRATION-TESTING OF BLADES IN VICES ACCORDING TO INSTRUCTIONS OF STEAM TURBINE LABRATORY.
(iii) MOMENT WEIGHING IN ACCORDANCE WITH INSTRUCTIONS NO. 1310-65.
(iv) WEIGHING IN COMMERCIAL BALANCES, wt. OF BLADES 2.56±0.060kg.
11. IN 50% BLADES OF A STAGE, HOLES FOR RIVETS ARE TO BE MADE ON OPPOSITE SIDE AS SHOWN WITH DOTTED LINES.



ROOT PROFILE NO.551
DRG. No. 32304017(A- 316244).

SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE.

20Cr13
Cs50 - 0500.706
2x13 U4MT Y - 1 - 187 - 67

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INVENTORY NO. 1138424

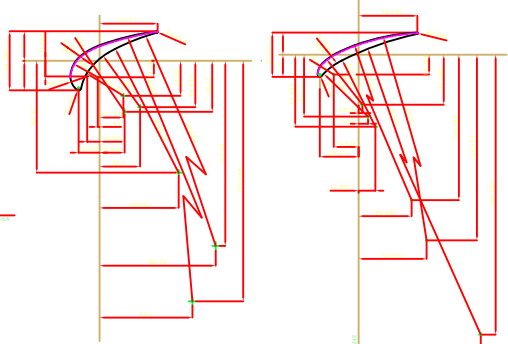
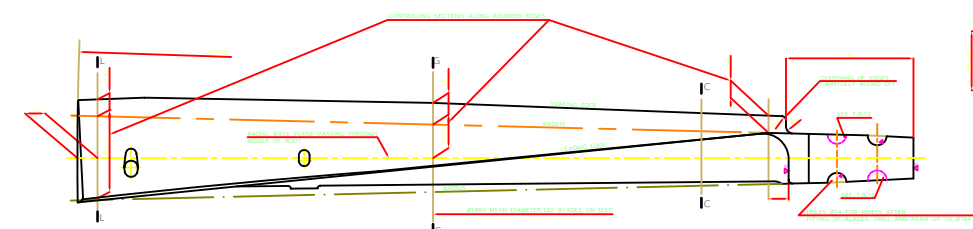
C.B.O.M. - NO. 00032305000		STATUS OF DRG. U		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		STEAM TURBINE			
DESIGNED BY: ST	NAME: B.L. KAMRA	SIGN: SD/	DATE: 19.04.74	Bharat Heavy Electricals Ltd. Ranipur, Hardwar		DRN: N.B. MATHUR	SD/-	30.03.74	NO. OF VAR
WELDING: /B/C/D/A0621104						CHK: N.B. MATHUR	SD/-	02.04.74	
GAS CUTTING: /T3/AA0621104						APPL: K.L. KHURANA	SD/-	08.05.74	
REV. DATE	ALTERED	REV. DATE	ALTERED	DEPT. STE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF SHEETS
01	9.12.11	CHECKED	PK BANSAL	4011	1:1	2.56	32305000	22	23
THIS DRAWING SUPERSEDES OLD DRG. UNDER THE SAME NUMBER. REVISED DRG. DEPOSITED IN WRENCH SERVER.				TITLE		DRAWING NO.		CARD CODE	
(STE - 11 - F0373)				BLADE 28 th STAGE (PROFILE NO. 1178)		32305005		22 23 24	
						SHEET No. 01		No. OF SHEETS 01	

90050EZE

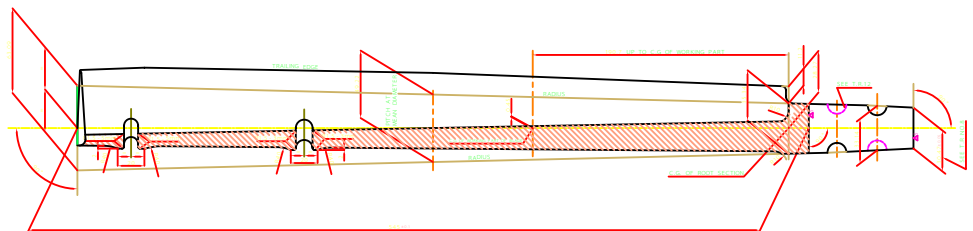
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm.)

