

No. NAL/PUR/ACD/221/23

Date: 3-Jan-2024

CORRIGENDUM

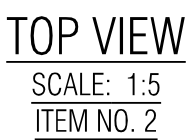
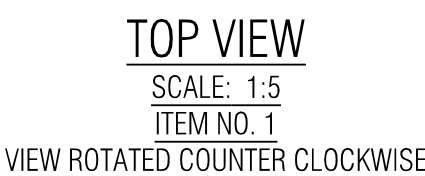
Tender ID: _2023_CSIR_179023_1

In continuation to our tender No. NAL/PUR/ACD/221/23 uploaded on **22-Dec-2023**, for “**Fabrication and supply of aluminium, steel & wood cores and accessories**”. In this pursuit, find attached drawing and CAD models as per chapter-4, clause No.4.2.1(i).

Kindly, note that, all other terms and conditions of the tender shall remain the same.



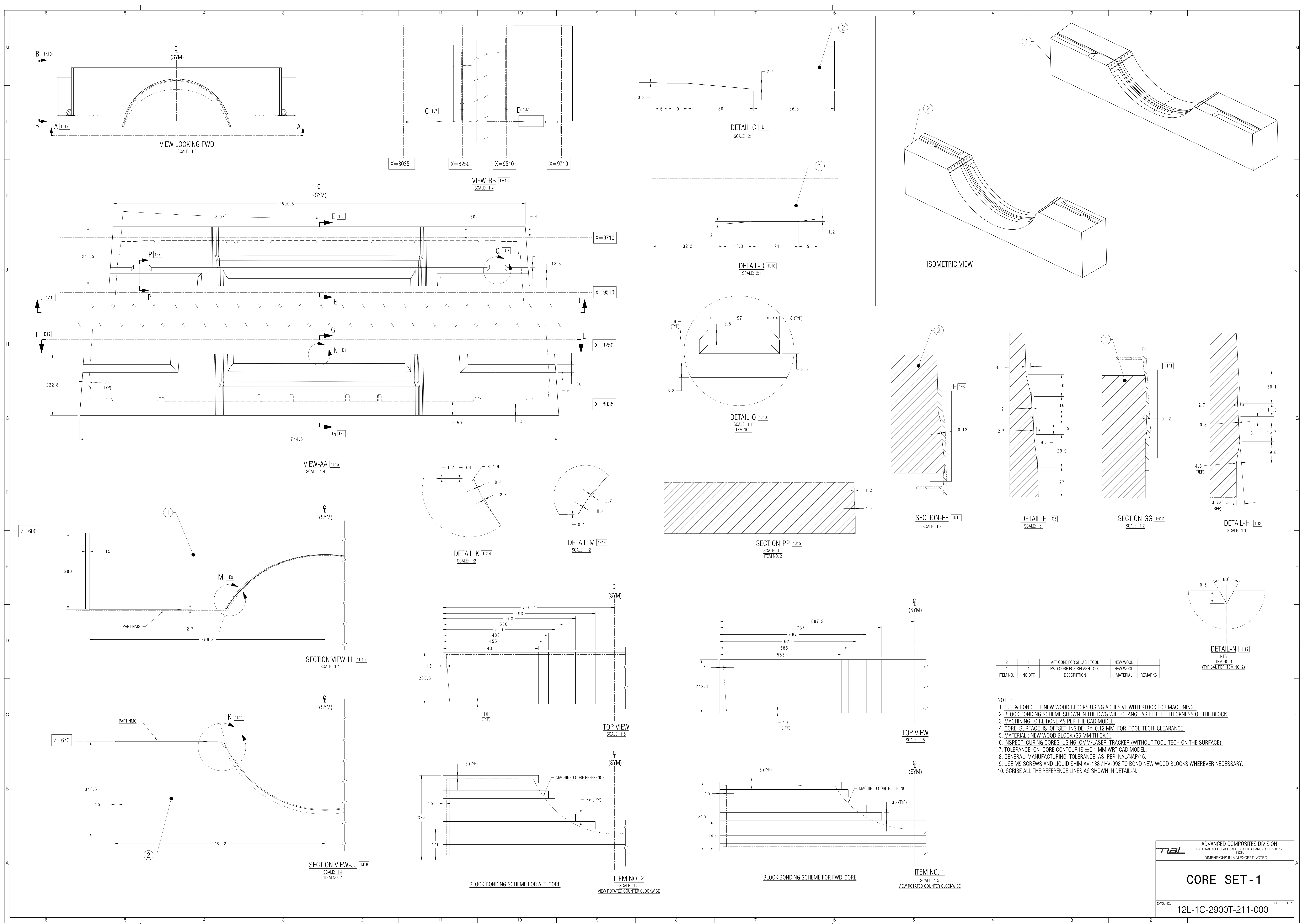
Controller of Stores & Purchase
For and on behalf of CSIR



NOTE:

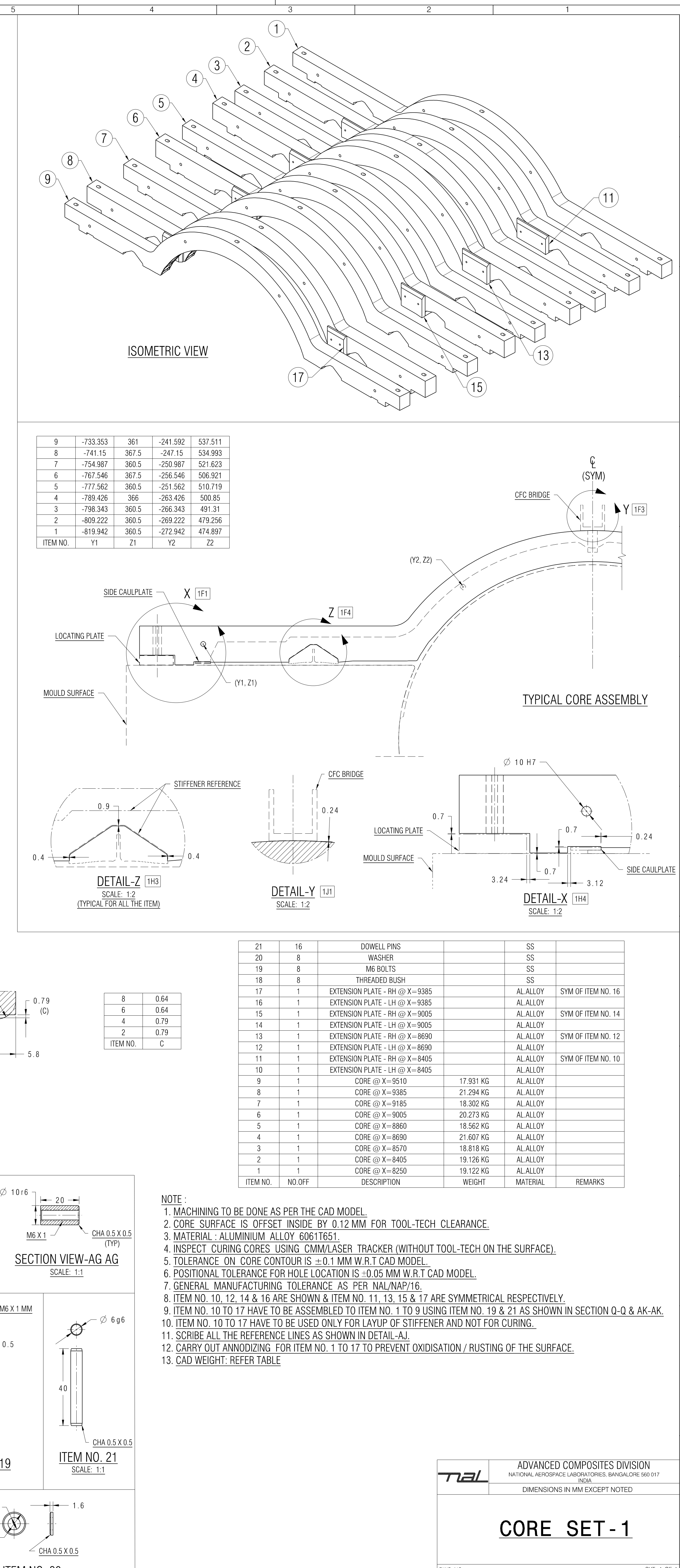
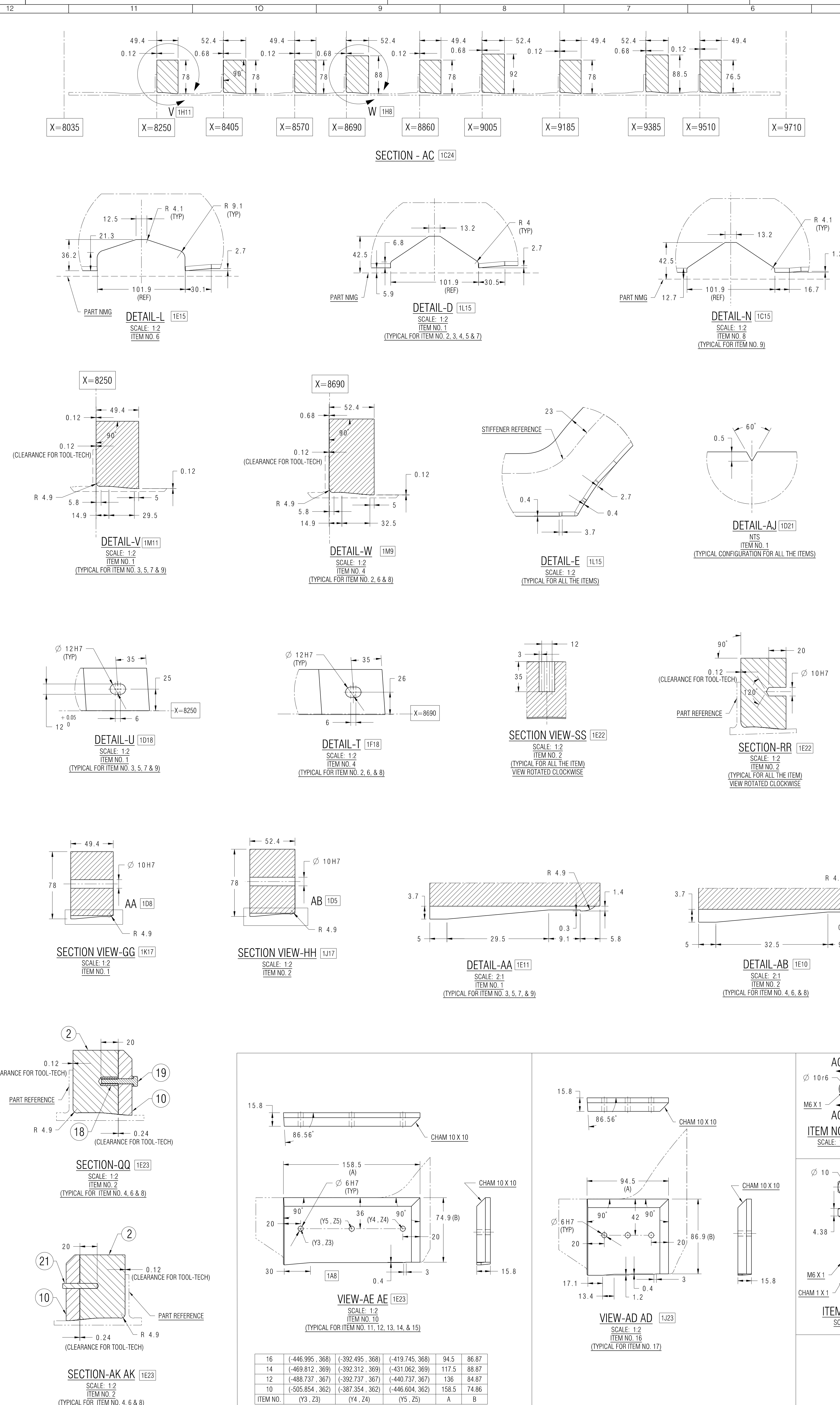
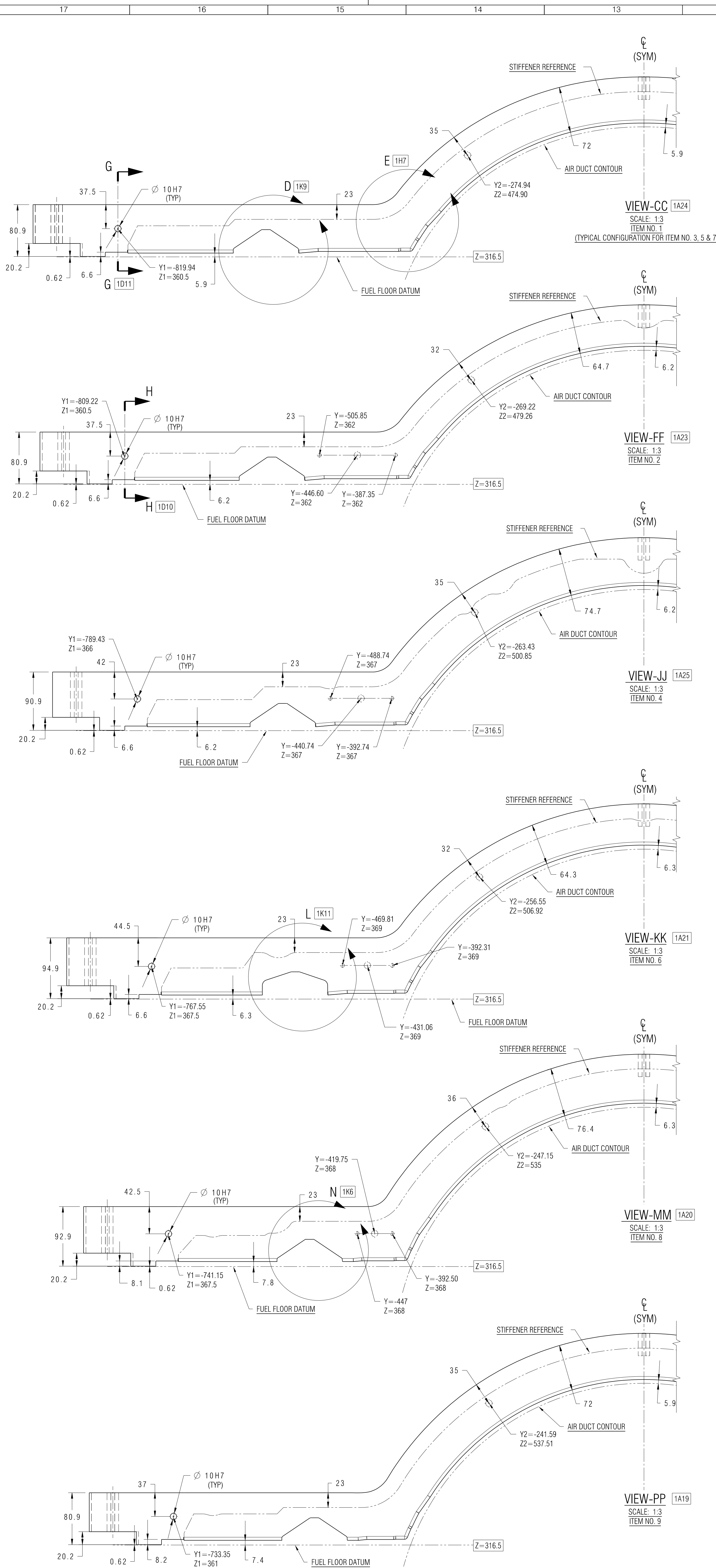
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
3. ASSEMBLE FLANGE PLATES TO THE CORE USING THE FASTNERS AS SHOWN IN SECTION VIEW-EE.
4. MATERIAL : ALUMINIUM ALLOY 6061T651.
5. INSPECT CURING CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE)
6. TOLERANCE ON CORE CONTOUR IS ± 0.1 MM WRT CAD MODEL.
7. TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM WRT CAD MODEL.
8. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
9. CARRY OUT ANNOZZING FOR ITEM NO. 1 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.

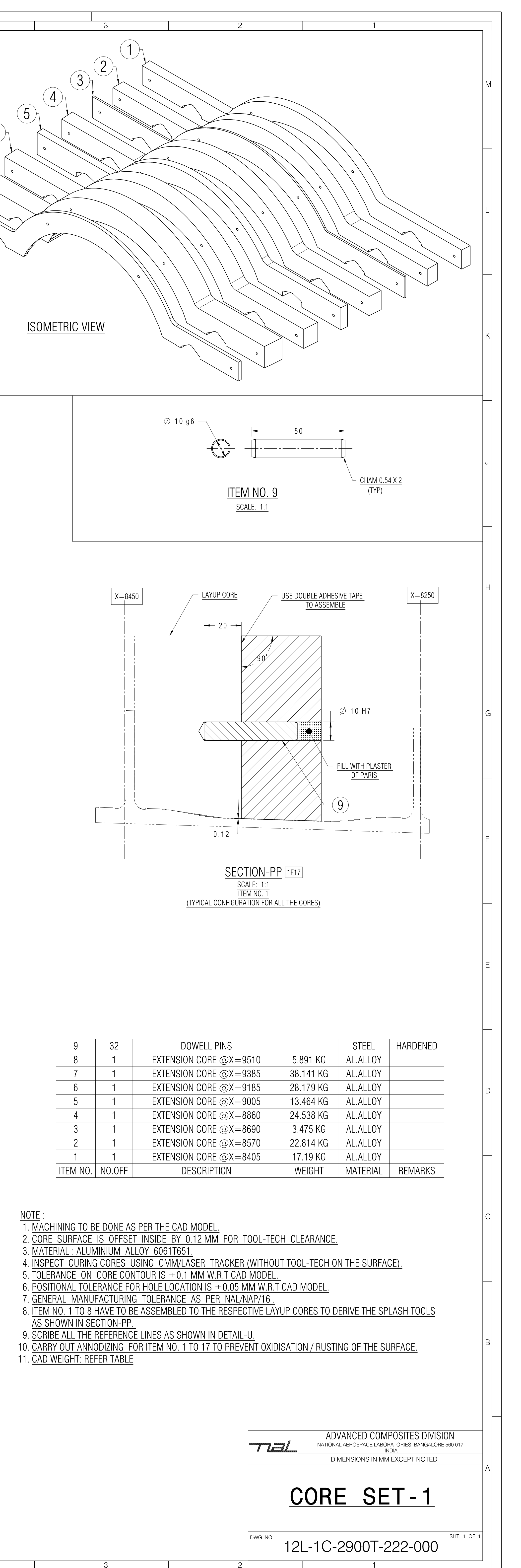
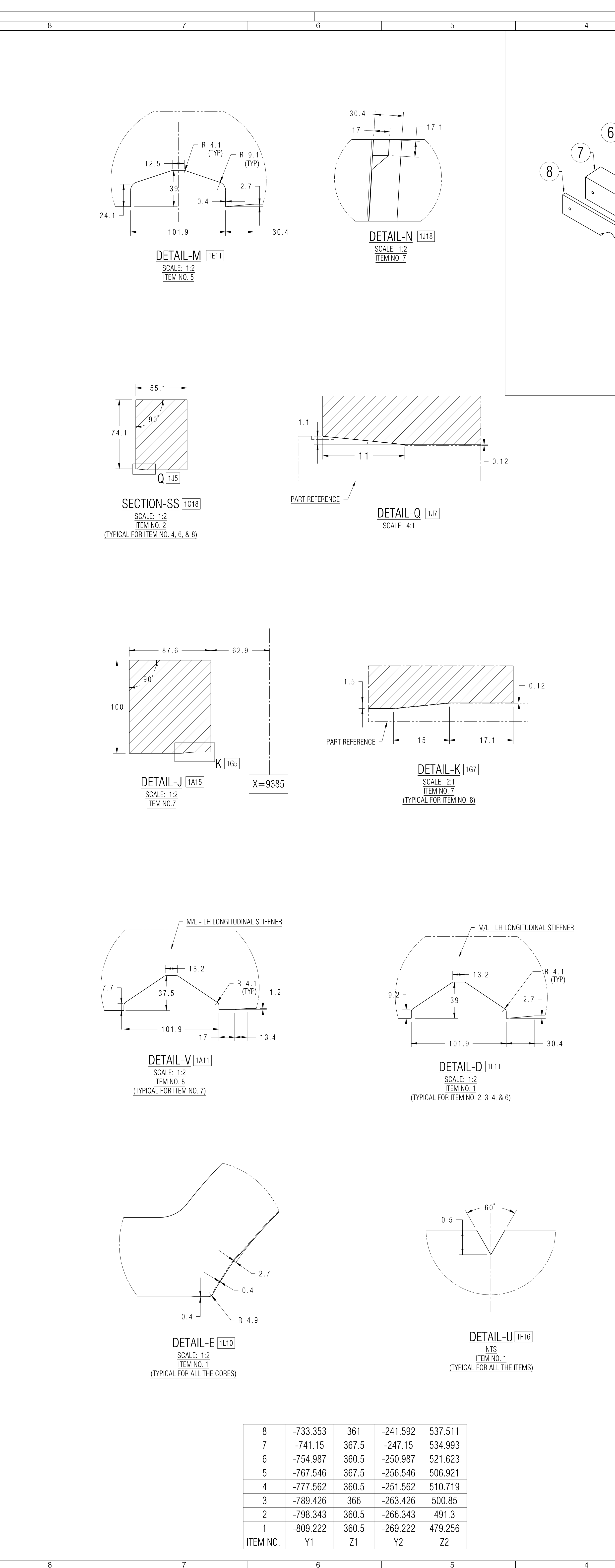
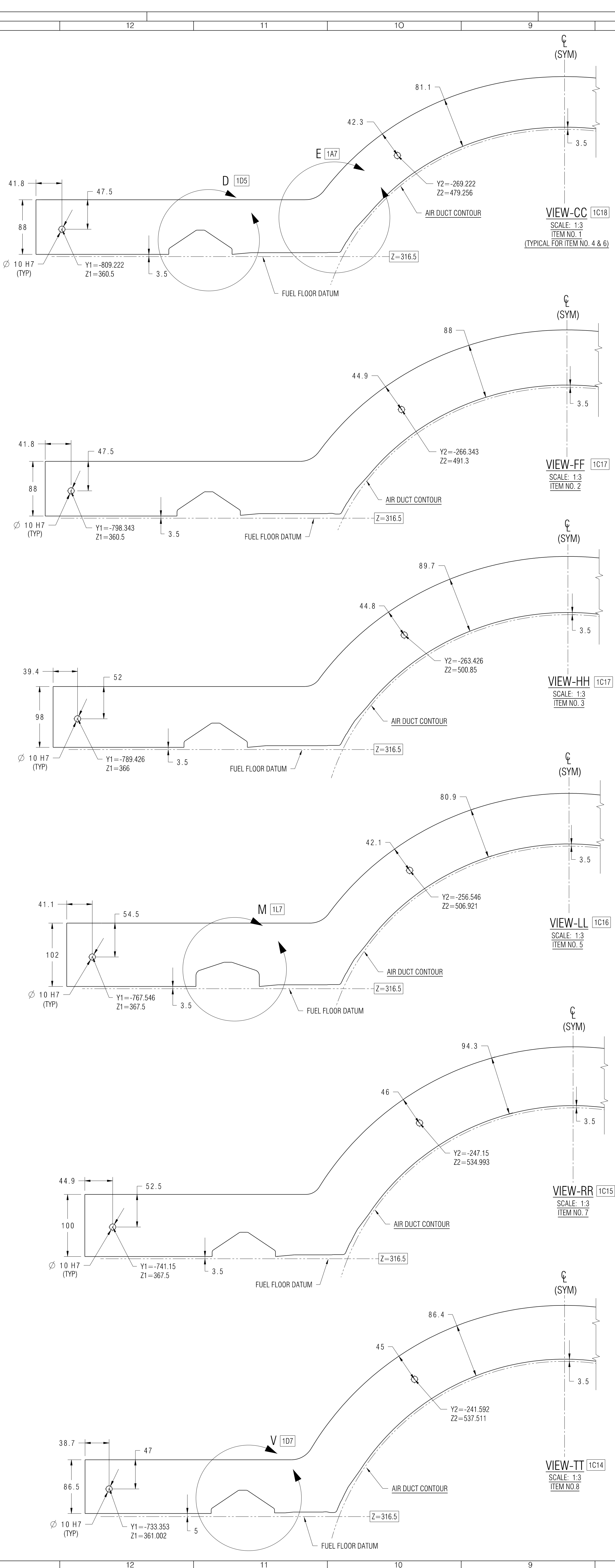
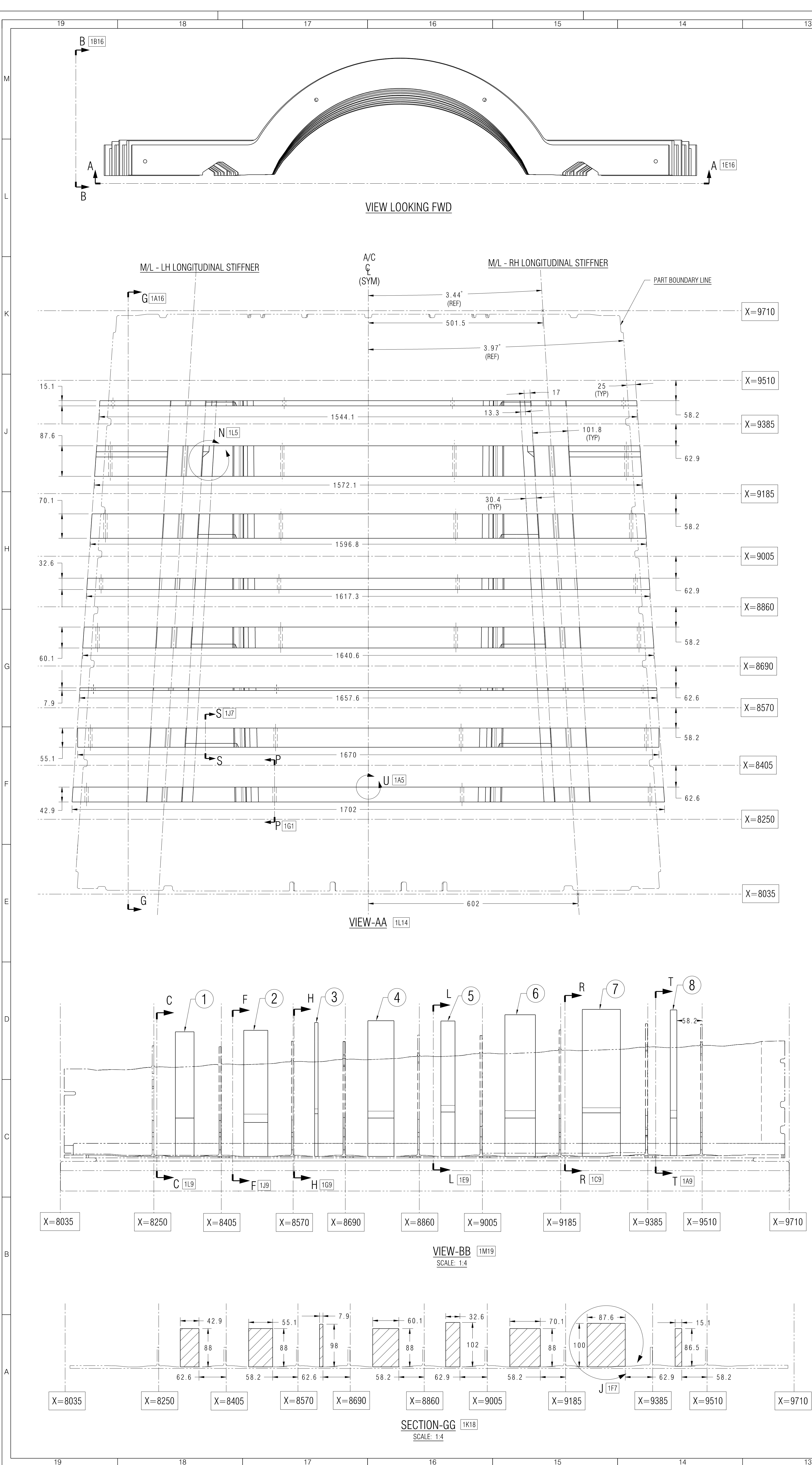




2	1	AFT CORE FOR SPLASH TOOL	NEW WOOD	
1	1	FWD CORE FOR SPLASH TOOL	NEW WOOD	
ITEM NO.	NO. OFF	DESCRIPTION	MATERIAL	REMARKS

- NOTE :
- CUT & BOND THE NEW WOOD BLOCKS USING ADHESIVE WITH STOCK FOR MACHINING.
 - BLOCK BONDING SCHEME SHOWN IN THE DWG WILL CHANGE AS PER THE THICKNESS OF THE BLOCK.
 - MACHINING TO BE DONE AS PER THE CAD MODEL.
 - CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
 - MATERIAL : NEW WOOD BLOCK (35 MM THICK).
 - INSPECT CURING CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
 - TOLERANCE ON CORE CONTOUR IS ± 0.1 MM WRT CAD MODEL.
 - GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
 - USE M5 SCREWS AND LIQUID SHIM AV-138 / HV-998 TO BOND NEW WOOD BLOCKS WHEREVER NECESSARY.
 - SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-N.

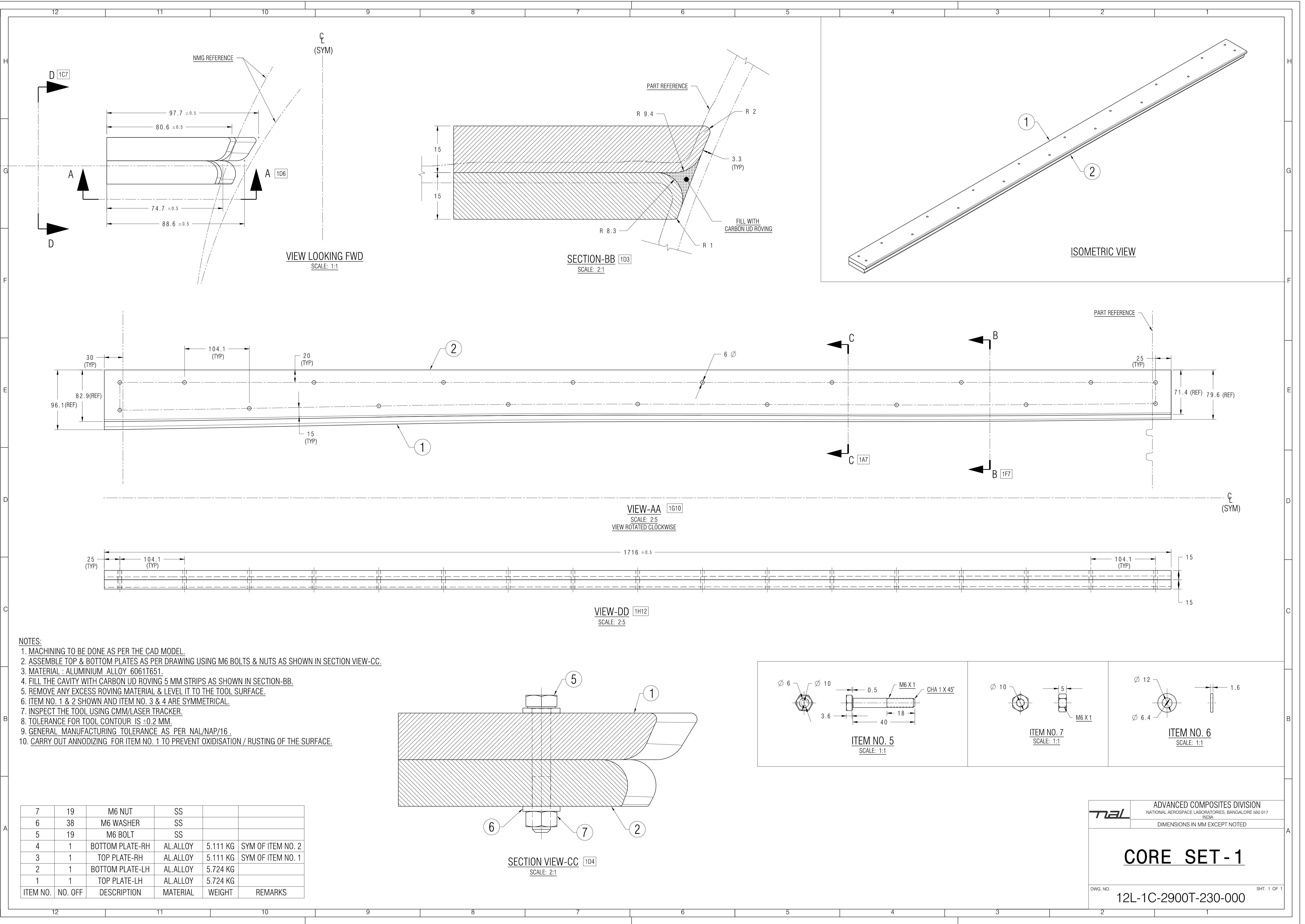


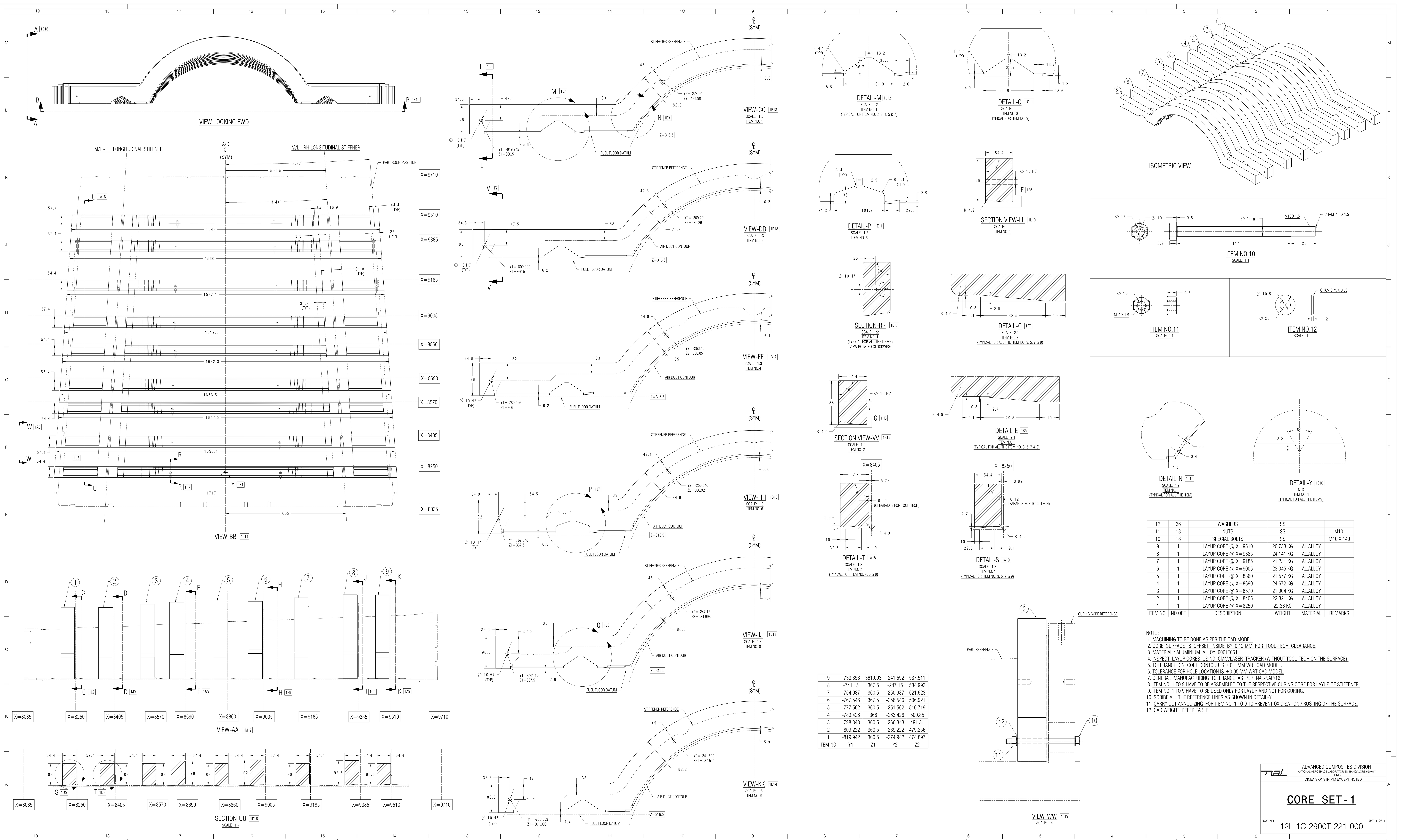


ITEM NO.	NO. OFF	DESCRIPTION	WEIGHT	MATERIAL	REMARKS
9	32	DOWELL PINS		STEEL	HARDENED
8	1	EXTENSION CORE @X=9510	5.891 KG	AL ALLOY	
7	1	EXTENSION CORE @X=9385	38.141 KG	AL ALLOY	
6	1	EXTENSION CORE @X=9185	28.179 KG	AL ALLOY	
5	1	EXTENSION CORE @X=9005	13.464 KG	AL ALLOY	
4	1	EXTENSION CORE @X=8860	24.538 KG	AL ALLOY	
3	1	EXTENSION CORE @X=8690	3.475 KG	AL ALLOY	
2	1	EXTENSION CORE @X=8570	22.814 KG	AL ALLOY	
1	1	EXTENSION CORE @X=8405	17.19 KG	AL ALLOY	

- NOTE:
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
 3. MATERIAL: ALUMINIUM ALLOY 6061T651.
 4. INSPECT CURING CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
 5. TOLERANCE ON CORE CONTOUR IS ± 0.1 MM W.R.T CAD MODEL.
 6. POSITIONAL TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM W.R.T CAD MODEL.
 7. GENERAL MANUFACTURING TOLERANCE AS PER NAL/MP/16.
 8. ITEM NO. 1 TO 8 HAVE TO BE ASSEMBLED TO THE RESPECTIVE LAYUP CORES TO DERIVE THE SPLASH TOWLS AS SHOWN IN SECTION-PP.
 9. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-U.
 10. CARRY OUT ANNOZING FOR ITEM NO. 1 TO 17 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.
 11. CAD WEIGHT: REFER TABLE

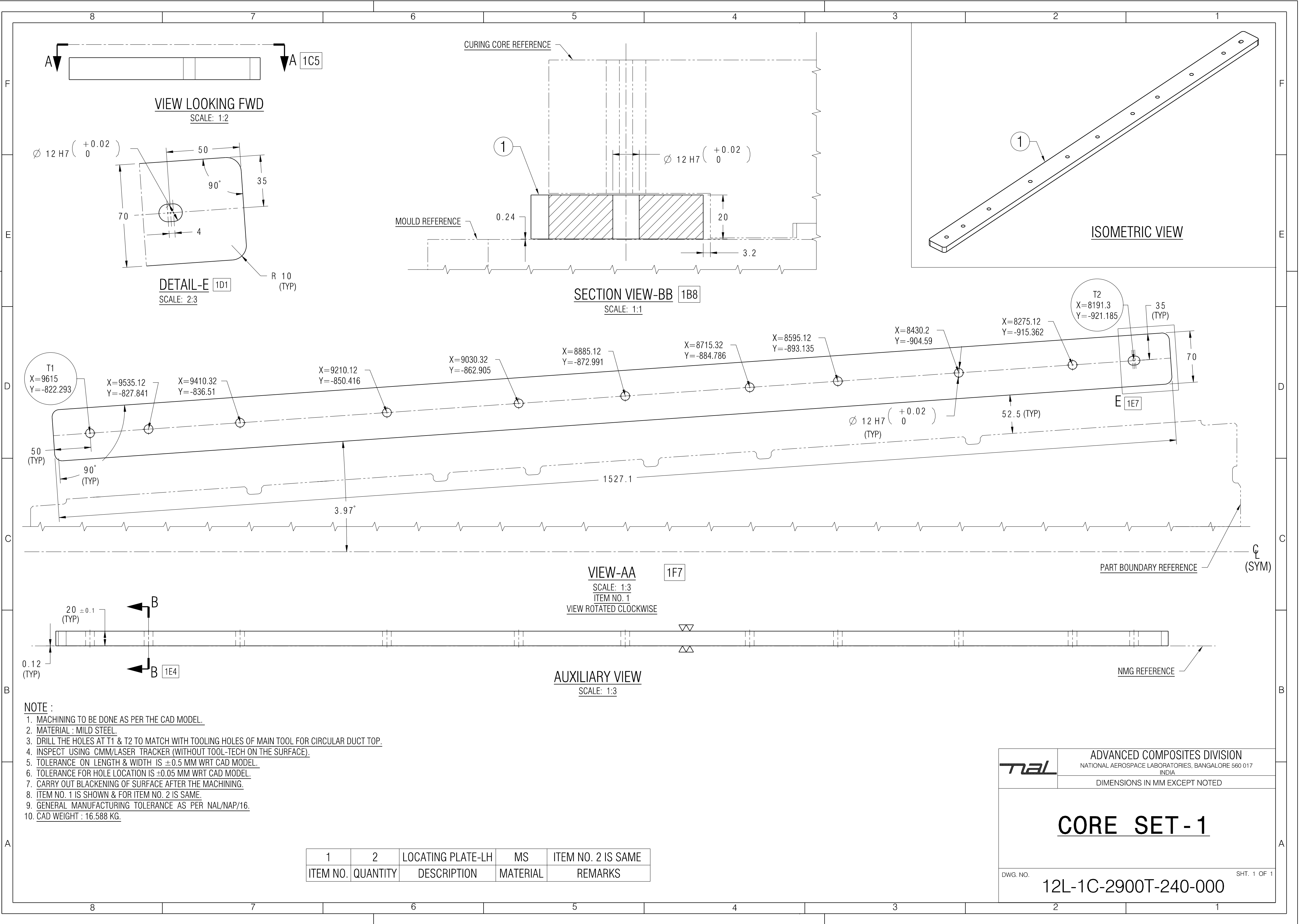
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8	-733.353	361	-241.592	537.511
7	-741.15	367.5	-247.15	534.993
6	-754.987	360.5	-250.987	521.623
5	-767.546	367.5	-256.546	506.921
4	-777.562	360.5	-251.562	510.719
3	-789.426	366	-263.426	500.85
2	-798.343	360.5	-266.343	491.3
1	-809.222	360.5	-269.222	479.256





