

Requirements for attachment of Backplate Cooling system onto Dee4

1. All FLOW lines (at 45 degree positions) are to be marked at the approximate interaction area between pipes and End Cap Patch Panel. (Figure A).
2. All FLOW lines are to be formed with the root of the bend at the marked interaction area (specified in 1.). Refer to Figure B for bend angle. Note that it would be preferable to maintain the pitch/spacing between the pipes as shown, it may be necessary to adjust the root bend for each pipe to achieve this.
3. All FLOW lines are to be cut to the length specified in Figure B; ends are to be burr free, clean and square.
4. All RETURN lines will require pairing internal to the End Cap. St/Steel welding is recommended. This should result in a single RETURN line exiting the End Cap through a suitable hole in the support ring. A suggested arrangement can be seen in Figures C and D, however the solution is open to design and will require some input from the welder at CERN.
5. The newly formed single RETURN lines should be marked at the exit point of the support ring.
6. The RETURN lines are to be formed with the root of the bend at the marked point (specified in 5.). Refer to Figure C for bend angle at 12/6 o'clock positions and Figure D for 3 o'clock position.
7. All RETURN lines are to be cut to the length specified; ends are to be burr free, clean and square. Refer to Figures C and D.
8. On completion all Backplate cooling pipes are to be fixed to the Backplate using the thermal compound provided (AS1607) and screws. Careful consideration is to be given on the amount of compound to be used and alignment of screw holes.

NOTE 1: One complication arising from the above sequence is at 4. Having to pair/weld the pipes together at this stage will essential couple two circuits together, making for an unwieldy assembly. This may also complicate attachment onto the Backplate with the thermal compound.

NOTE 2: Surface preparation of the Backplate for the attachment of the cooling pipes using the thermal compound is important. The surface is to be dust and grease free and it must be made sure that this is the case prior to the application of the compound. Use scotchbrite to roughen and clean the surface, acetone maybe used to clean the surface afterwards but must be wiped off and not allowed to dry naturally. Distilled water can be placed onto the areas cleaned as a check for any remaining surface grease (please note that this must be distilled water).

Required adjustment of the Environmental Screen Cooling Pipes on Dee 4

1. All four Outer Environmental Shield cooling pipes (FLOW and RETURN) are to be re-adjusted either side of the support ring webs. A greater clearance is required whilst maintaining an 'in-line' position along the line of the web. Refer to the top drawing in Figures E for required separation of pipes
2. All four Outer Environmental Shield cooling pipes (FLOW and RETURN) are to be cut to the length specified; ends are to be burr free, clean and square. Refer to the lower drawing of Figure E for length.
3. Both Front Environmental Shield cooling pipes may require re-adjusting. As currently positioned they are close to the patch panel/End Cap envelope. Their height

must be reduced below this envelope as shown in Figure F. Both pipes will require a traversing link section as the water supply is not located in an opposing service sector. This arrangement is yet to be decided but trim the pipe to the length specified again shown in Figure F.

NOTE: The area where the outer environmental shield cooling pipes emerge from the Backplate may require enlarging to allow for the necessary adjustment of pipes. Backplate material maybe removed up to 5mm either side of the existing slot, as shown in the top drawing of Figure E.

