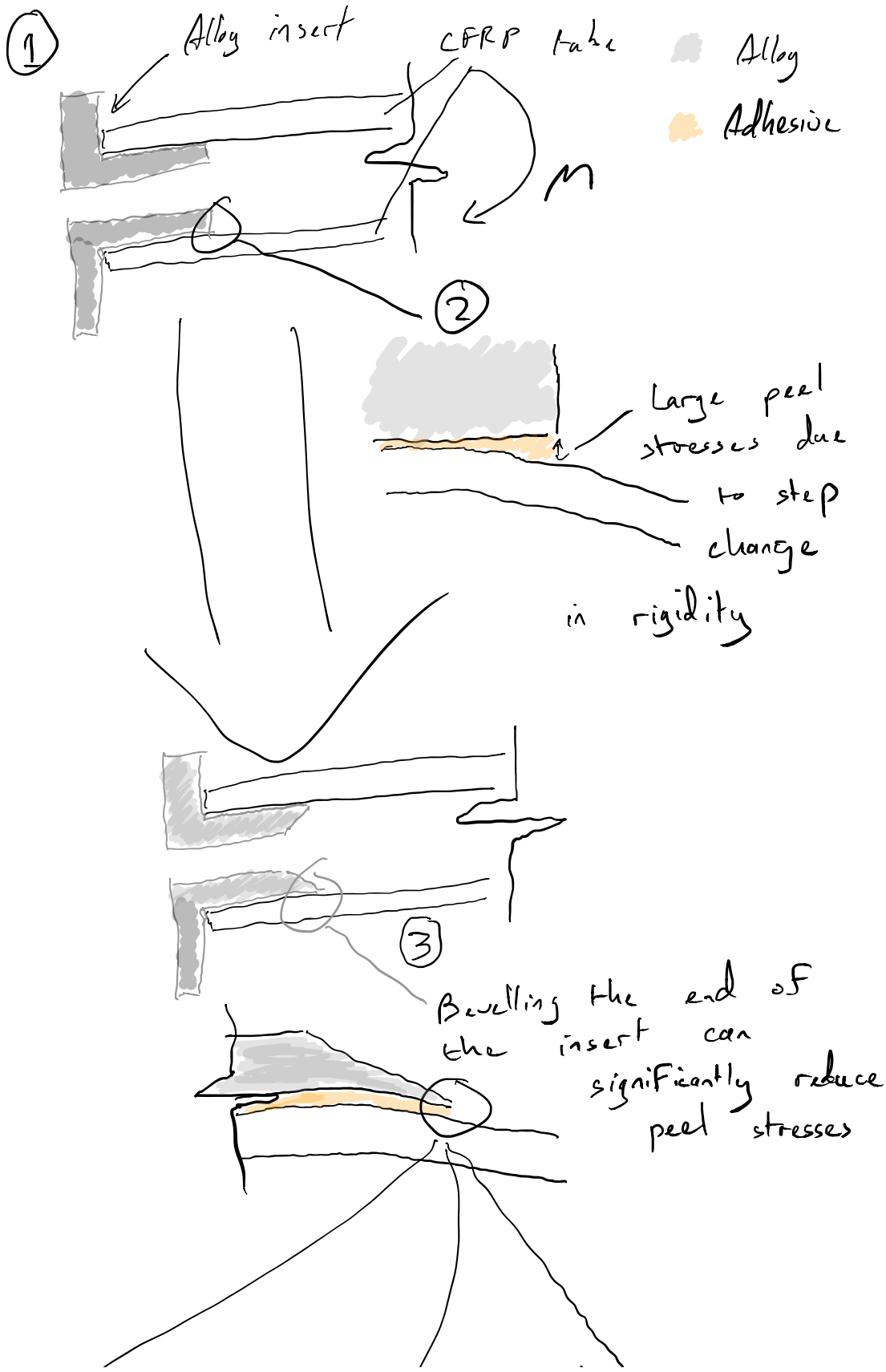
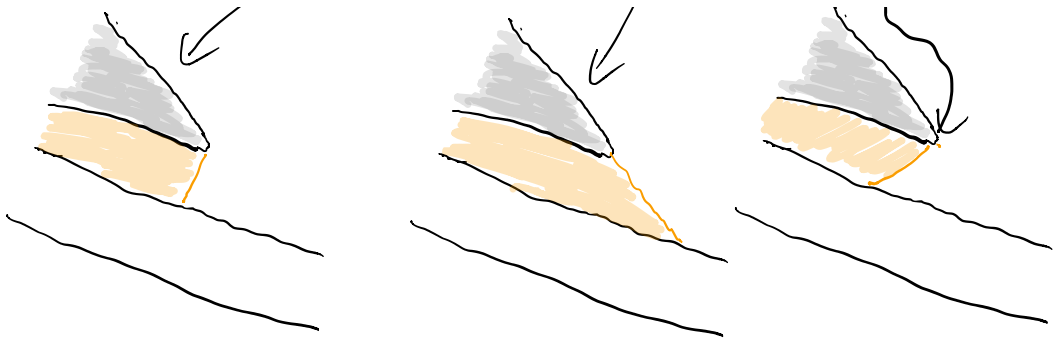
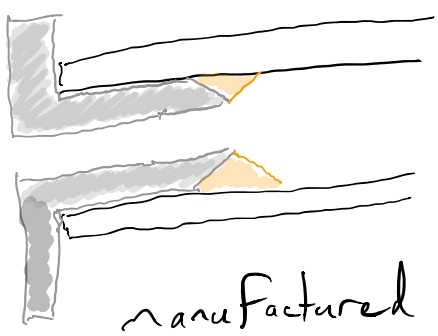

1
Alloy insert
CFRP tube
Alloy
Adhesive
M
2
Large peel stresses due to step change in rigidity
3
Bevelling the end of the insert can significantly reduce peel stresses



The geometry of the end of the adhesive bond requires consideration; especially as to how one might achieve it in a reproducable manner.

A reverse bevel and then a beveled or filleted adhesive bond may be more readily manufactured and reproducable.



Points to consider:

- What joint designs can you realistically and reproducably manufacture?

- How are you going to do any stress analysis of these joint designs? N.B. Three different length scales (1, 2 and 3) have been used to illustrate features of adhesive bond design in here already. Coupling of numerical analyses across length scales is possible but distinctly non-trivial and outside the capabilities of your run of the mill mesh monkies.

- How are you going to determine the properties of your adhesive system? Parameters like your grit blasting media, etching process, degrease process, etc... will affect adhesion between your adhesive and substrates. Factors such as bond line thickness can hugely affect the cohesive behaviour of the adhesive

- Failure of adhesives is normally a FRACTURE dominated process; values like 'peel strength' on data sheets have little to no use in adhesive bond design and should only be considered for QC, if at all.