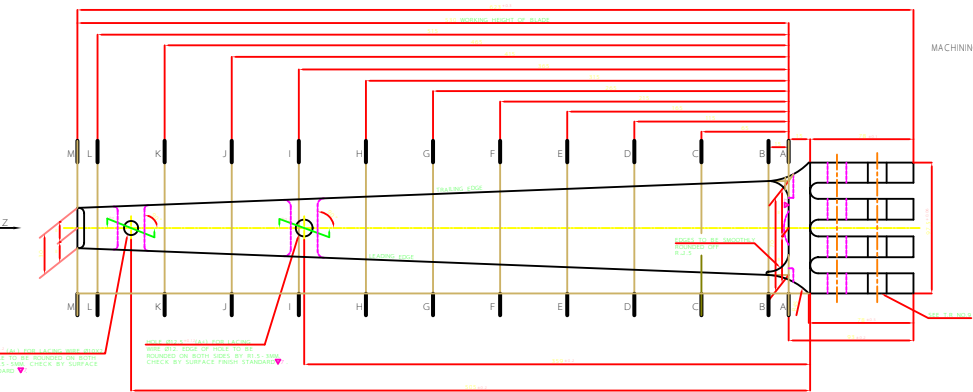
FORM 00.44.2.8.1



THICKENING OF THE PROFILE IN SECTION ALONG LOWER LACING WIRE



THICKENING OF THE PROFILE IN SECTION ALONG UPPER LACING WIRE



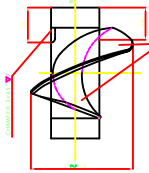
MACHINING OF THE UPPER END OF BLADE



SCALE 1:1

TECH. REQUIREMENTS:-

1. SECTIONS BB,CC,DD,EE,FF,GG,HH,II,JK,LL ARE CONTROLLING ONES.
2. FOR BLADE DRAWING SEE DIMENSIONS SPECIFIED IN THE SHEETS.
3. FOR ROUNDING OFF OF EDGES SEE BLADE SECTION DRAWING.
4. FOR PERMISSIBLE DEVIATION FROM THEORETICAL PROFILES/ANGLES ALONG CONVEX AND CONCAVE SURFACE OF BLADE SEE BLADE SECTION DRAWING.
5. PERMISSIBLE DEVIATION FROM STRAIGHTNESS ALONG CONCAVE LINE BETWEEN CONTROL SECTIONS WITH TOLERANCE FROM 0.04mm TO 0.06mm.
6. PERMISSIBLE DEVIATION FROM TEMPLATE NOT TO EXCEED ±0.20mm.
7. RADIUS R100 IS SHOWN BY ACCORDING TO TOLERATE WITH CLEARANCE 0.03mm (WITH RESPECT TO THEORETICAL ANGLE).
8. WHILE MANUFACTURING, ION OF THE BLADES SHOULD BE MANUFACTURED WITH FITCH TOLERANCE.
9. LEADING EDGE OF WORKING PART OF BLADE SHOULD BE ORIENTED ALONG LEADING EDGE OF ROOT PERMISSIBLE DEVIATION UP TO 0.10mm.
10. DURING MANUFACTURE OF THE SET OF BLADES, MACHINING OF CONVEX SURFACE OF BLADE AND DRILLING OF HOLES FOR LACING WIRE TO BE CARRIED OUT ONLY AFTER VIBRATION TUNING OF BLADE PACKETS (A OF HOLES THICKENING AND FINAL MACHINING OF BLADE WILL BE GIVEN AFTER VIBRATION TUNING OF BLADE PACKETS).
11. AFTER FINAL MACHINING, BLADES UNDER GO:-
 - a. TESTING BY ANGULARLY METHOD.
 - b. VIBRATION TESTING OF BLADES ACCORDING TO INSTRUCTIONS OF S/L LAB.
 - c. WIREMENT WEIGHING ACCORDING TO INSTRUCTIONS OF S/L LAB.
 - d. WEIGHING IN CONVENTIONAL BALANCES, HEIGHT OF BLADE SHOULD BE 10.
12. IN THE BLADES OF A STAGE, HOLES FOR WIRES ARE TO BE MADE ON OPPOSITE SIDE AS SHOWN WITH DOTTED LINE.