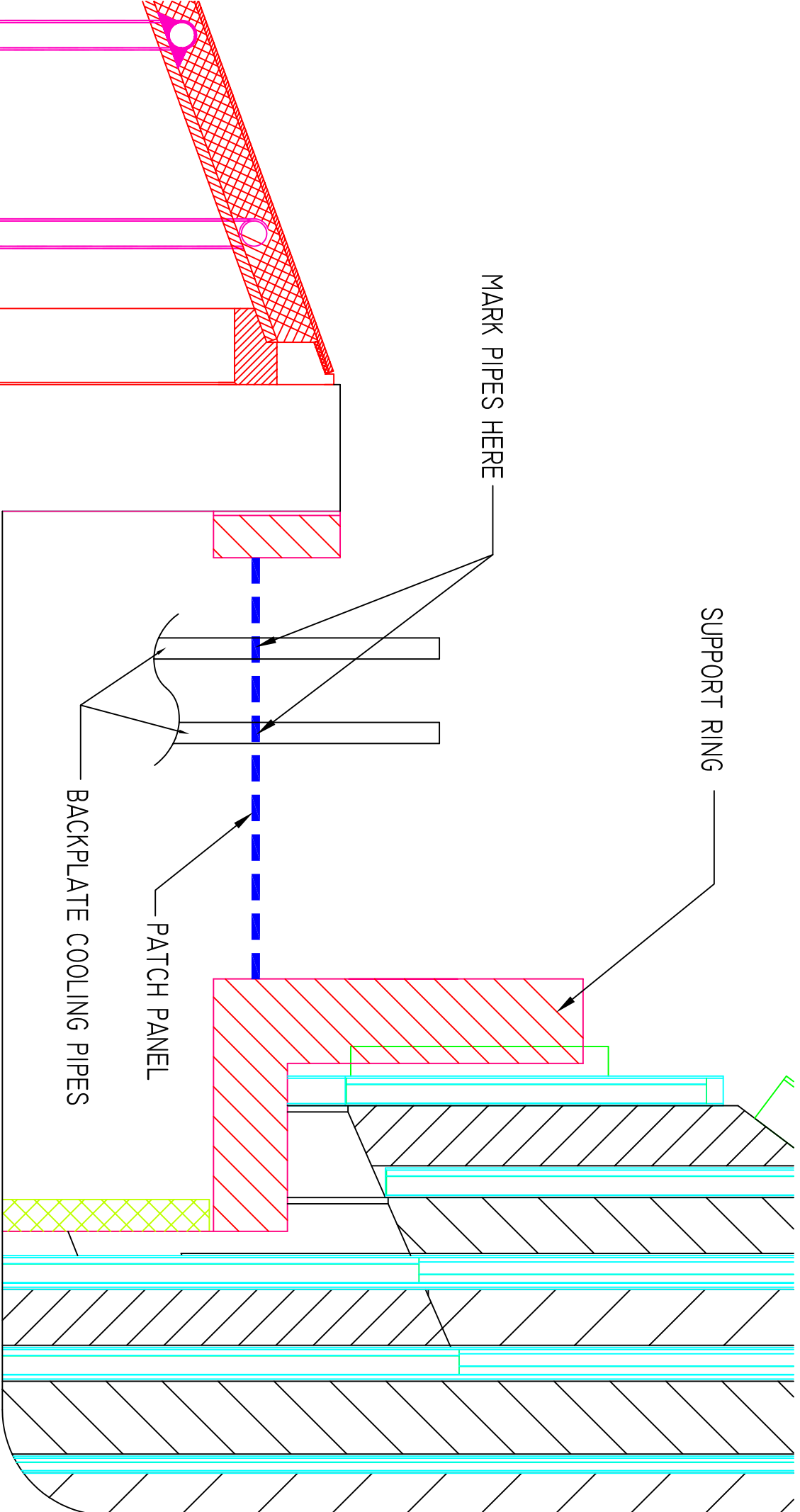


FIGURE A
 TYPICAL MARKING OF
 BACKPLATE COOLING PIPES (ALL POSITIONS)