ITEM NO.	NO. OFF	DESCRIPTION	WEIGHT	MATERIAL	REMARKS
12	36	WASHERS	SS		
11	18	NUTS	SS		
10	18	SPECIAL BOLTS	SS		
9	1	LAYUP CORE @ X=9510	20.753 KG	AL-ALLOY	
8	1	LAYUP CORE @ X=9385	24.141 KG	AL-ALLOY	
7	1	LAYUP CORE @ X=9185	21.231 KG	AL-ALLOY	
6	1	LAYUP CORE @ X=9005	23.045 KG	AL-ALLOY	
5	1	LAYUP CORE @ X=8860	21.577 KG	AL-ALLOY	
4	1	LAYUP CORE @ X=8690	24.672 KG	AL-ALLOY	
3	1	LAYUP CORE @ X=8570	21.904 KG	AL-ALLOY	
2	1	LAYUP CORE @ X=8405	22.321 KG	AL-ALLOY	
1	1	LAYUP CORE @ X=8250	22.33 KG	AL-ALLOY	

NOTE :
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
3. MATERIAL : ALUMINIUM ALLOY 6061T651.
4. INSPECT LAYUP CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
5. TOLERANCE ON CORE CONTOUR IS ± 0.1 MM WRT CAD MODEL.
6. TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM WRT CAD MODEL.
7. GENERAL MANUFACTURING TOLERANCE AS PER MALNAP/16.
8. ITEM NO. 1 TO 9 HAVE TO BE ASSEMBLED TO THE RESPECTIVE CURING CORE FOR LAYUP OF STIFFENER.
9. ITEM NO. 1 TO 9 HAVE TO BE USED ONLY FOR LAYUP AND NOT FOR CURING.
10. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-Y.
11. CARRY OUT ANODIZING FOR ITEM NO. 1 TO 9 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.
12. CAD WEIGHT: REFER TABLE

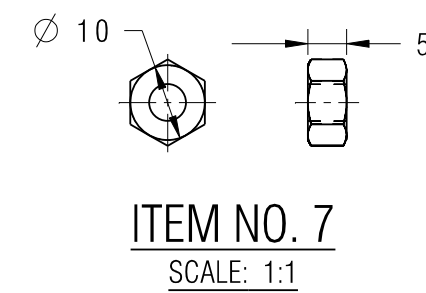
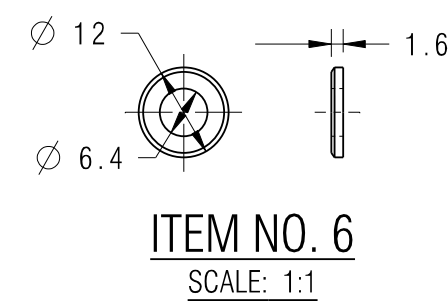
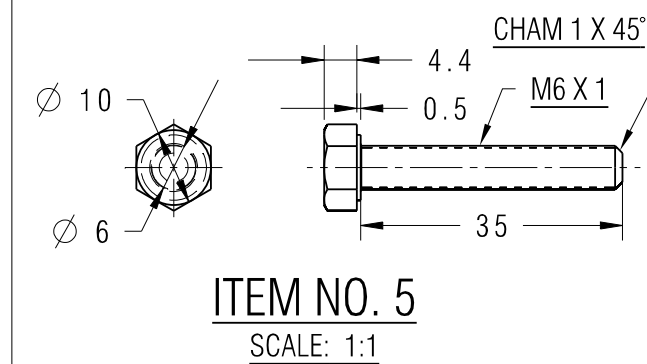
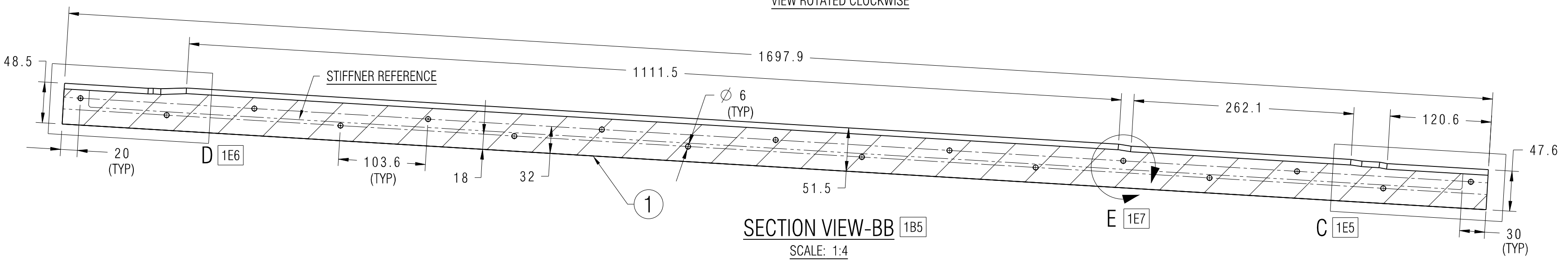
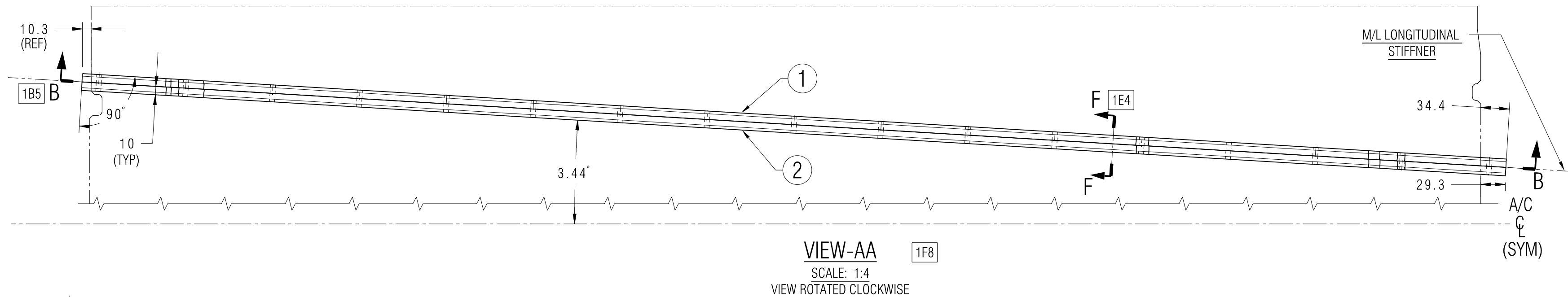
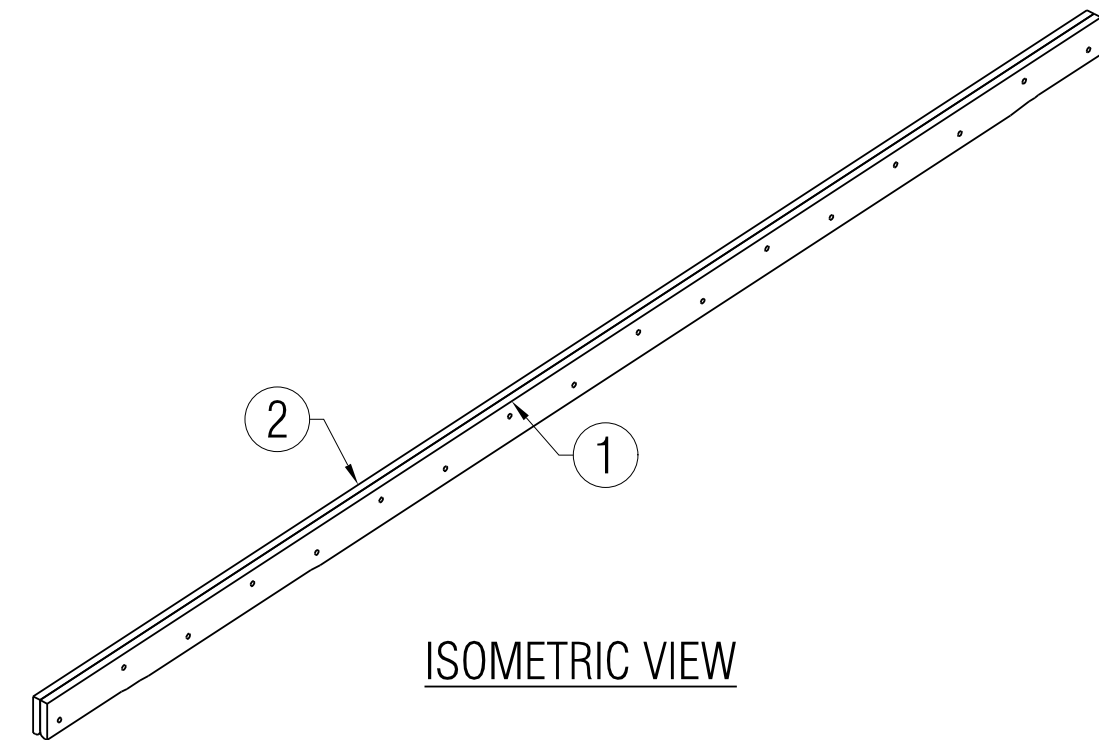
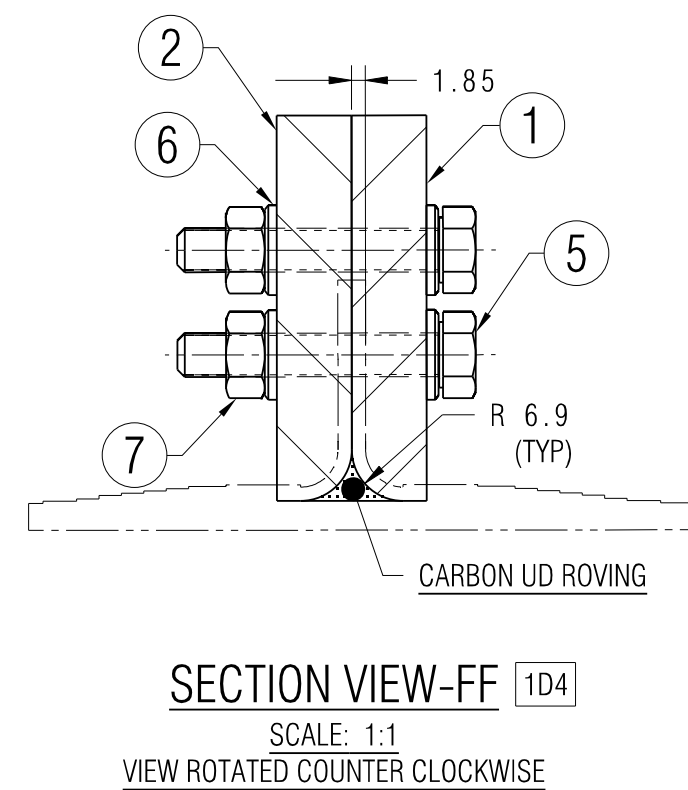
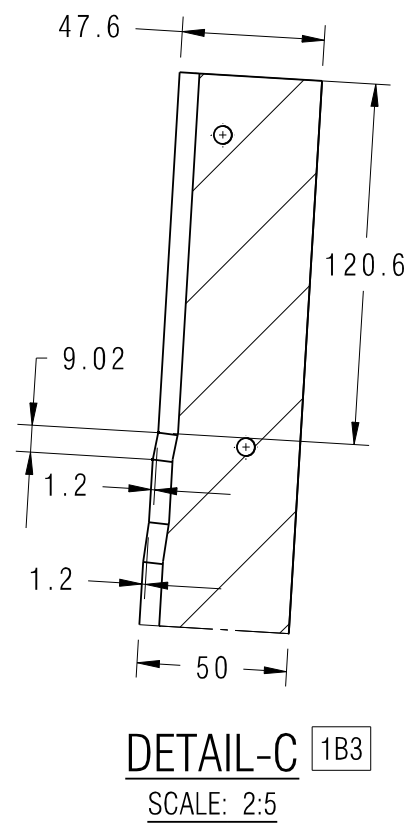
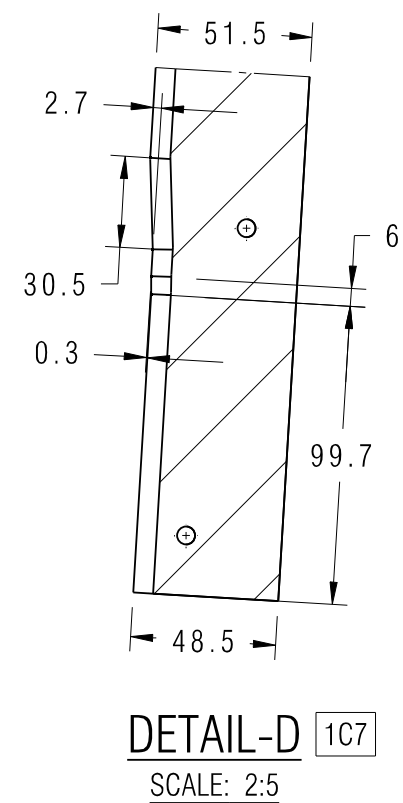
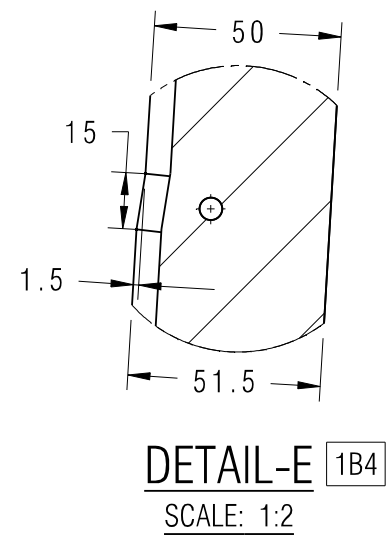
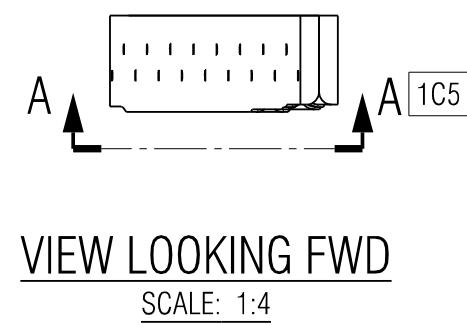




ADVANCED COMPOSITES DIVISION
NATIONAL AEROSPACE LABORATORIES, BANGALORE 560 017
INDIA
DIMENSIONS IN MM EXCEPT NOTED

CORE SET - 1

DWG. NO. 12L-1C-2900T-240-000 SHT. 1 OF 1



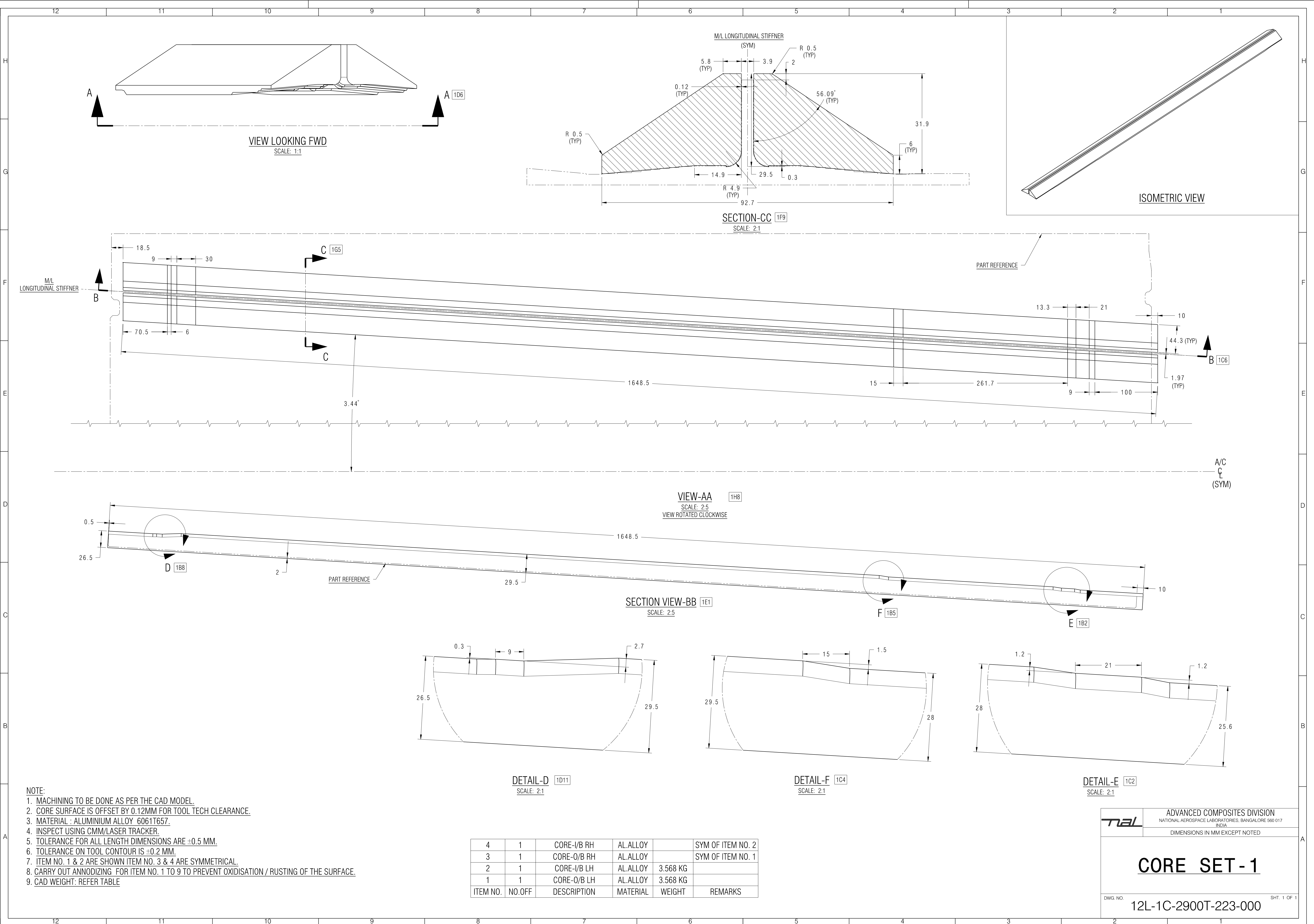
- NOTES :
1. MAKE THESE ROVING TOOLS BY CNC MACHINING USING AL.ALLOY PLATE.
 2. ASSEMBLE IB & OB PLATES USING M6 BOLTS & NUTS AS SHOWN IN SECTION VIEW-FF.
 3. INSPECT ROVING TOOLS USING CMM/LASER TRACKER.
 4. TOLERANCE ON PROFILE IS ± 0.2 MM.
 5. GENERAL MANUFACTURING TOLERANCES AS PER NAL/NAP/16.
 6. FILL ROVING TOOLS CAVITY USING 5 MM UD STRIPS.
 7. REMOVE ANY EXCESS ROVING MATERIAL AND LEVEL IT TO THE TOOL SURFACE.
 8. CARRY OUT ANNOIDIZING FOR ITEM NO. 1 TO 4 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.

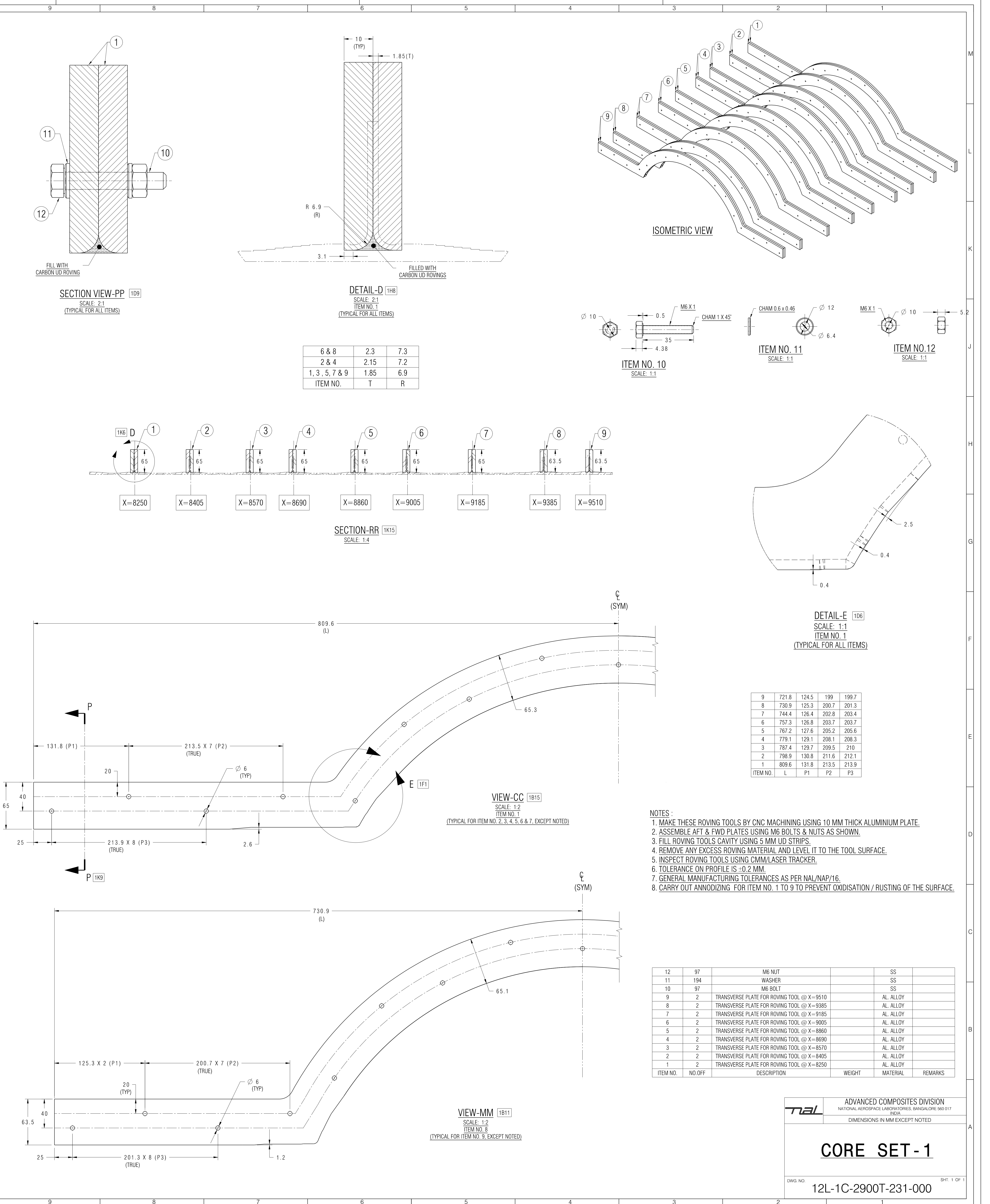
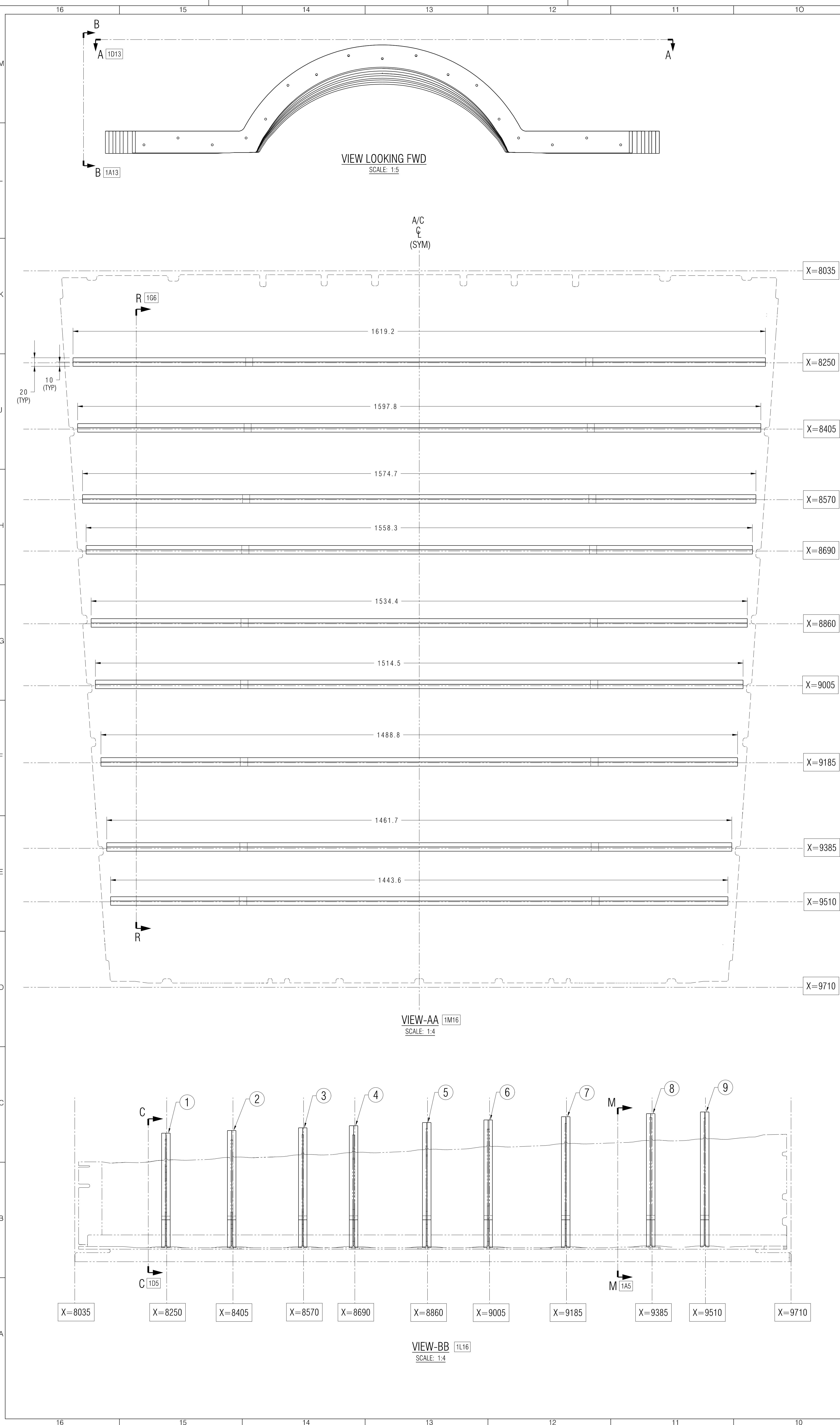
7	17	M6 NUT	SS	
6	34	M6 WASHER	SS	
5	17	M6 BOLT	SS	
4	1	IB - PLATE RH	AL.ALLOY	SYM OF ITEM NO. 2
3	1	OB - PLATE RH	AL.ALLOY	SYM OF ITEM NO. 1
2	1	IB - PLATE LH	AL.ALLOY	
1	1	OB - PLATE LH	AL.ALLOY	
ITEM NO.	NO. OFF	DESCRIPTION	MATERIAL	REMARKS

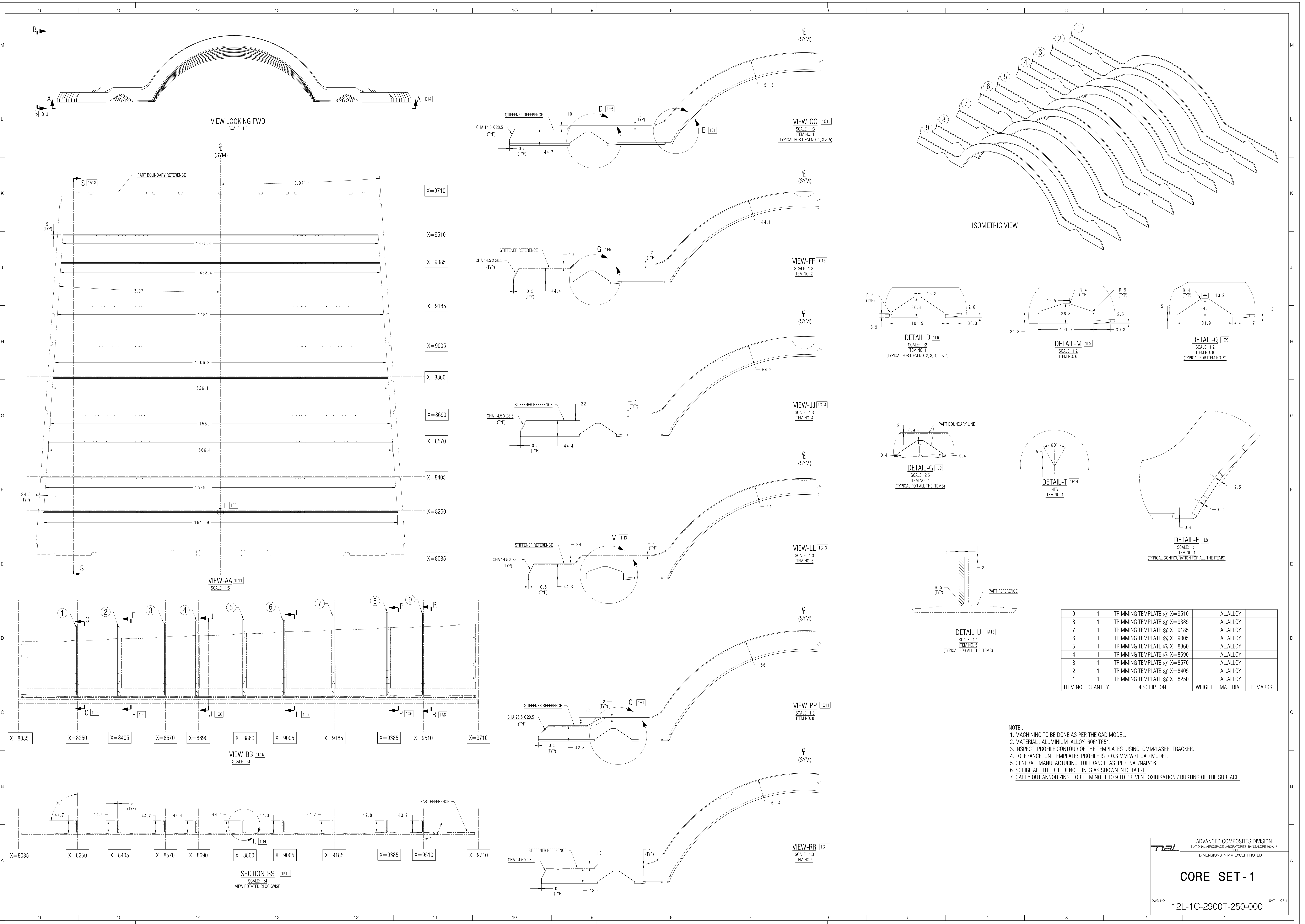
ADVANCED COMPOSITES DIVISION
NATIONAL AEROSPACE LABORATORIES, BANGALORE 560 017
INDIA.
DIMENSIONS IN MM EXCEPT NOTED

CORE SET - 1

DWG. NO. 12L-1C-2900T-232-000 SHT. 1 OF 1

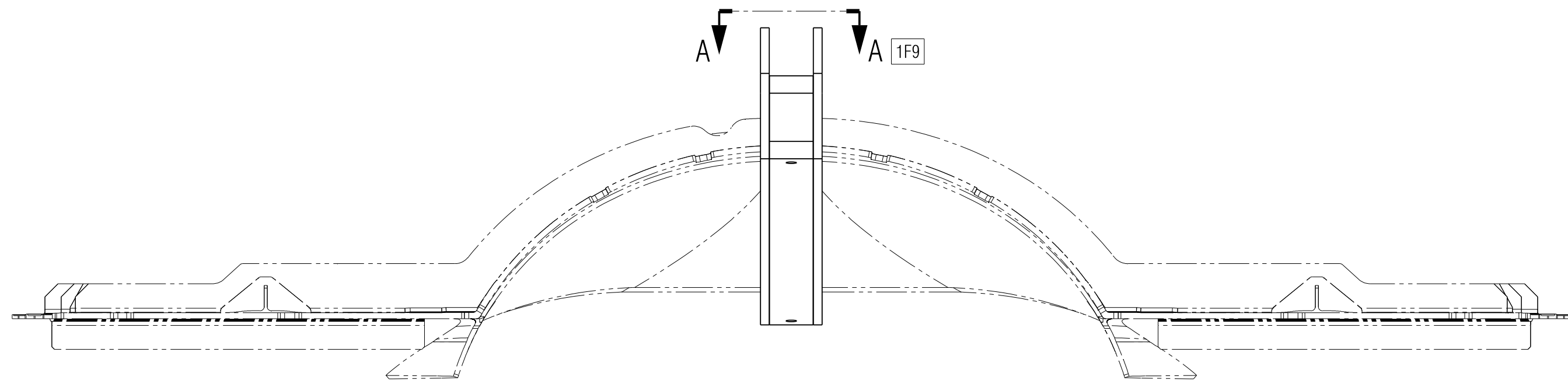




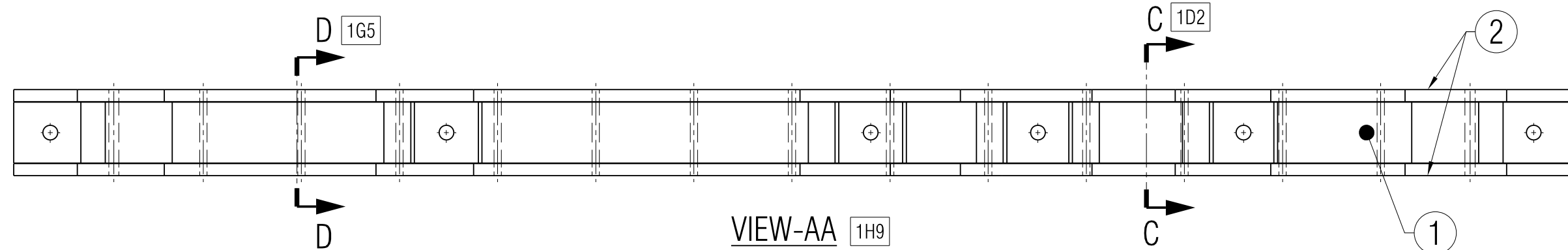


9	1	TRIMMING TEMPLATE @ X=9510		AL-ALLOY	
8	1	TRIMMING TEMPLATE @ X=9385		AL-ALLOY	
7	1	TRIMMING TEMPLATE @ X=9185		AL-ALLOY	
6	1	TRIMMING TEMPLATE @ X=9005		AL-ALLOY	
5	1	TRIMMING TEMPLATE @ X=8860		AL-ALLOY	
4	1	TRIMMING TEMPLATE @ X=8690		AL-ALLOY	
3	1	TRIMMING TEMPLATE @ X=8570		AL-ALLOY	
2	1	TRIMMING TEMPLATE @ X=8405		AL-ALLOY	
1	1	TRIMMING TEMPLATE @ X=8250		AL-ALLOY	
ITEM NO.	QUANTITY	DESCRIPTION	WEIGHT	MATERIAL	REMARKS

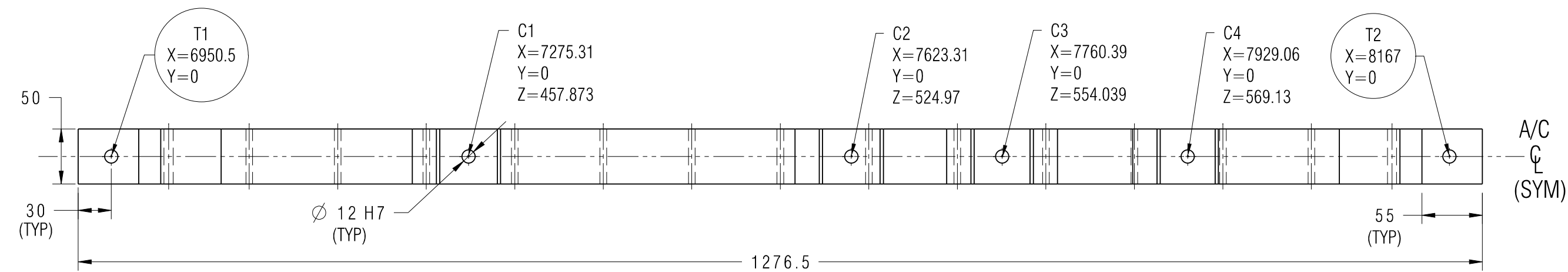
- NOTE:
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. MATERIAL - ALUMINIUM ALLOY 6061T651.
 3. INSPECT PROFILE CONTOUR OF THE TEMPLATES USING CMM/LASER TRACKER.
 4. TOLERANCE ON TEMPLATES PROFILE IS ± 0.3 MM WRT CAD MODEL.
 5. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
 6. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-T.
 7. CARRY OUT ANNOZING FOR ITEM NO. 1 TO 9 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.