VIEW Z

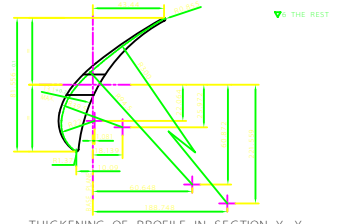
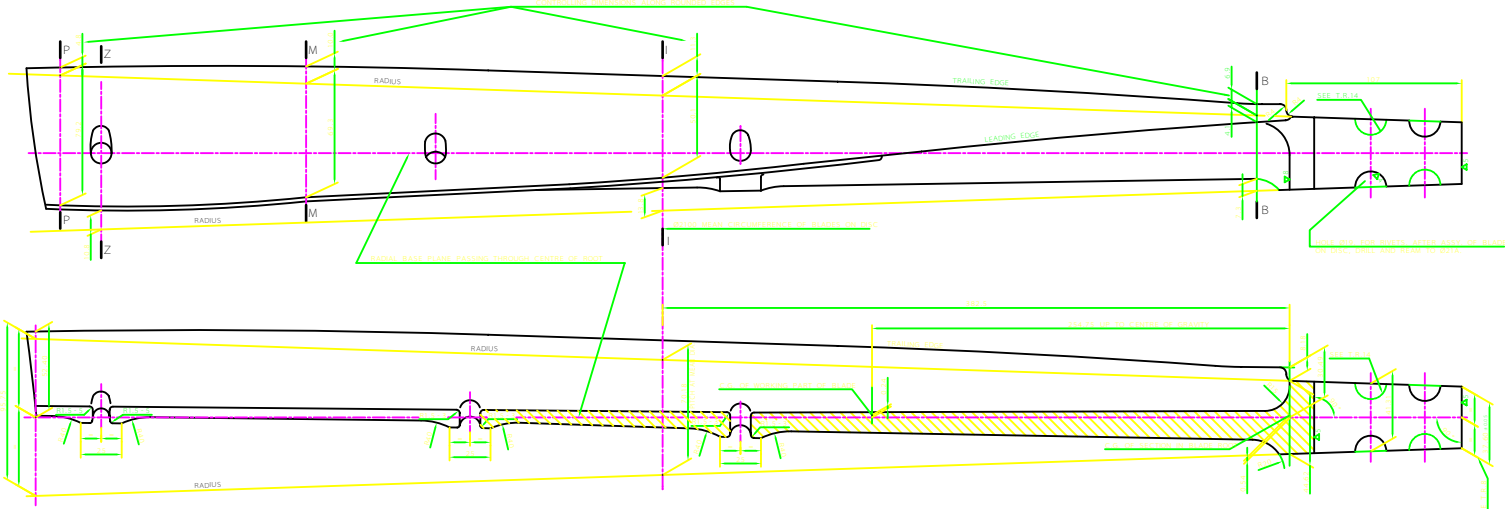
BLADE OF LEFT ROTATION.
 BLADE PROFILE NO 1181, DRG.NO 32305027
 ROOT PROFILE NO:749, DRG:NO 31305031

EDGE OF HOLES TO BE FINISHED ON BOTH SIDES BY RT 1.5UM CHECK BY SURFACE FINISH STANDARD

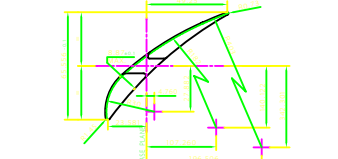
LEADING EDGE OF ION OF BLADES TO BE FINISHED ON BOTH SIDES BY RT 1.5UM CHECK BY SURFACE FINISH STANDARD