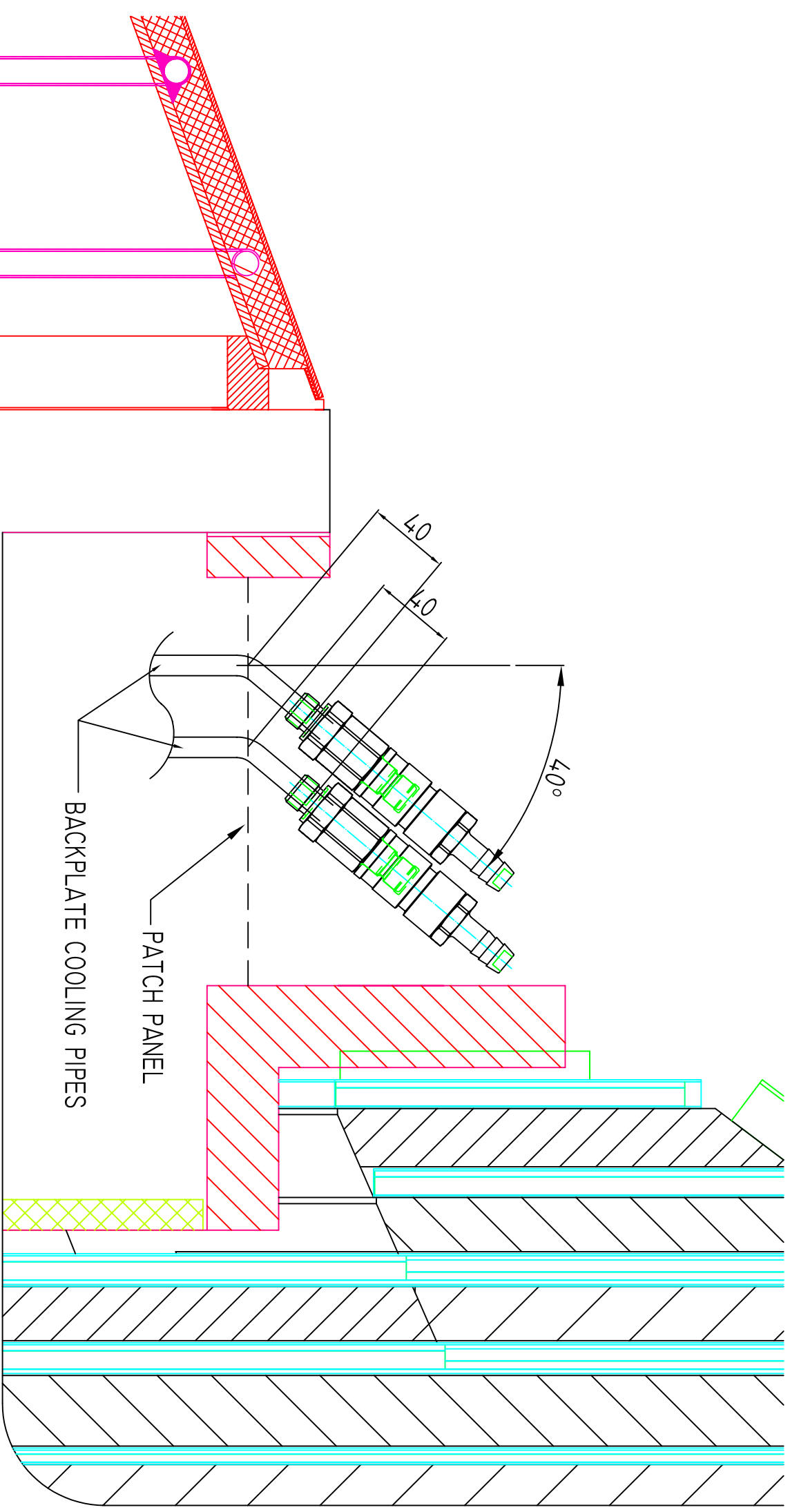


FIGURE B
 BACKPLATE COOLING