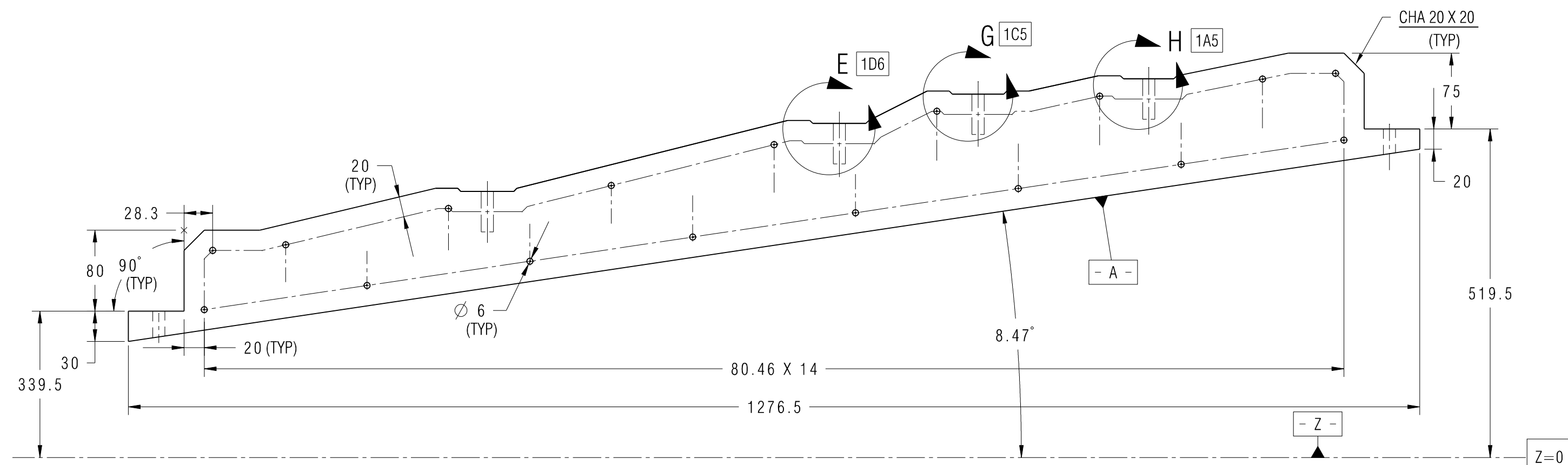
VIEW LOOKING FWD
SCALE: 1:5



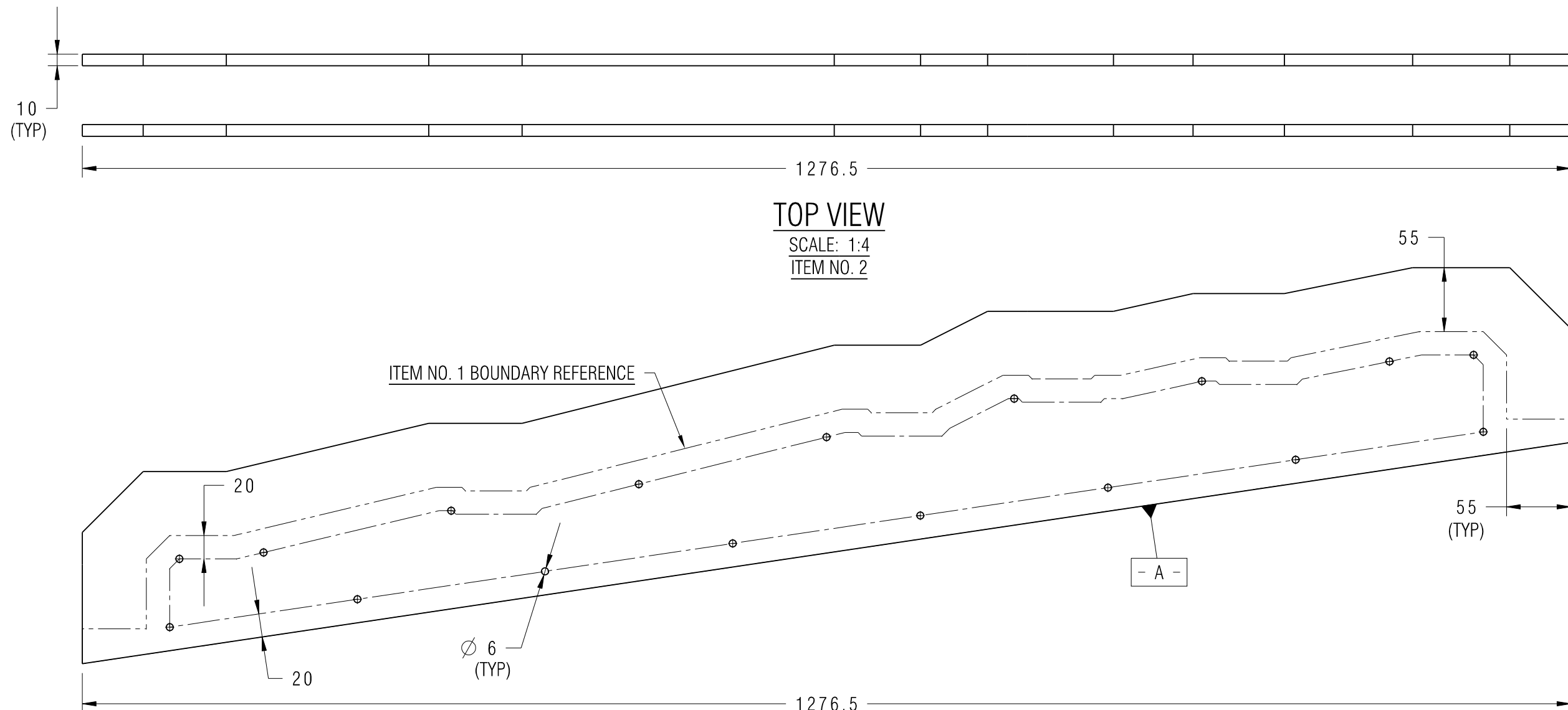
VIEW-AA 1H9
SCALE: 1:4



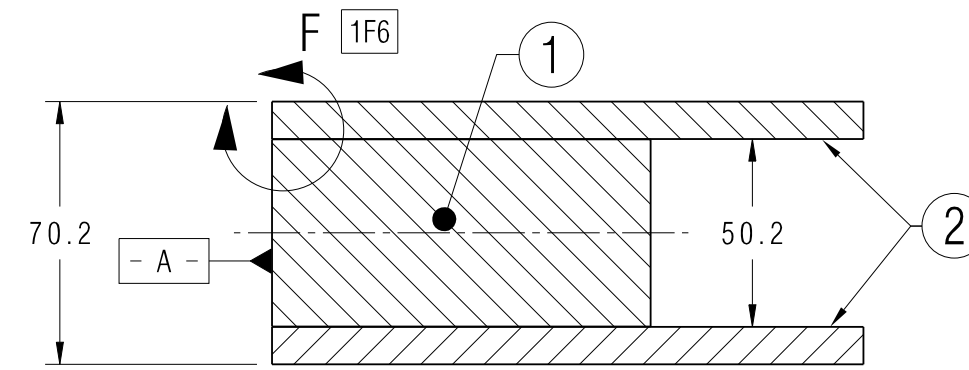
TOP VIEW
SCALE: 1:4
ITEM NO. 1



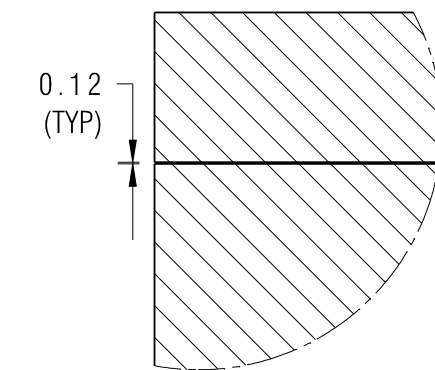
SIDE VIEW
SCALE: 1:4



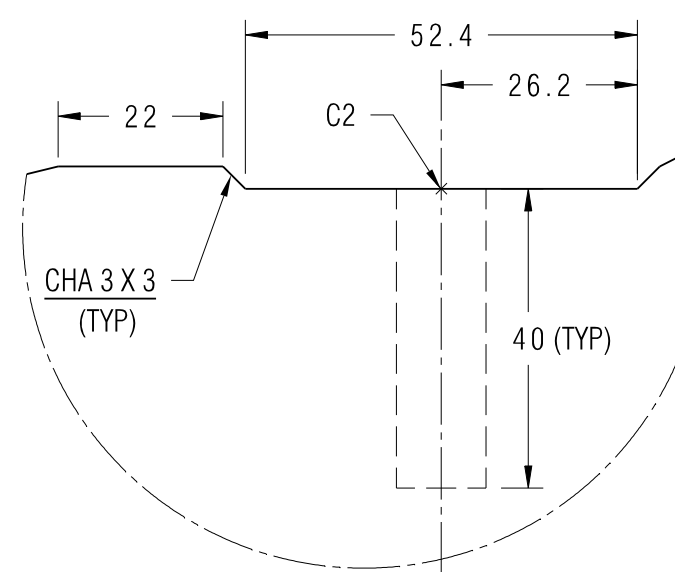
BOTTOM VIEW
SCALE: 1:4



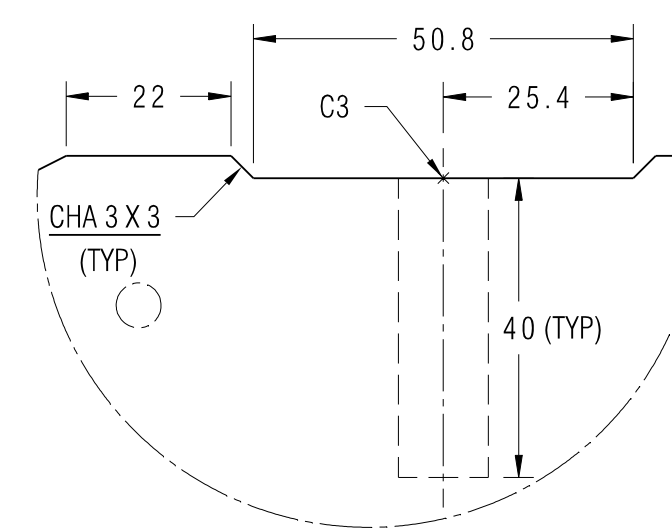
SECTION-DD 1G11
SCALE: 1:2



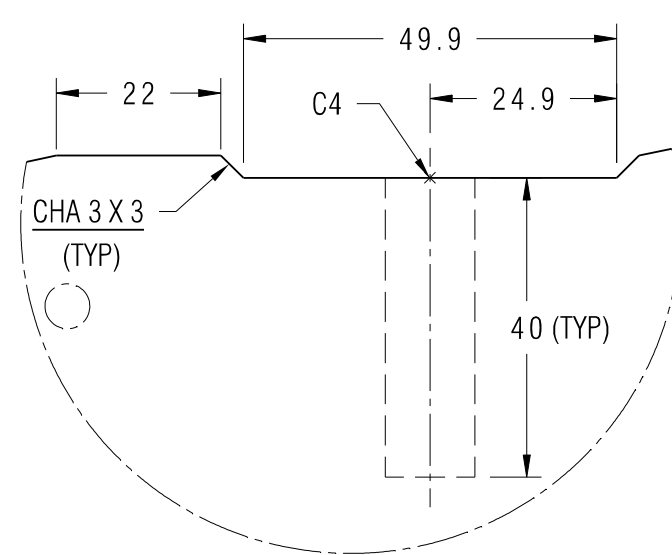
DETAIL-F 1H6
SCALE: 2:1



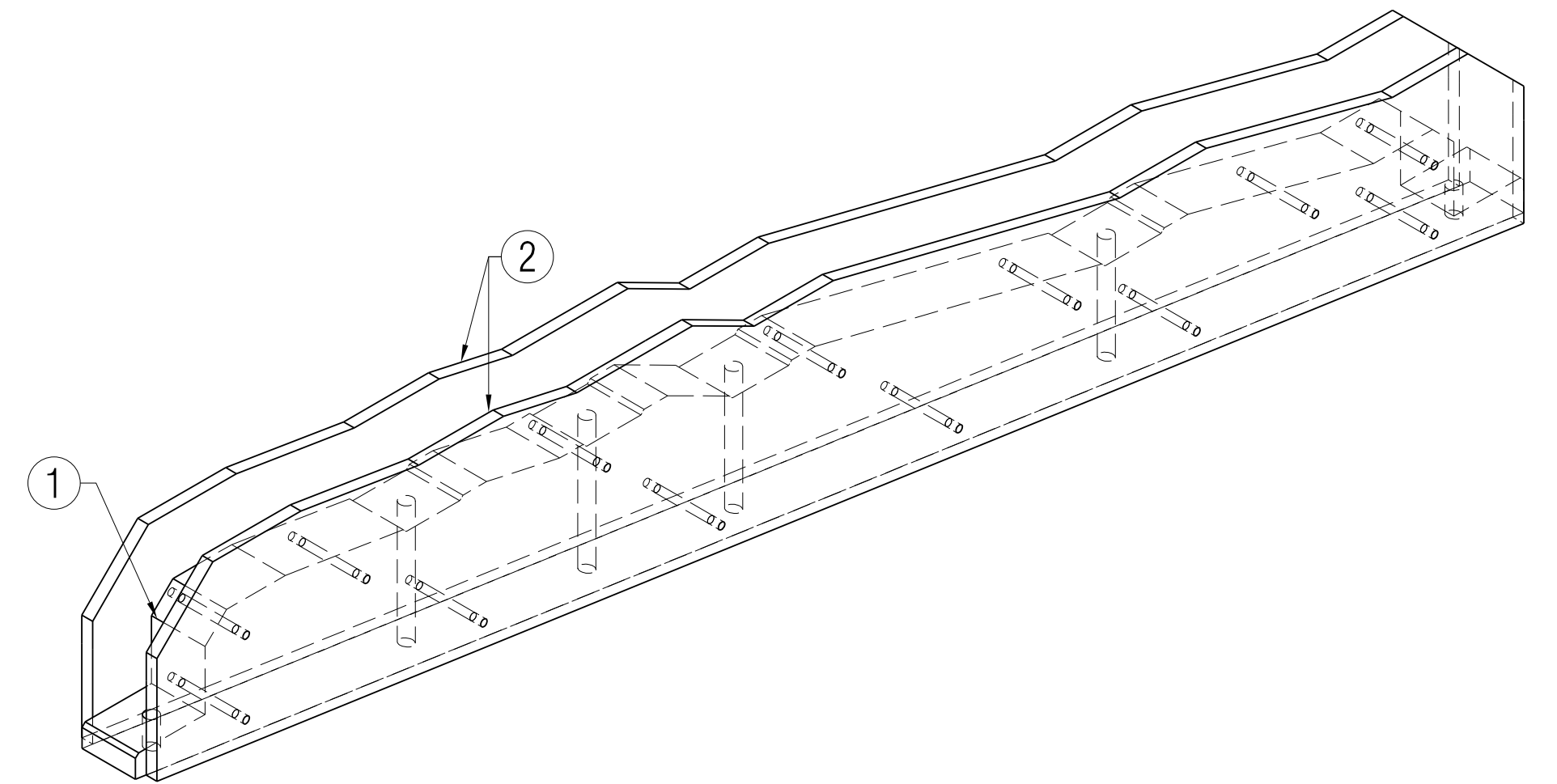
DETAIL-E 1D9
(TYP AT C1)



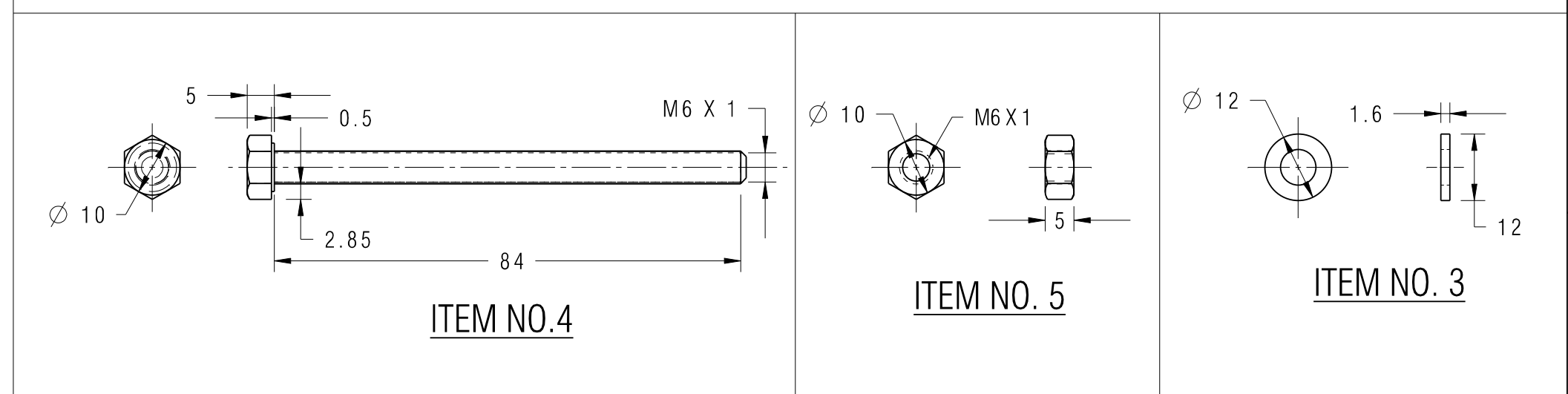
DETAIL-G 1D9



DETAIL-H 1D8



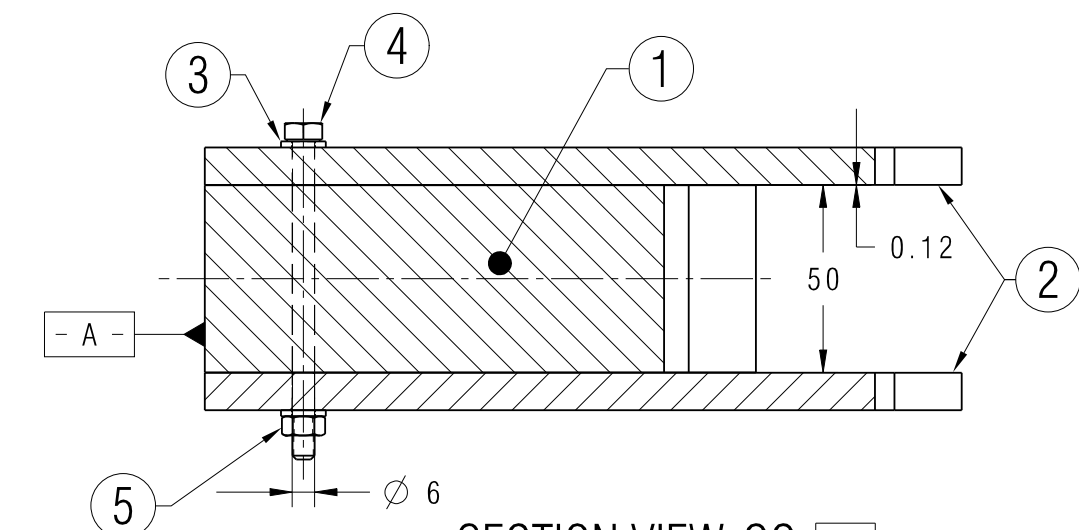
ISOMETRIC VIEW



ITEM NO. 4

ITEM NO. 5

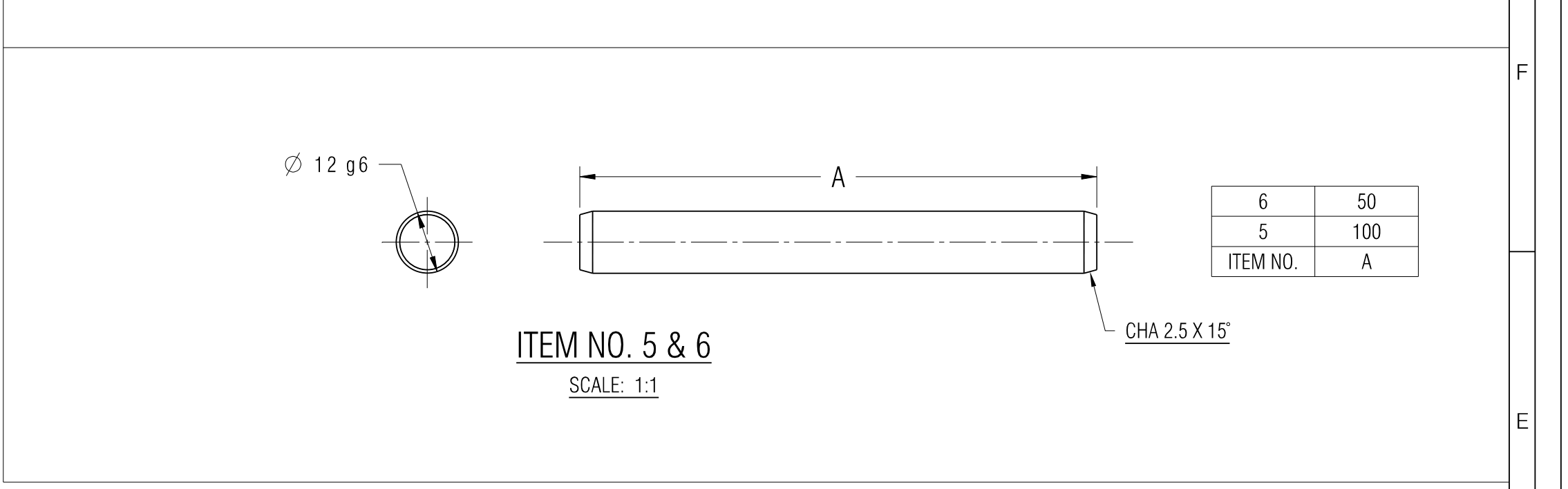
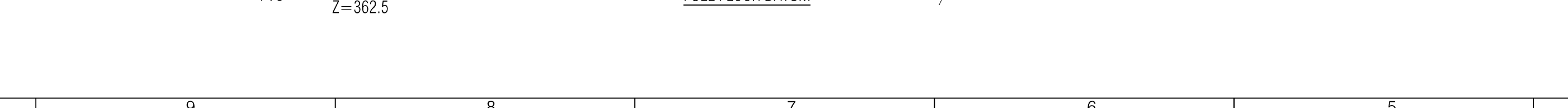
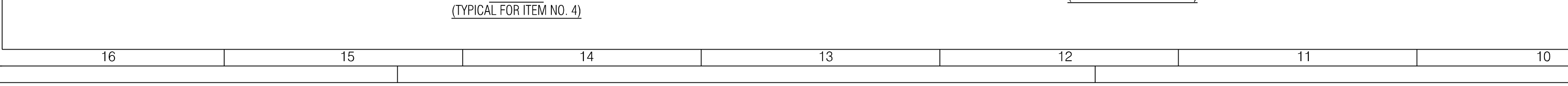
ITEM NO. 3



SECTION VIEW-CC 1G8
SCALE: 1:2

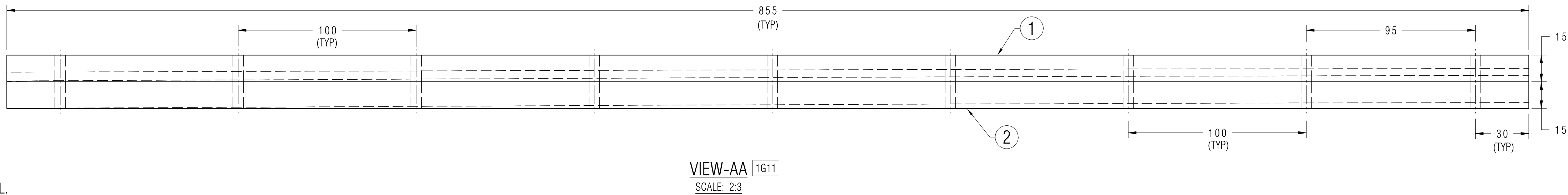
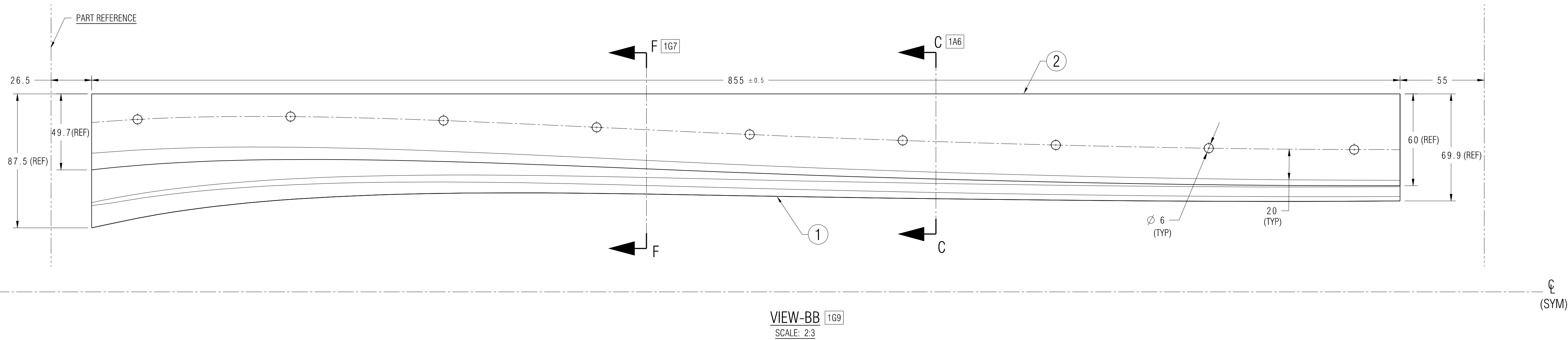
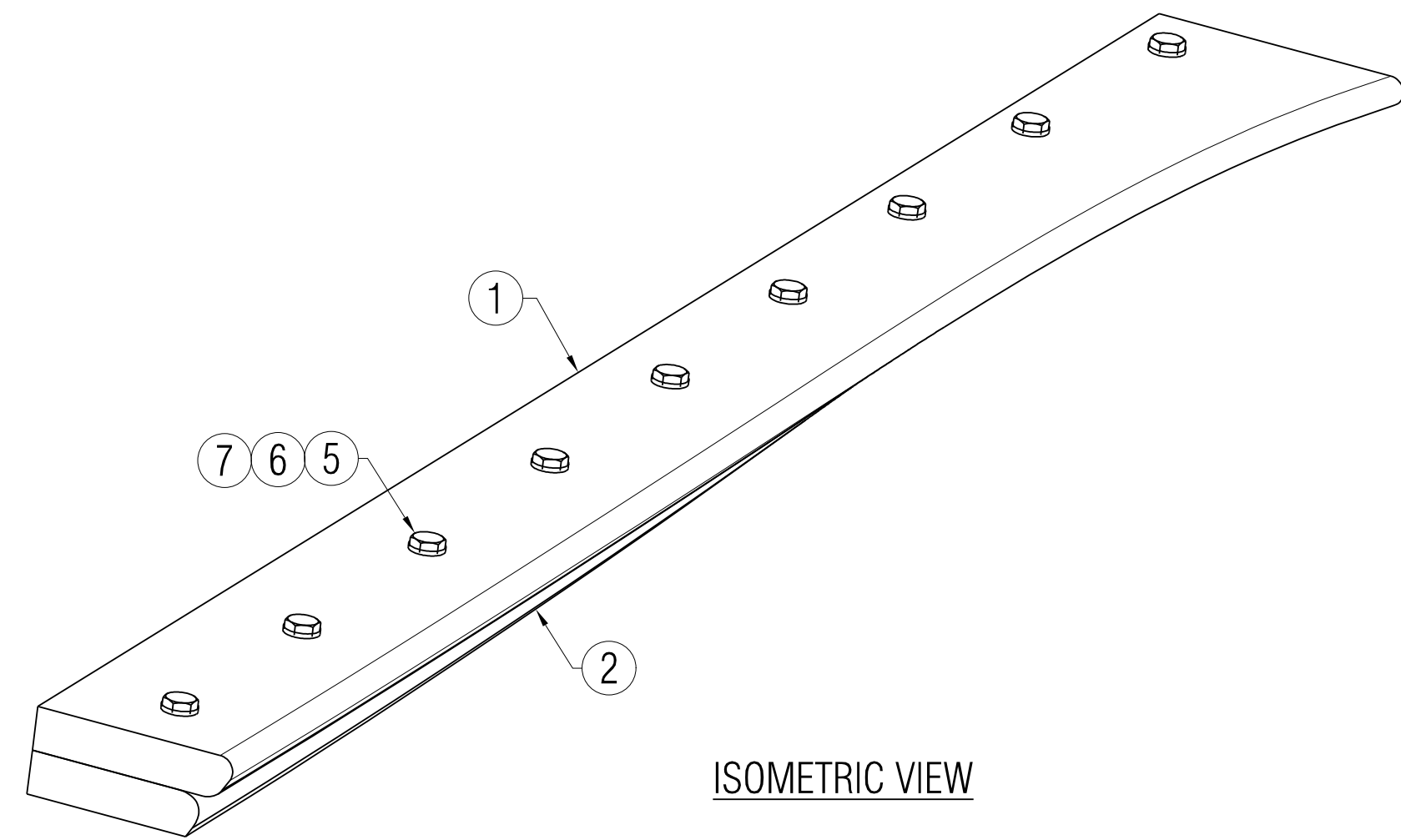
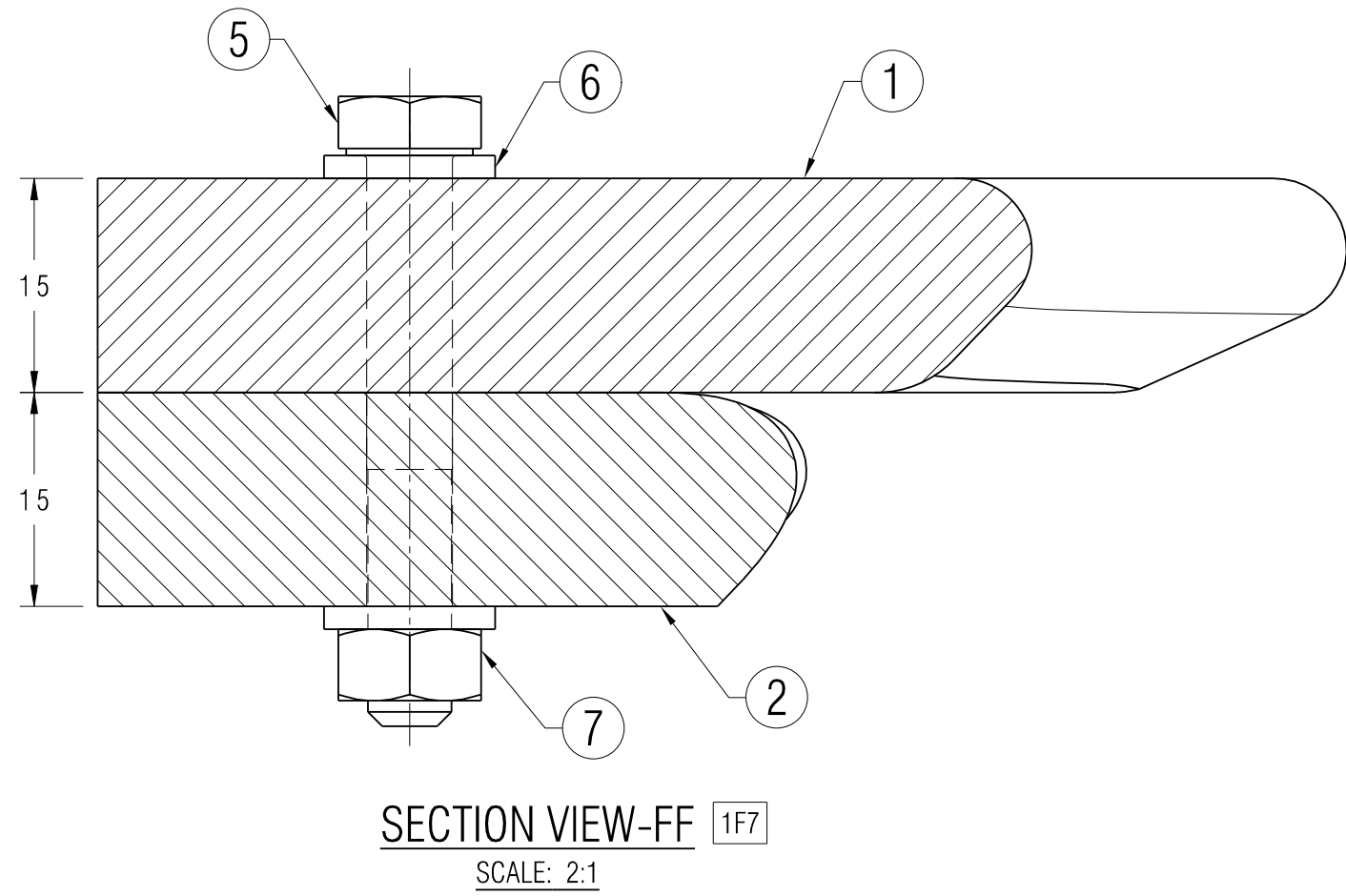
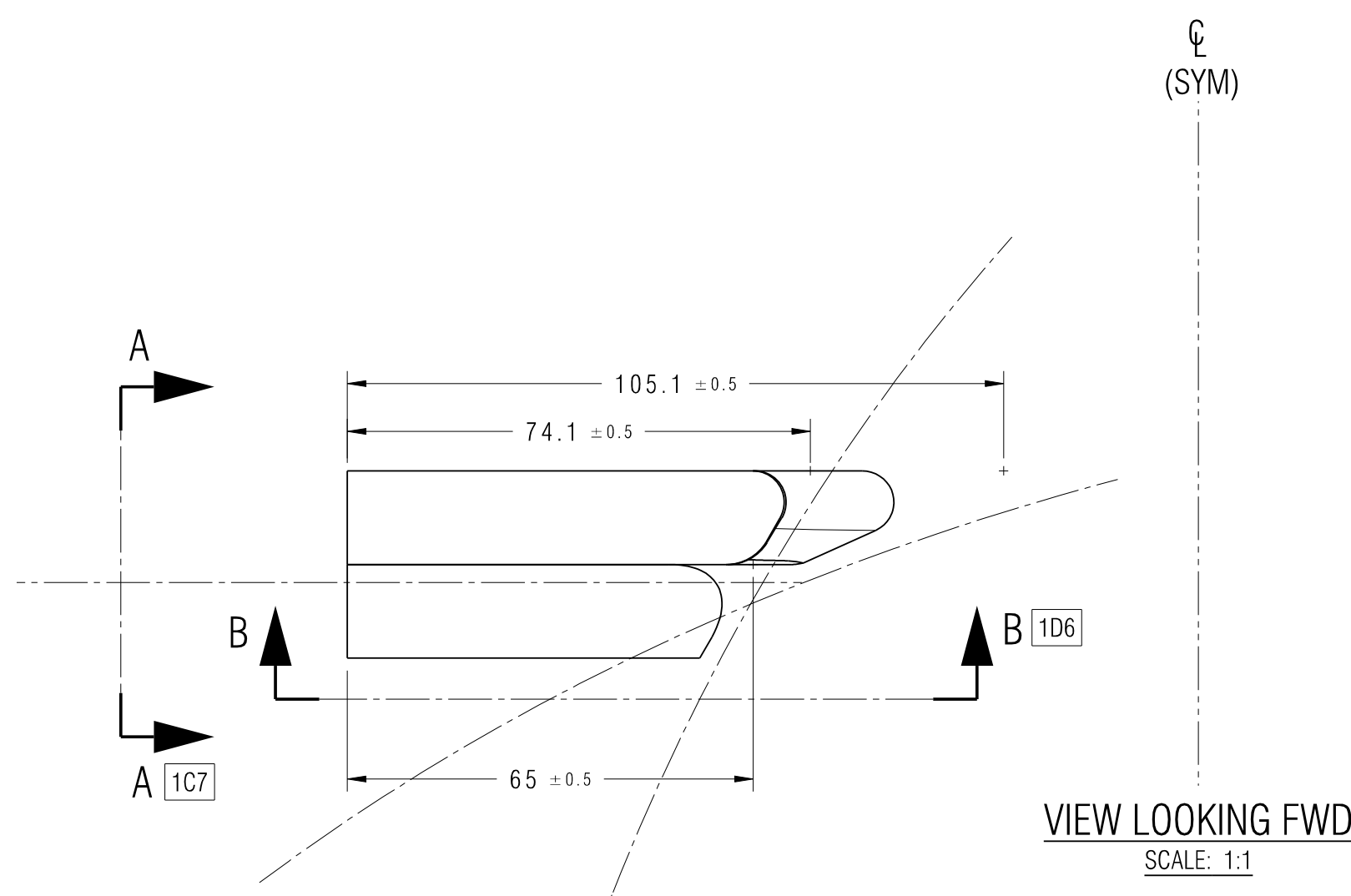
5	17	M6 NUT	SS		
4	17	M6 BOLT	SS		
3	34	WASHER	SS		
2	2	FLANGE PLATES	AL. ALLOY	5.6 KG	
1	1	AL. CORE FOR BRIDGE	AL. ALLOY	17.318 KG	
ITEM NO.	QUANTITY	DESCRIPTION	MATERIAL	WEIGHT	REMARKS

- NOTE:
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
 3. ASSEMBLE FLANGE PLATES TO THE CORE USING THE FASTNERS AS SHOWN IN SECTION VIEW-CC.
 4. MATERIAL : ALUMINIUM ALLOY 6061T651.
 5. INSPECT CURING CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
 6. TOLERANCE ON CORE CONTOUR IS ± 0.1 MM WRT CAD MODEL.
 7. TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM WRT CAD MODEL.
 8. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
 9. CARRY OUT ANNOZING FOR ITEM NO. 1 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.



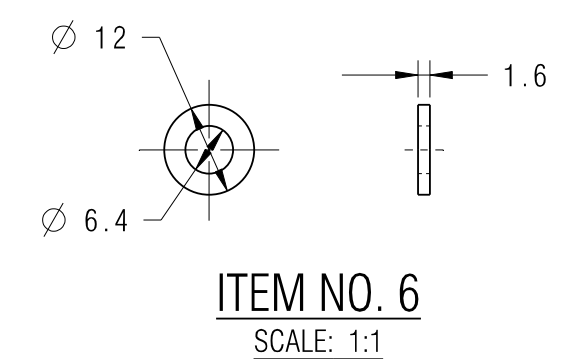
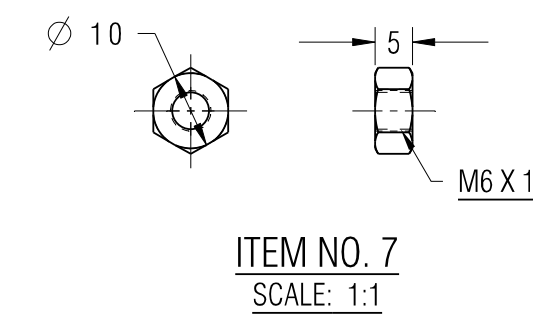
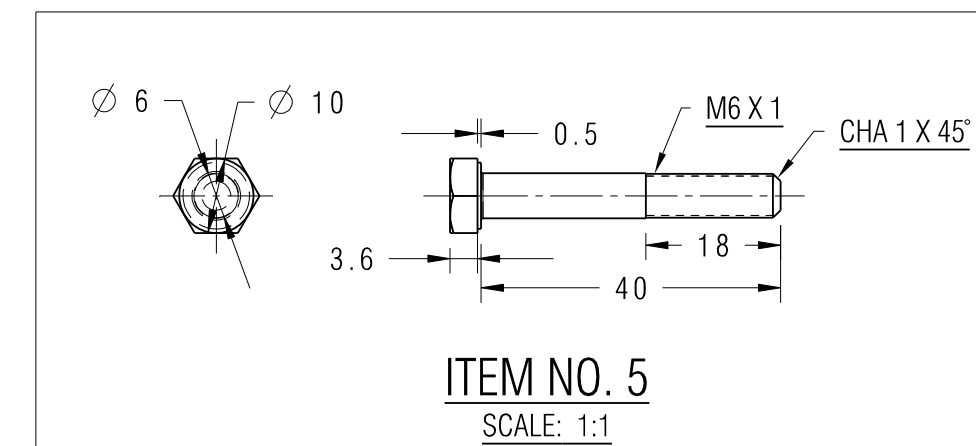
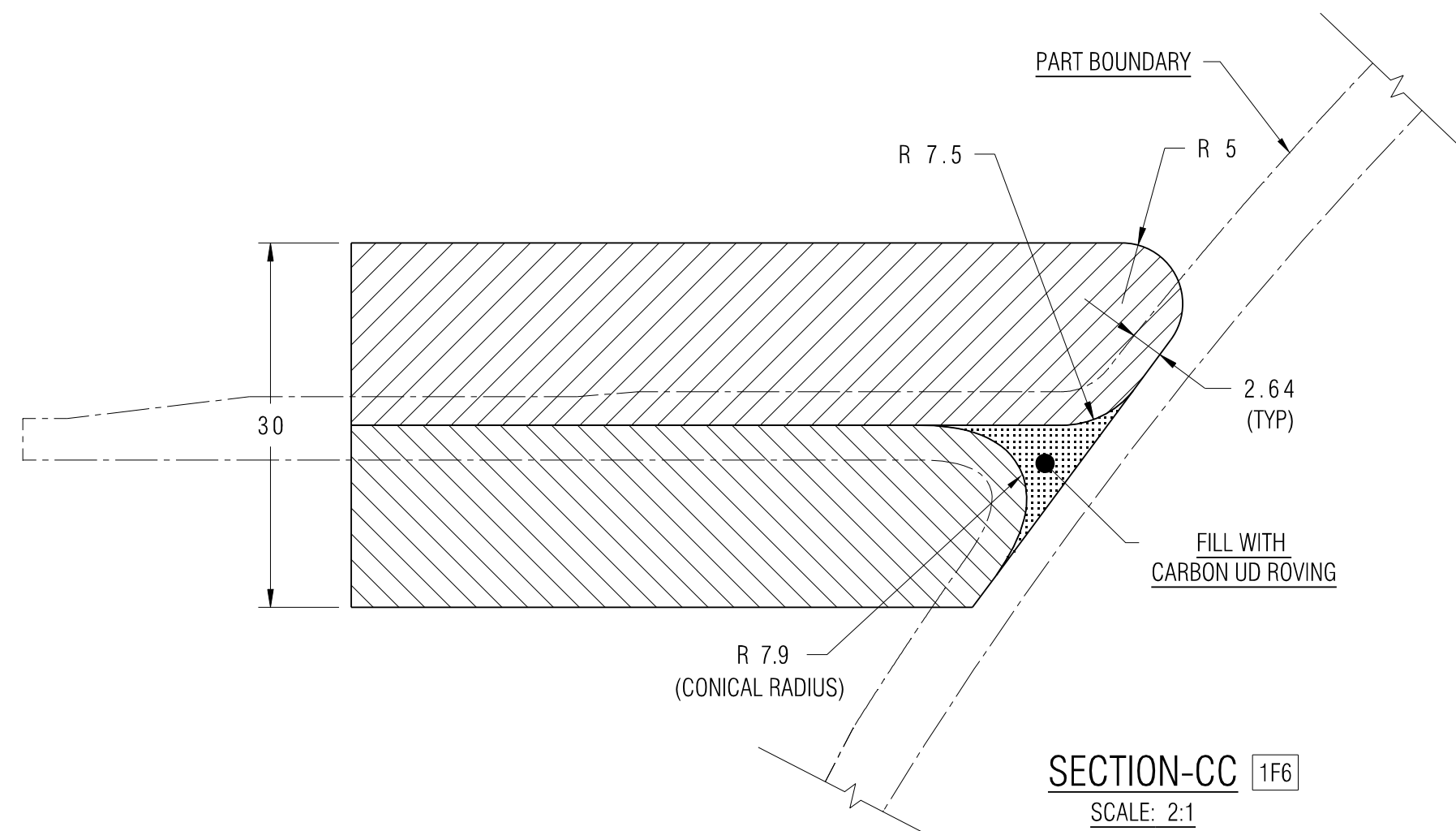
NOTE :

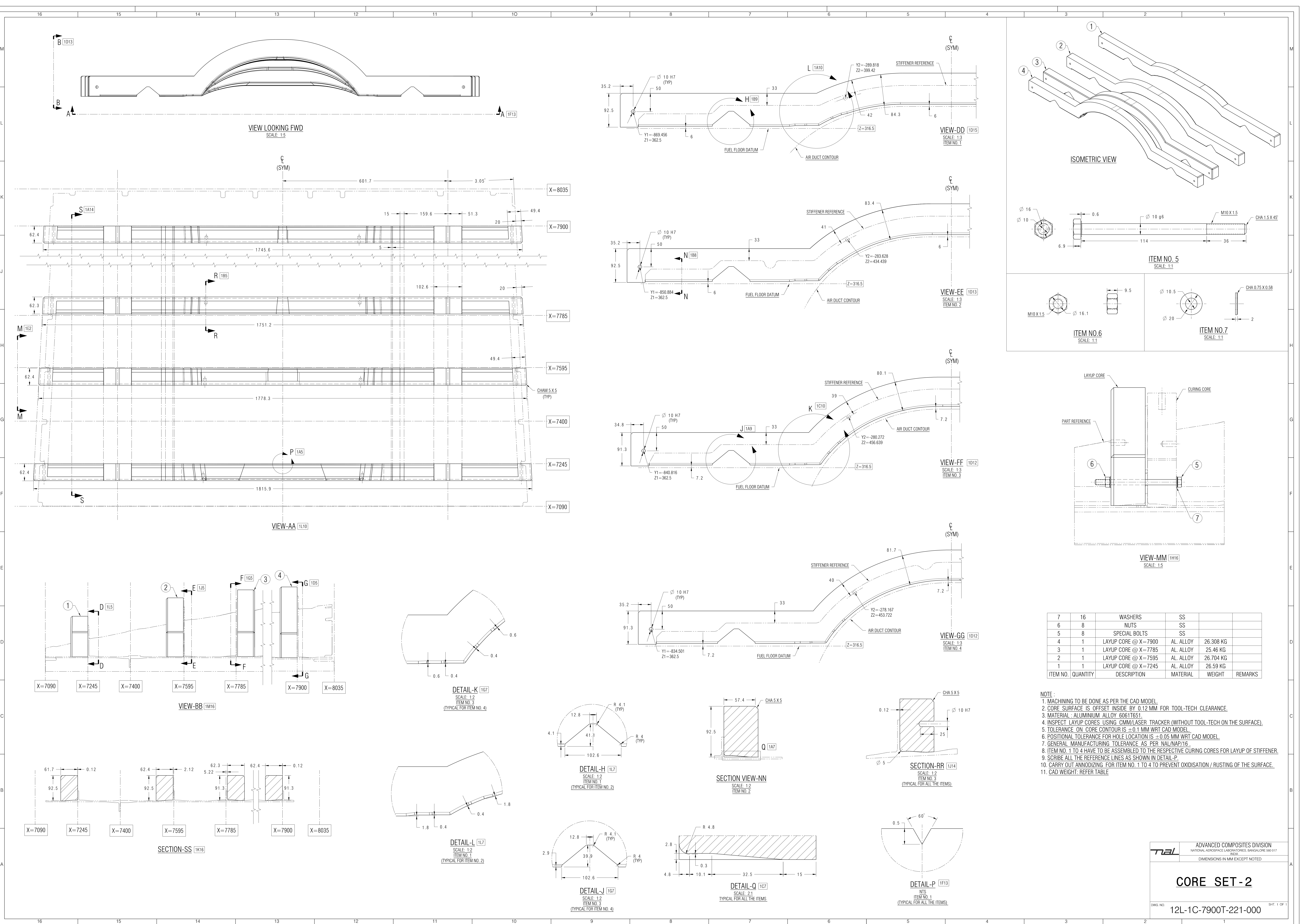
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
3. MATERIAL : ALUMINIUM ALLOY 6061T651.
4. INSPECT CURING CORES USING GMM/LASER WRITER (WITHOUT TOOL-TECH ON THE SURFACE).
5. TOLERANCE ON CORE CONTOUR IS ± 1MM WRT CAD MODEL.
6. TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM WRT CAD MODEL.
7. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
8. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-5.
9. CARRY OUT ANODIZING FOR ITEM NO. 1 TO 4 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.
10. CAD WEIGHT: REFER TABLE



- NOTES:
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. ASSEMBLE TOP & BOTTOM PLATES AS PER DRAWING USING M6 BOLTS & NUTS AS SHOWN IN SECTION VIEW-FF.
 3. MATERIAL : ALUMINIUM ALLOY 6061T651.
 4. FILL THE CAVITY WITH CARBON UD ROVING 5 MM STRIPS AS SHOWN IN SECTION-CC.
 5. REMOVE ANY EXCESS ROVING MATERIAL & LEVEL IT TO THE TOOL SURFACE.
 6. ITEM NO. 1 & 2 SHOWN AND ITEM NO. 3 & 4 ARE SYMMETRICAL.
 7. INSPECT THE TOOL USING CMM/LASER TRACKER.
 8. TOLERANCE FOR TOOL CONTOUR IS ± 0.2 MM.
 9. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
 10. CARRY OUT ANNOIDIZING FOR ITEM NO. 1 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.

