How Support Material Can Reduce the Need for Buildability In 3D Printed Concrete Mix Design

UNDERGRADUATE RESEARCH SESSION

BY

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With Dr. Hojati
& Dr. Torres

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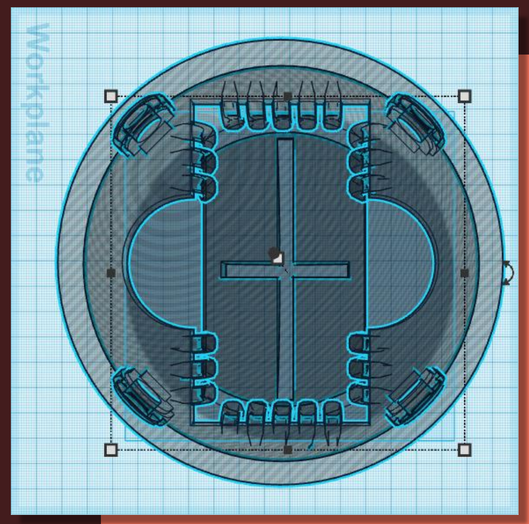

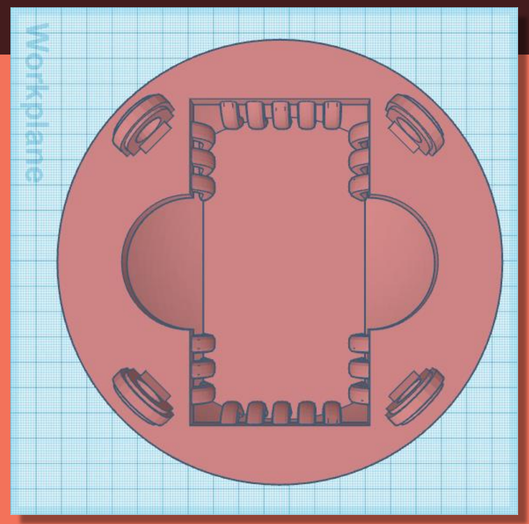

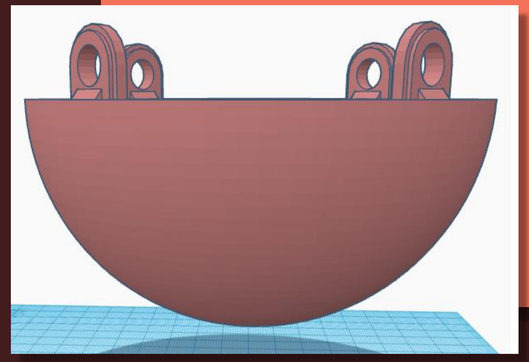

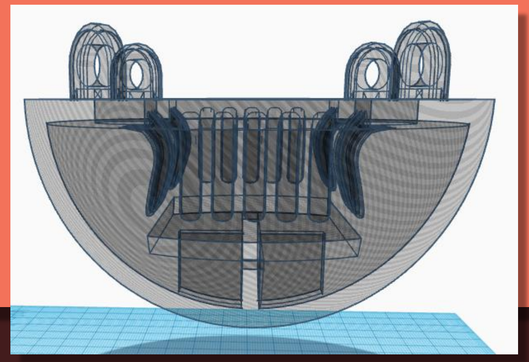

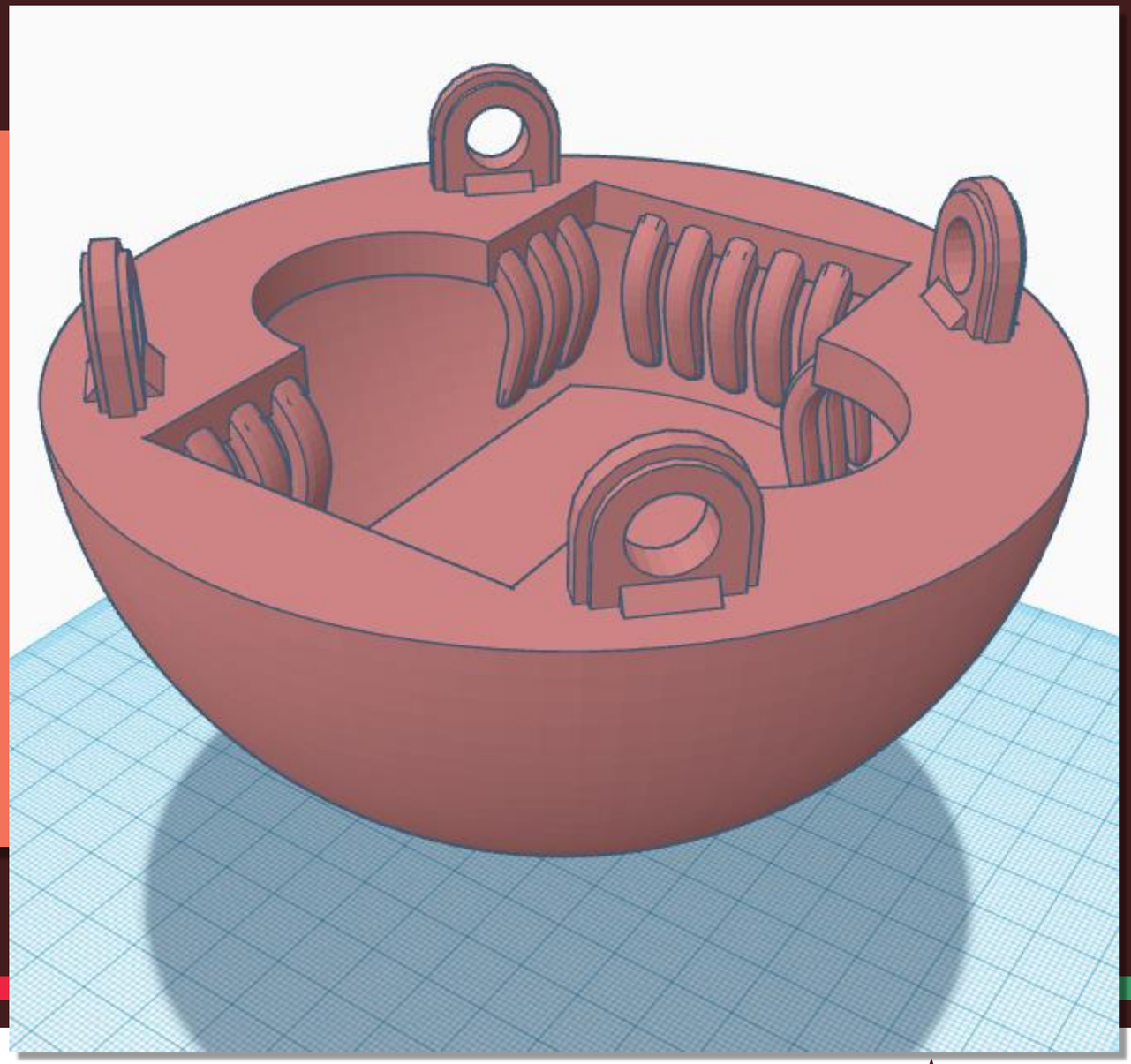

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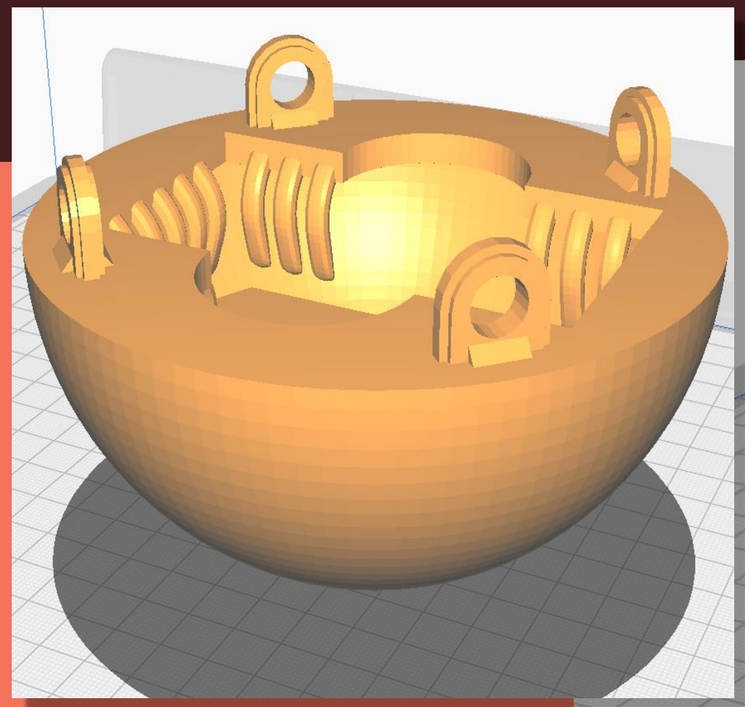