 BEND PIPES AND TRIM TO APPROX LENGTH

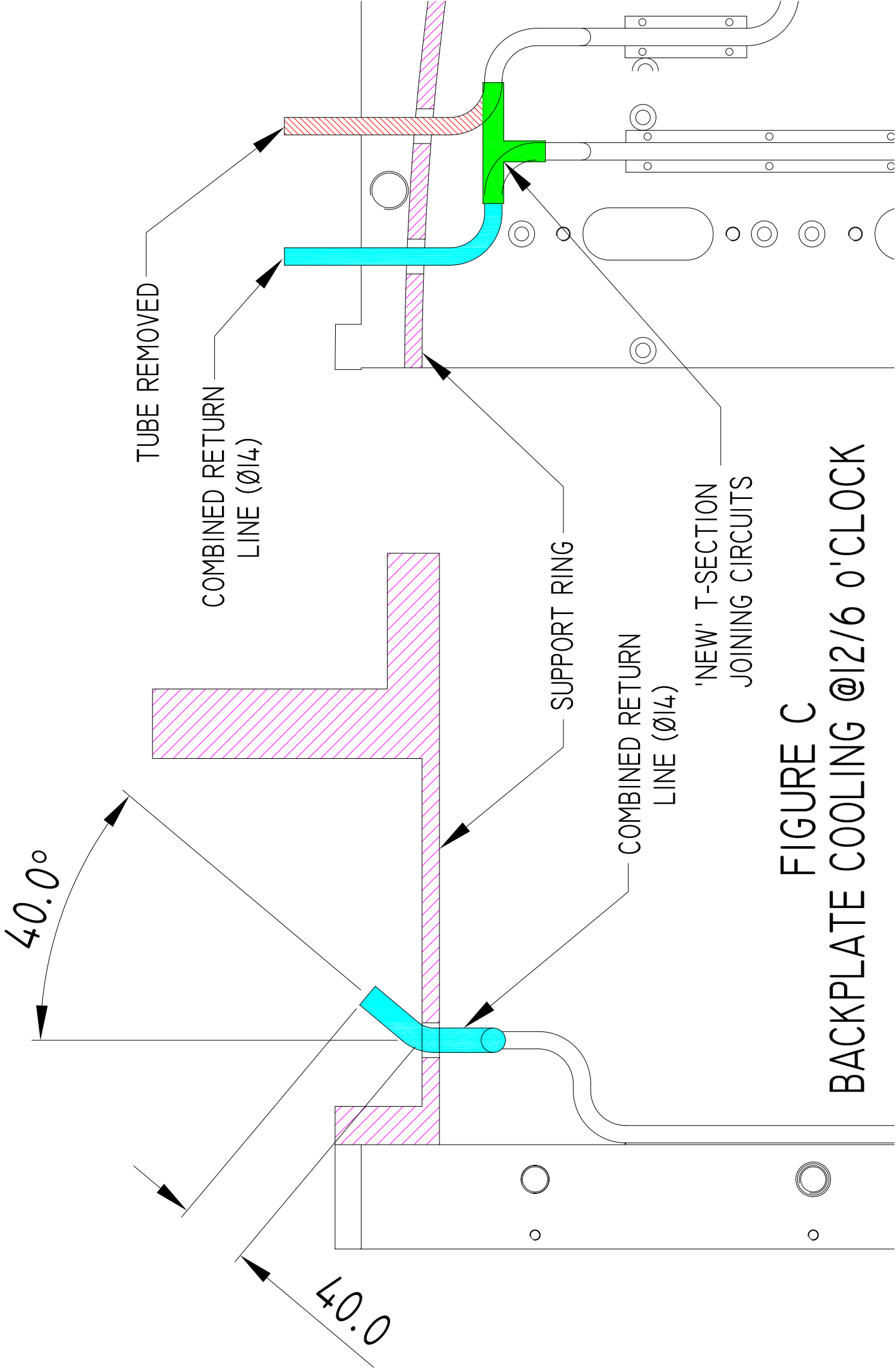