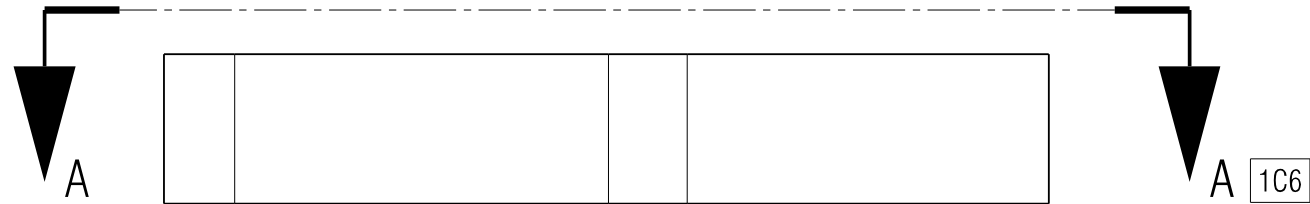
7	19	M6 NUT	STEEL		
6	38	M6 WASHER	STEEL		
5	19	M6 BOLT	STEEL		
4	1	BOTTOM PLATE-RH	AL.ALLOY	1.714 KG	SYM OF ITEM NO. 2
3	1	TOP PLATE-RH	AL.ALLOY	2.3 KG	SYM OF ITEM NO. 1
2	1	BOTTOM PLATE-LH	AL.ALLOY	1.714 KG	
1	1	TOP PLATE-LH	AL.ALLOY	2.3 KG	
ITEM NO.	NO. OFF	DESCRIPTION	MATERIAL	WEIGHT	REMARKS



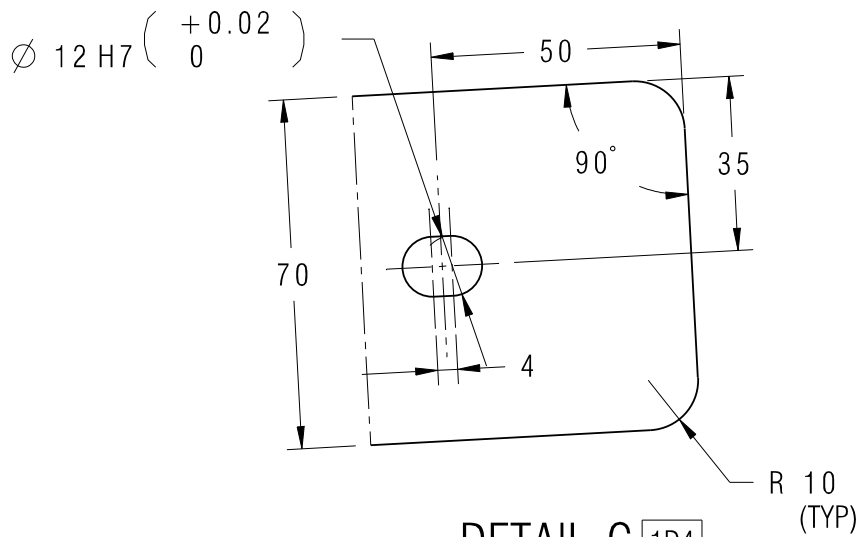


7	16	WASHERS	SS		
6	8	NUTS	SS		
5	8	SPECIAL BOLTS	SS		
4	1	LAYUP CORE @ X=7900	AL. ALLOY	26.308 KG	
3	1	LAYUP CORE @ X=7785	AL. ALLOY	25.46 KG	
2	1	LAYUP CORE @ X=7595	AL. ALLOY	26.704 KG	
1	1	LAYUP CORE @ X=7245	AL. ALLOY	26.59 KG	
ITEM NO.	QUANTITY	DESCRIPTION	MATERIAL	WEIGHT	REMARKS

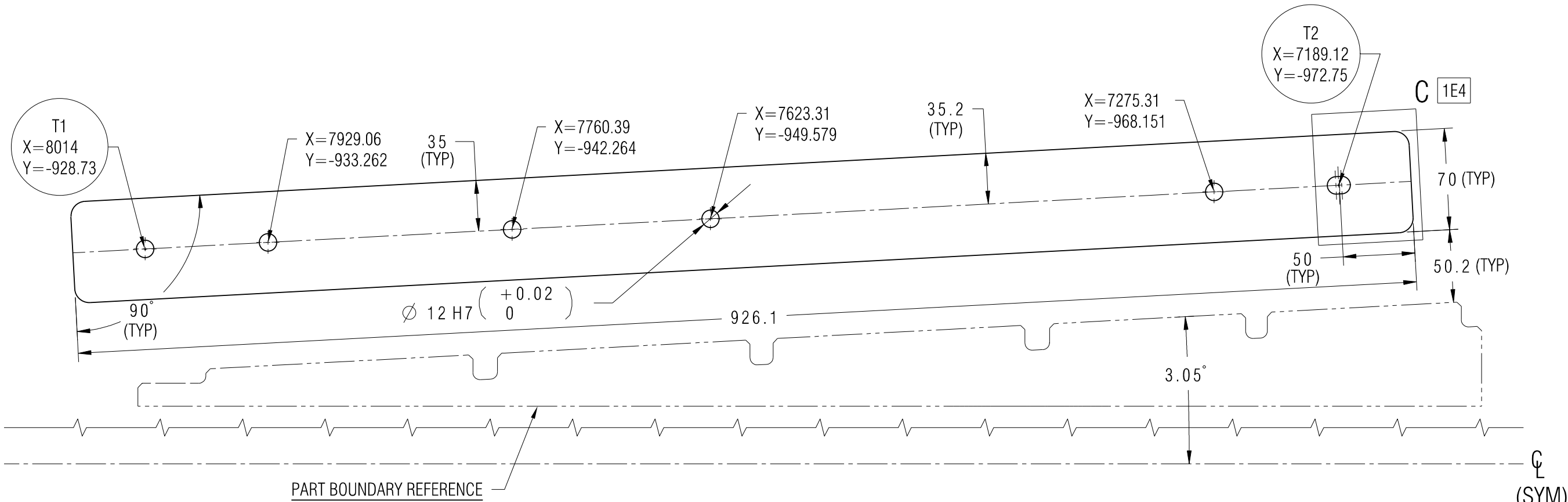
- NOTE :
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
 3. MATERIAL : ALUMINIUM ALLOY 6061T651.
 4. INSPECT LAYUP CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
 5. TOLERANCE ON CORE CONTOUR IS ± 0.1 MM WRT CAD MODEL.
 6. POSITIONAL TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM WRT CAD MODEL.
 7. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
 8. ITEM NO. 1 TO 4 HAVE TO BE ASSEMBLED TO THE RESPECTIVE CURING CORES FOR LAYUP OF STIFFENER.
 9. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-P.
 10. CARRY OUT ANNOIDIZING FOR ITEM NO. 1 TO 4 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.
 11. CAD WEIGHT: REFER TABLE



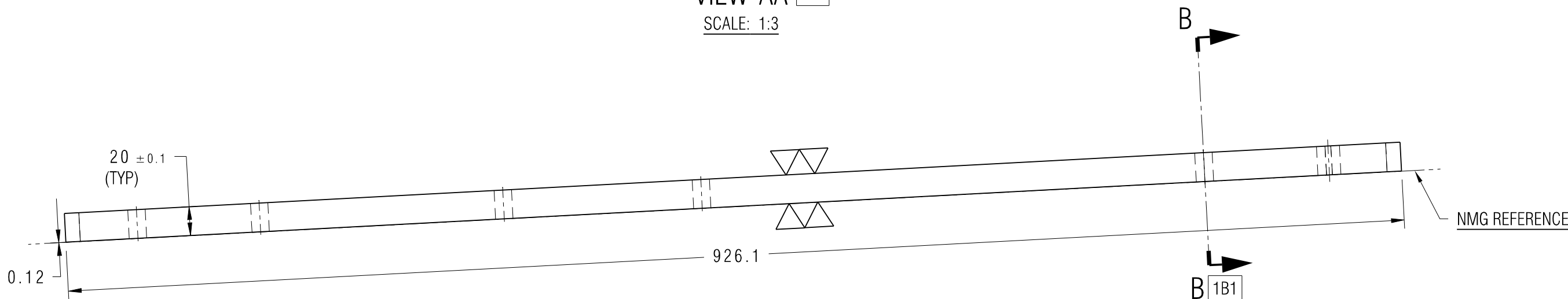
VIEW LOOKING FWD
SCALE: 1:1



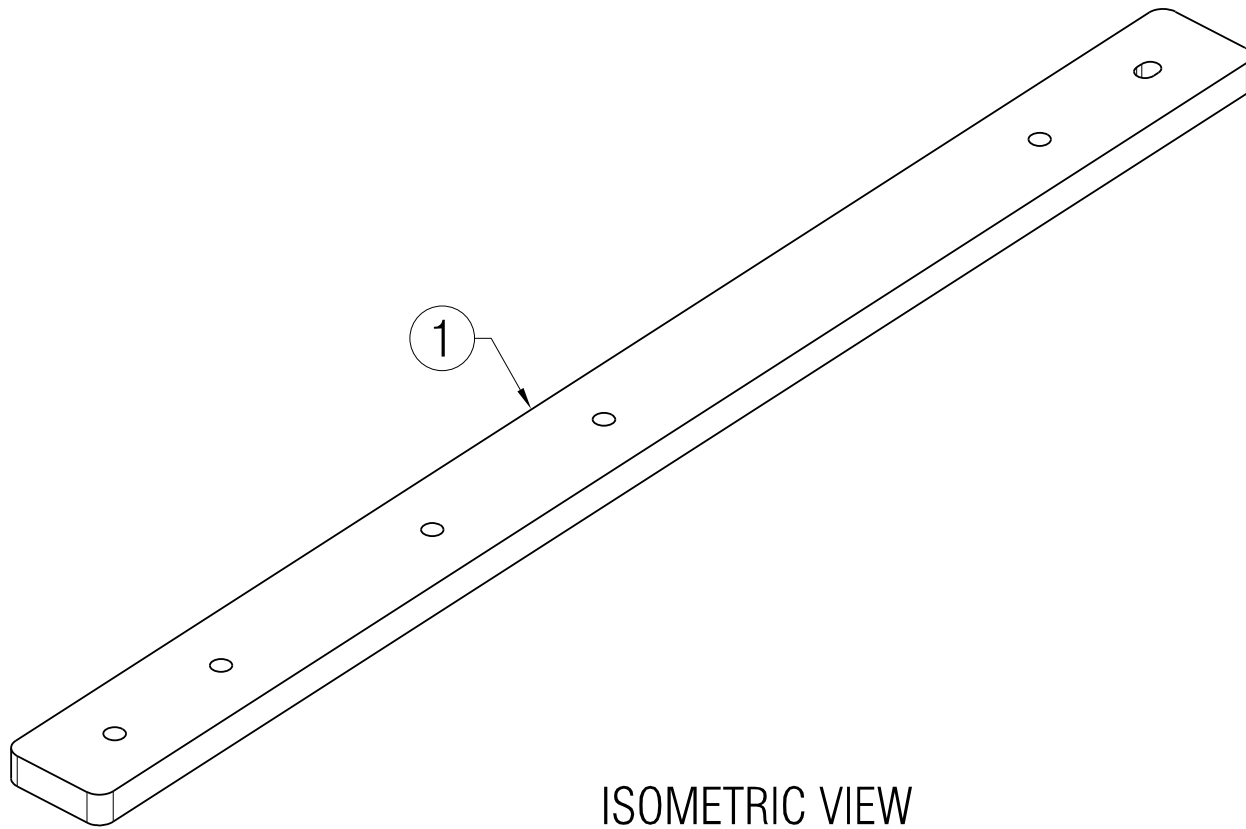
DETAIL-C 1D4
SCALE: 2:3



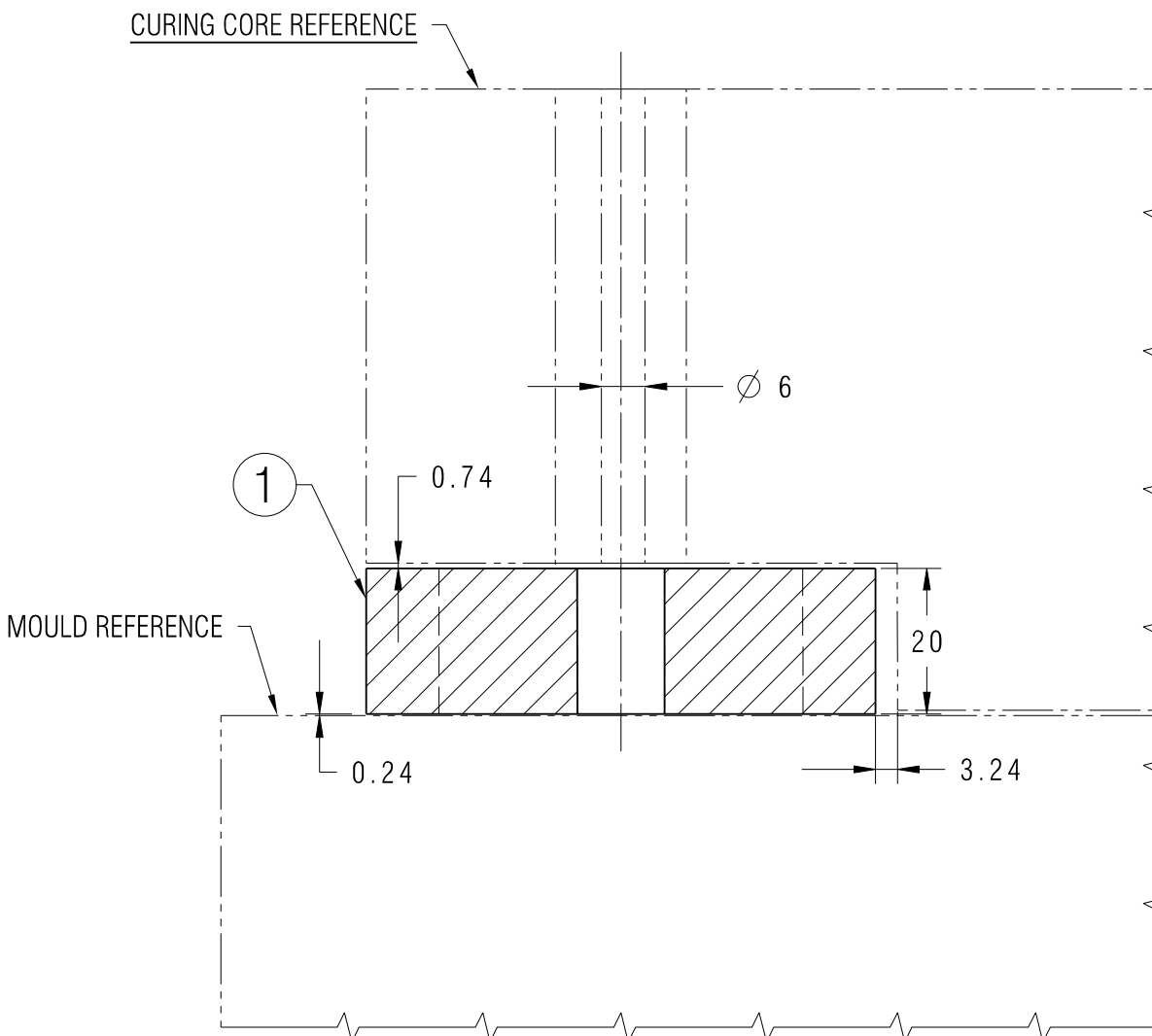
VIEW-AA 1F6
SCALE: 1:3



AUXILIARY VIEW
SCALE: 1:3



ISOMETRIC VIEW



SECTION VIEW-BB 1B4
SCALE: 1:1

- NOTE :
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. MATERIAL : MILD STEEL.
 3. DRILL THE HOLES AT T1 & T2 TO MATCH WITH TOOLING HOLES OF MAIN TOOL FOR TROUSER DUCT AFT.
 4. INSPECT USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
 5. TOLERANCE ON LENGTH & WIDTH IS ±0.5 MM WRT CAD MODEL.
 6. TOLERANCE FOR HOLE LOCATION IS ±0.05 MM WRT CAD MODEL.
 7. CARRY OUT BLACKENING OF SURFACE AFTER THE MACHINING.
 8. ITEM NO. 1 IS SHOWN & FOR ITEM NO. 2 IS SAME.
 9. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
 10. CAD WEIGHT : 10.063 KG.

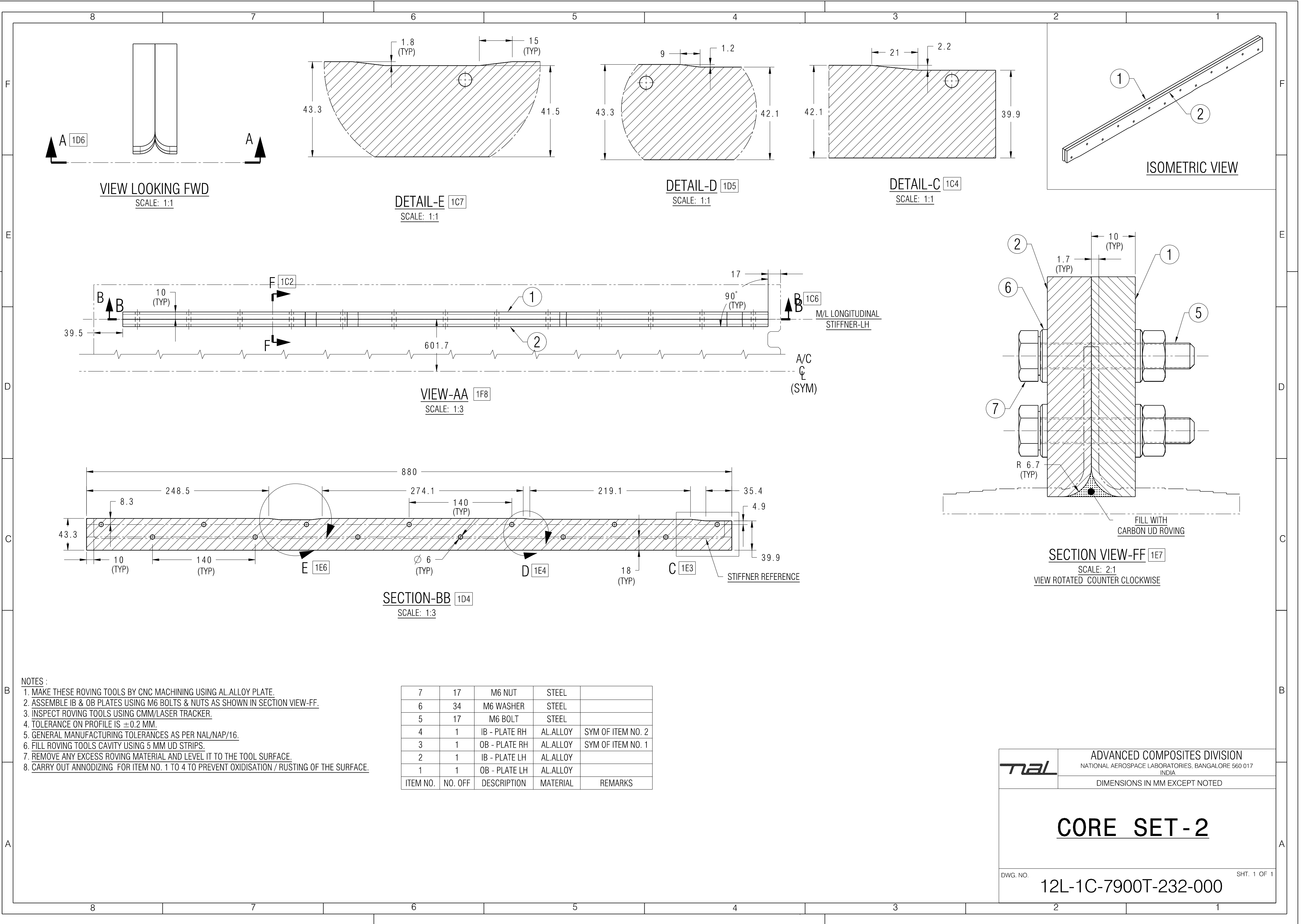
1	2	LOCATING PLATE-LH	MS	ITEM NO. 2 IS SAME
ITEM NO.	NO.OFF	DESCRIPTION	MATERIAL	REMARKS

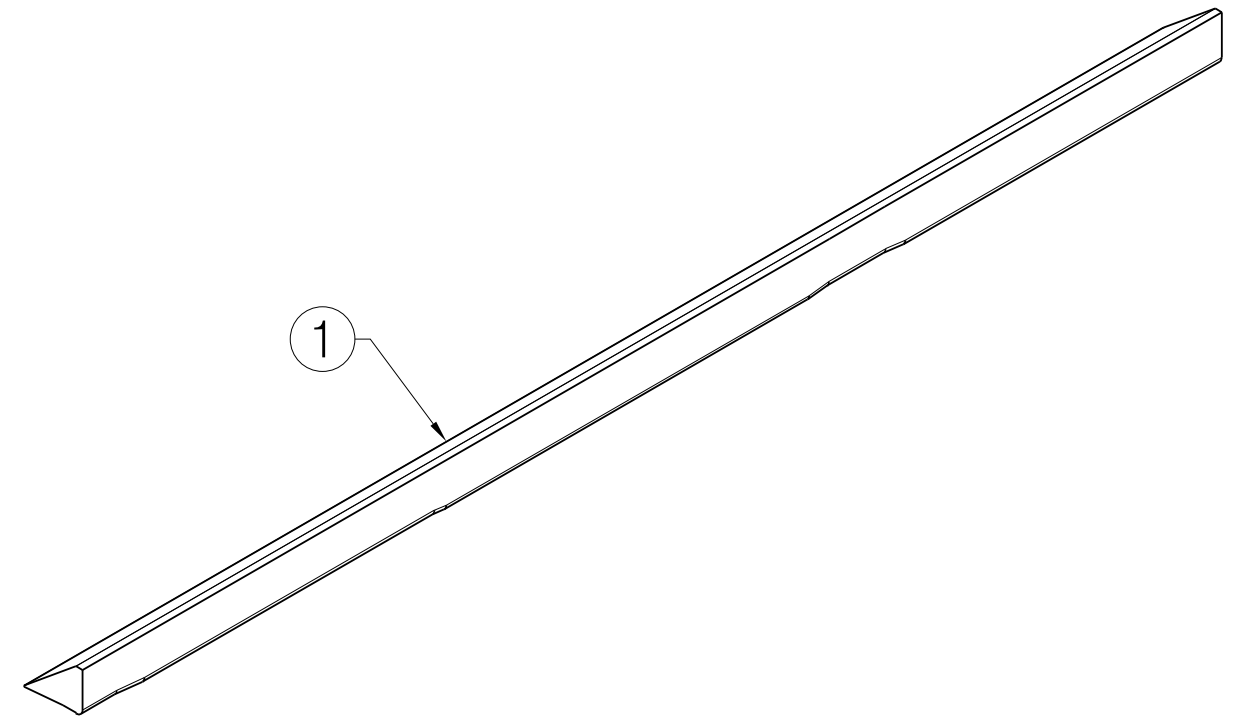
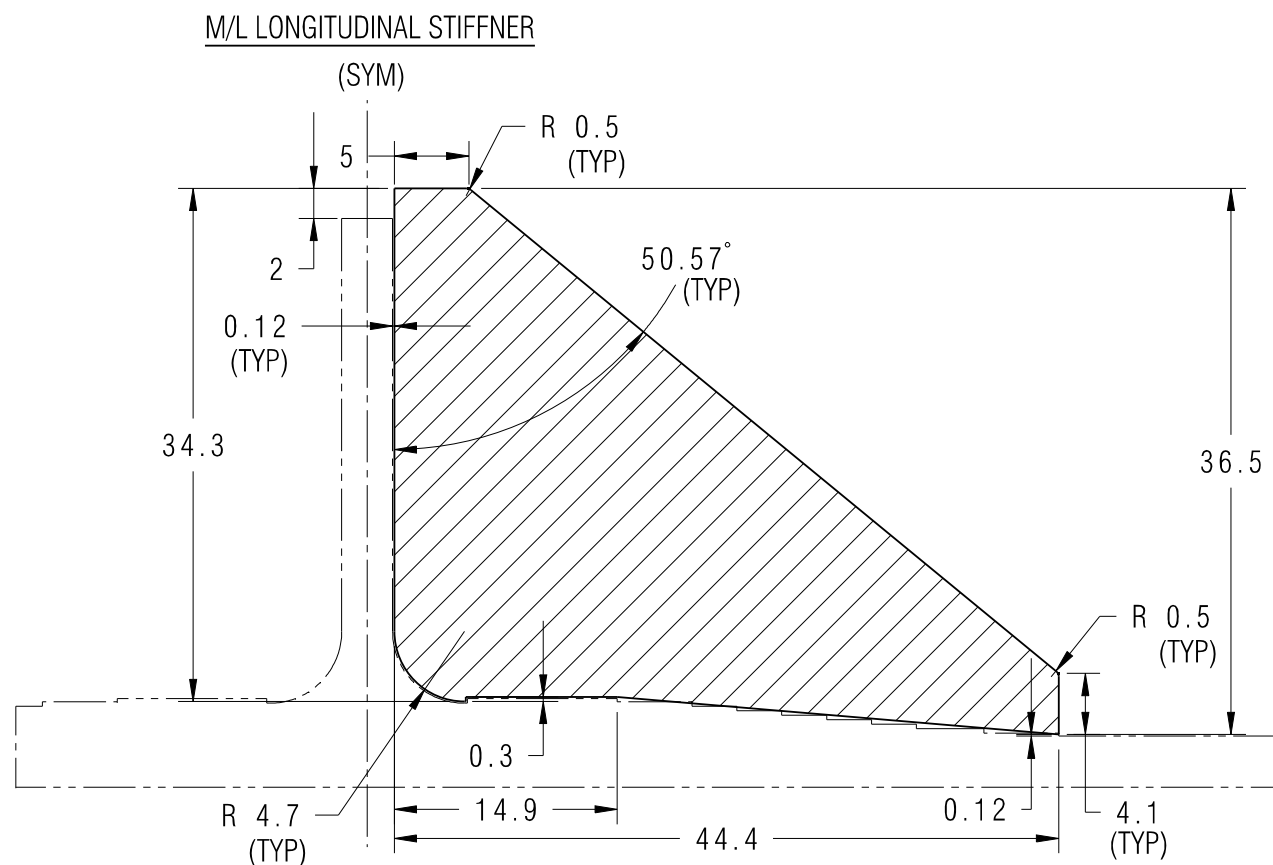
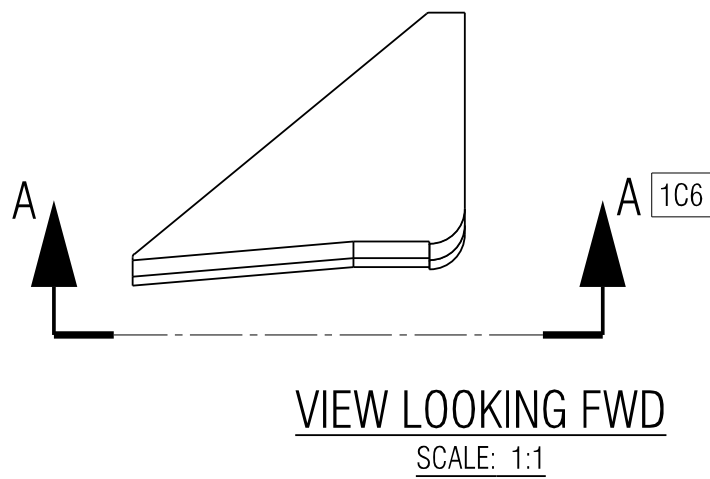


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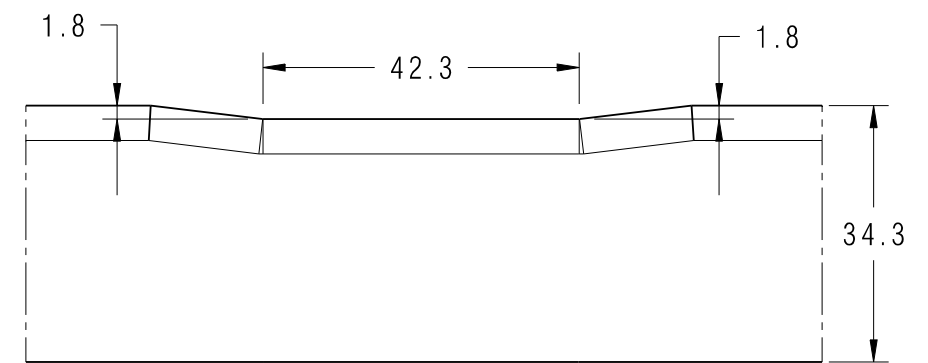
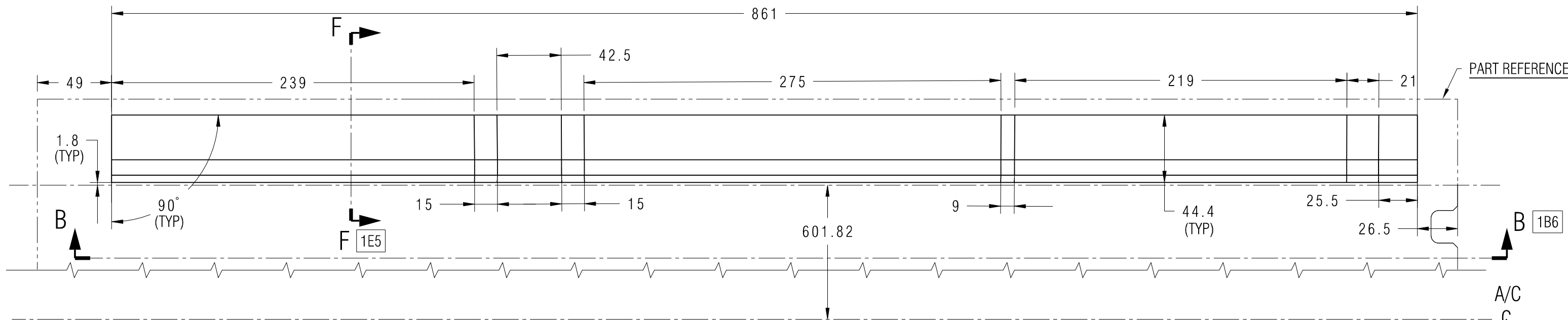
CORE SET - 2

DWG. NO. 12L-1C-7900T-240-000 SHT. 1 OF 1

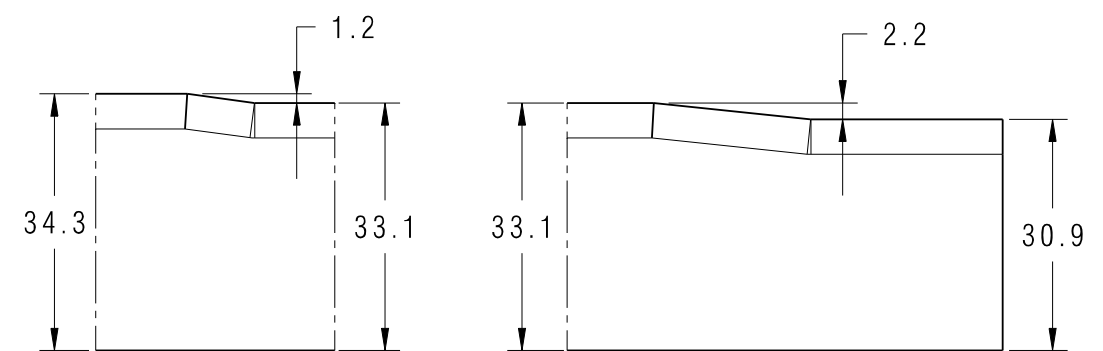




SECTION-AA 1E7
SCALE: 2:5

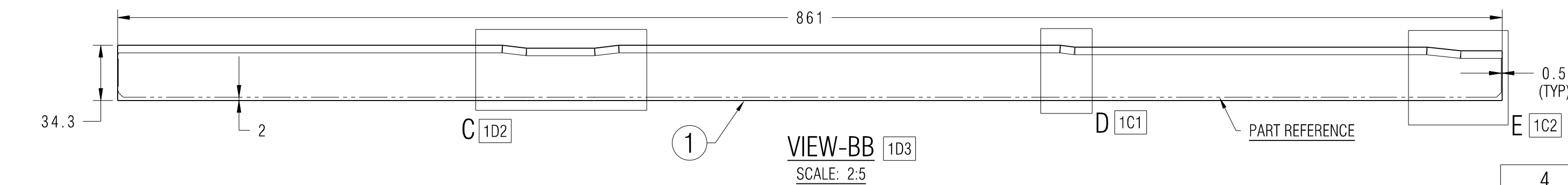


DETAIL-C 1B7
SCALE: 1:1



DETAIL-D 1B5
SCALE: 1:1

DETAIL-E 1B3
SCALE: 1:1



VIEW-AA 1E7
SCALE: 2:5

- NOTE:
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. CORE SURFACE IS OFFSET BY 0.12MM FOR TOOL TECH CLEARANCE.
 3. MATERIAL : ALUMINIUM ALLOY 6061T657.
 4. INSPECT USING CMM/LASER TRACKER.
 5. TOLERANCE FOR ALL LENGTH DIMENSIONS ARE ± 0.5 MM.
 6. TOLERANCE ON TOOL CONTOUR IS ± 0.2 MM.
 7. ITEM NO. 1 IS SHOWN, ITEM NO. 2 & 3 ARE SYMMETRICAL AND ITEM NO. 4 IS SAME AS ITEM NO. 1.
 8. CARRY OUT ANNOIDIZING FOR ITEM NO. 1 TO 9 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.
 9. CAD WEIGHT: REFER TABLE.

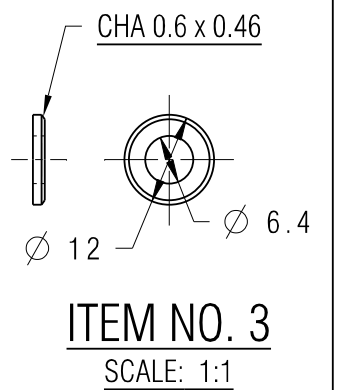
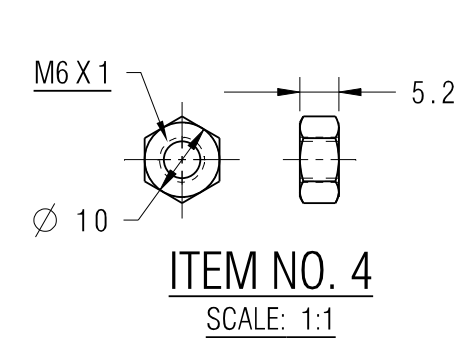
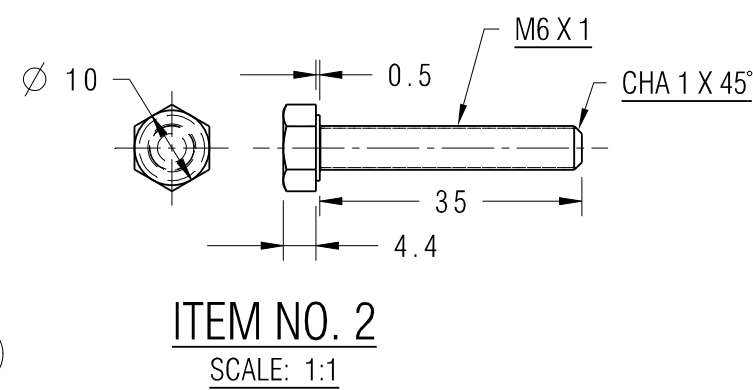
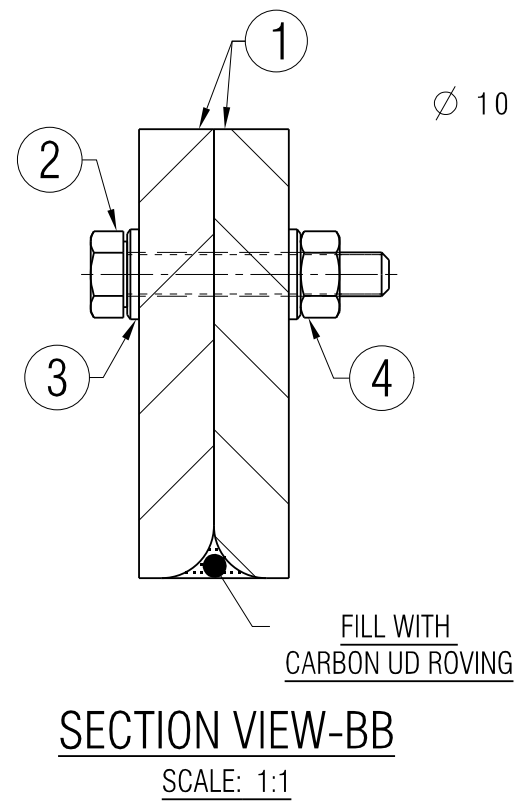
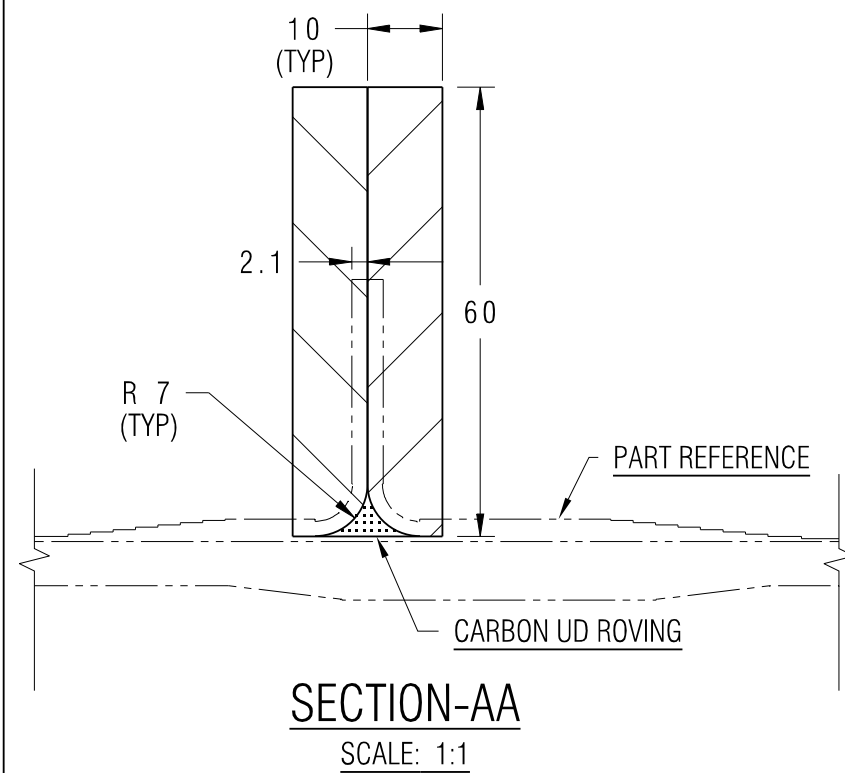
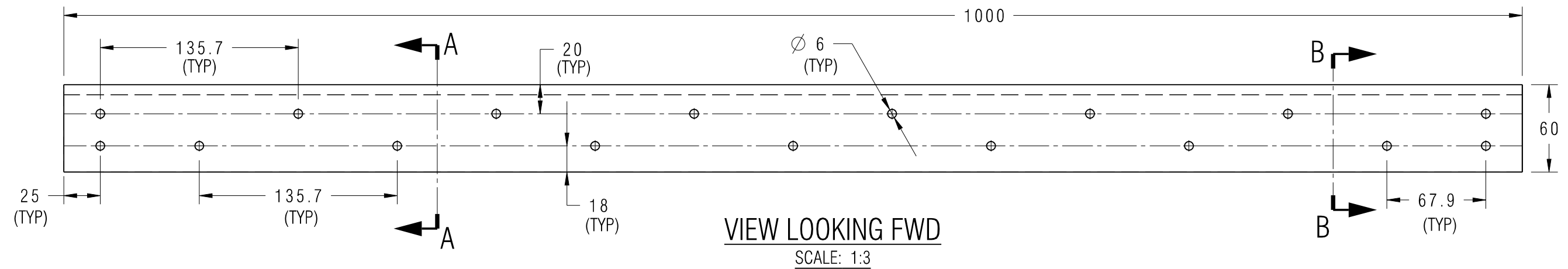
4	1	CORE-I/B RH			SAME AS ITEM NO. 1
3	1	CORE-O/B RH			SYM OF ITEM NO. 1
2	1	CORE-I/B LH	AL.ALLOY	2.046 KG	SYM OF ITEM NO. 1
1	1	CORE-O/B LH	AL.ALLOY	2.046 KG	
ITEM NO.	QUANTITY	DESCRIPTION	MATERIAL	WEIGHT	REMARKS



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INDIA
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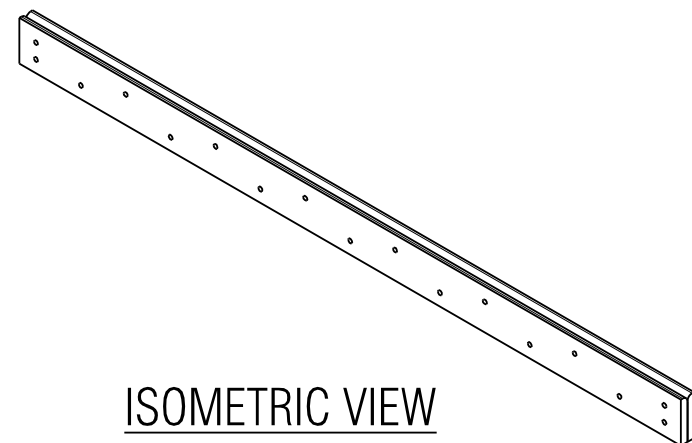
CORE SET - 2

DWG. NO. 12L-1C-7900T-223-000SHT. 1 OF 1

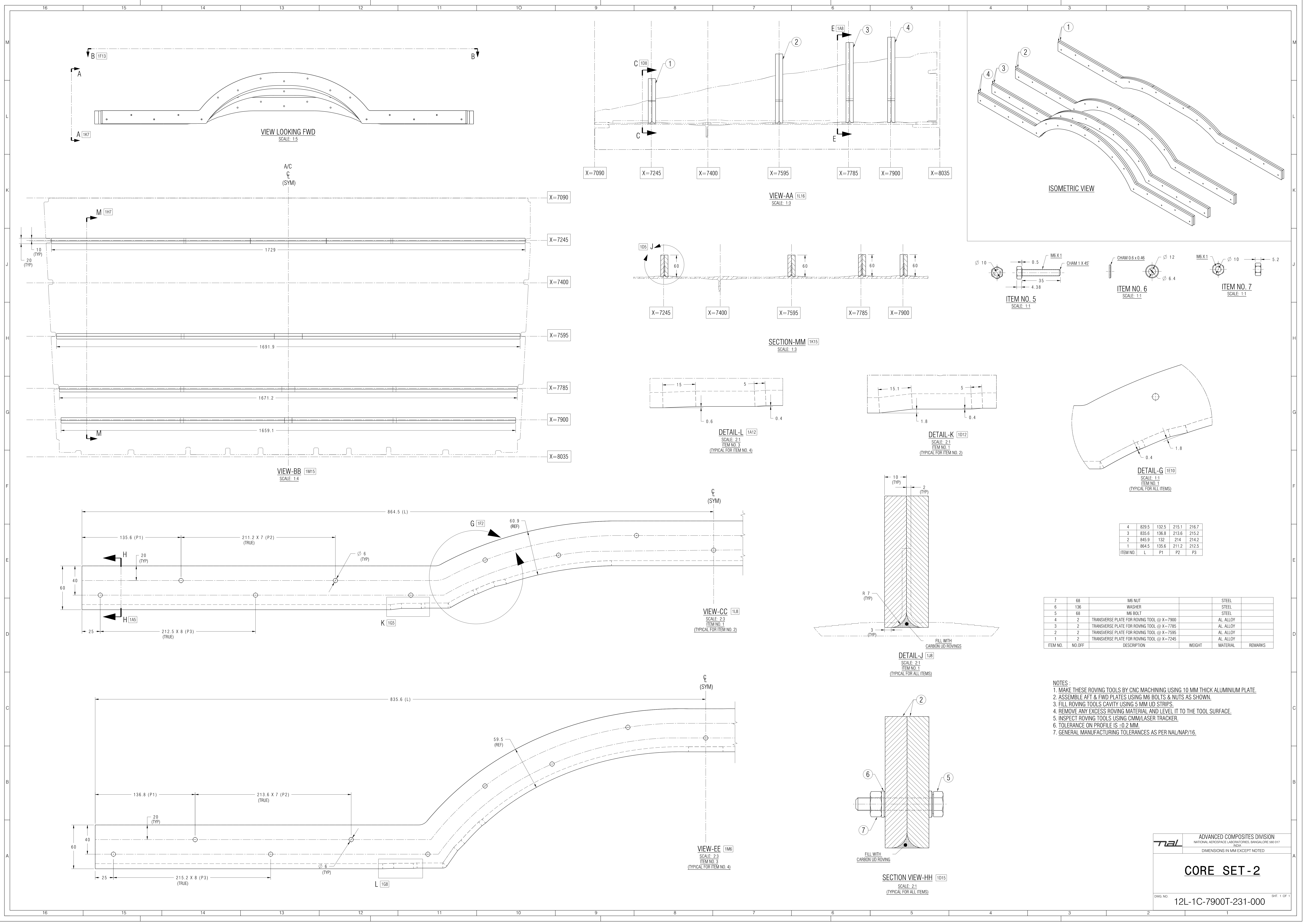


- NOTES :
1. MAKE THESE ROVING TOOL BY CNC MACHINING USING 10 MM THICK ALUMINIUM PLATE.
 2. ASSEMBLE AFT & FWD PLATES USING M6 BOLTS & NUTS AS SHOWN.
 3. FILL ROVING TOOL CAVITY USING 5 MM UD STRIPS.
 4. REMOVE ANY EXCESS ROVING MATERIAL AND LEVEL IT TO THE TOOL SURFACE.
 5. INSPECT ROVING TOOL USING CMM/LASER TRACKER.
 6. TOLERANCE ON PROFILE IS ± 0.2 MM.
 7. GENERAL MANUFACTURING TOLERANCES AS PER NAL/NAP/16.