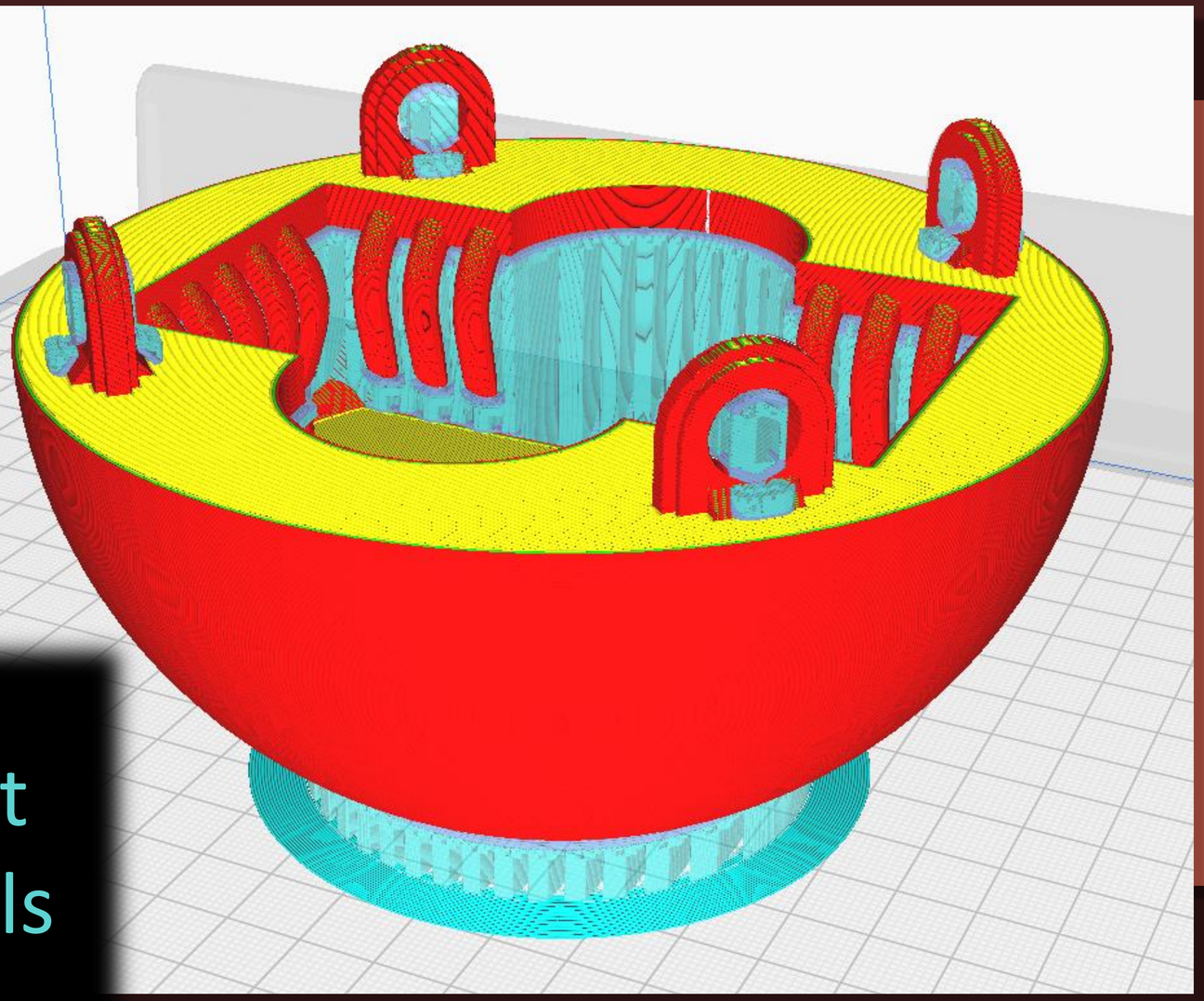

Support Materials

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Sand as a
Support Material

Reduced Need
For Buildability

Good

BAD

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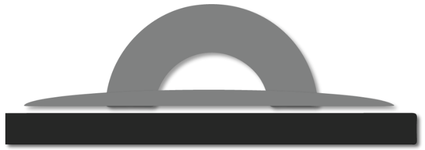
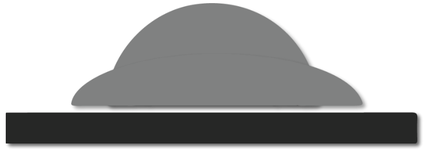
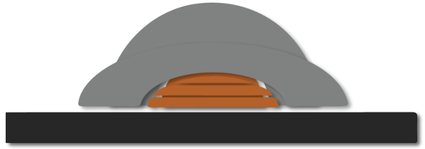


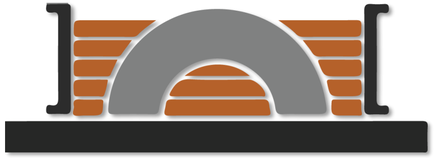
No Supports



Solid



Interior Support



Interior and
Exterior Support