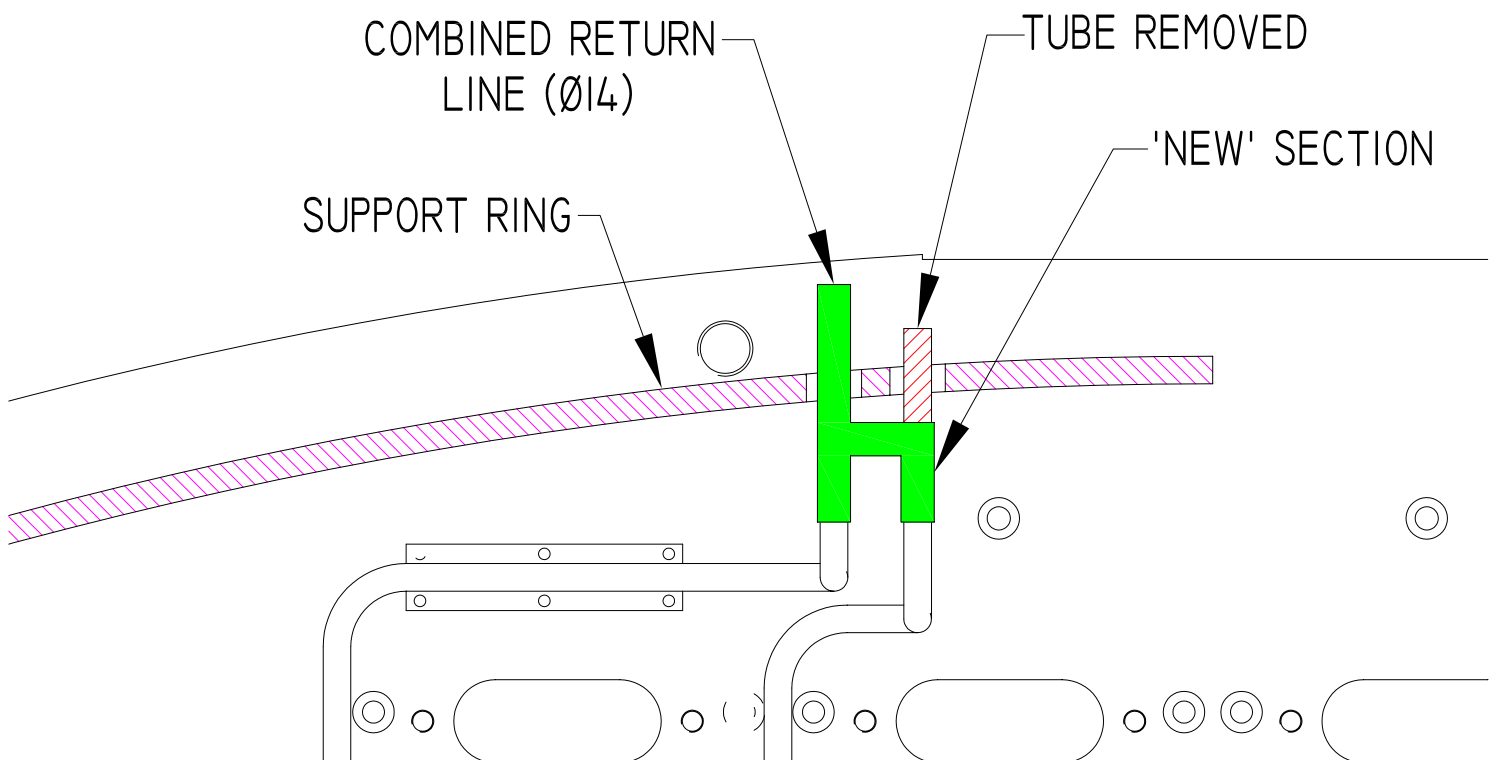