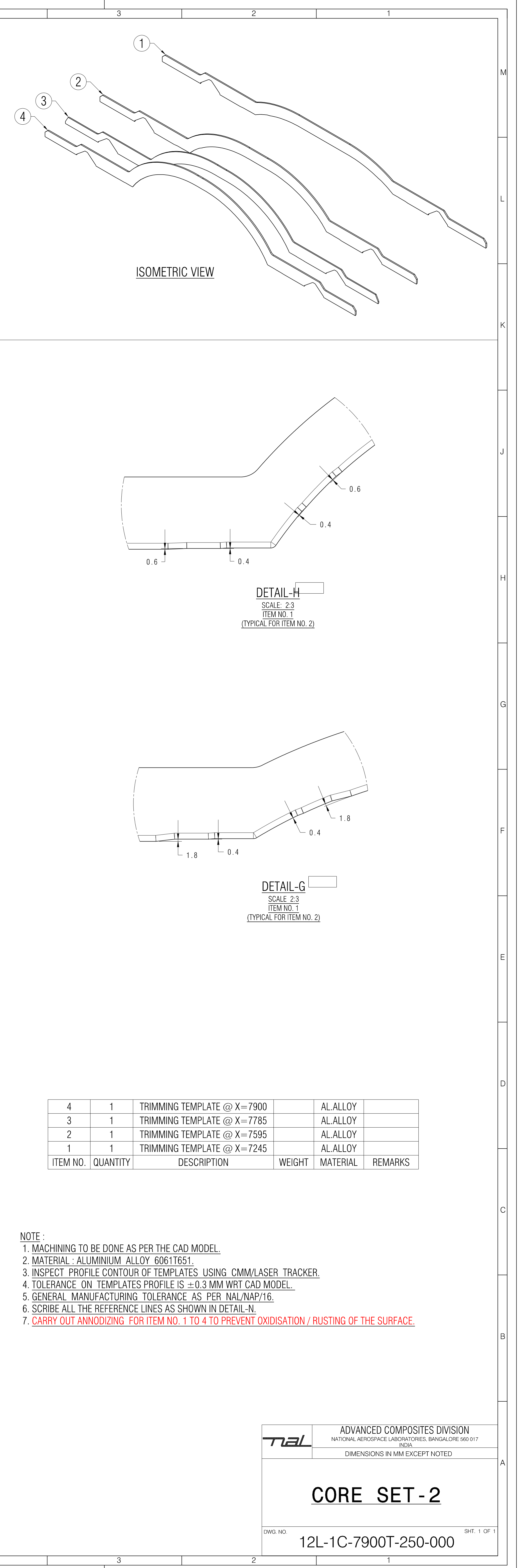
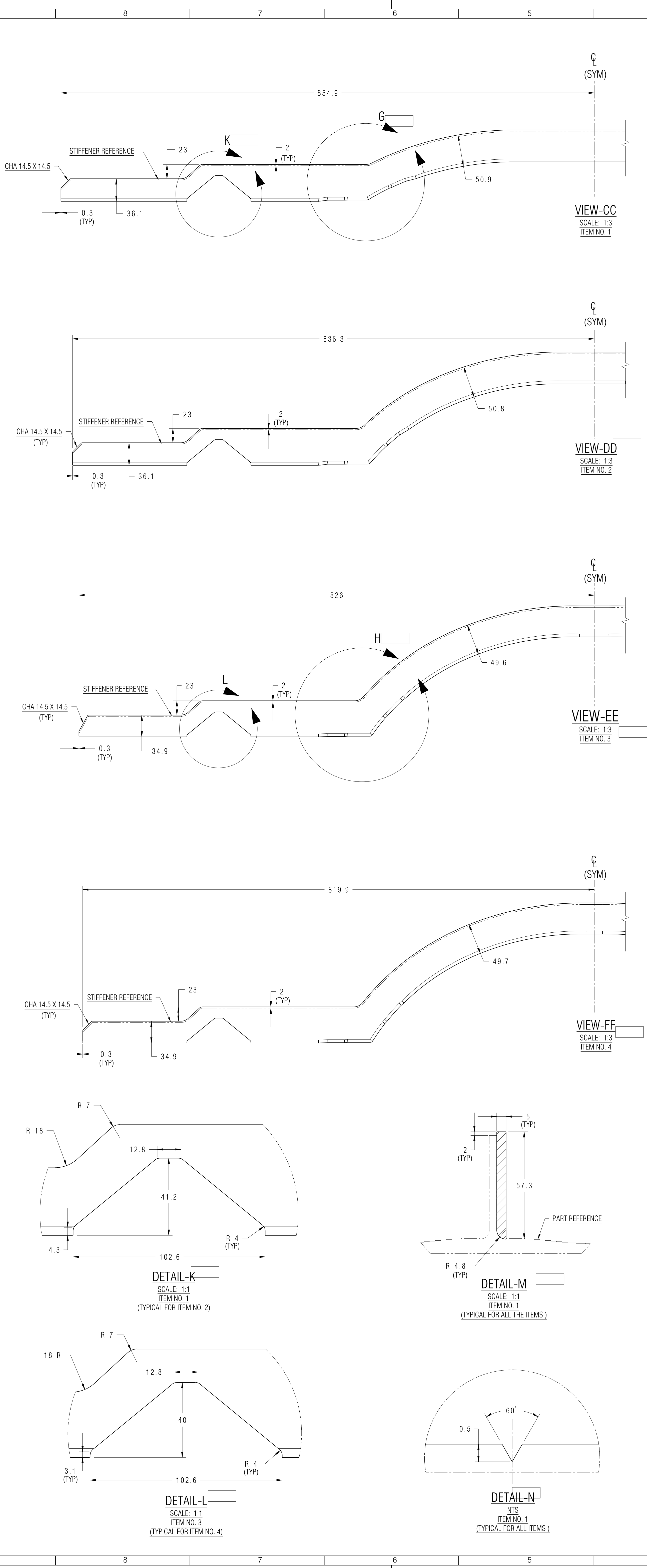
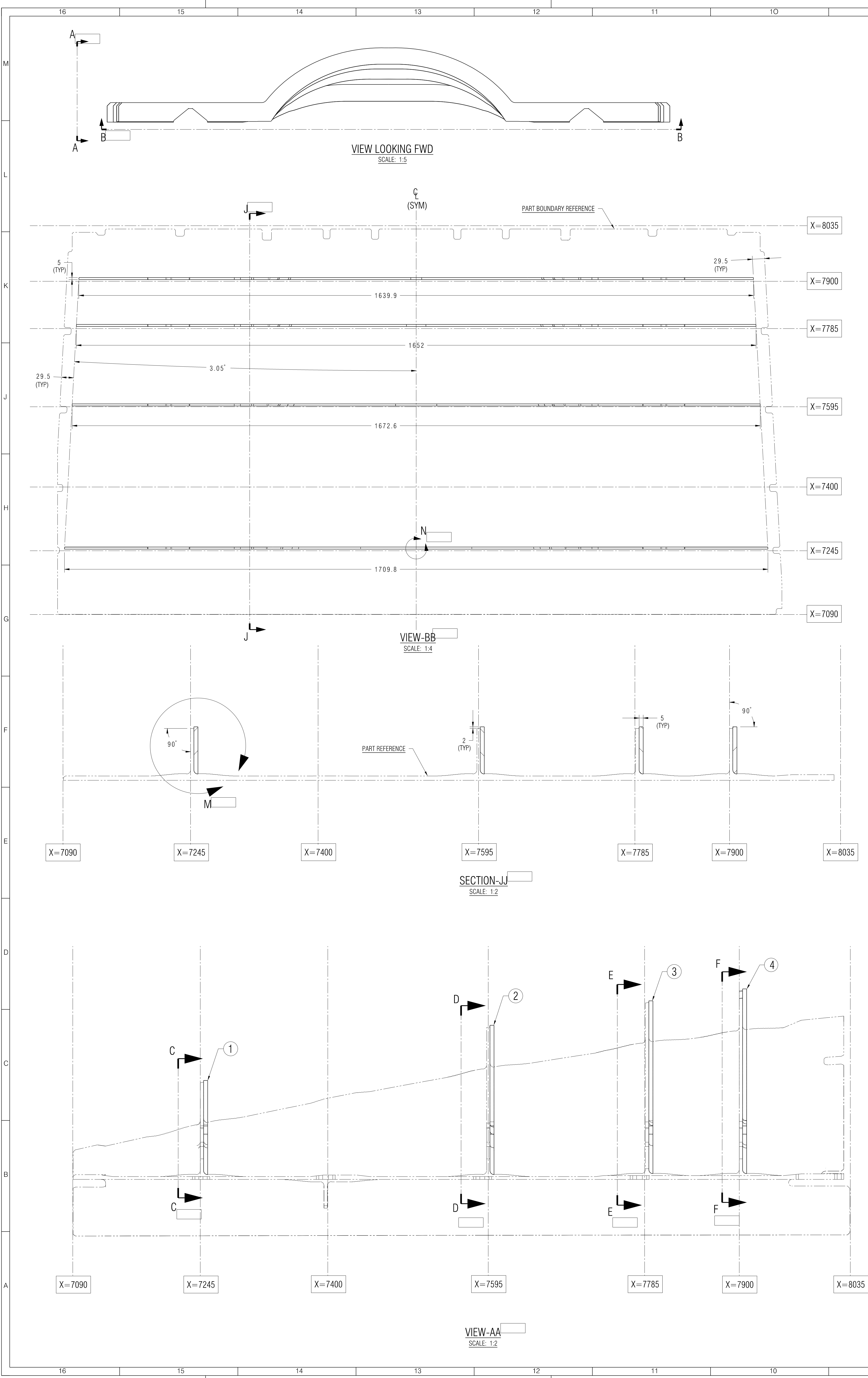
4	17	M6 NUT		STEEL	
3	34	WASHER		STEEL	
2	17	M6 BOLT		STEEL	
1	2	CO-BONDING ROVING TOOL		AL. ALLOY	
ITEM NO.	NO.OFF	DESCRIPTION	WEIGHT	MATERIAL	REMARKS



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	DIMENSIONS IN MM EXCEPT NOTED
CORE SET - 2	
DWG. NO.	SHT. 1 OF 1
12L-1C-7900T-261-000	

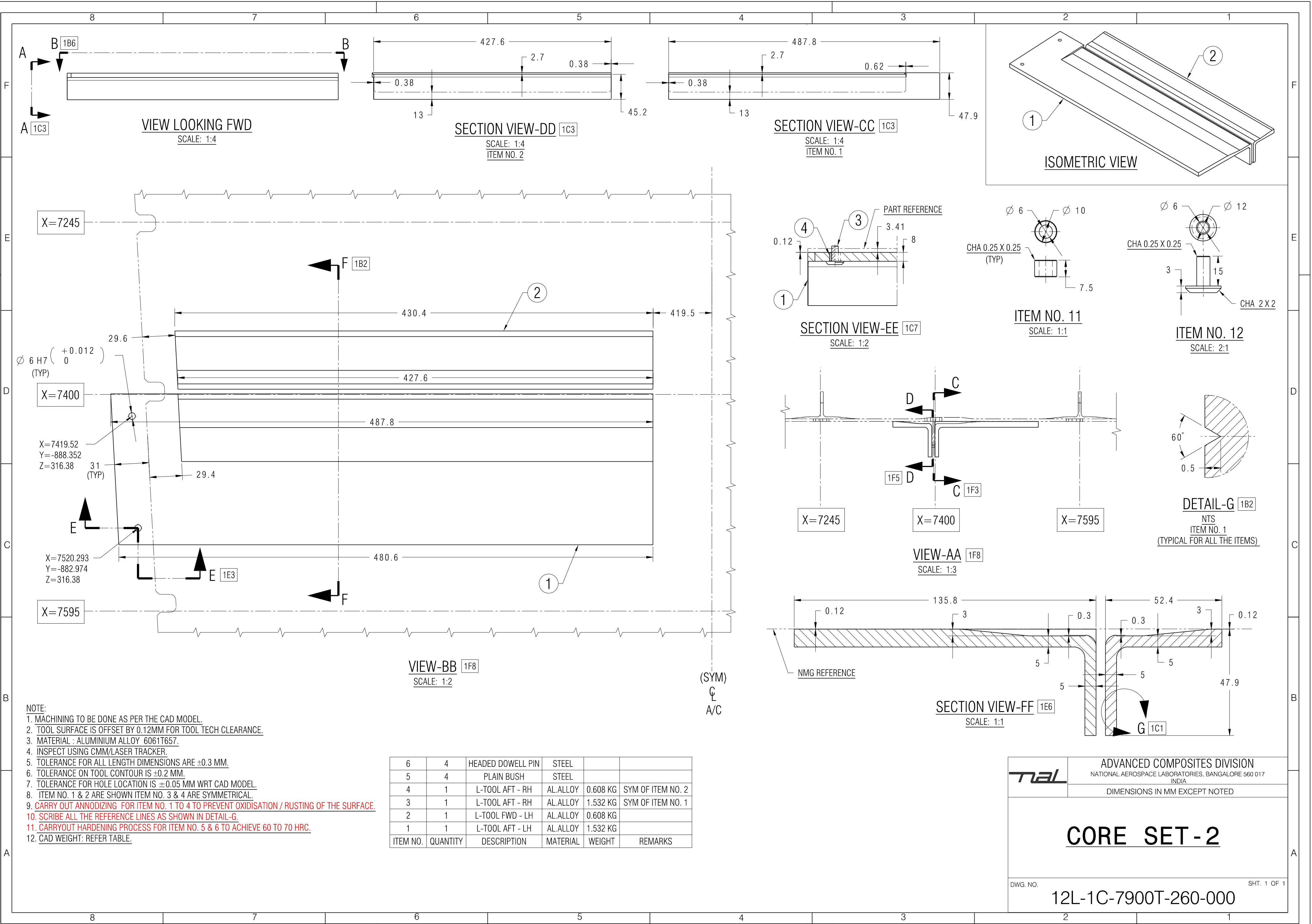


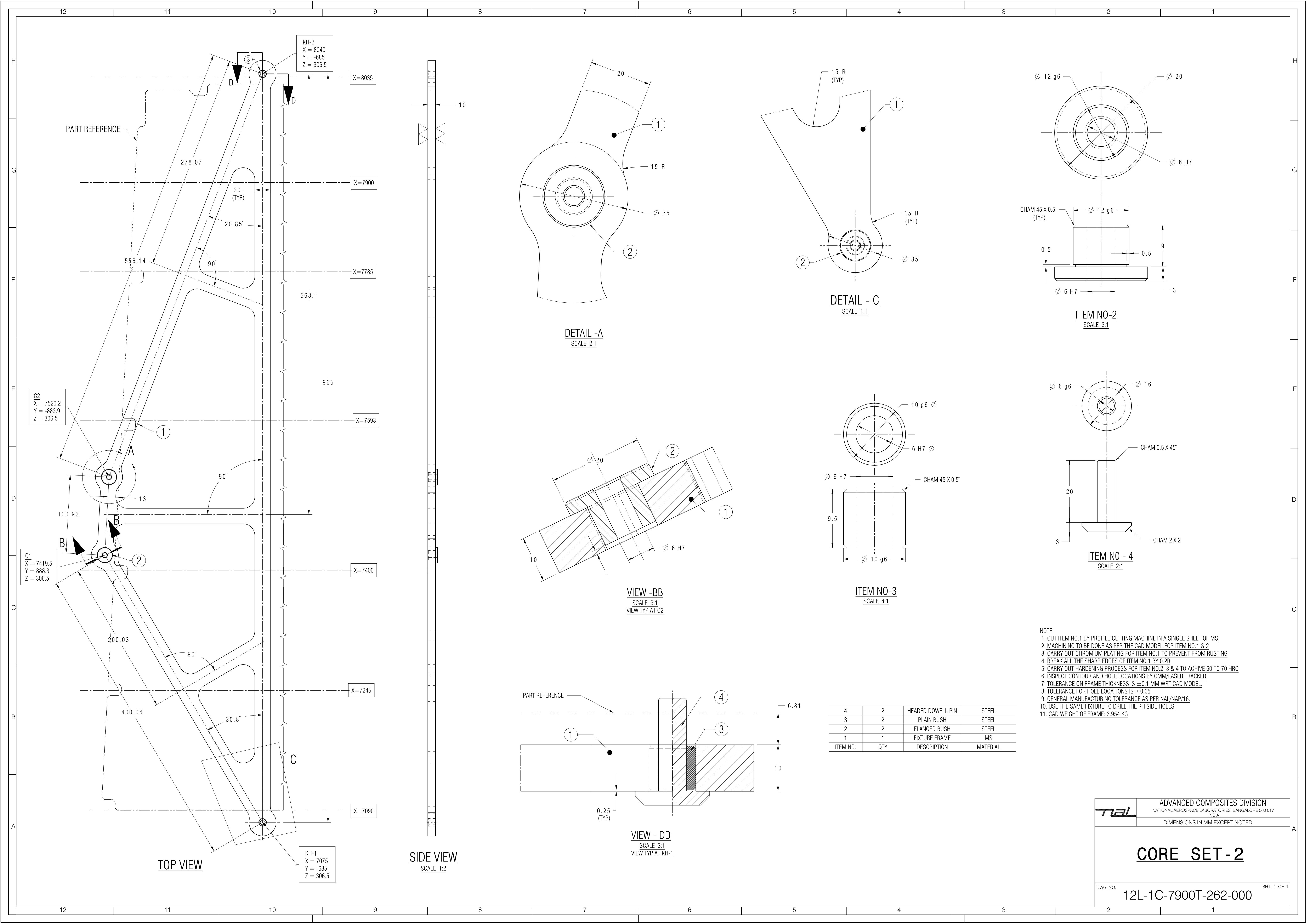
NOTES :
1. MAKE THESE ROVING TOOLS BY CNC MACHINING USING 10 MM THICK ALUMINIUM PLATE.
2. ASSEMBLE AFT & FWD PLATES USING M6 BOLTS & NUTS AS SHOWN.
3. FILL ROVING TOOLS CAVITY USING 5 MM UD STRIPS.
4. REMOVE ANY EXCESS ROVING MATERIAL AND LEVEL IT TO THE TOOL SURFACE.
5. INSPECT ROVING TOOLS USING CMM/LASER TRACKER.
6. TOLERANCE ON PROFILE IS ± 0.2 MM.
7. GENERAL MANUFACTURING TOLERANCES AS PER NAL/NAP/16.

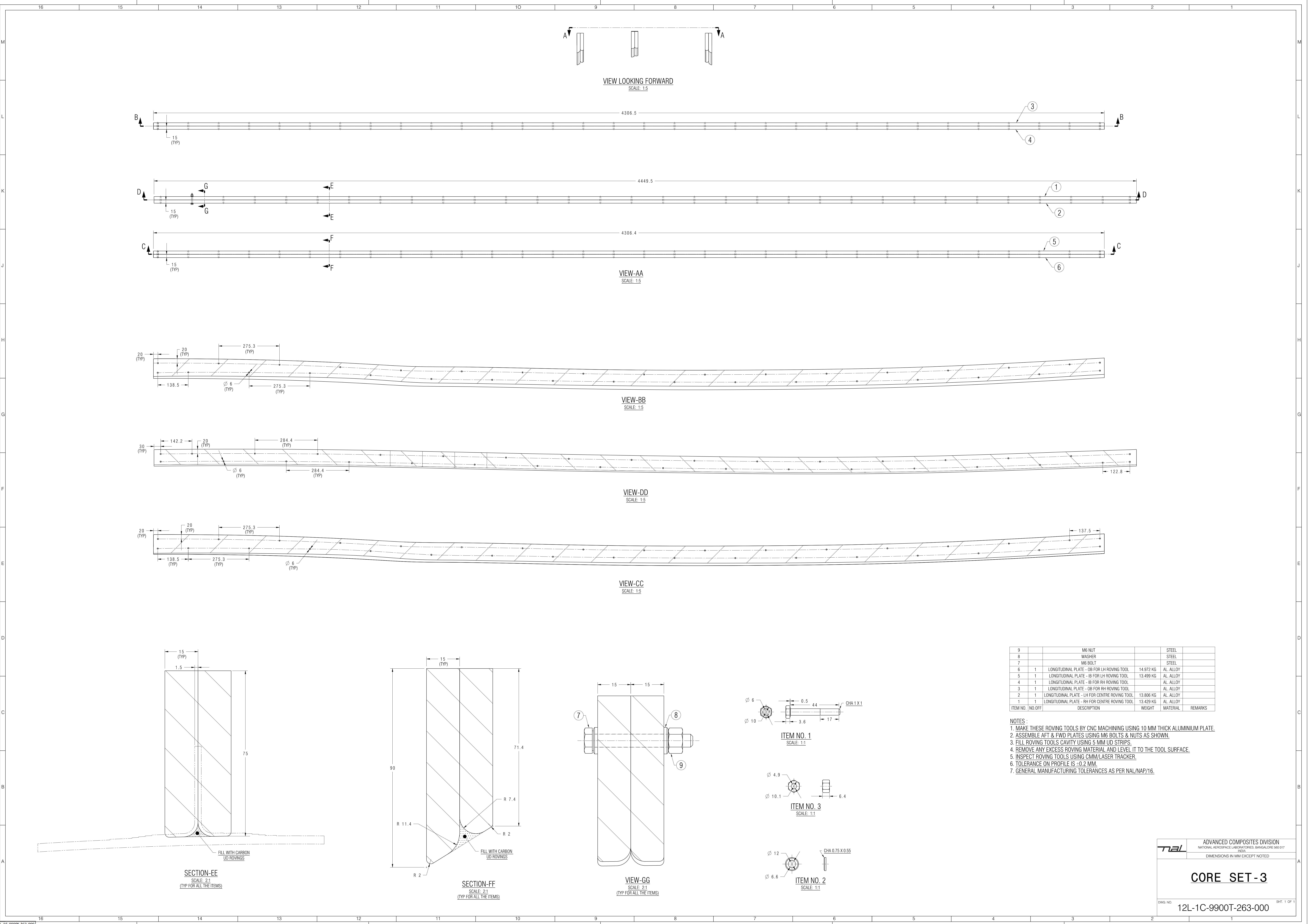


4	1	TRIMMING TEMPLATE @ X=7900		AL ALLOY	
3	1	TRIMMING TEMPLATE @ X=7785		AL ALLOY	
2	1	TRIMMING TEMPLATE @ X=7595		AL ALLOY	
1	1	TRIMMING TEMPLATE @ X=7245		AL ALLOY	
ITEM NO.	QUANTITY	DESCRIPTION	WEIGHT	MATERIAL	REMARKS

NOTE :
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
2. MATERIAL : ALUMINIUM ALLOY 6061T651.
3. INSPECT PROFILE CONTOUR OF TEMPLATES USING CMM/LASER TRACKER.
4. TOLERANCE ON TEMPLATES PROFILE IS ± 0.3 MM WRT CAD MODEL.
5. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
6. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-N.
7. CARRY OUT ANNOIDIZING FOR ITEM NO. 1 TO 4 TO PREVENT OXIDISATION / RUSTING OF THE SURFACE.