EXPERIENCE AND SKILL UNDER THE SUPERVISION OF THE DESIGN ENGINEER

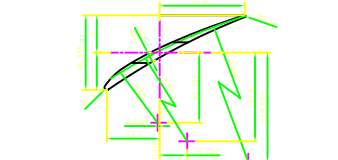
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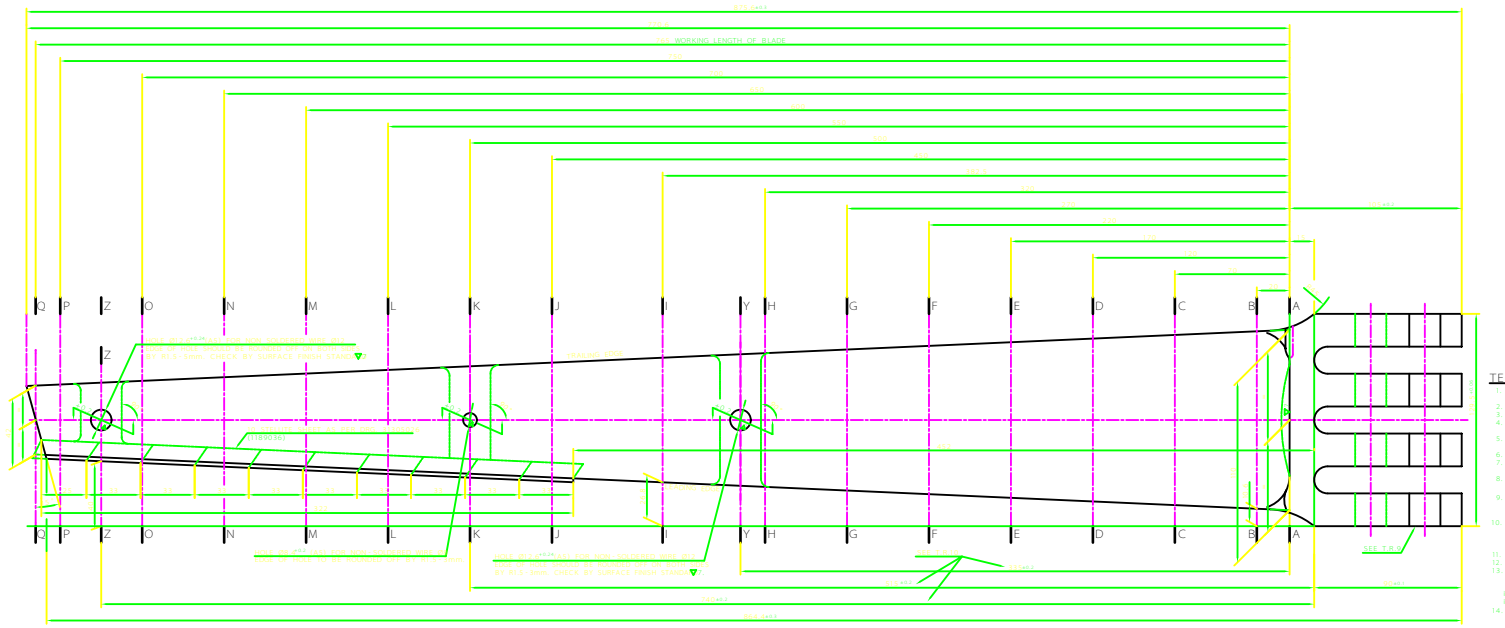
THICKENING OF PROFILE IN SECTION Y-Y FOR LOWER LACING WIRE