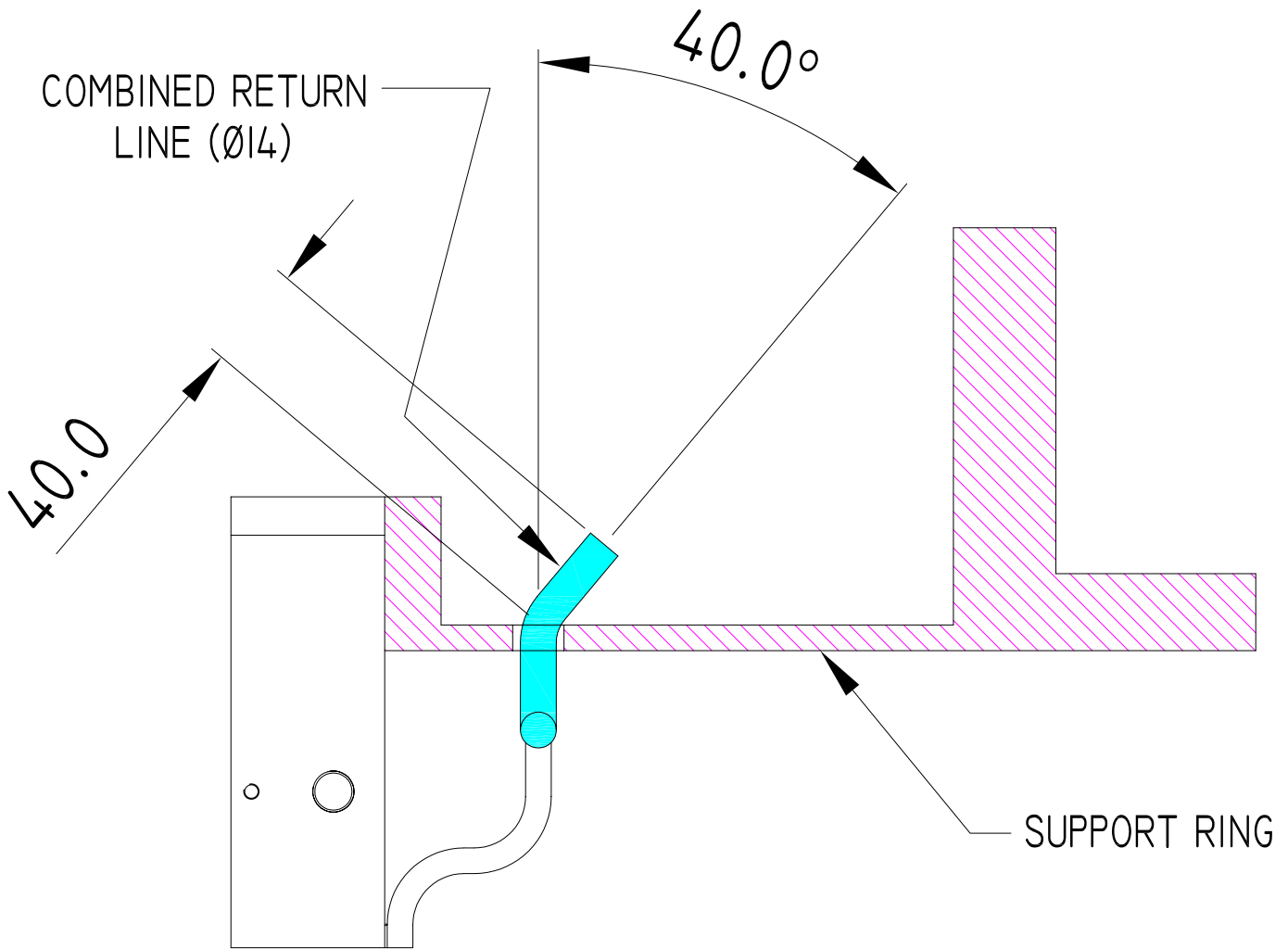
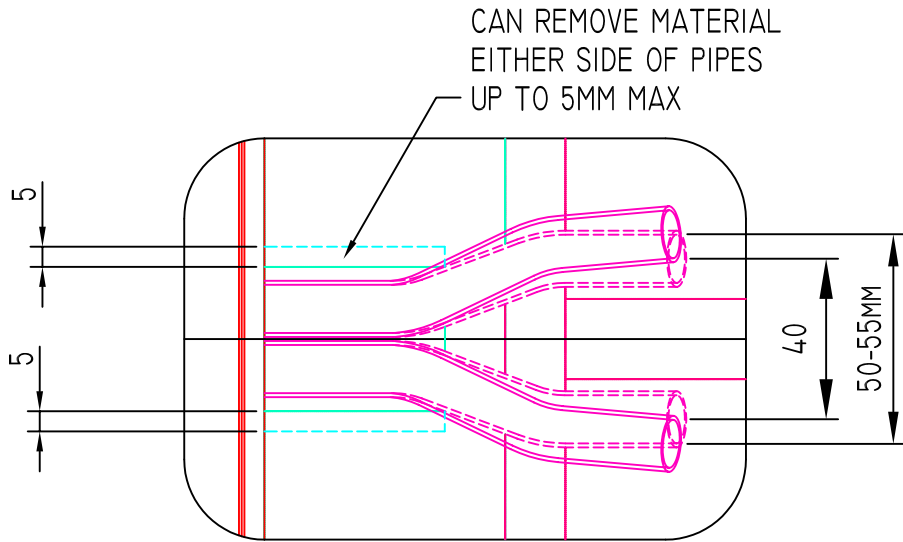