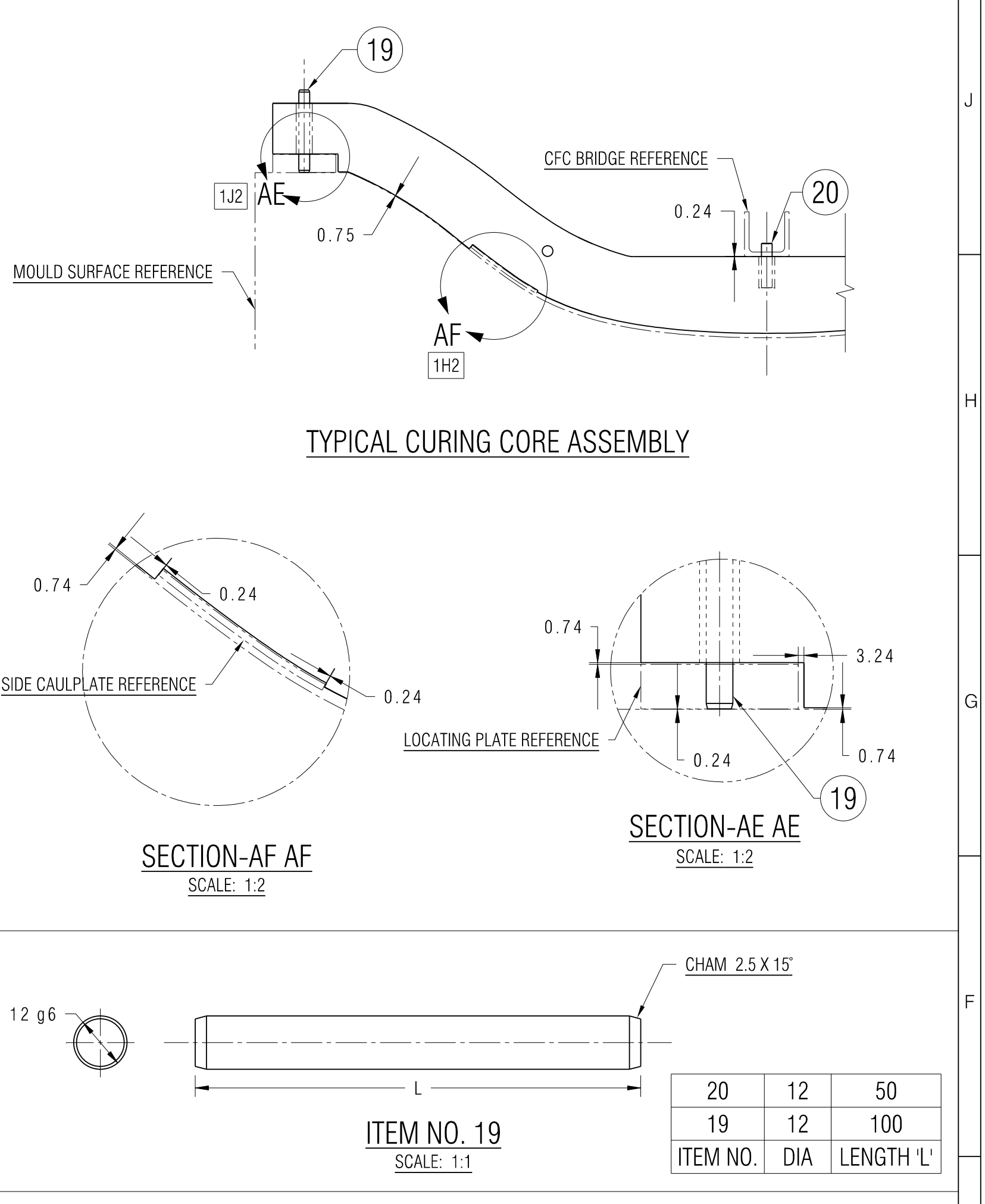
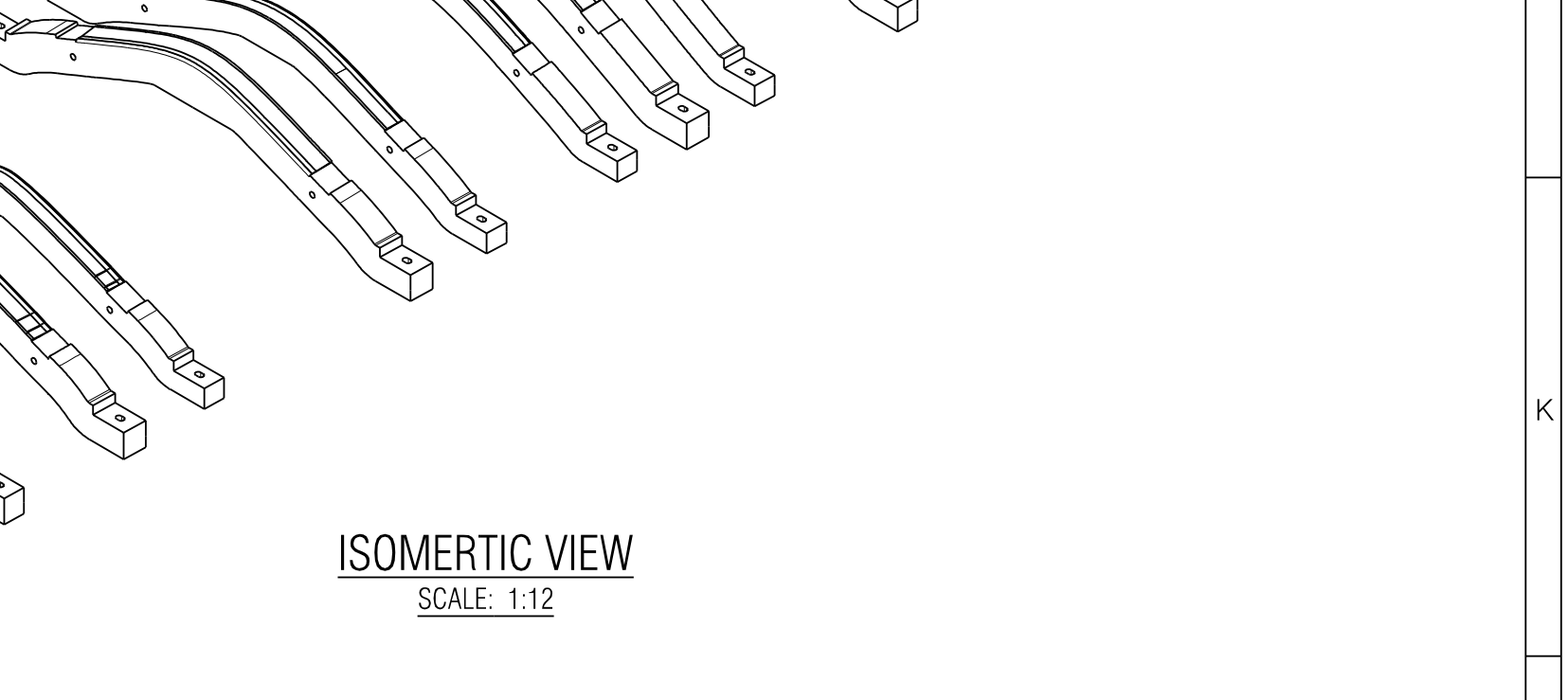
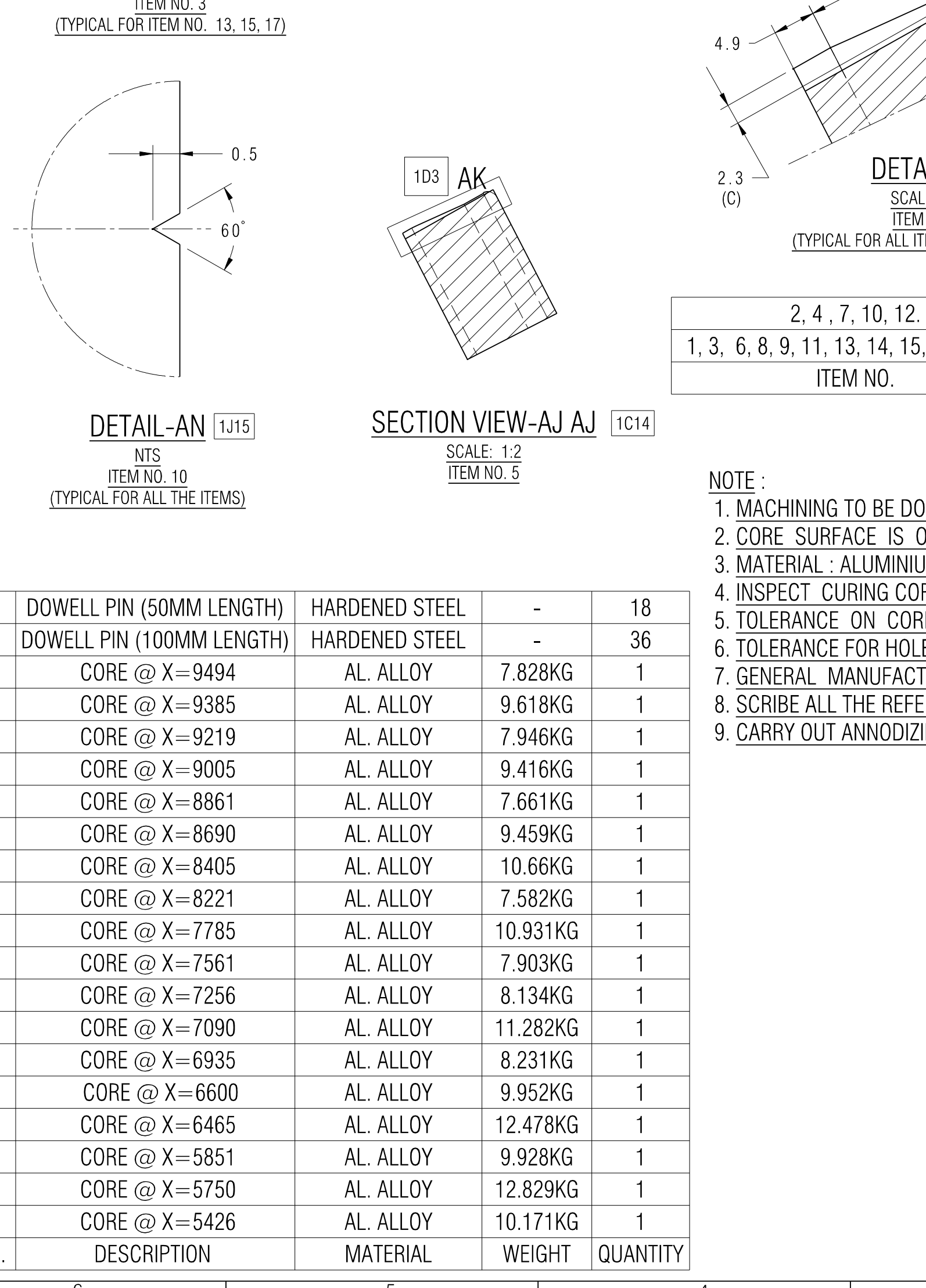
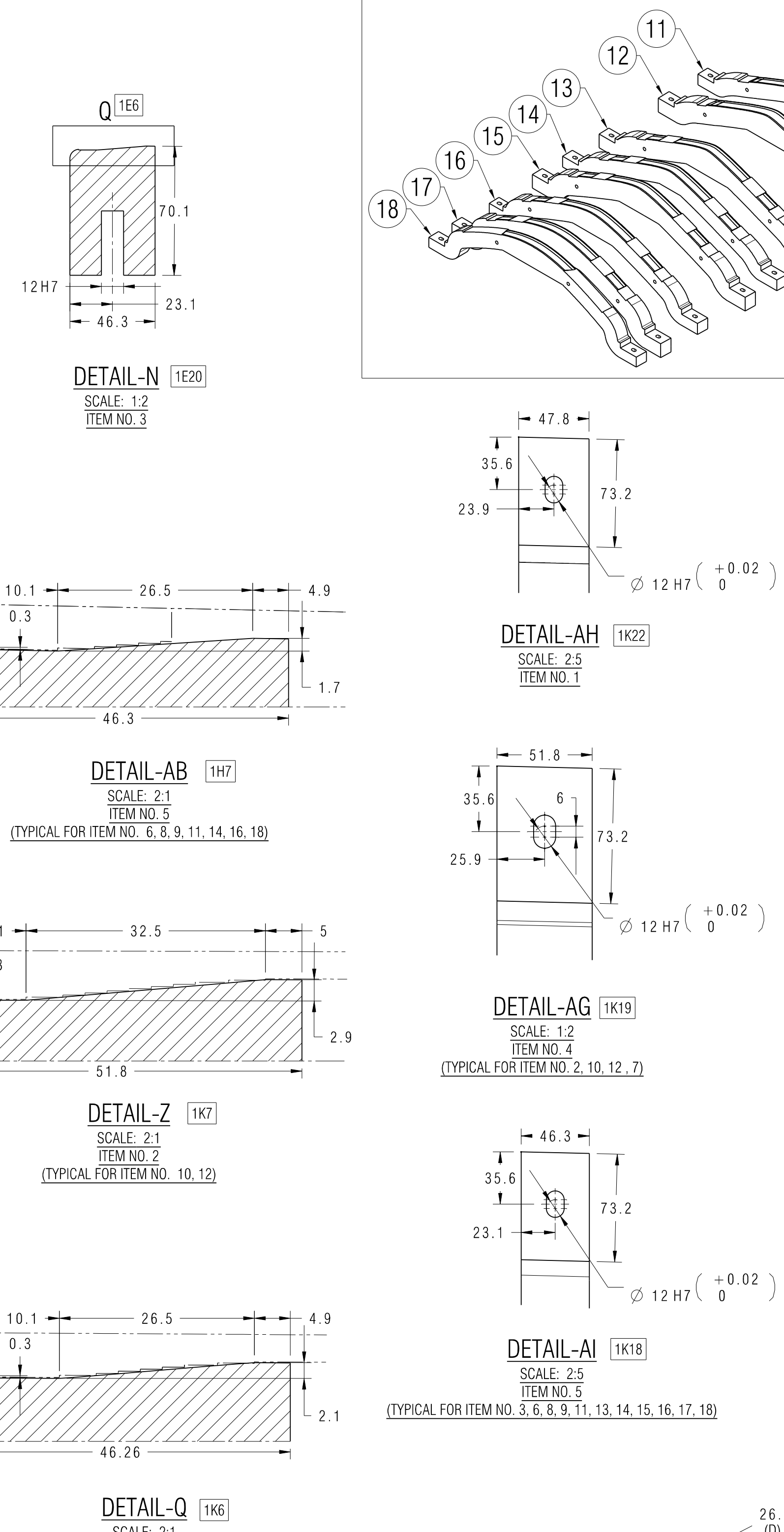
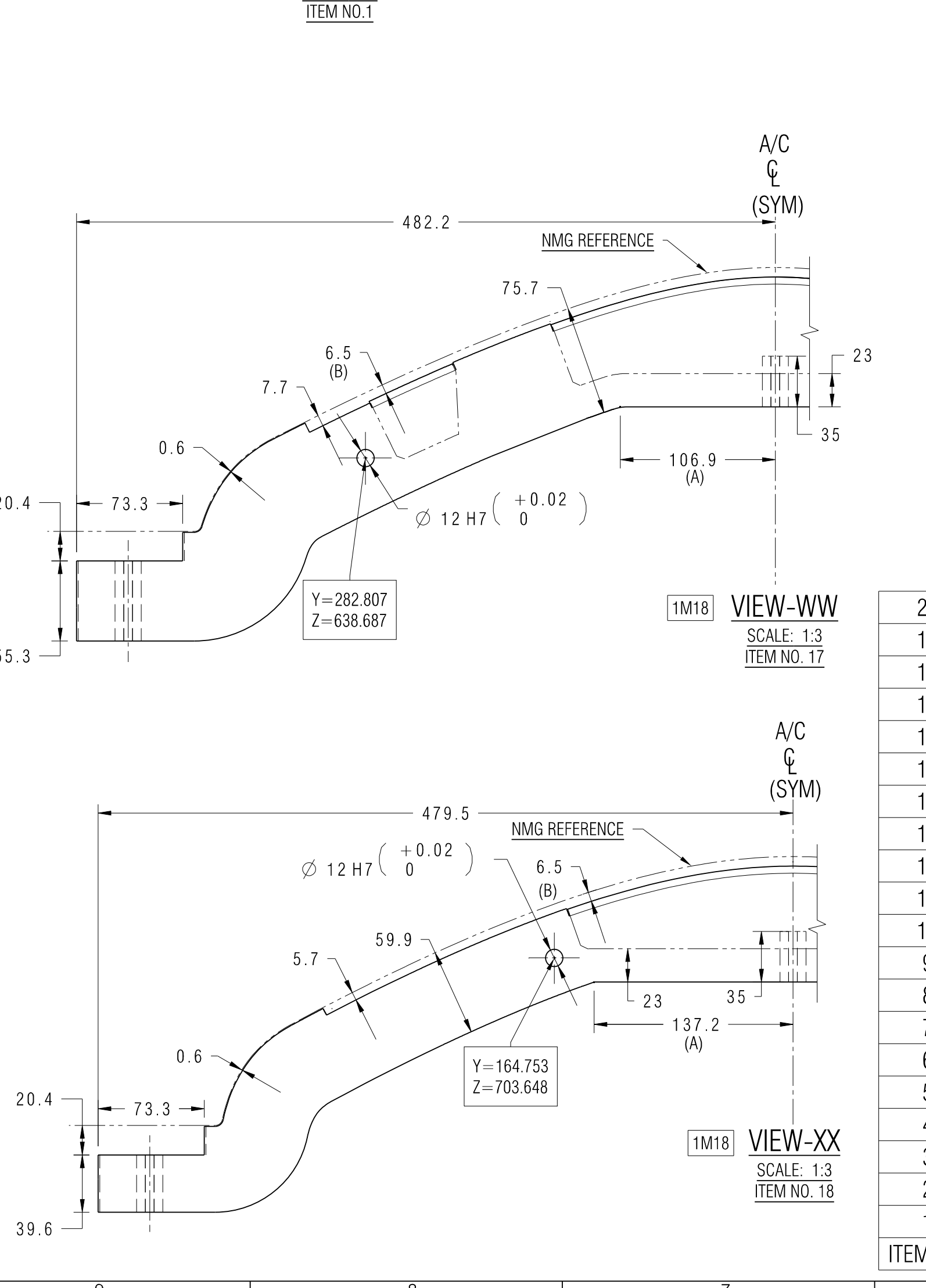
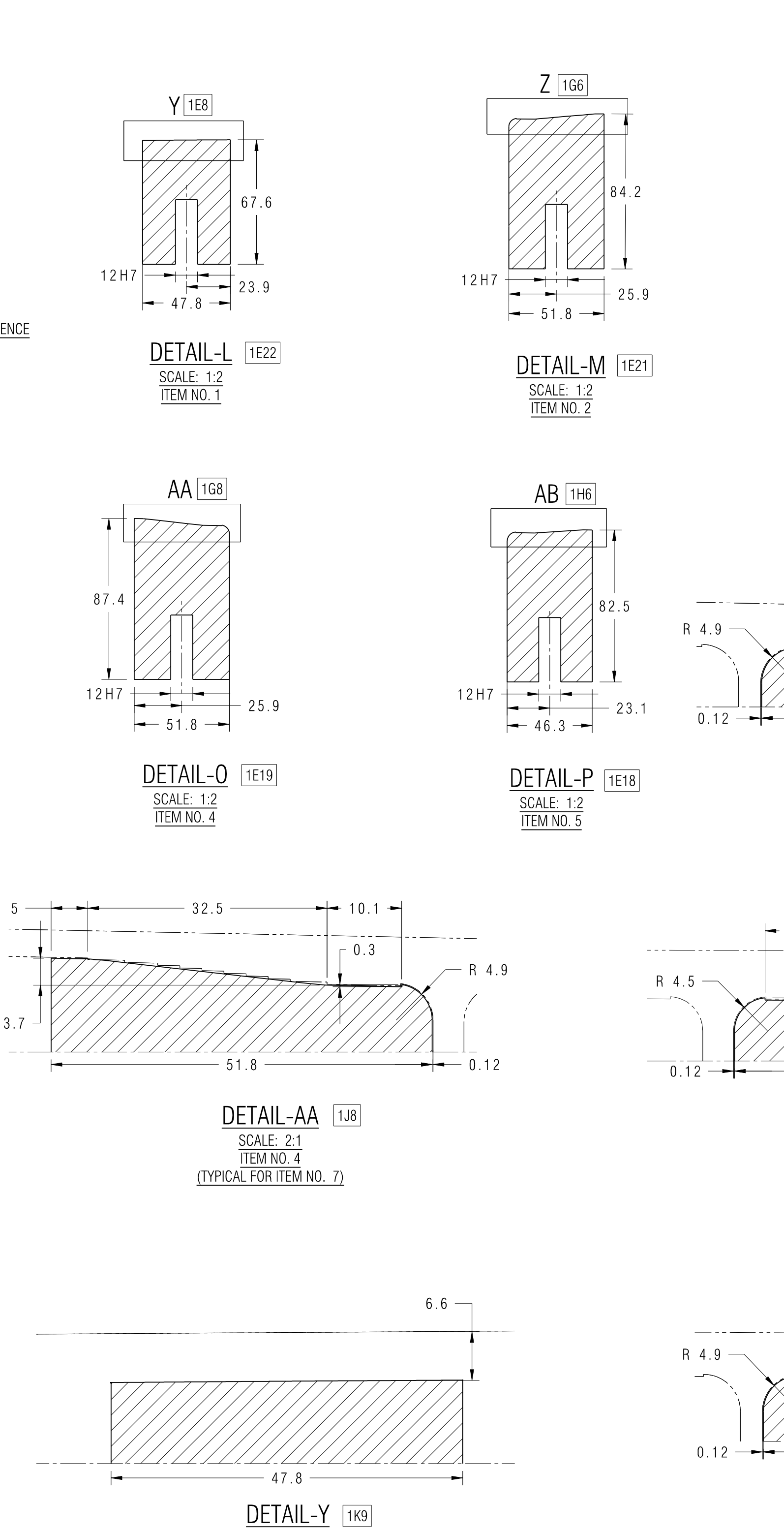
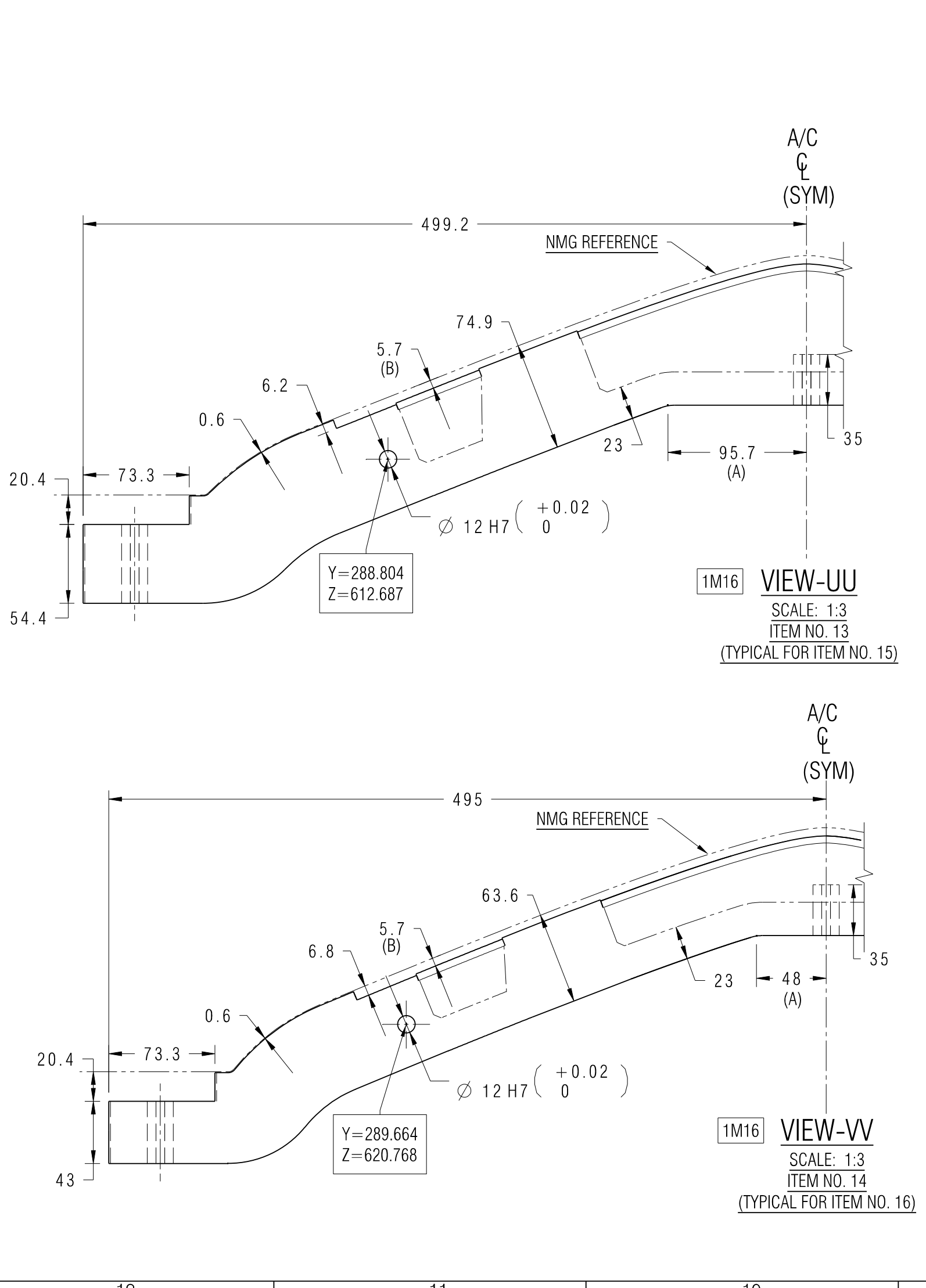
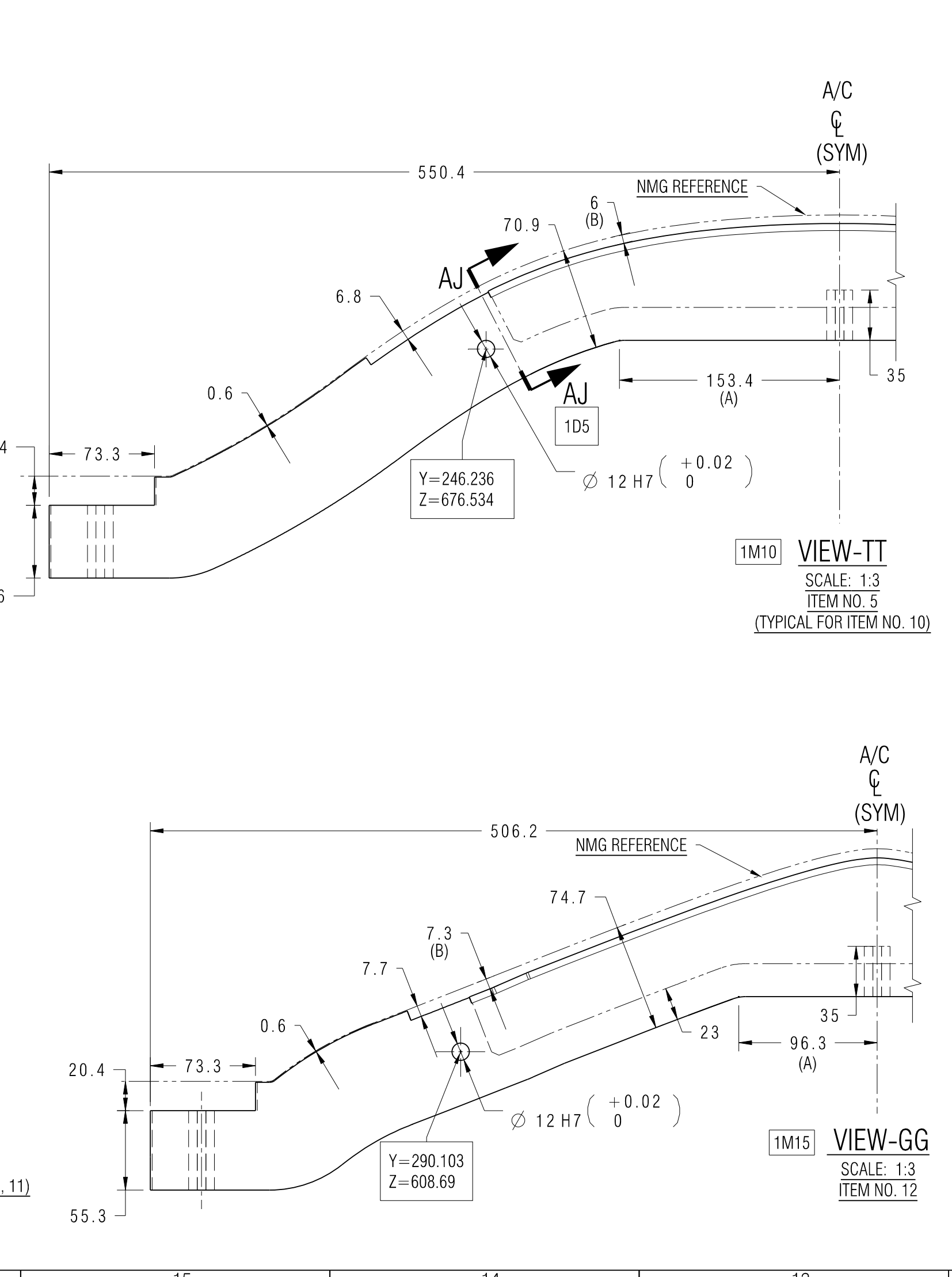
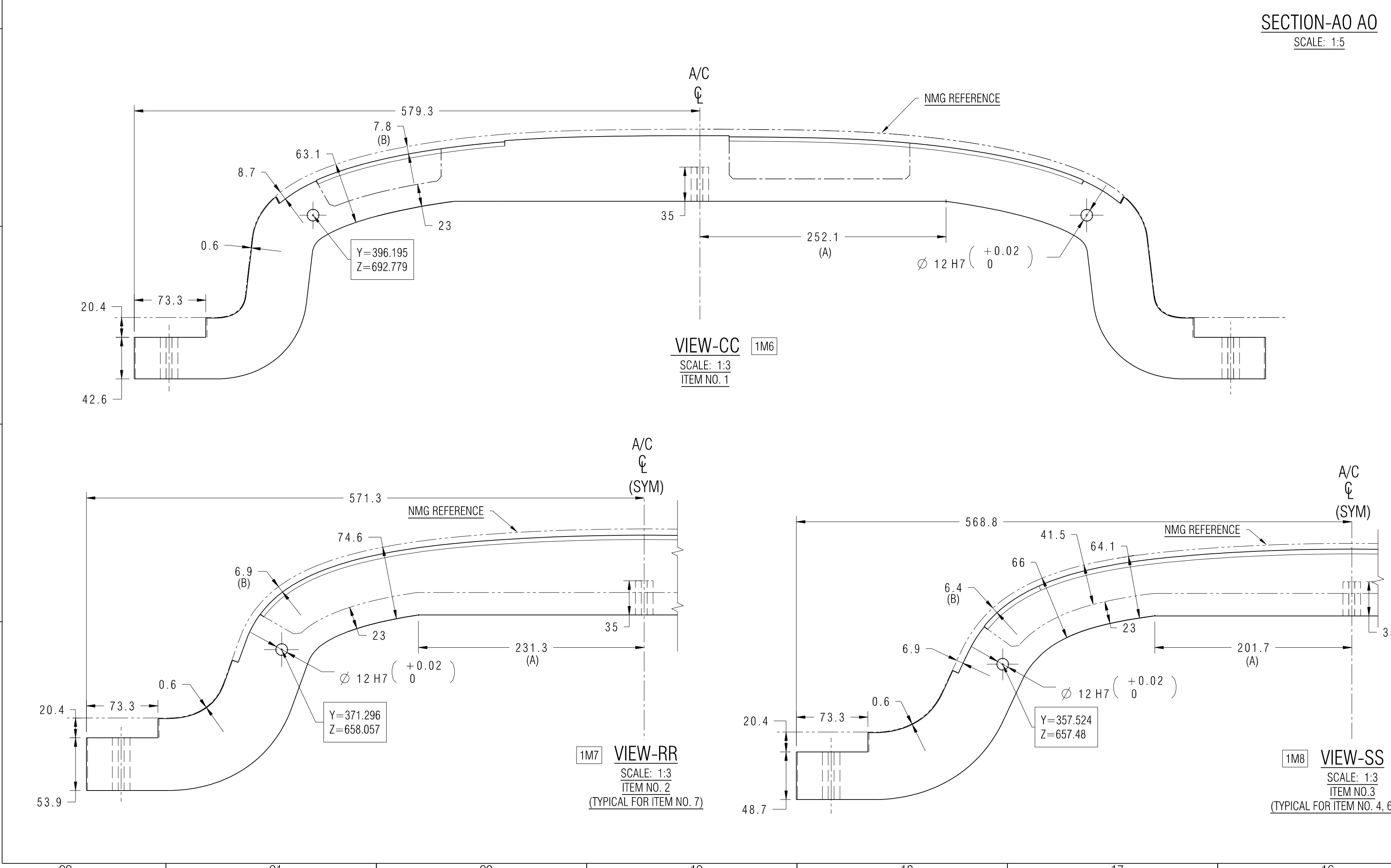
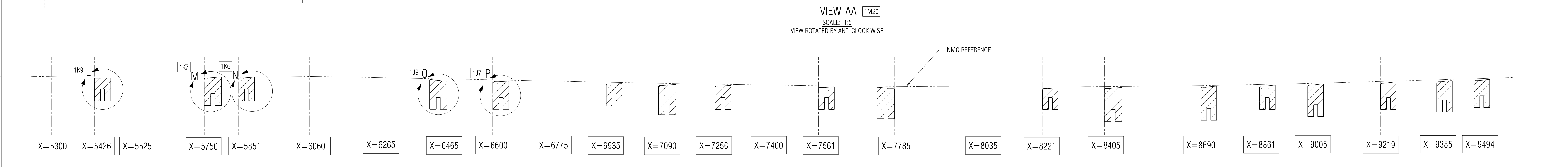
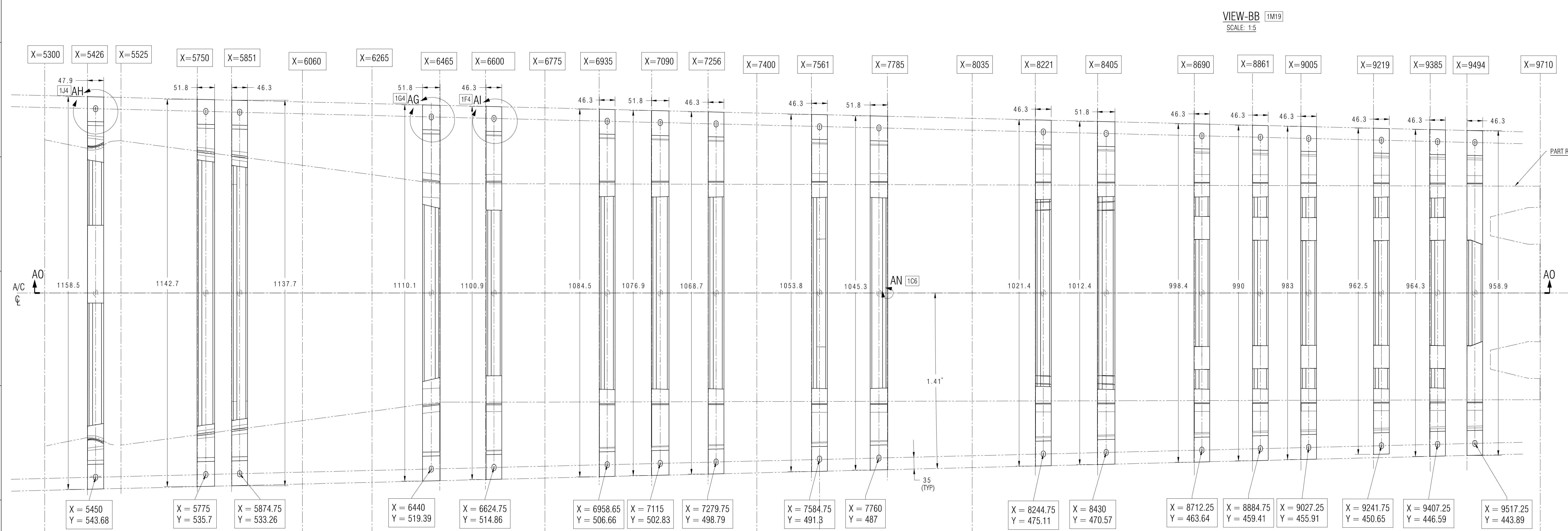
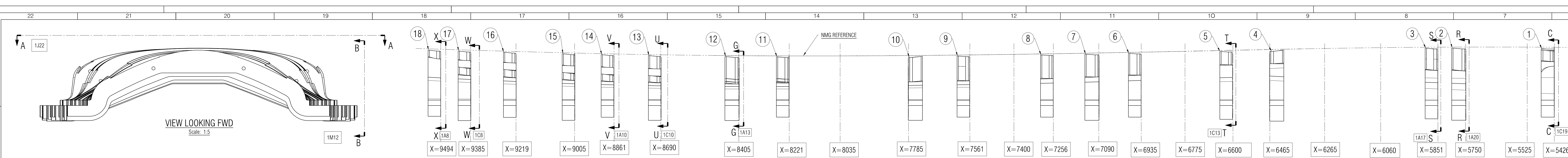






9		M6 NUT		STEEL	
8		WASHER		STEEL	
7		M6 BOLT		STEEL	
6	1	LONGITUDINAL PLATE - OB FOR LH ROVING TOOL	14.972 KG	AL. ALLOY	
5	1	LONGITUDINAL PLATE - IB FOR LH ROVING TOOL	13.499 KG	AL. ALLOY	
4	1	LONGITUDINAL PLATE - IB FOR RH ROVING TOOL		AL. ALLOY	
3	1	LONGITUDINAL PLATE - OB FOR RH ROVING TOOL		AL. ALLOY	
2	1	LONGITUDINAL PLATE - LH FOR CENTRE ROVING TOOL	13.806 KG	AL. ALLOY	
1	1	LONGITUDINAL PLATE - RH FOR CENTRE ROVING TOOL	13.429 KG	AL. ALLOY	
ITEM NO.	NO. OFF	DESCRIPTION	WEIGHT	MATERIAL	REMARKS

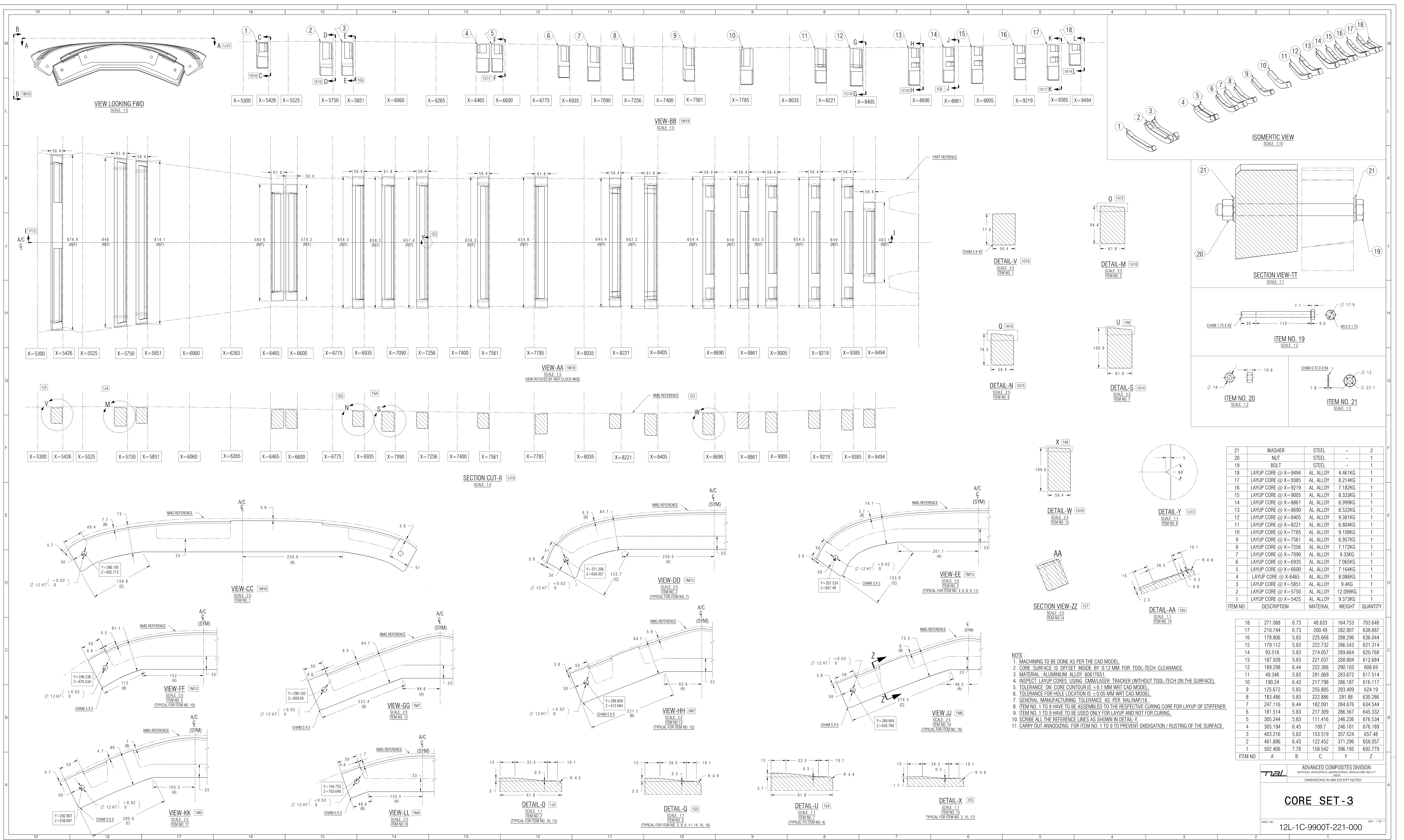
NOTES :
1. MAKE THESE ROVING TOOLS BY CNC MACHINING USING 10 MM THICK ALUMINIUM PLATE.
2. ASSEMBLE AFT & FWD PLATES USING M6 BOLTS & NUTS AS SHOWN.
3. FILL ROVING TOOLS CAVITY USING 5 MM UD STRIPS.
4. REMOVE ANY EXCESS ROVING MATERIAL AND LEVEL IT TO THE TOOL SURFACE.
5. INSPECT ROVING TOOLS USING CMM/LASER TRACKER.
6. TOLERANCE ON PROFILE IS ± 0.2 MM.
7. GENERAL MANUFACTURING TOLERANCES AS PER NAL/NAP/16.



ITEM NO.	A	B	Y	Z
18	137.217	6.73	164.753	703.648
17	107.048	6.73	282.807	638.687
16	91.078	5.83	288.296	288.296
15	48	5.83	286.543	621.314
14	48.429	5.83	289.664	620.768
13	95.757	5.83	288.804	612.687
12	96.35	6.44	290.103	606.69
11	25.86	5.83	283.672	617.514
10	98.72	6.43	286.187	616.117
9	64.346	5.835	293.409	624.19
8	93.232	5.834	286.691	627.274
7	125.03	6.452	284.676	634.544
6	91.9	5.836	286.567	645.332
5	154.357	5.834	246.236	676.534
4	154.318	6.438	246.101	676.189
3	202.574	5.832	357.524	657.48
2	231.979	6.438	371.296	658.057
1	252.08	7.78	396.195	692.779

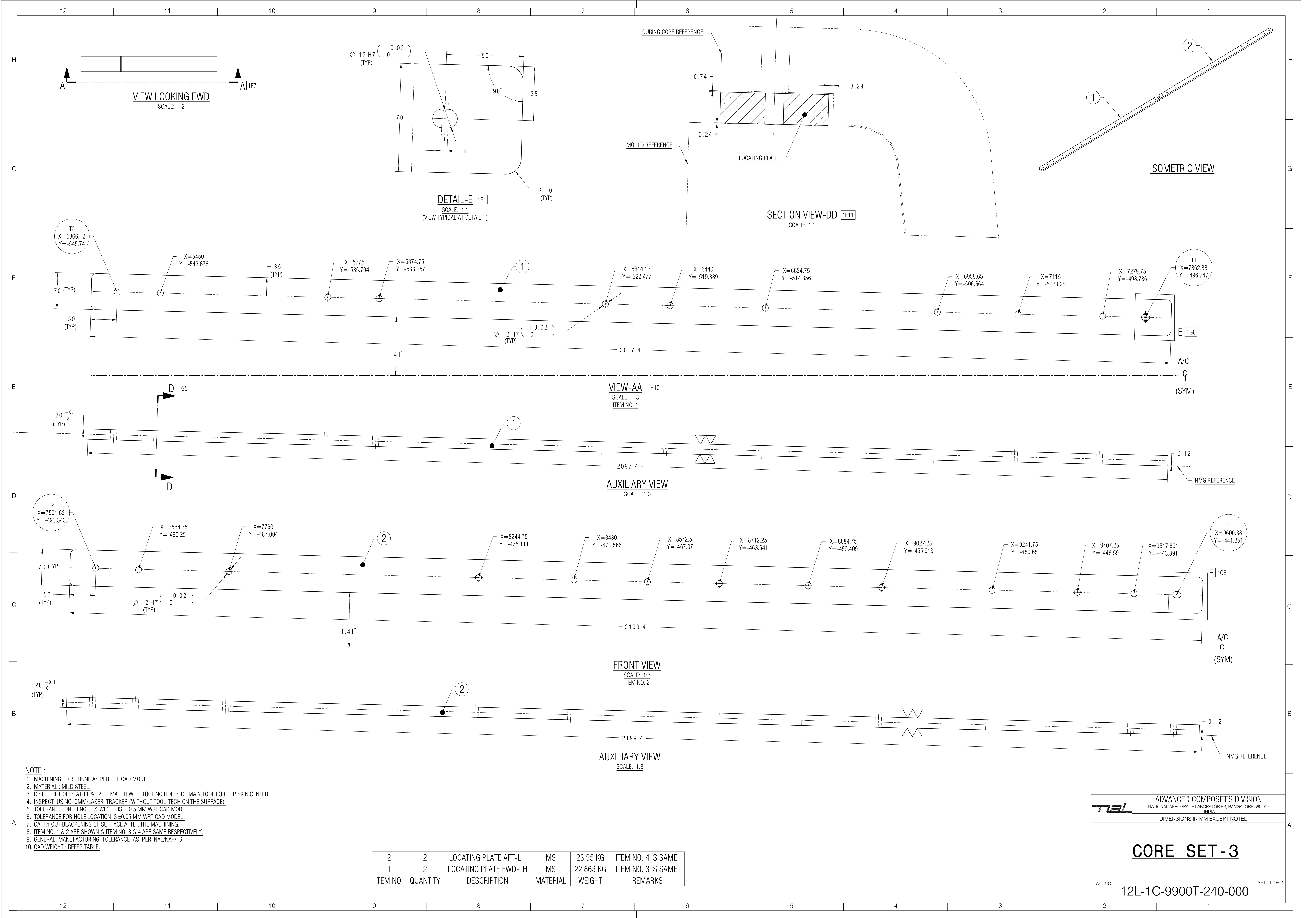
NOTE:
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
3. MATERIAL: ALUMINUM ALLOY 6061T651.
4. INSPECT CURING CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
5. TOLERANCE ON CORE CONTOUR IS ± 0.1 MM WRT CAD MODEL.
6. TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM WRT CAD MODEL.
7. GENERAL MANUFACTURING TOLERANCE AS PER NAL/NAP/16.
8. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-AN.
9. CARRY OUT ANODIZING FOR ALL ITEM TO PREVENT OXIDATION / RUSTING OF THE CORE SURFACE.

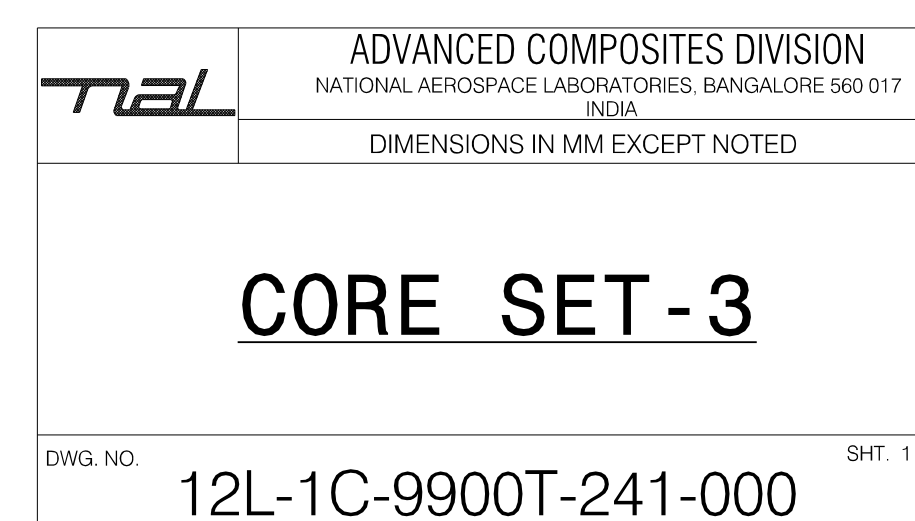
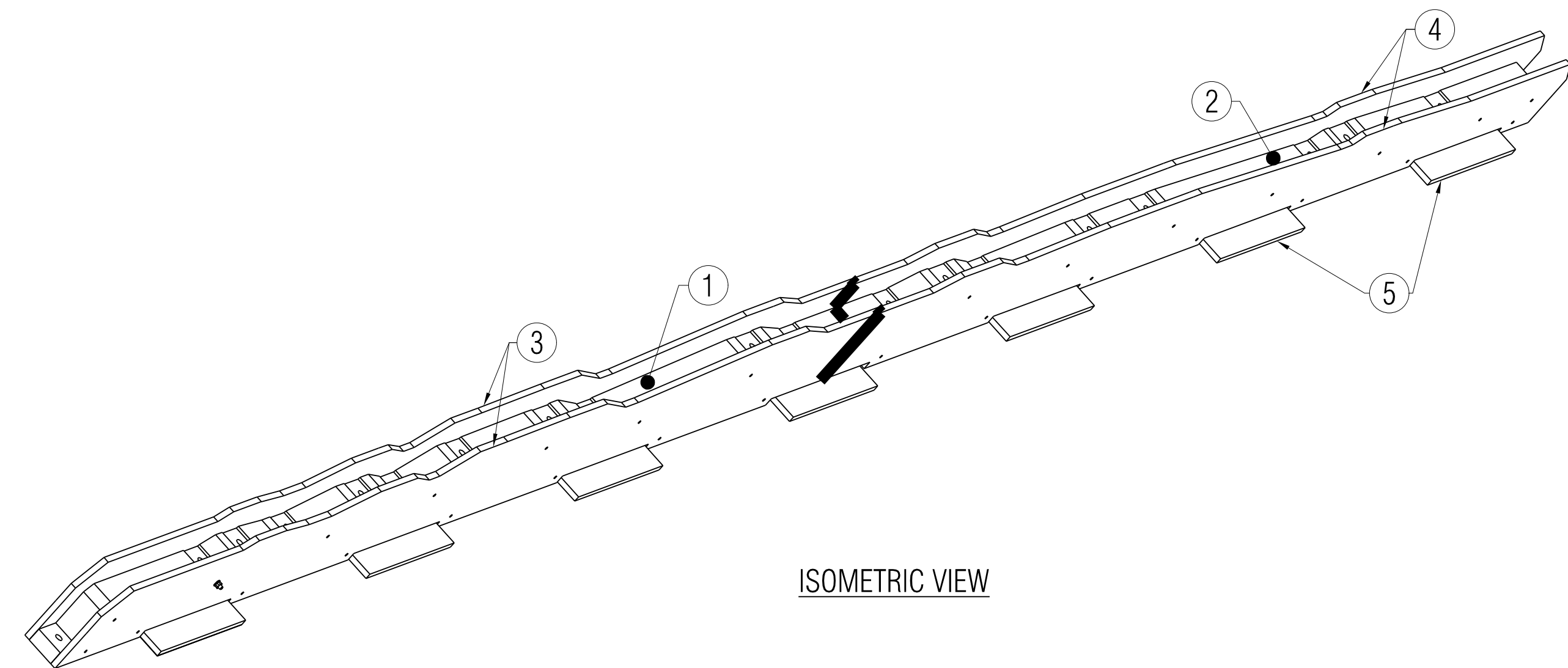
ITEM NO.	DESCRIPTION	WEIGHT	QUANTITY
20	DOWELL PIN (50MM LENGTH)	HARDENED STEEL	18
19	DOWELL PIN (100MM LENGTH)	HARDENED STEEL	36
18	CORE @ X=9494	AL. ALLOY	7.828KG
17	CORE @ X=9385	AL. ALLOY	9.618KG
16	CORE @ X=9219	AL. ALLOY	7.946KG
15	CORE @ X=9005	AL. ALLOY	9.416KG
14	CORE @ X=8861	AL. ALLOY	7.661KG
13	CORE @ X=8690	AL. ALLOY	9.459KG
12	CORE @ X=8405	AL. ALLOY	10.66KG
11	CORE @ X=8221	AL. ALLOY	7.582KG
10	CORE @ X=7785	AL. ALLOY	10.931KG
9	CORE @ X=7561	AL. ALLOY	7.903KG
8	CORE @ X=7256	AL. ALLOY	8.134KG
7	CORE @ X=7090	AL. ALLOY	11.282KG
6	CORE @ X=6935	AL. ALLOY	8.231KG
5	CORE @ X=6600	AL. ALLOY	9.952KG
4	CORE @ X=6465	AL. ALLOY	12.478KG
3	CORE @ X=5851	AL. ALLOY	9.928KG
2	CORE @ X=5750	AL. ALLOY	12.829KG
1	CORE @ X=5426	AL. ALLOY	10.171KG