THICKENING OF PROFILE IN SECTION K-K FOR MIDDLE LACING WIRE



THICKENING OF PROFILE IN SECTION Z-Z FOR UPPER LACING WIRE



- TECHNICAL REQUIREMENTS:**
1. SECTIONS B-B, C-C, D-D, E-E, F-F, G-G, H-H, I-I, J-J, K-K, L-L, M-M, N-N, O-O, P-P ARE CONTROLLING SIZES.
 2. FOR BLADE SECTIONS SEE DRG. NO. 32305031 (1/18A23) (IN TWO SHEETS).
 3. FOR ROUNDING OFF OF EDGES SEE BLADE SECTION DRAWING.
 4. FOR PERMISSIBLE DEVIATION FROM THEORETICAL PROFILES (CLEARANCE) ALONG CONVEX AND CONCAVE SURFACE OF BLADES SEE SECTION DRAWING.
 5. PERMISSIBLE DEVIATION FROM STRAIGHTNESS ALONG GENERATING LINES (BETWEEN CONTIGUOUS SECTIONS WITH TEMPLATE LENGTH SHOWN) IS 0.1mm.
 6. PERMISSIBLE DEVIATION FROM TEMPLATE NOT TO EXCEED ±0.2mm.
 7. RADIAL ANGLE SHOULD BE ACCORDING TO TEMPLATE WITH CLEARANCE 0.03 (WITH RESPECT TO THEORETICAL ANGLE).
 8. WHILE MANUFACTURING, 10% OF THE BLADES SHOULD BE MANUFACTURED WITH PITCH TOLERANCES.
 9. LEADING EDGE OF WORKING PART OF BLADE SHOULD BE ORIENTED ALONG SIDE SURFACE OF ROOT. PERMISSIBLE DEVIATION UP TO 0.2mm AT UPPER CONTROLLING DIMENSION.
 10. DURING MANUFACTURE OF 1st SET OF BLADES, MACHINING OF CONVEX SURFACE OF BLADE AND DRILLING OF HOLES FOR LACING WIRE TO BE CARRIED OUT ONLY AFTER VIBRATION-TUNING OF BLADE PACKETS (2) OF HOLES, THICKENING AND FINAL POSITION OF BLADES WILL BE GIVEN AFTER VIBRATION-TUNING OF BLADE PACKETS).
 11. STELLITE PLATE SOLDERING IS CARRIED OUT ACCORDING TO INSTRUCTIONS OF WELDING SECTION.
 12. FOR MACHINING OF INLET EDGE AND SOLDERING OF STELLITE PLATES, SEE DRG. NO. 32305032.
 13. AFTER FINAL MACHINING, BLADES UNDER GO-1.
 - i. TESTING BY MAGNIFLUX METHOD.
 - ii. VIBRATION TESTING OF BLADES, ACCORDING TO INSTRUCTIONS OF S.T. LAB.
 - iii. MOMENT WELDING ACCORDING TO INSTRUCTIONS OF S.T. LAB.
 - iv. WELDING IN COMMERCIAL BALANCE, Wt. OF BLADE 0.88 KG.
 14. IN 1st SET BLADES OF A STAGE, HOLES FOR RIVETS ARE TO BE MADE ON OPPOSITE SIDE AS SHOWN WITH DOTTED LINES.

BLADE PROFILE NO. 1183, DRG. NO. 32305031 OF LEFT ROTATION. ROOT PROFILE NO. 749, DRG. NO. 31305032

UNFINISHED AND DEFORMED UNDER THE SAME NUMBER. VISUALLY AND CHANGE.

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BLADE 31ST STAGE 32305008

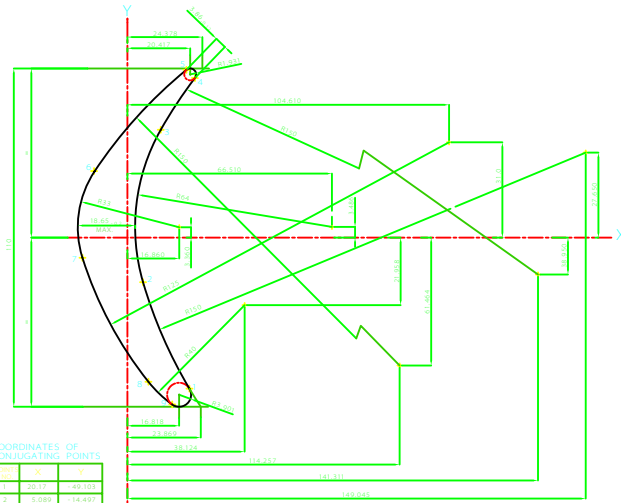
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

