CLAIMS

1. A method of fabricating an interfacial structure, the interfacial structure comprising a substrate and a projection on the substrate, the method comprising the steps of:
   a) providing the substrate;
   b) creating a number of steps on as a protrusion on a surface of the substrate, such that the protrusion extends outwardly from the surface of the substrate; and
   c) fabricating the projection on the substrate by additive manufacturing onto the number of steps, thereby creating a stepped interfacial joint between the substrate and the projection, wherein the projection extends outwardly from the surface of the substrate and the number of steps.

~~2. The method of claim 1, wherein step b) comprises creating the number of steps as a recess on the surface of the substrate.~~

~~3. The method of claim 2, wherein step b) comprises creating the number of steps to fully surround the recess.~~

~~4. The method of claim 1, wherein step b) comprises creating the number of steps as a protrusion on the surface of the substrate.~~

~~5.~~2. The method of claim ~~4~~1, wherein step b) comprises creating the number of steps to fully surround the protrusion.

~~6. The method of any one of claims 1 to 5, wherein step b) comprises creating the number of steps by subtractive manufacturing.~~

~~7.~~3. The method of claim ~~6~~1 or 2, wherein ~~in step b), the number of steps are created by metal machining and wherein in step c),~~ the projection is created by laser metal deposition.

~~8.~~4. The method of any one of claims 1 to ~~7~~3, wherein step a) comprises fabricating the substrate by additive manufacturing.

~~9.~~5. The method of claim ~~8 when dependent on any one of claims 1 to 5~~4, wherein step b) comprises creating the number of steps during additive manufacturing fabrication of the

substrate.

~~10.~~6. The method of any one of claims 1 to ~~9~~5, wherein the stepped interfacial joint comprises a metallurgical bond.

~~11.~~7. The method of any one of claims 1 to ~~10~~6, wherein each of the number of steps comprises a sideways-facing surface and an upwards-facing surface when the surface of the substrate is facing up, wherein step a) comprises creating each sideways-facing surface to be at an angle θ from the vertical and creating each upwards-facing surface to be at an angle α from the horizontal, and wherein θ and α each ranges from 0° to 80°.

~~12.~~8. The method of claim ~~11~~7, wherein step a) comprises creating a fillet between at least one upwards-facing surface and one sideways-facing surface.

~~13.~~9. The method of claim ~~11~~ 7 or ~~12~~8, wherein step a) comprises creating a chamfer between at least one sideways-facing surface and one upwards-facing surface.

~~14.~~10. The method of any one of claims 1 to ~~13~~9, wherein step b) comprises fabricating a thin-walled solid body of the projection onto the number of steps.

~~15.~~11. The method of any one of claims 1 to ~~14~~9, wherein step b) comprises fabricating a non-hollow portion of the projection onto the number of steps.

~~16.~~12. A fabricated interfacial structure comprising:

a substrate having a number of steps created as a protrusion on a surface of the substrate, such that the protrusion extends outwardly from the surface of the substrate;

a projection fabricated by additive manufacturing onto the number of steps; and

a stepped interfacial joint between the substrate and the projection,

wherein the projection extends outwardly from the surface of the substrate and the number of steps.

~~17. The fabricated interfacial structure of claim 16, wherein the number of steps are created as a recess on the surface of the substrate.~~

~~18. The fabricated interfacial structure of claim 17, wherein the number of steps fully surround~~

~~the recess.~~

~~19. The fabricated interfacial structure of claim 16, wherein the number of steps are created as a protrusion on the surface of the substrate.~~

~~20.~~13. The fabricated interfacial structure of claim ~~19~~12, wherein the number of steps fully surround the protrusion.

~~21.~~14. The fabricated interfacial structure of ~~any one of claims 16 to 20~~claim 12 or 13, wherein the stepped interfacial joint comprises a metallurgical bond.

~~22.~~15. The fabricated interfacial structure of any one of claims ~~16~~ 12 to ~~21~~14, wherein each of the number of steps comprises a sideways-facing surface and an upwards-facing surface when the surface of the substrate is facing up, wherein each sideways-facing surface is at an angle θ from the vertical and each upwards-facing surface is at an angle α from the horizontal, and wherein θ and α each ranges from 0° to 80°.

~~23.~~16. The fabricated interfacial structure of any one of claims ~~16~~ 12 to ~~22~~15, wherein the projection comprises a thin-walled solid body fabricated onto the number of steps.

~~24.~~17. The fabricated interfacial structure of any of claims ~~16~~ 12 to ~~22~~15, wherein the projection comprises a non-hollow solid body fabricated onto the number of steps.