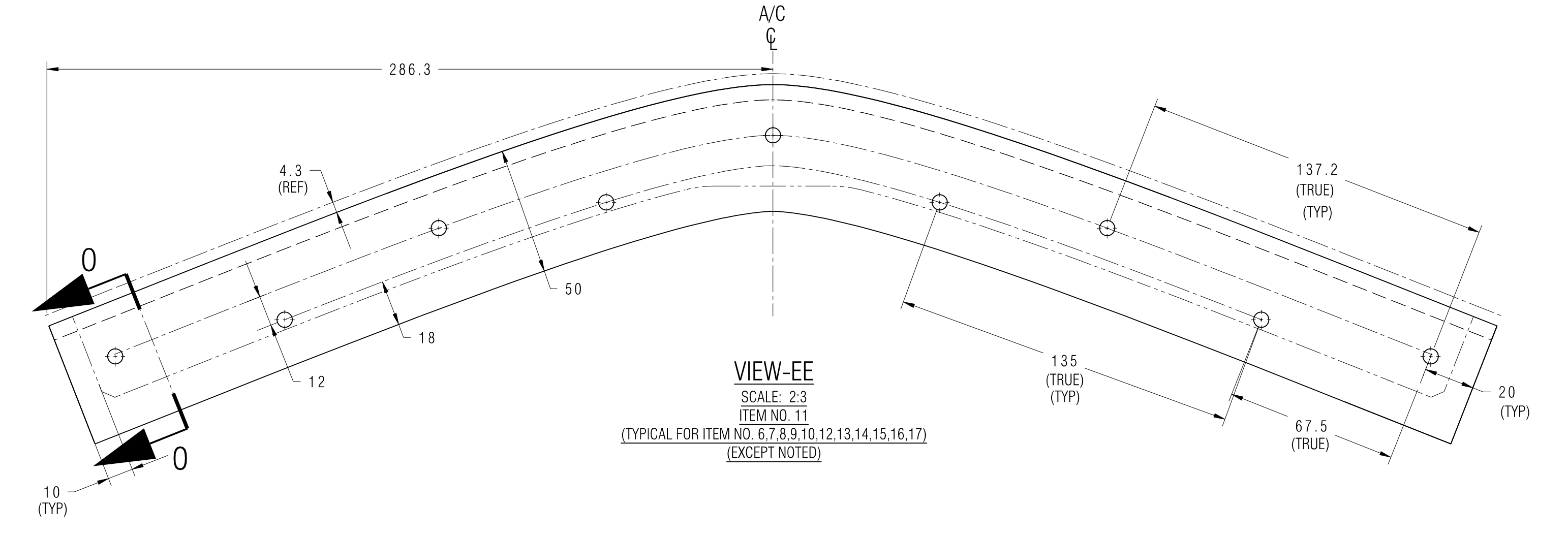
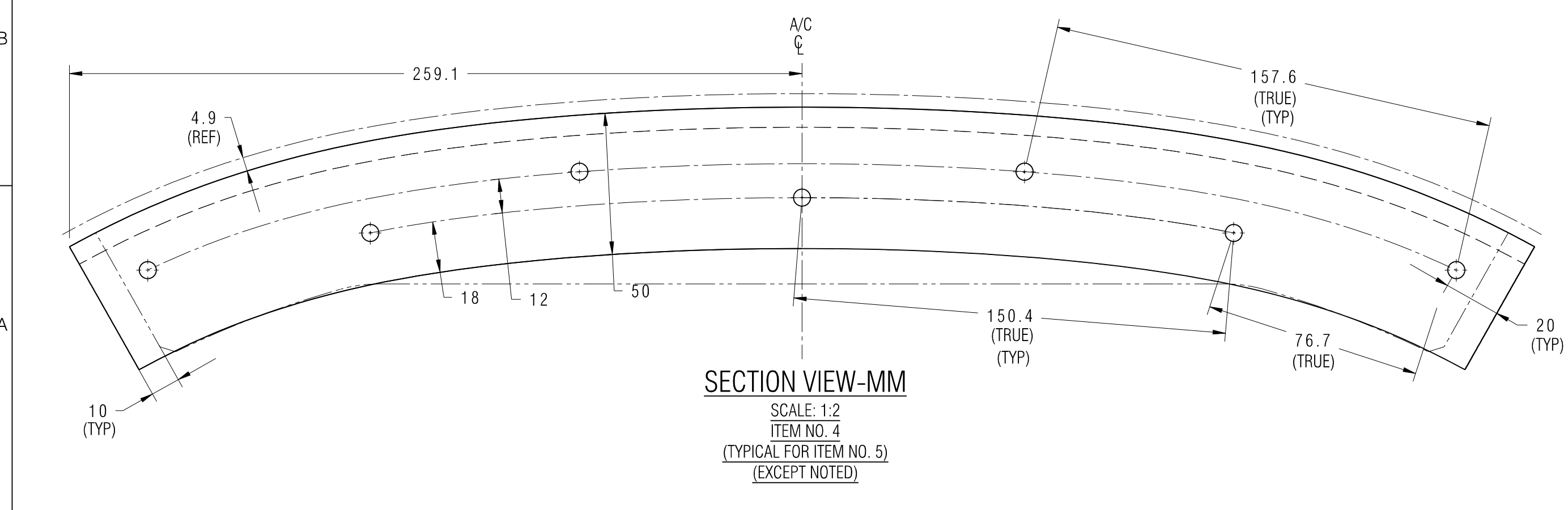
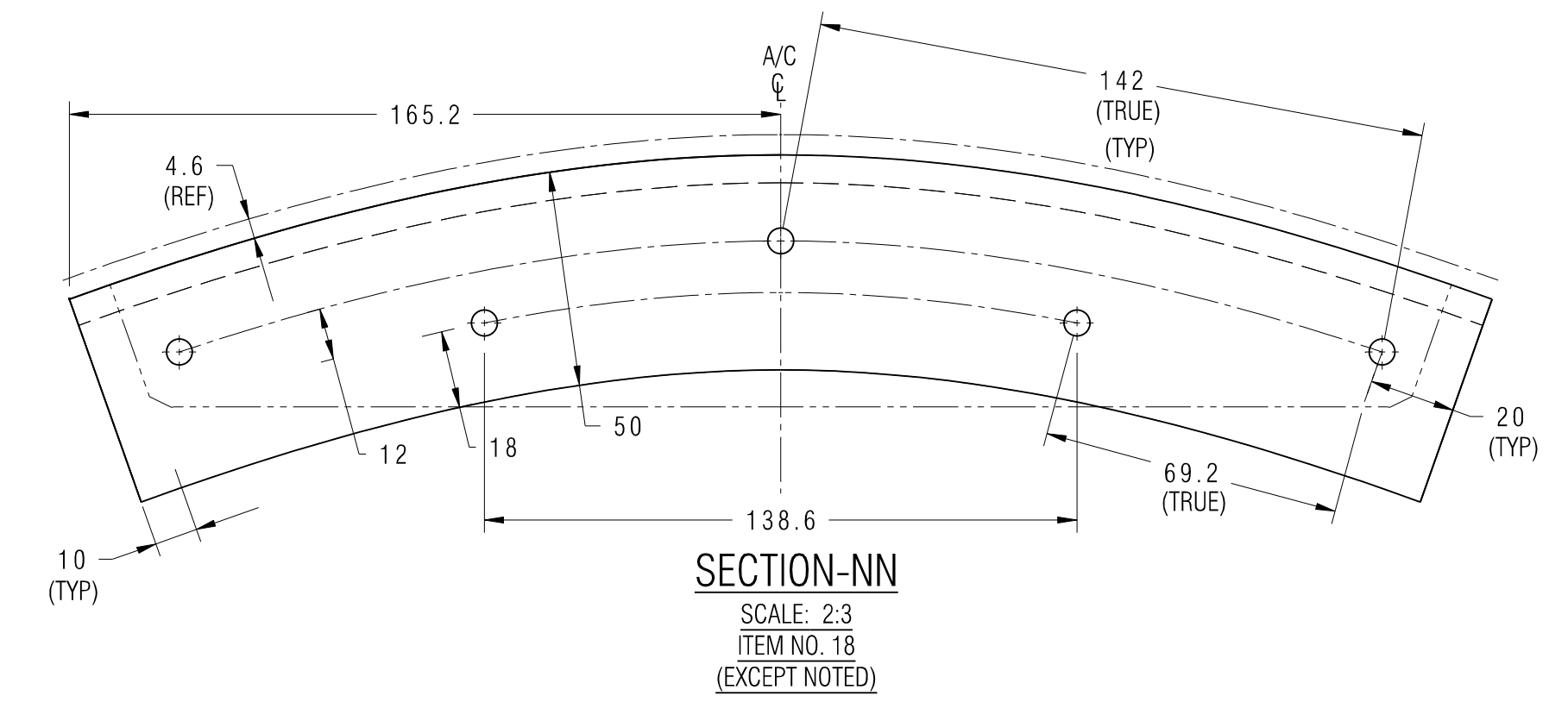
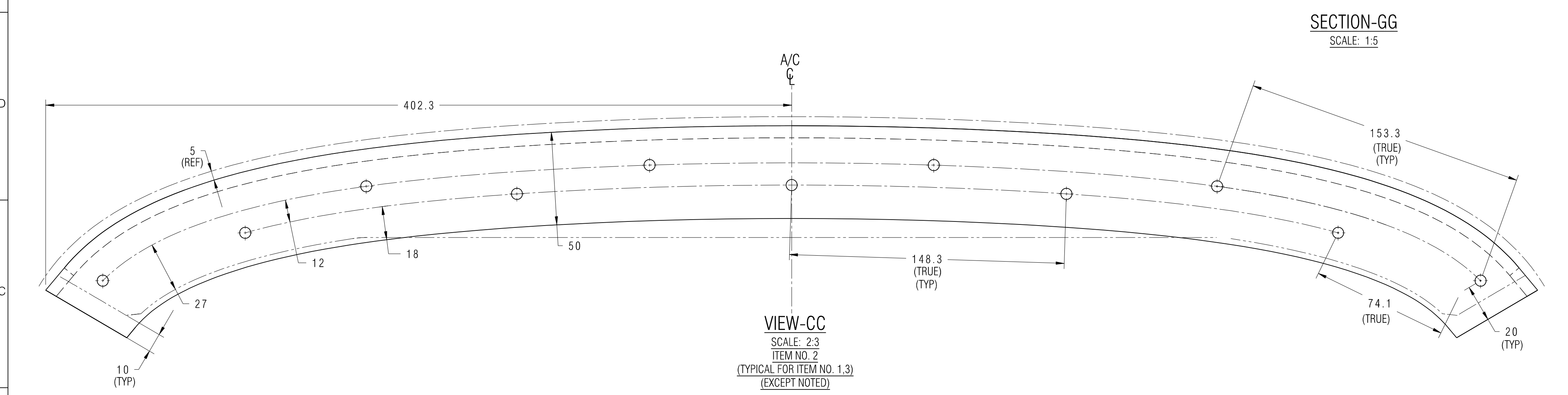
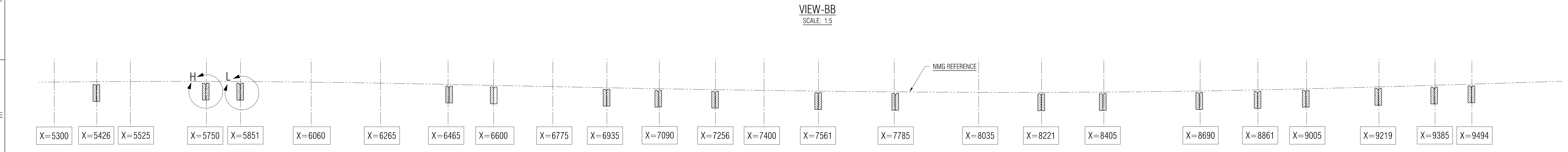
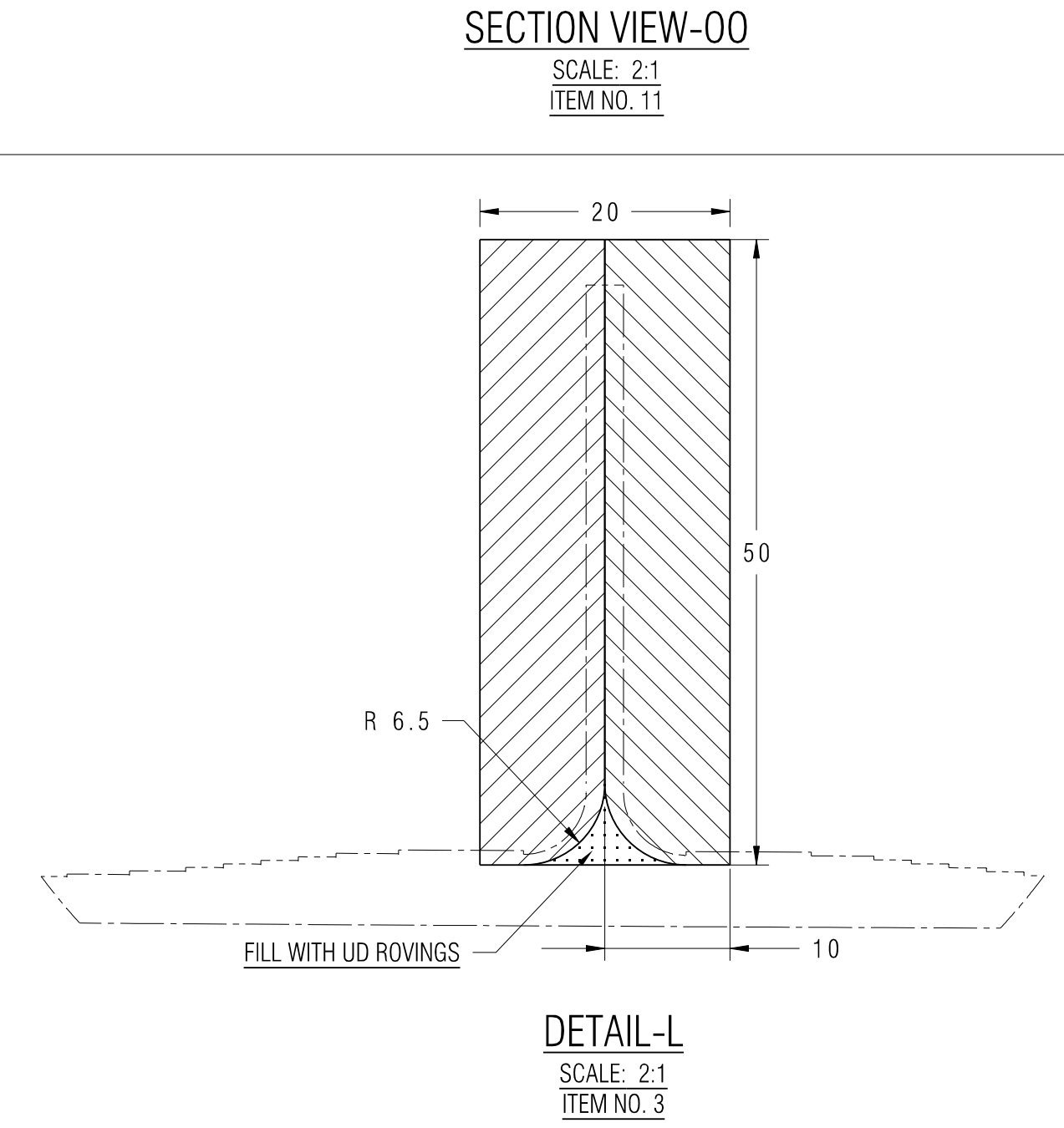
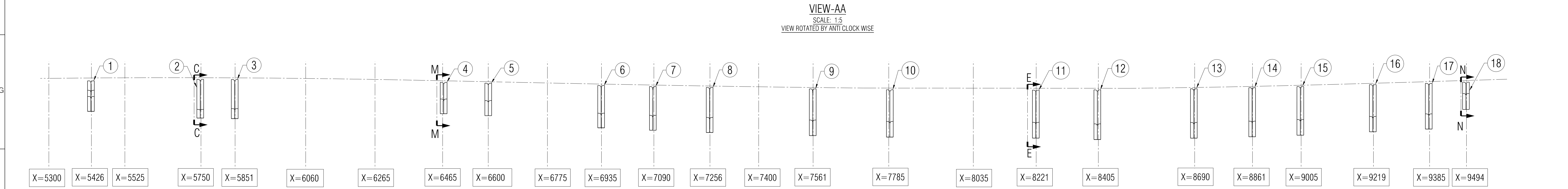
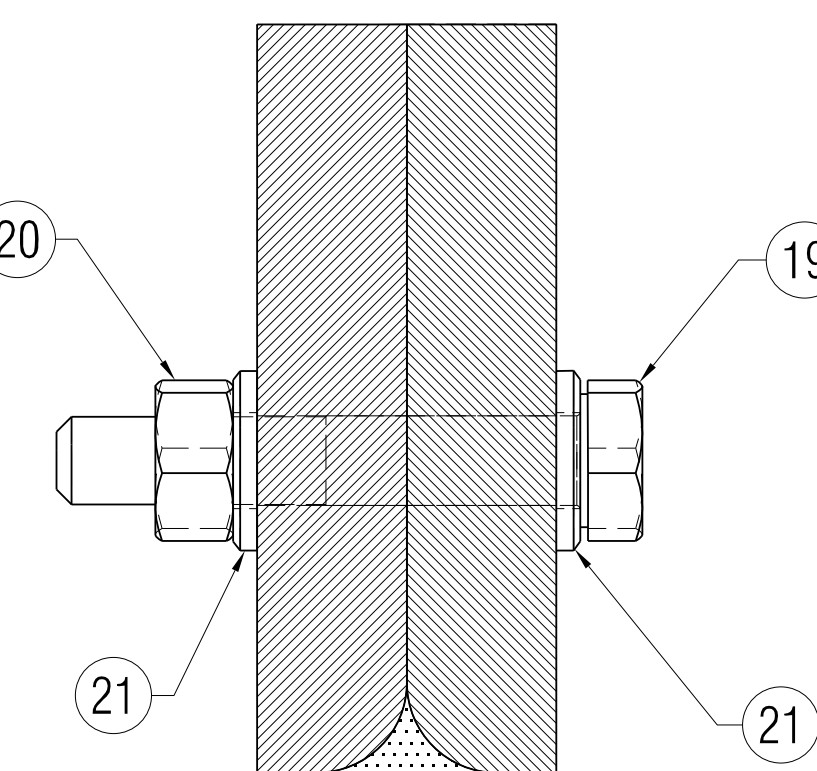
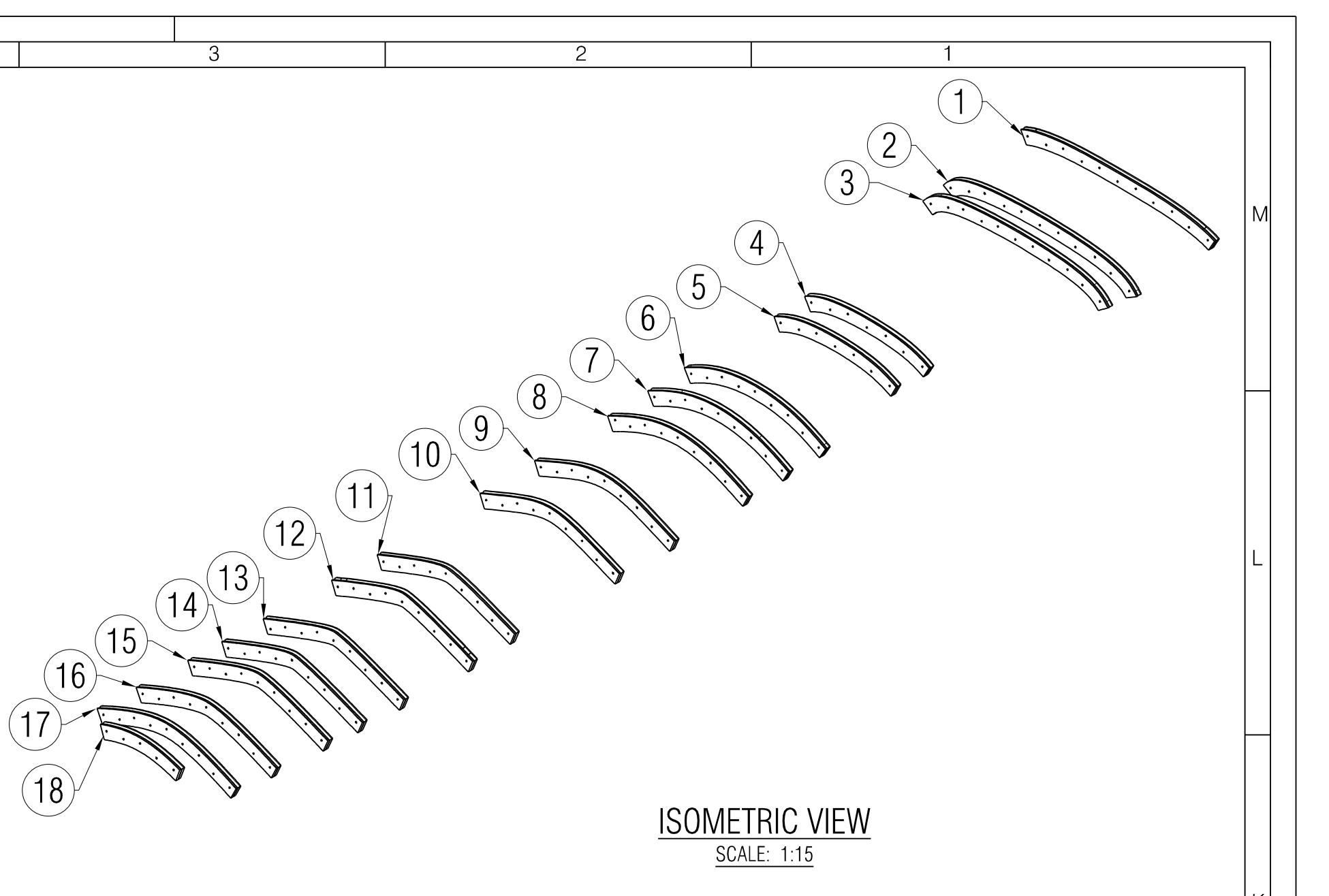
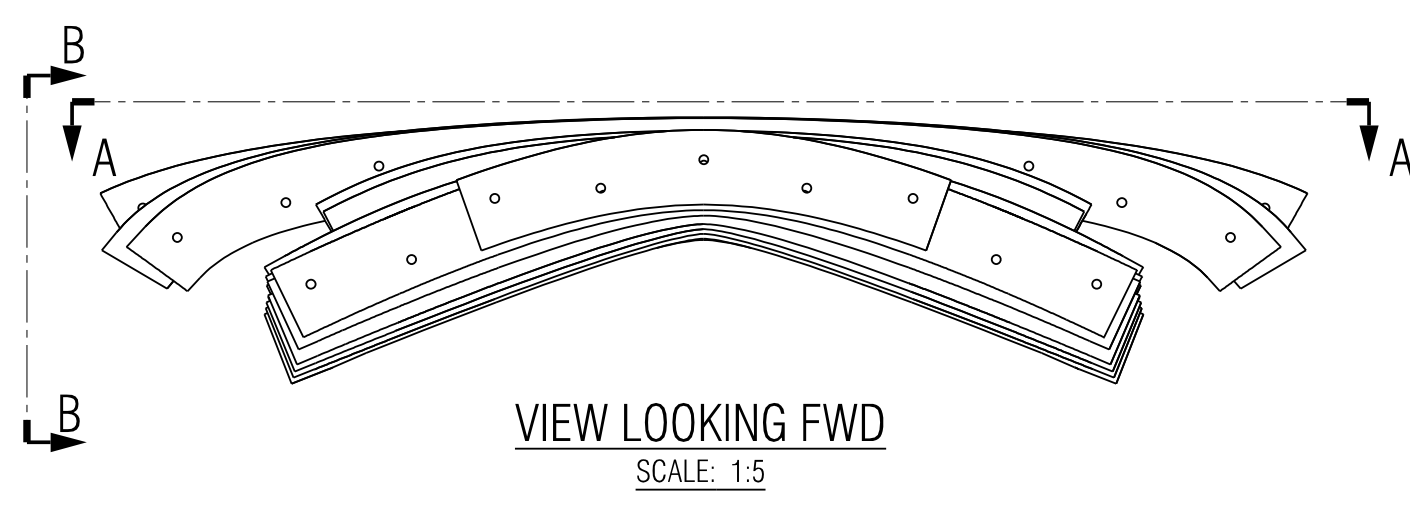
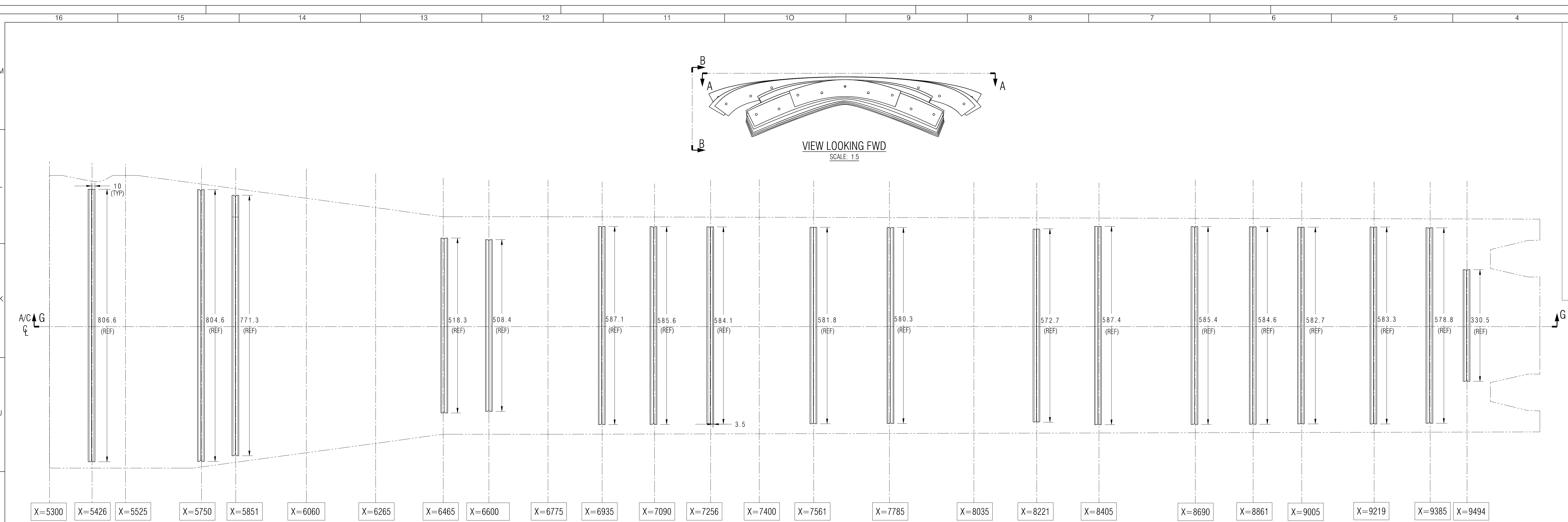


21	WASHER	STEEL	-	2
20	NUT	STEEL	-	1
19	BOLT	STEEL	-	1
18	LAYUP CORE @ X=9494	AL ALLOY	4.461KG	1
17	LAYUP CORE @ X=9385	AL ALLOY	8.214KG	1
16	LAYUP CORE @ X=9219	AL ALLOY	7.182KG	1
15	LAYUP CORE @ X=9005	AL ALLOY	8.333KG	1
14	LAYUP CORE @ X=8861	AL ALLOY	6.999KG	1
13	LAYUP CORE @ X=8690	AL ALLOY	8.522KG	1
12	LAYUP CORE @ X=8405	AL ALLOY	9.381KG	1
11	LAYUP CORE @ X=8221	AL ALLOY	6.804KG	1
10	LAYUP CORE @ X=7785	AL ALLOY	9.108KG	1
9	LAYUP CORE @ X=7561	AL ALLOY	6.957KG	1
8	LAYUP CORE @ X=7256	AL ALLOY	7.172KG	1
7	LAYUP CORE @ X=7090	AL ALLOY	9.33KG	1
6	LAYUP CORE @ X=6935	AL ALLOY	7.065KG	1
5	LAYUP CORE @ X=6600	AL ALLOY	7.164KG	1
4	LAYUP CORE @ X=6465	AL ALLOY	8.086KG	1
3	LAYUP CORE @ X=5851	AL ALLOY	9.4KG	1
2	LAYUP CORE @ X=5750	AL ALLOY	12.099KG	1
1	LAYUP CORE @ X=5425	AL ALLOY	9.373KG	1
ITEM NO.	DESCRIPTION	MATERIAL	WEIGHT	QUANTITY

18	271.088	6.73	48.633	164.753	703.648
17	210.744	6.73	200.49	282.807	638.687
16	178.806	5.83	225.668	288.296	636.044
15	179.112	5.83	222.732	286.543	621.314
14	93.518	5.83	274.057	289.664	620.768
13	187.928	5.83	221.037	288.804	612.684
12	189.298	6.44	222.366	290.103	608.69
11	49.346	5.83	291.069	283.672	617.514
10	190.24	6.43	217.798	286.187	616.117
9	125.672	5.83	255.885	293.409	624.19
8	183.486	5.83	222.886	291.88	630.286
7	247.116	6.44	182.091	284.676	634.544
6	181.514	5.83	217.309	286.567	645.332
5	305.244	5.83	111.416	246.236	676.534
4	305.194	6.45	109.7	246.101	676.189
3	403.216	5.83	153.519	357.524	657.48
2	461.886	6.43	122.452	371.296	658.057
1	502.406	7.78	158.542	396.195	692.779
ITEM NO.	A	B	C	Y	Z