ISSUE NO. 46 OF 8.1

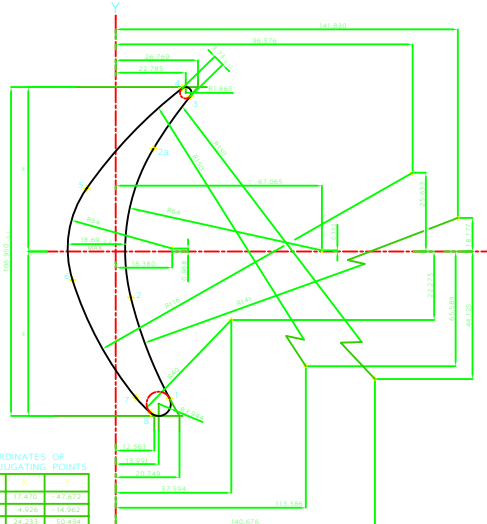
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SECTION AA

COORDINATES OF CONJUGATING POINTS

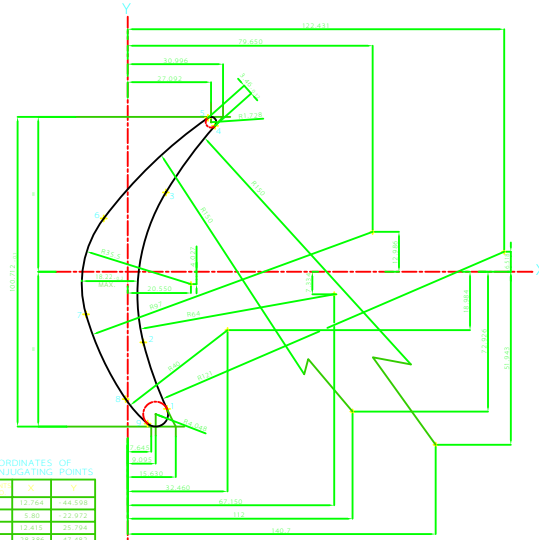
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3	10.84	31.256
4	10.104	11.839
5	12.191	14.393
6	10.84	21.44
7	14.616	8.534
8	18.896	46.879
9	14.576	14.248



SECTION BB

COORDINATES OF CONJUGATING POINTS

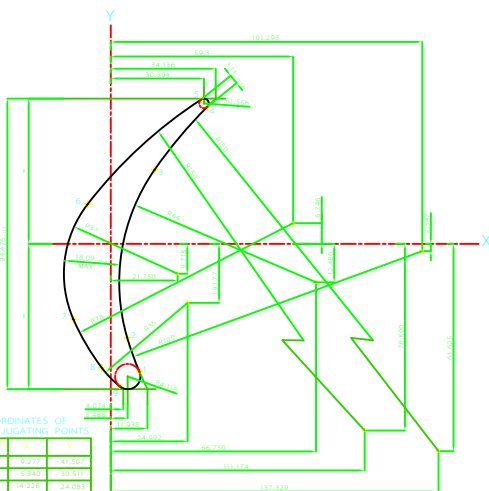
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2	4.926	16.902
3	12.711	16.434
4	21.162	18.192
5	18.487	28.876
6	12.045	9.299
7	16.551	41.800
8	13.459	12.212
9	12.230	13.431



SECTION CC

COORDINATES OF CONJUGATING POINTS

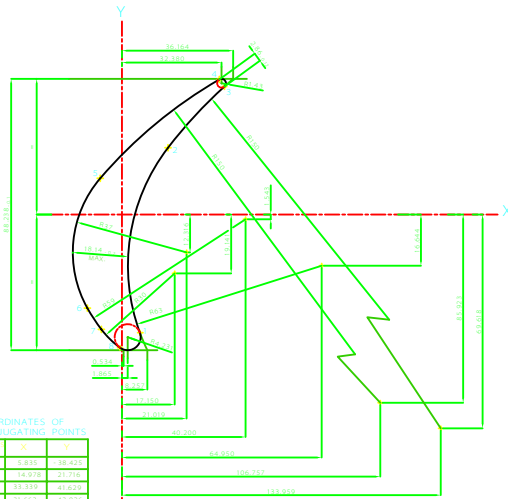
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2	4.800	22.272
3	12.415	12.214
4	28.386	47.802
5	26.113	10.071
6	17.891	17.185
7	11.868	11.471
8	12.654	41.415
9	6.964	19.214