FIGURE C
 BACKPLATE COOLING @12/6 O'CLOCK

FIGURE D
BACKPLATE COOLING @3 o'CLOCK





RE-BEND INNER SHIELD PIPES OUTWARDS
AWAY FROM WEB, AS SHOWN

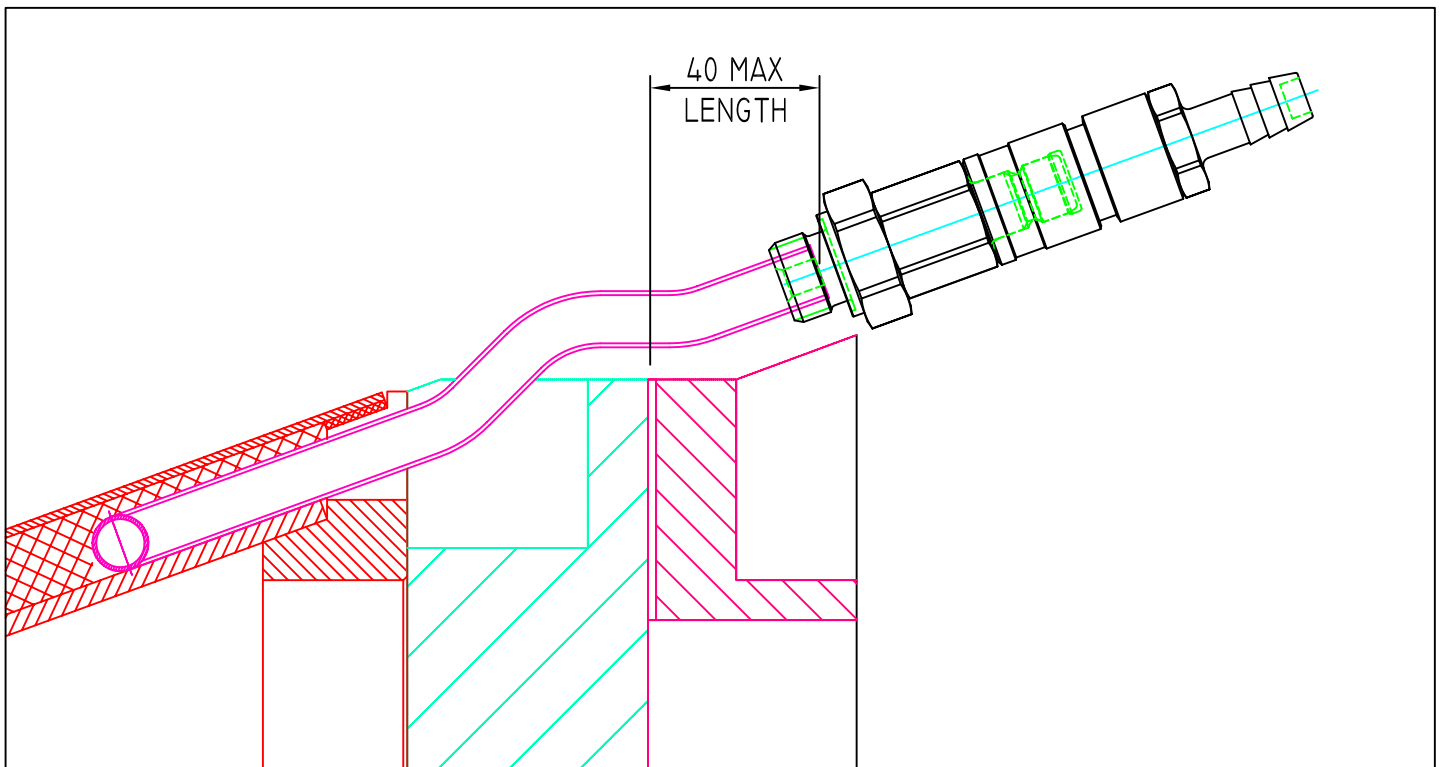


FIGURE E
REWORK OF OUTER SHIELD PIPES

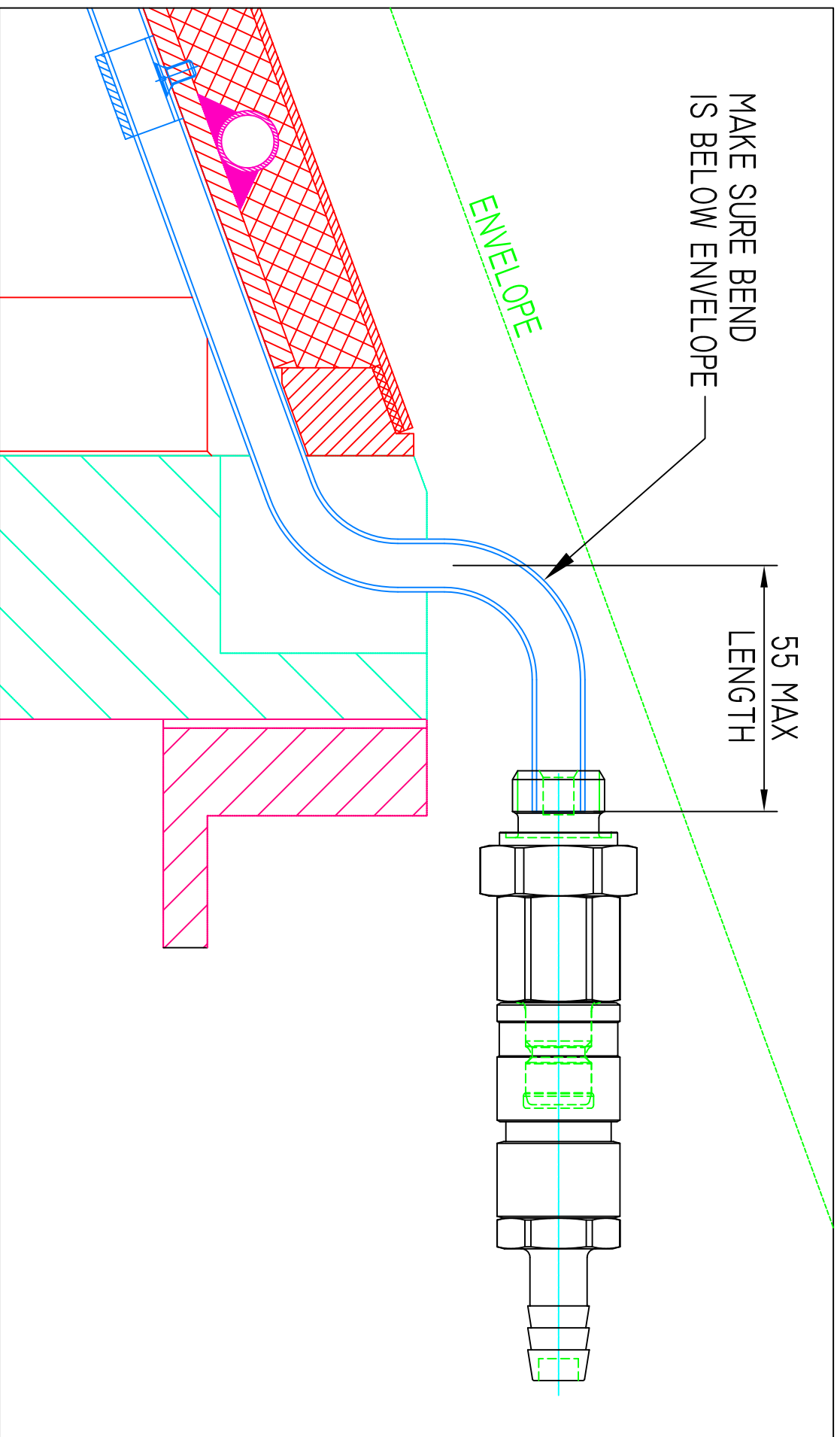


FIGURE F

REWORK OF FRONT SHIELD PIPES