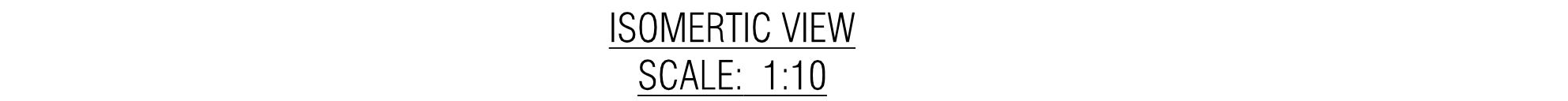
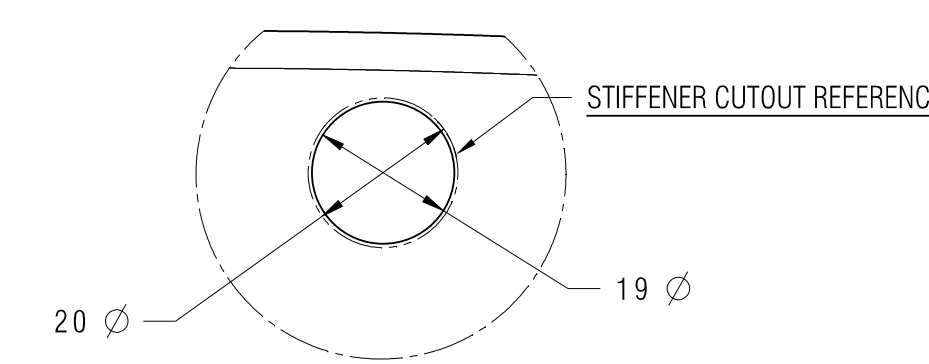
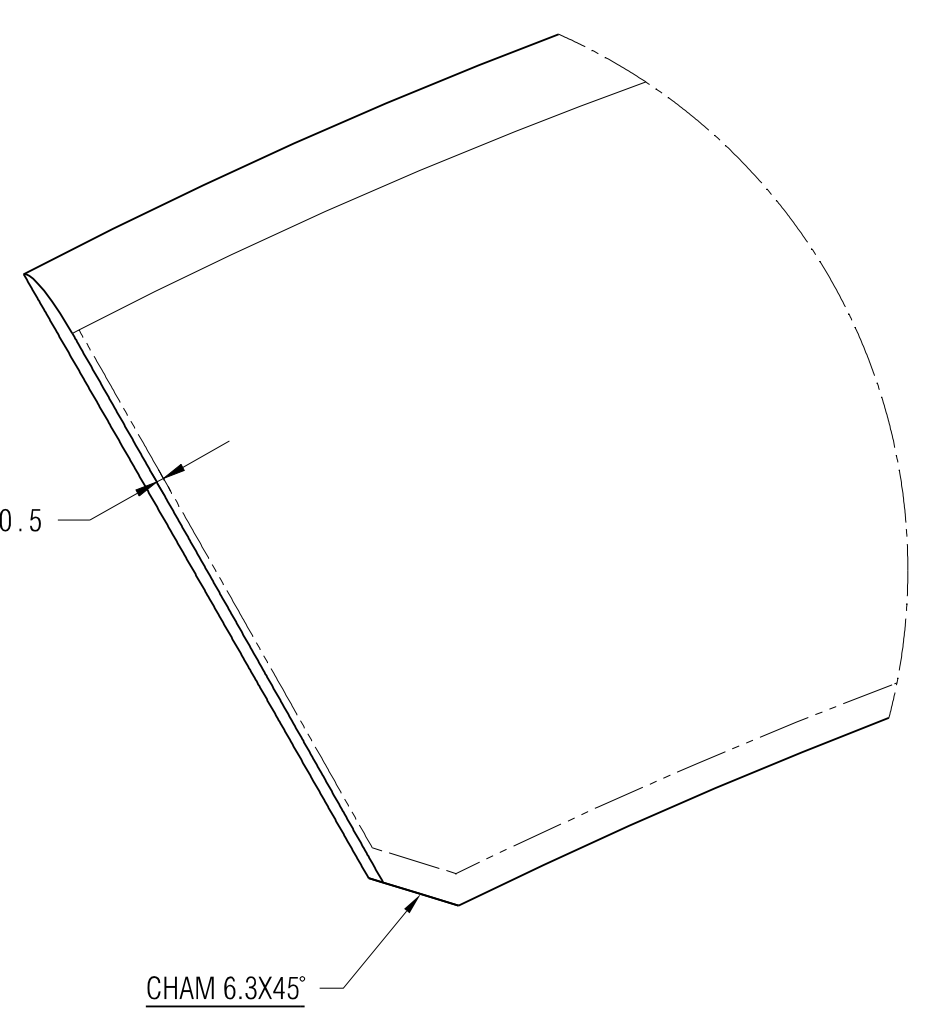
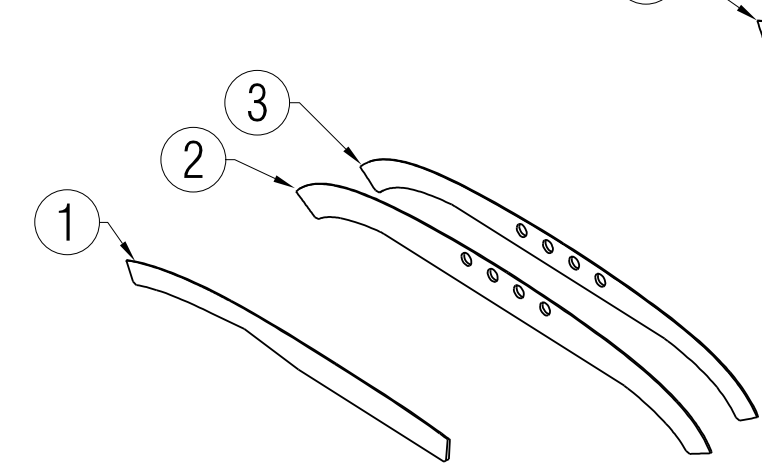
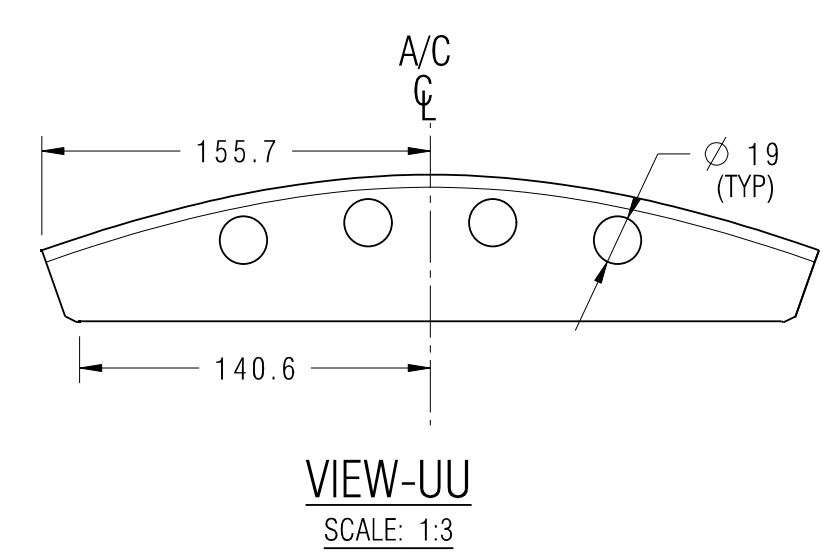
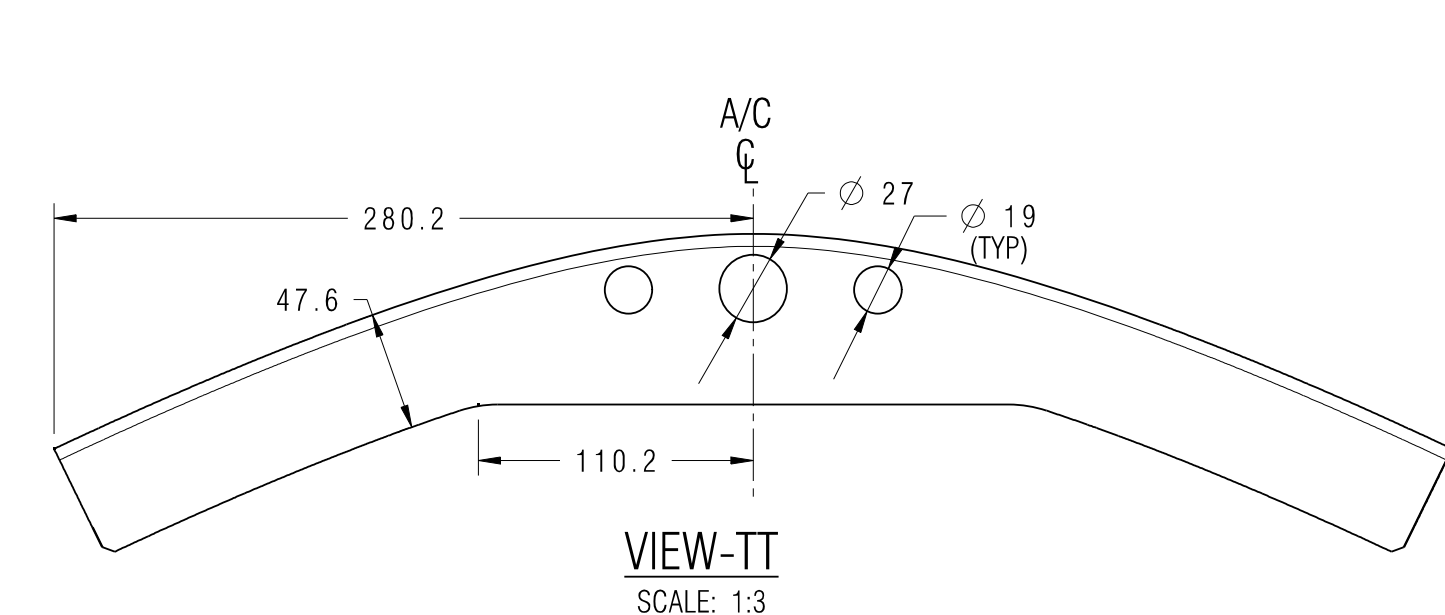
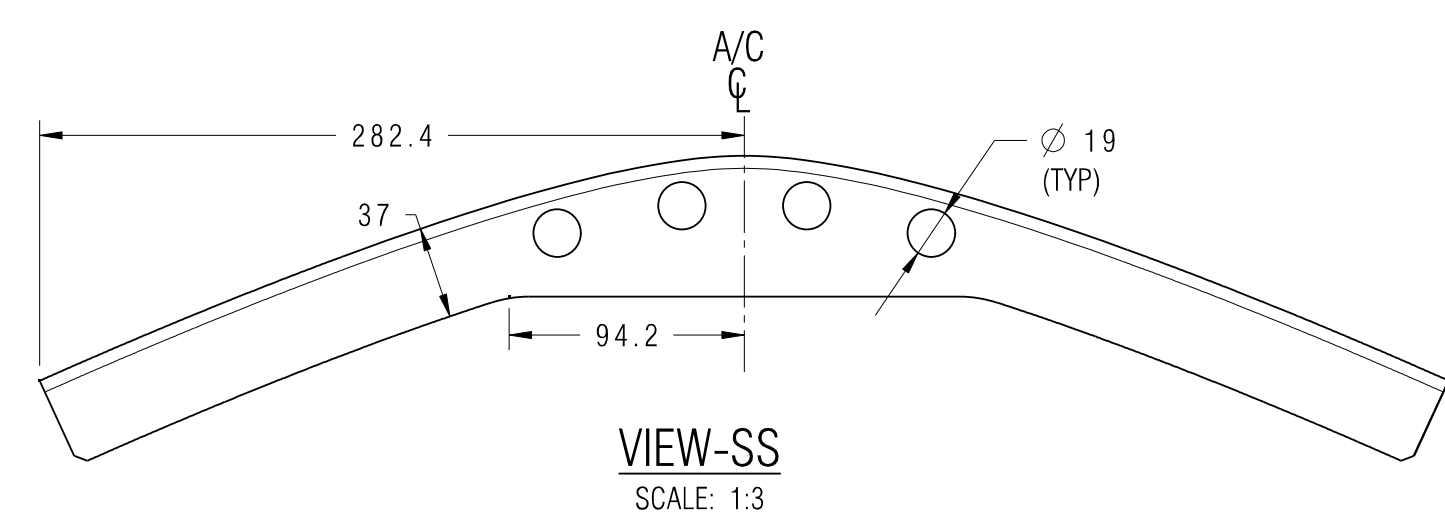
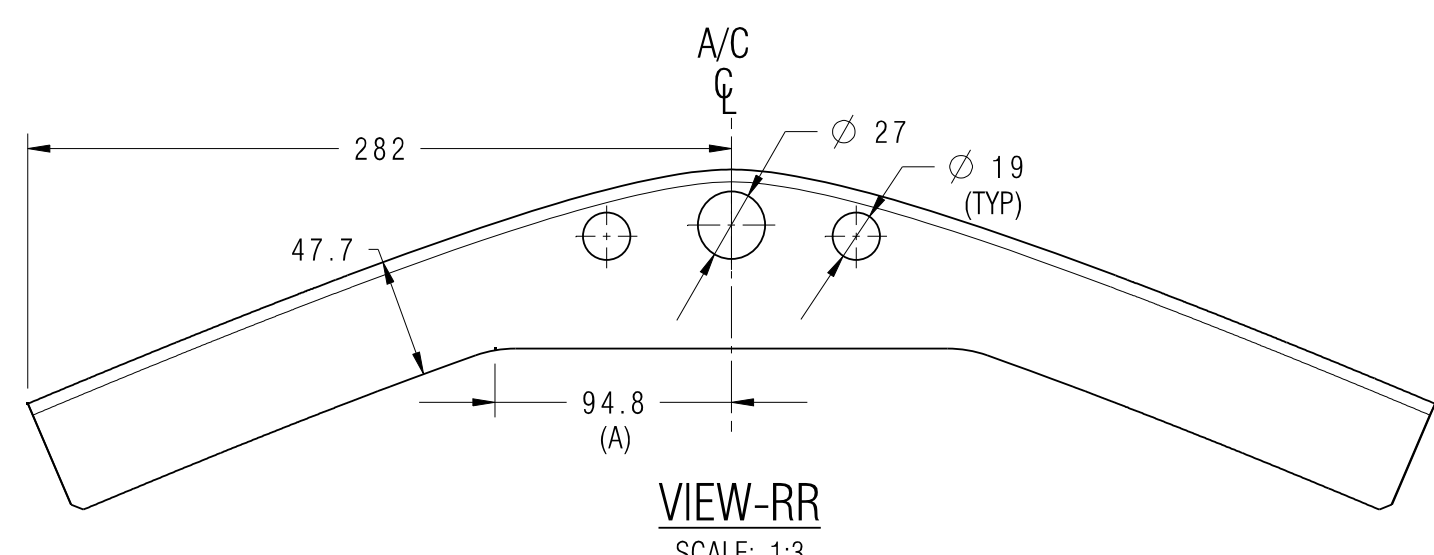
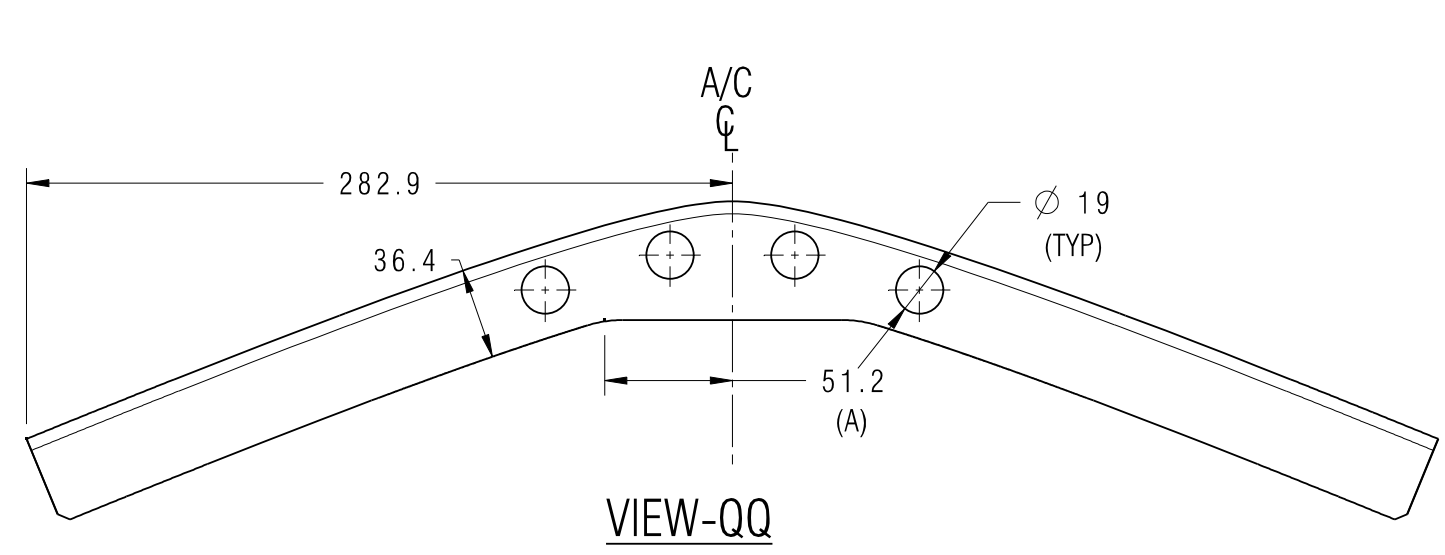
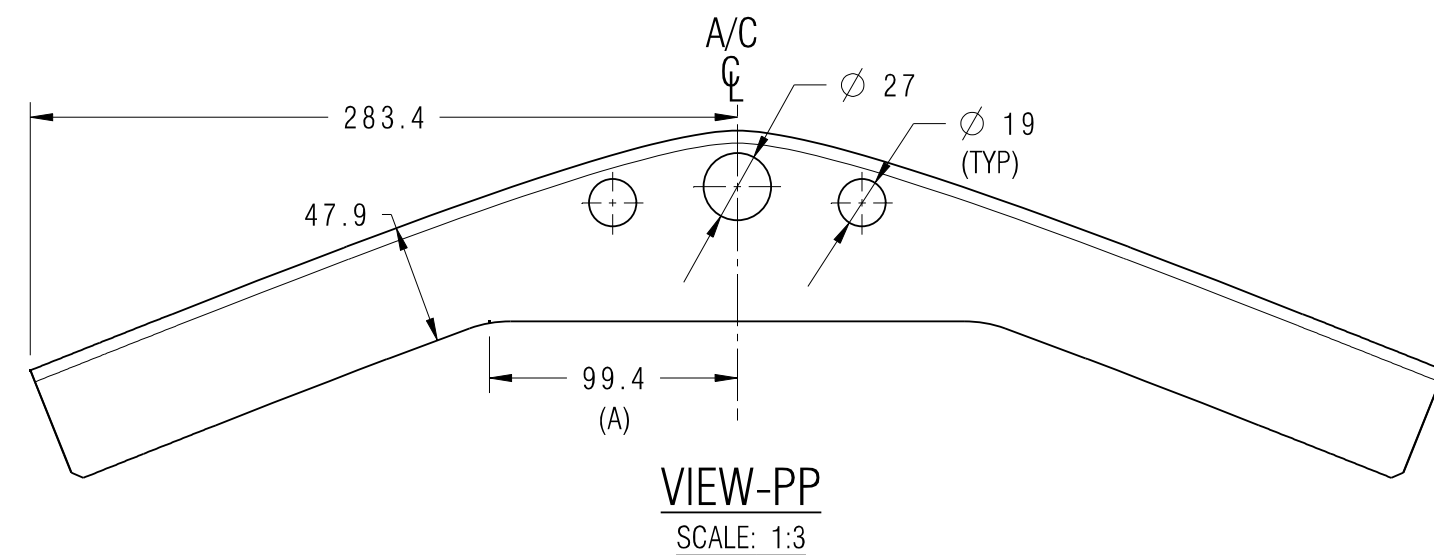
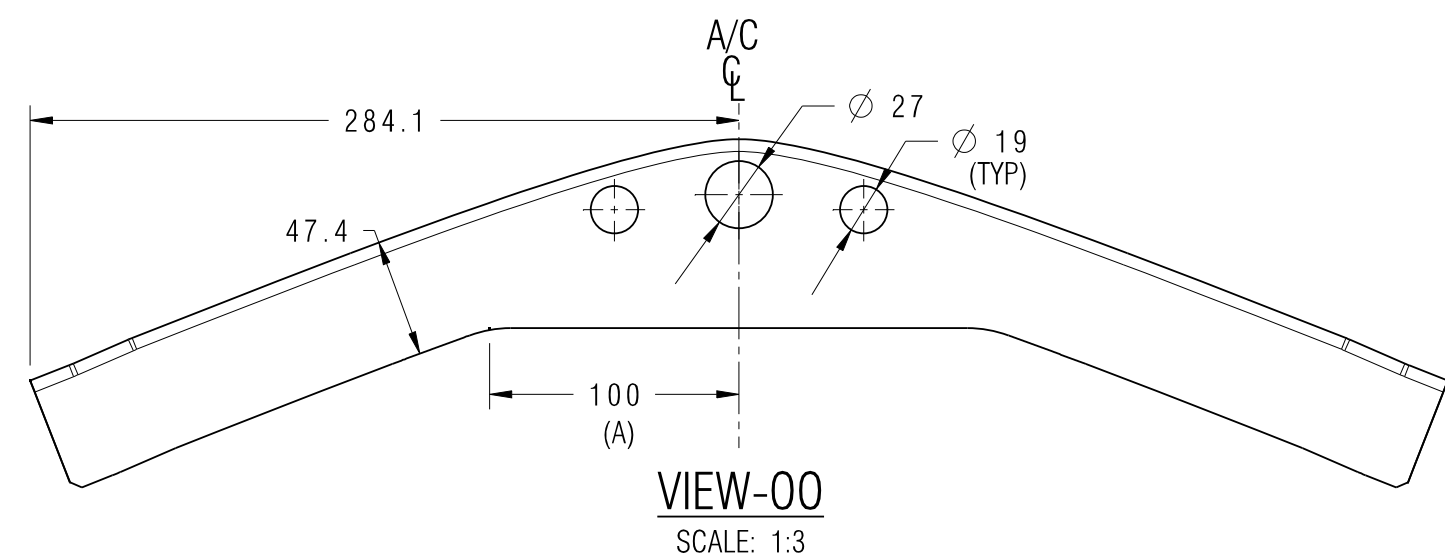
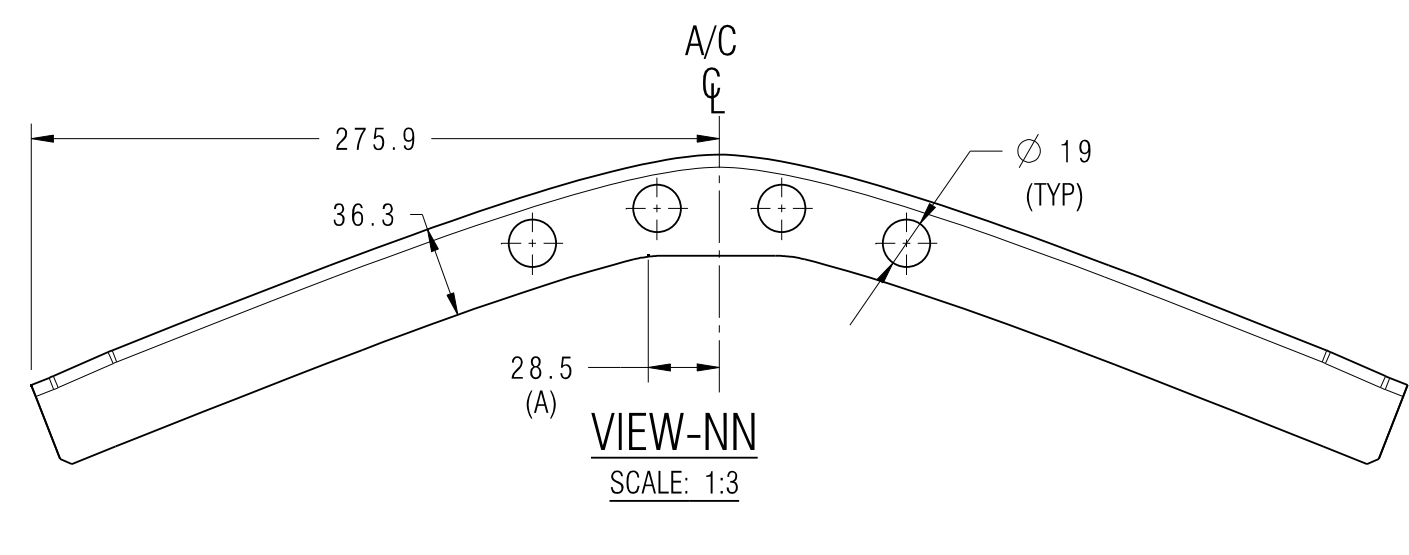
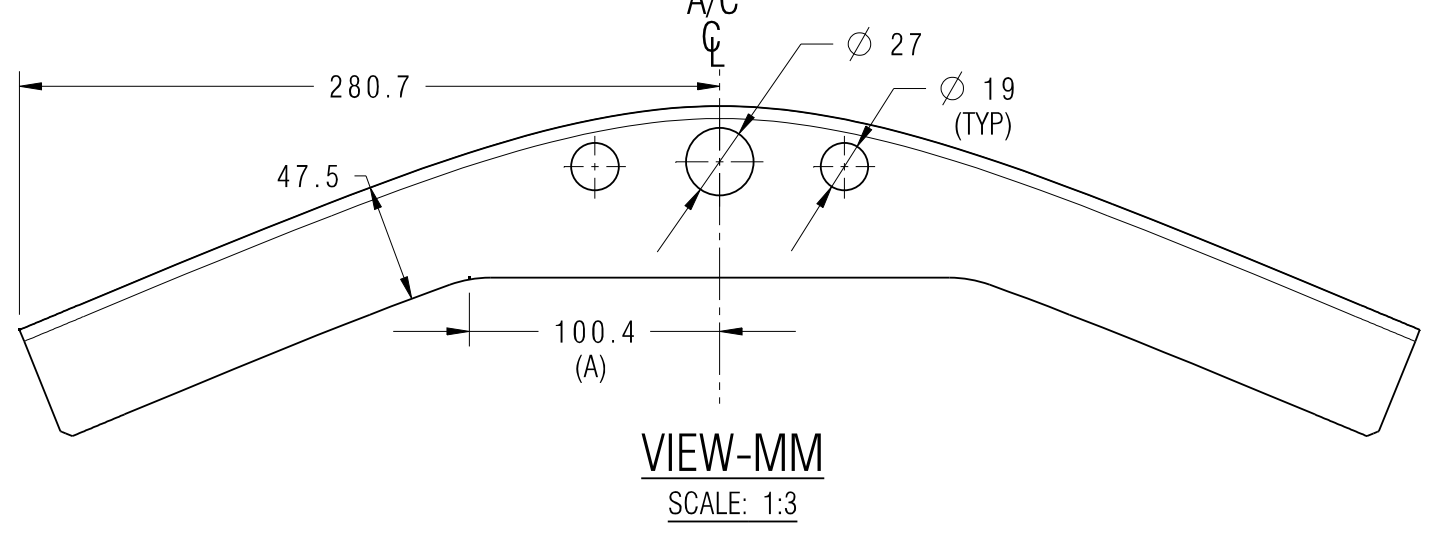
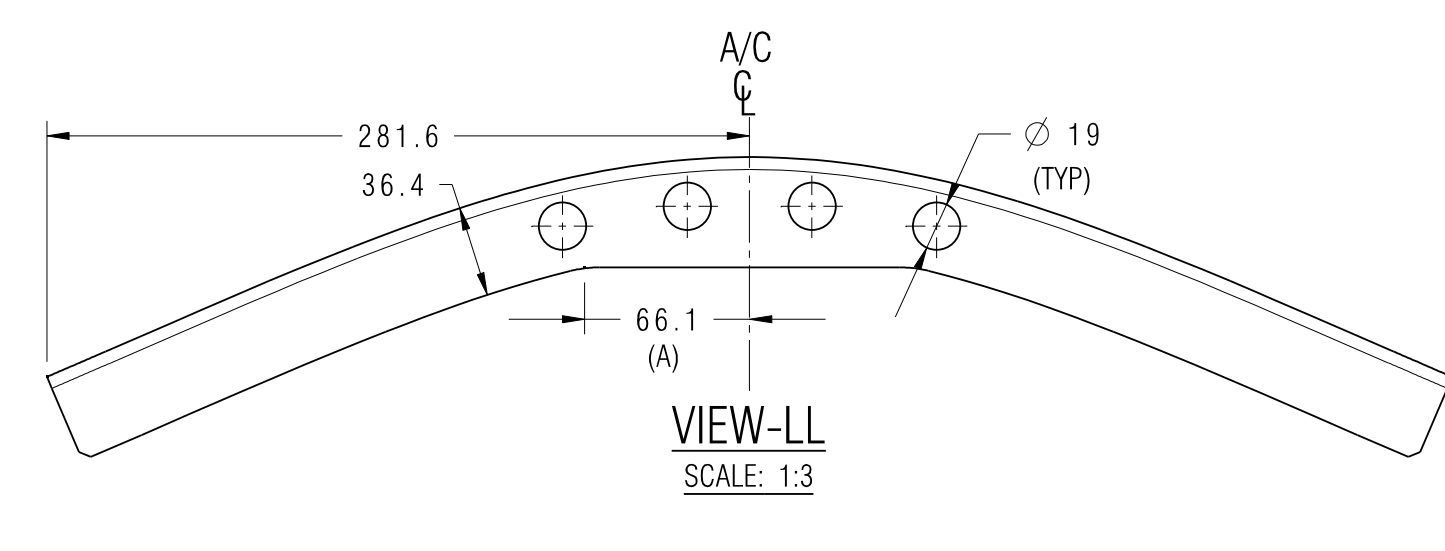
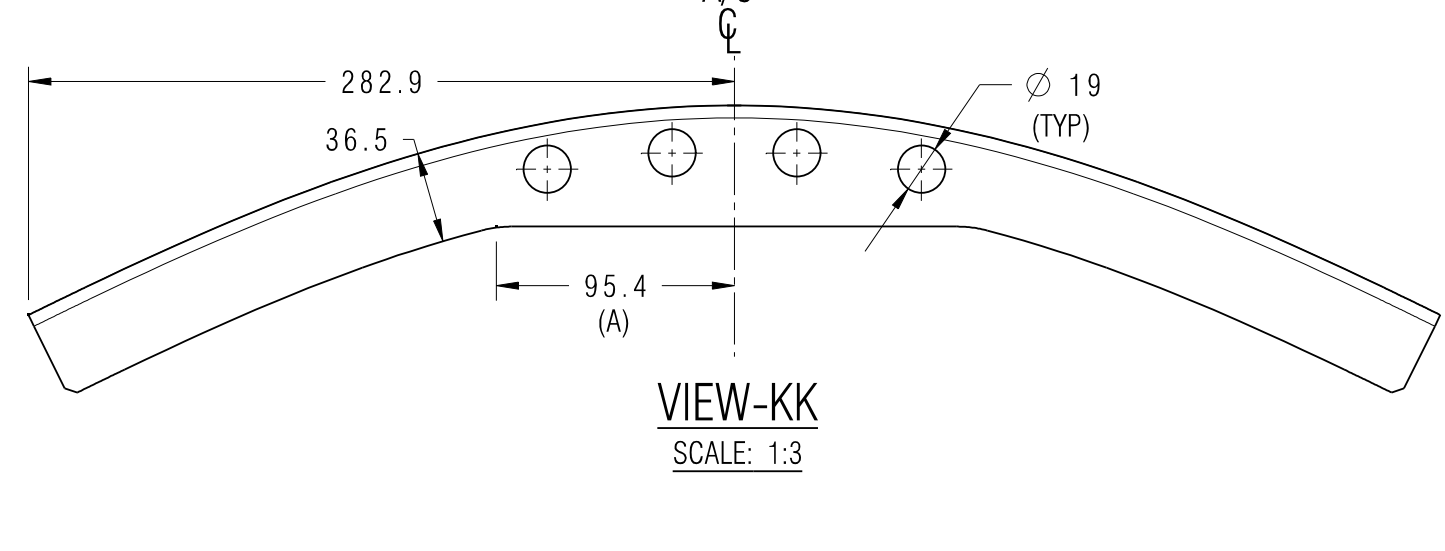
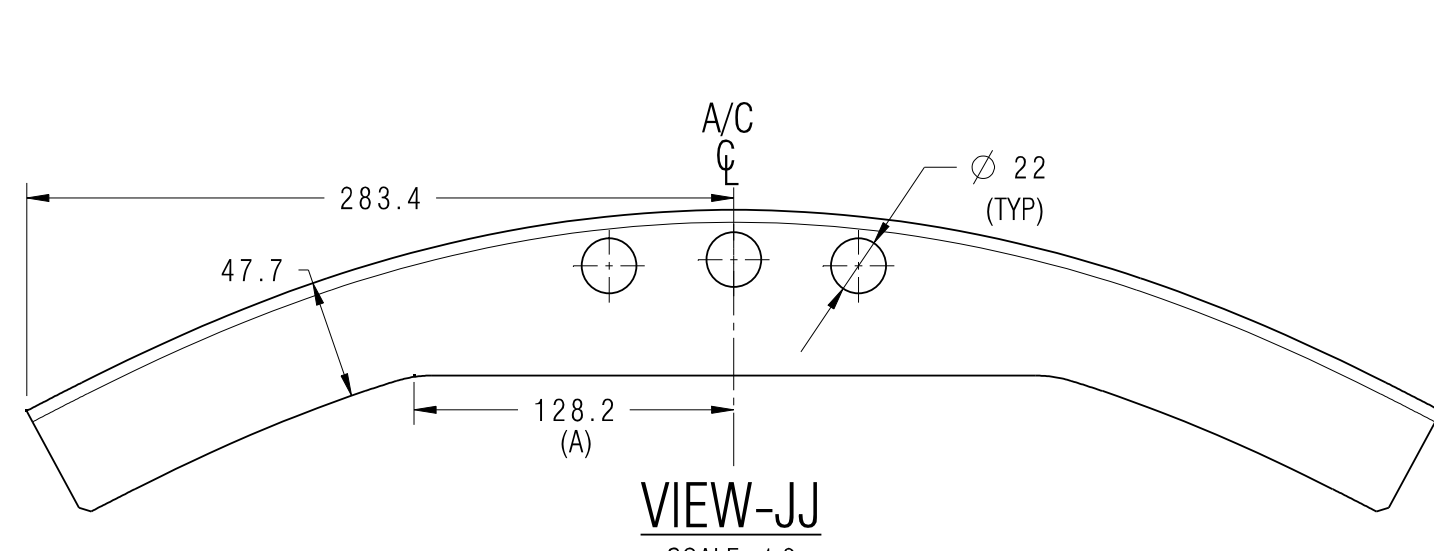
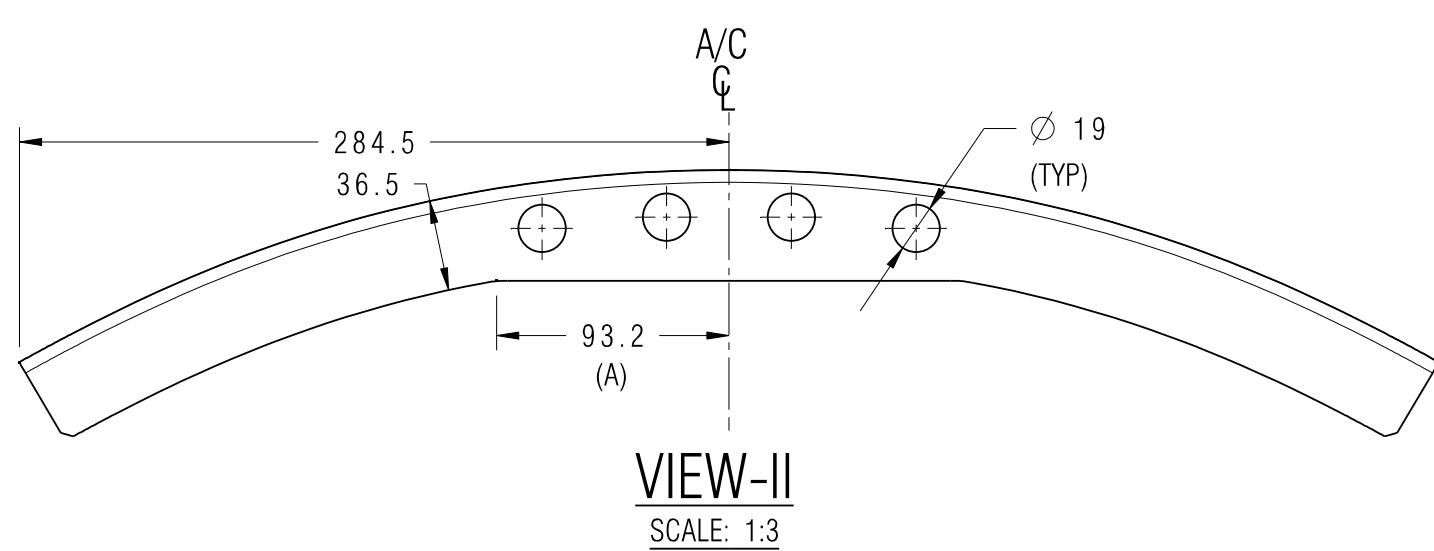
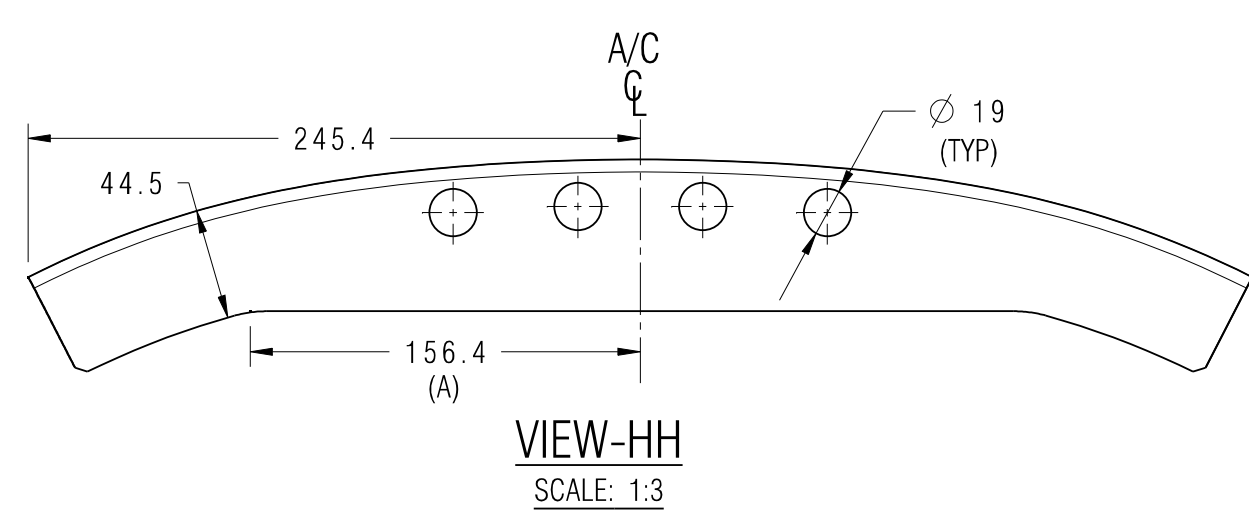
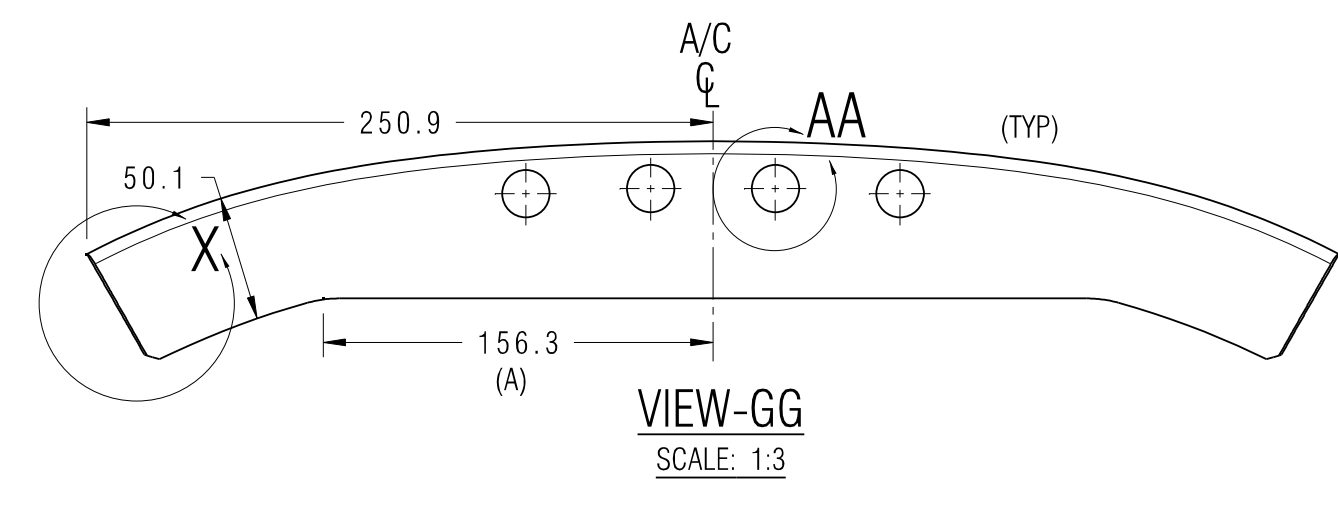
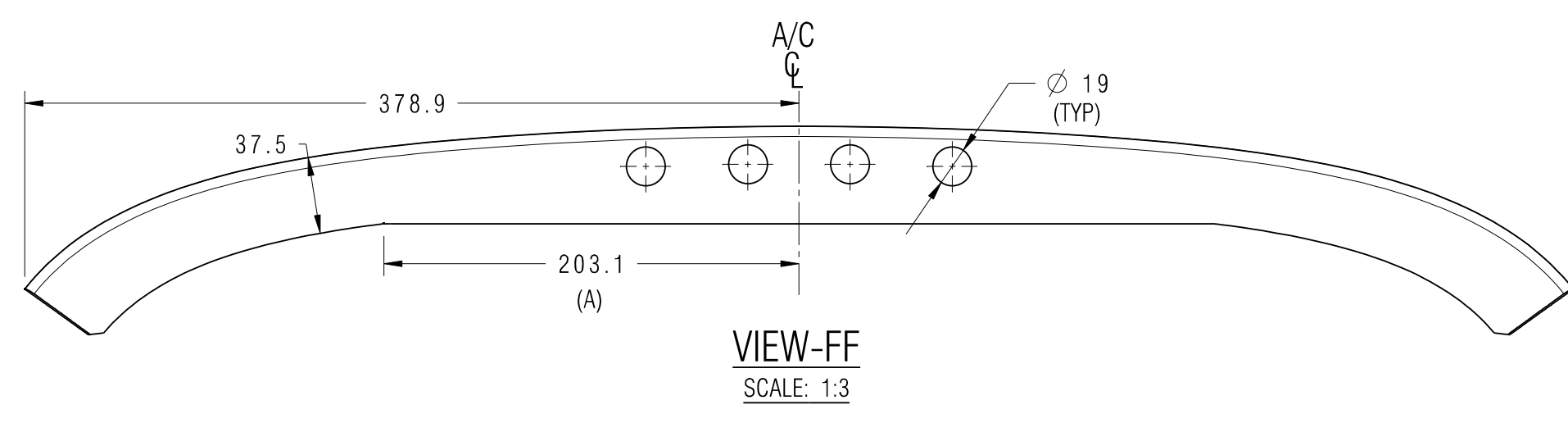
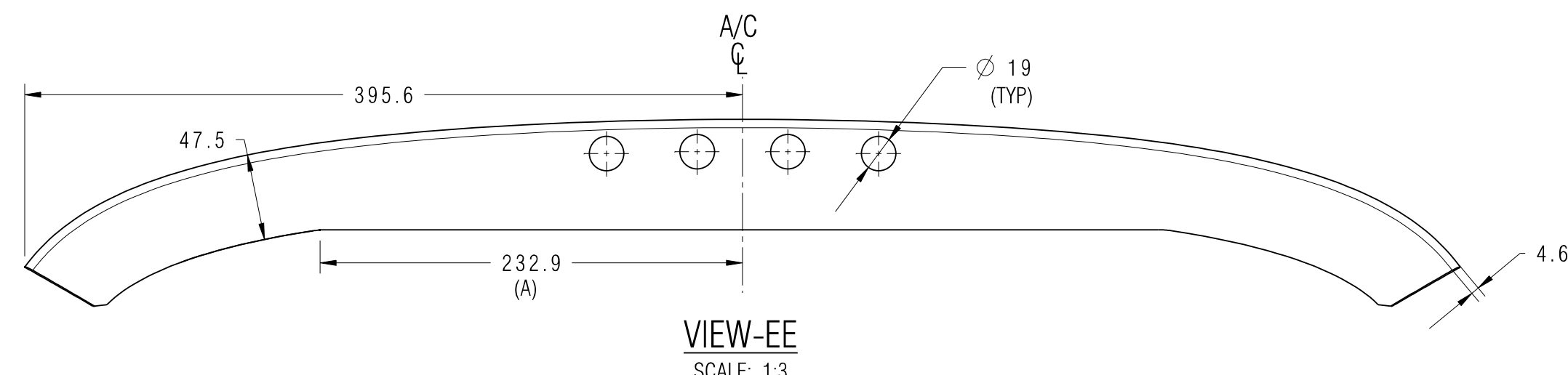
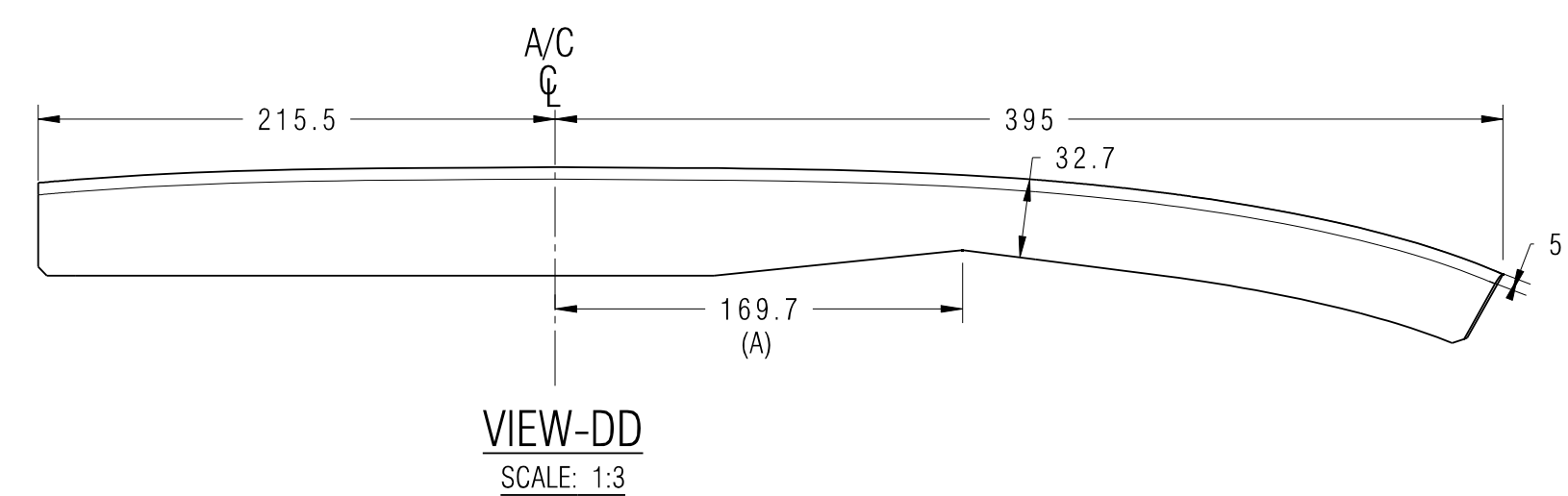
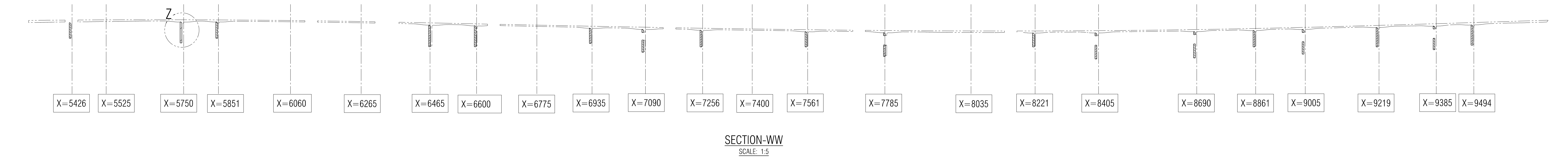
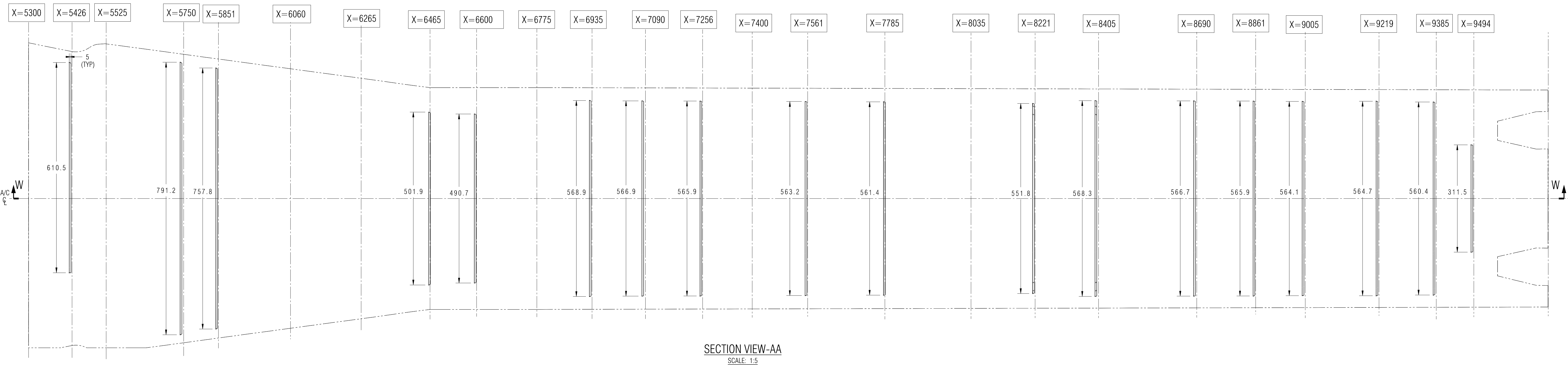
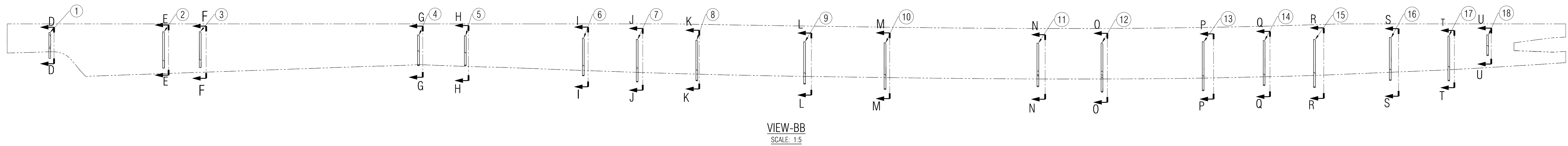
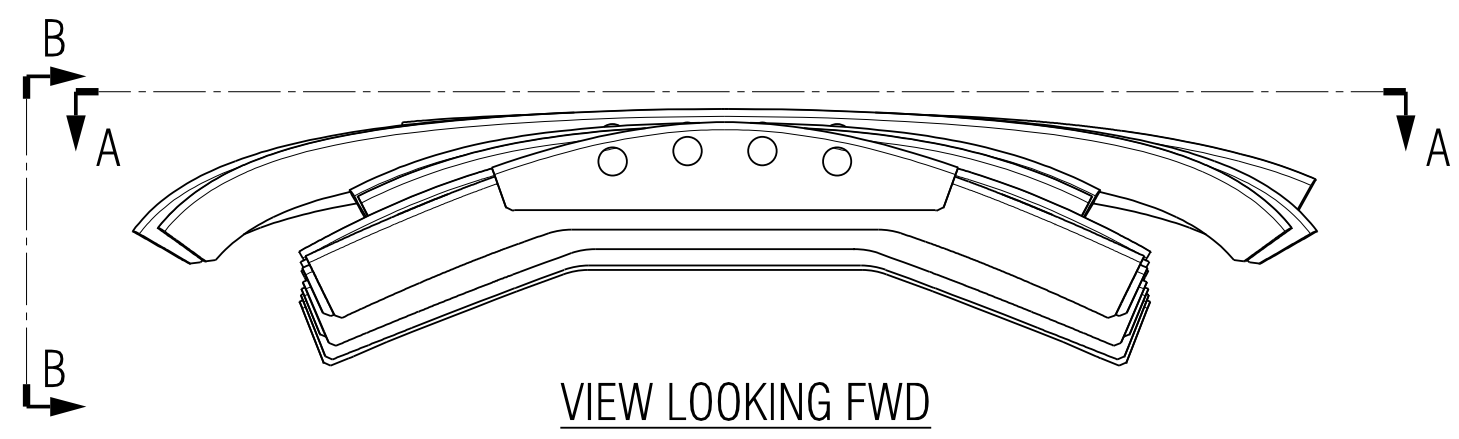




18	142	69.2	138.6
6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,	137.2	67.5	135
4, 5	157.6	76.7	150.4
1, 2, 3	153.3	74.1	148.3
ITEM NO.	P1	P2	P3

21	WASHER		STEEL	320
20	NUT		STEEL	160
19	BOLT		STEEL	160
18	PLATE FOR ROVING TOOL @ X=9494 FWD	0.424 KG	AL. ALLOY	2
17	PLATE FOR ROVING TOOL @ X=9385 FWD	0.775 KG	AL. ALLOY	2
16	PLATE FOR ROVING TOOL @ X=9219 FWD	0.783 KG	AL. ALLOY	2
15	PLATE FOR ROVING TOOL @ X=9005 FWD	0.786 KG	AL. ALLOY	2
14	PLATE FOR ROVING TOOL @ X=8861 FWD	0.79 KG	AL. ALLOY	2
13	PLATE FOR ROVING TOOL @ X=8690 FWD	0.792 KG	AL. ALLOY	2
12	PLATE FOR ROVING TOOL @ X=8405 FWD	0.793 KG	AL. ALLOY	2
11	PLATE FOR ROVING TOOL @ X=8221 FWD	0.774 KG	AL. ALLOY	2
10	PLATE FOR ROVING TOOL @ X=7785 FWD	0.78 KG	AL. ALLOY	2
9	PLATE FOR ROVING TOOL @ X=7561 FWD	0.784 KG	AL. ALLOY	2
8	PLATE FOR ROVING TOOL @ X=7256 FWD	0.782 KG	AL. ALLOY	2
7	PLATE FOR ROVING TOOL @ X=7090 FWD	0.777 KG	AL. ALLOY	2
6	PLATE FOR ROVING TOOL @ X=6935 FWD	0.778 KG	AL. ALLOY	2
5	PLATE FOR ROVING TOOL @ X=6600 FWD	0.66 KG	AL. ALLOY	2
4	PLATE FOR ROVING TOOL @ X=6465 FWD	0.667 KG	AL. ALLOY	2
3	PLATE FOR ROVING TOOL @ X=5851 FWD	1.01 KG	AL. ALLOY	2
2	PLATE FOR ROVING TOOL @ X=5750 FWD	1.05 KG	AL. ALLOY	2
1	PLATE FOR ROVING TOOL @ X=5426 FWD	1.047 KG	AL. ALLOY	2
ITEM NO.	DESCRIPTION	WEIGHT	MATERIAL	QUANTITY

- NOTES :
- MAKE THESE ROVING TOOLS BY CNC MACHINING USING 10 MM THICK ALUMINIUM PLATE.
 - ASSEMBLY AFT & FWD PLATES USING M6 BOLTS & NUTS AS SHOWN.
 - FILL ROVING TOOLS CAVITY USING 5MM UD STRIPS.
 - REMOVE ANY EXCESS ROVING MATERIAL AND LEVEL IT TO THE TOOL SURFACE.
 - INSPECT ROVING TOOLS USING CMM/LASER TRACKER.
 - TOLERANCE ON PROFILE IS ± 0.2 MM.
 - GENERAL MANUFACTURING TOLERANCE AS PER IS/AS/16.
 - CARRY OUT ANNOIDIZING FOR ALL ITEM TO PREVENT OXIDISATION/ RUSTING OF THE SURFACE.



ITEM NO.	DESCRIPTION	WEIGHT	QUANTITY
18	TRIMMING TAMPATE @ 9494	0.179	1
17	TRIMMING TAMPATE @ 9385	0.383	1
16	TRIMMING TAMPATE @ 9219	0.297	1
15	TRIMMING TAMPATE @ 9005	0.386	1
14	TRIMMING TAMPATE @ 8861	0.274	1
13	TRIMMING TAMPATE @ 8690	0.396	1
12	TRIMMING TAMPATE @ 8405	0.395	1
11	TRIMMING TAMPATE @ 8221	0.258	1
10	TRIMMING TAMPATE @ 7785	0.382	1
9	TRIMMING TAMPATE @ 7561	0.271	1
8	TRIMMING TAMPATE @ 7256	0.283	1
7	TRIMMING TAMPATE @ 7090	0.389	1
6	TRIMMING TAMPATE @ 6935	0.274	1
5	TRIMMING TAMPATE @ 6600	0.317	1
4	TRIMMING TAMPATE @ 6465	0.346	1
3	TRIMMING TAMPATE @ 5851	0.403	1
2	TRIMMING TAMPATE @ 5750	0.534	1
1	TRIMMING TAMPATE @ 5426	0.314	1

ITEM NO.	A
18	140.2
17	110.2
16	94.2
15	94.8
14	51.2
13	99.4
12	100
11	28.5
10	100.1
9	66.1
8	95.4
7	128.2
6	93.2
5	156.4
4	156.3
3	203.1
2	232.9
1	169.7

- NOTE :
1. MACHINING TO BE DONE AS PER THE CAD MODEL.
 2. CORE SURFACE IS OFFSET INSIDE BY 0.12 MM FOR TOOL-TECH CLEARANCE.
 3. MATERIAL : ALUMINIUM ALLOY 6061T651.
 4. INSPECT CURING CORES USING CMM/LASER TRACKER (WITHOUT TOOL-TECH ON THE SURFACE).
 5. TOLERANCE ON CORE CONTOUR IS ± 0.1 MM WRT CAD MODEL.
 6. TOLERANCE FOR HOLE LOCATION IS ± 0.05 MM WRT CAD MODEL.
 7. GENERAL MANUFACTURING TOLERANCE AS PER MAL/NA716.
 8. SCRIBE ALL THE REFERENCE LINES AS SHOWN IN DETAIL-AA.
 9. CARRY OUT ANODIZING FOR ALL ITEM TO PREVENT OXIDISATION / RUSTING OF THE CORE SURFACE.