SECTION DD

COORDINATES OF CONJUGATING POINTS

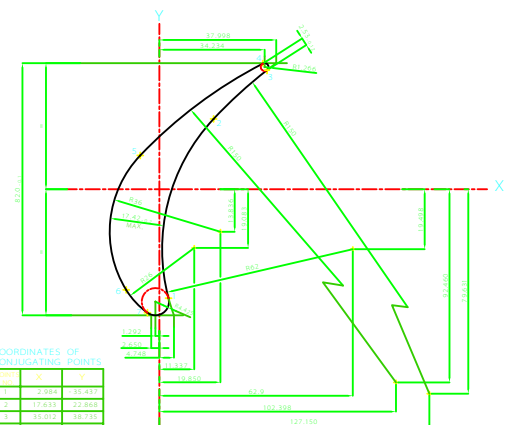
NO.	X	Y
1	6.272	41.507
2	15.342	10.511
3	11.221	28.083
4	11.403	44.580
5	18.41	46.861
6	17.532	12.802
7	12.211	28.512
8	12.211	40.272
9	2.85	40.313



SECTION EE

COORDINATES OF CONJUGATING POINTS

NO.	X	Y
1	7.00	41.812
2	18.825	18.412
3	14.978	21.716
4	31.931	41.622
5	11.613	41.275
6	17.282	17.713
7	11.242	18.414
8	4.495	17.346
9	10.641	41.277



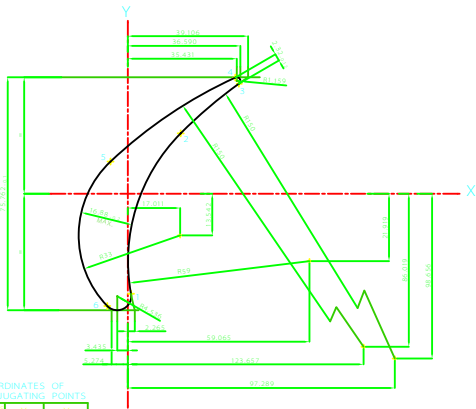
SECTION FF

COORDINATES OF CONJUGATING POINTS

NO.	X	Y
1	2.916	38.237
2	10.813	12.968
3	15.012	48.735
4	13.657	46.819
5	16.212	10.592
6	10.894	18.296
7	5.822	14.163

SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE.

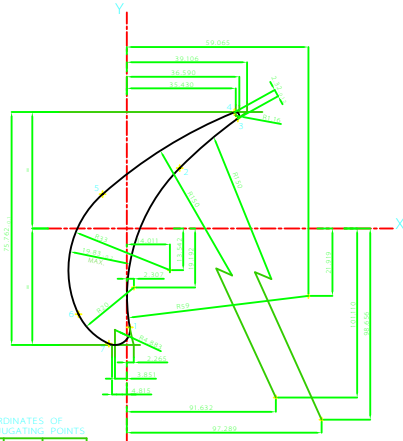
PROJECT NO.	32305028	DATE	12/2017
ISSUE NO.	46	SCALE	AS SHOWN
DESIGNER	ANIL K. SHARMA	CHECKED	ANIL K. SHARMA
APPROVED	ANIL K. SHARMA	DATE	12/2017
PROJECT TITLE	STEAM TURBINE		
PROJECT LOCATION	RAIPUR, HARDWAR		
CLIENT	BHARAT HEAVY ELECTRICALS LTD.		
PROJECT NO.	32305028	ISSUE NO.	46
SCALE	2:1	DATE	12/2017
PROJECT NO.	32305028	ISSUE NO.	46
SCALE	2:1	DATE	12/2017
PROJECT TITLE	BLADE PROFILE		
PROJECT NO.	32305028	ISSUE NO.	46
SCALE	2:1	DATE	12/2017



