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 to fully surround the protrusion.

3. The method of claim 1 or 2, wherein the projection is created by laser metal deposition.

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

5. The method of claim 4, wherein step b) comprises creating the number of steps during additive manufacturing fabrication of the substrate.

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

7. The method of any one of claims 1 to 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°.

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

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

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

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

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.

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

14. The fabricated interfacial structure of claim 12 or 13, wherein the stepped interfacial joint comprises a metallurgical bond.

15. The fabricated interfacial structure of any one of claims 12 to 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°.

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

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