COORDINATES OF CONJUGATING POINTS

NO.	X	Y
1	1027	32.529
2	13187	19.646
3	38.107	15.741
4	35.940	37.736
5	10.633	10.955
6	3.493	34.931

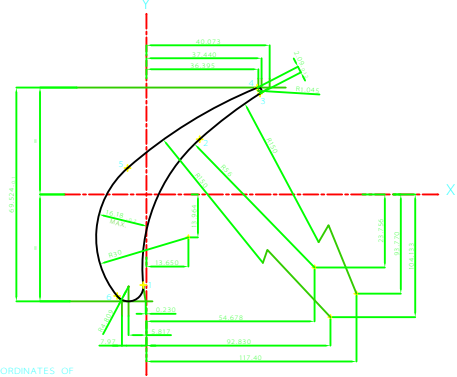
SECTION GG



COORDINATES OF CONJUGATING POINTS

NO.	X	Y
1	0.908	32.136
2	11.187	19.640
3	36.107	15.730
4	34.980	37.824
5	11.039	11.133
6	3.840	37.433

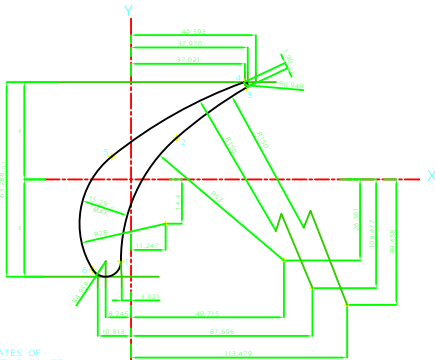
SECTION GG (THICKENED)



COORDINATES OF CONJUGATING POINTS

NO.	X	Y
1	11.932	29.943
2	11.932	17.954
3	35.950	32.835
4	35.950	34.684
5	10.940	8.978
6	9.533	33.005

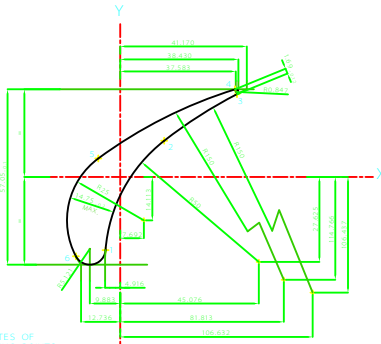
SECTION HH



COORDINATES OF CONJUGATING POINTS

NO.	X	Y
1	3.284	-26.857
2	14.833	18.590
3	17.000	-29.876
4	36.895	31.531
5	6.293	7.421
6	12.440	-27.320

SECTION I-1



COORDINATES OF CONJUGATING POINTS

NO.	X	Y
1	14.777	23.750
2	16.499	17.780
3	31.971	26.924
4	31.832	38.481
5	12.332	6.038
6	14.416	33.739

SECTION JJ

TECHNICAL REQUIREMENTS:

- GIVEN PROFILE IS OBTAINED FROM PROFILE NO. 1182, DRAWING NO. 32305029, (A-118442), SH-N0.11 BY SHIFTING CONCAVE SURFACE BY 2MM ALONG X-Y AXIS (DIRECTION OF ARROW) AND BY SHIFTING CONVEX SURFACE BY 2MM ALONG X-AXIS (OPPPOSITE TO DIRECTION OF ARROW) CO-ORDINATES OF R150 ALONG CONVEX SURFACE OF TRAILING EDGE ARE CHANGED FOR THINNING OF TRAILING EDGE.
- X-COORDINATE OF TRAILING EDGE HAS BEEN INCREASED BY 1MM (TRADING IN TO CONSIDERATION ROUNDING RADIUS) IN COMPARISON WITH PROFILE NO. 1182.
- FOR OTHER TECHNICAL REQUIREMENTS, SEE PROFILE NO. 1182, DRAWING NO. 32305029 (A-118442).

SUPERSEDES OLD DRAWING UNDER THE SAME NUMBER WITHOUT ANY CHANGE

32305029		TYPE OF PRODUCT		STEAM TURBINE	
32305029		NAME OF CUSTOMER/PROJECT		BHARAT HEAVY ELECTRICALS LTD RANIPUR, HARDWAR	
32305029		DRAWING NO.		32305029	
32305029		SCALE		2:1	
32305029		DATE		32305029	
32305029		NO.		32305029	
32305029		REV.		32305029	
32305029		DATE		32305029	
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32305029		APPROVED		32305029	
32305029		DATE		32305029	
32305029		BY		32305029	
32305029		CHECKED		32305029	
32305029		APPROVED		32305029	
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