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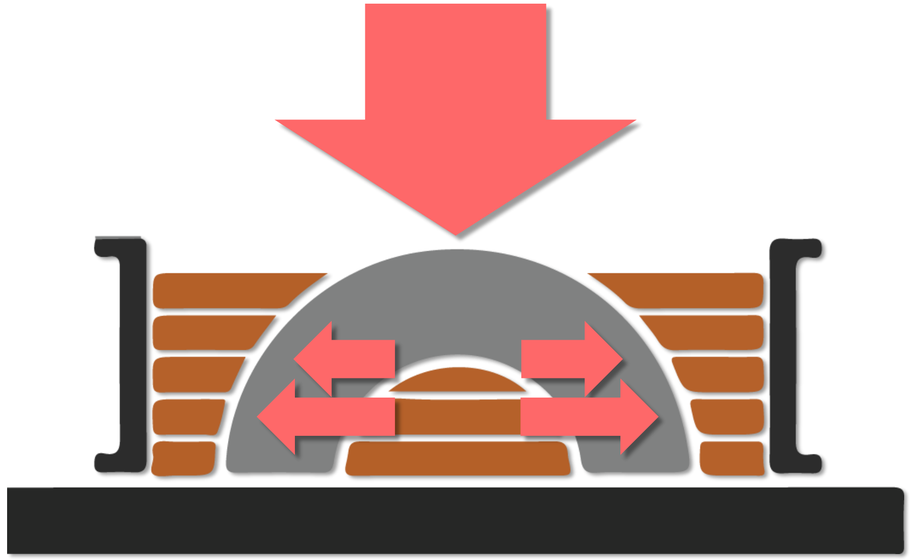

Exterior and Interior Supports

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Print 1: Standard Mix Design W/C .35

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Print 2: Increased Water Content W/C 0.38

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Print 3: W/C 0.38 and Increased Size

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Print 3: W/C 0.38 and Increased Size

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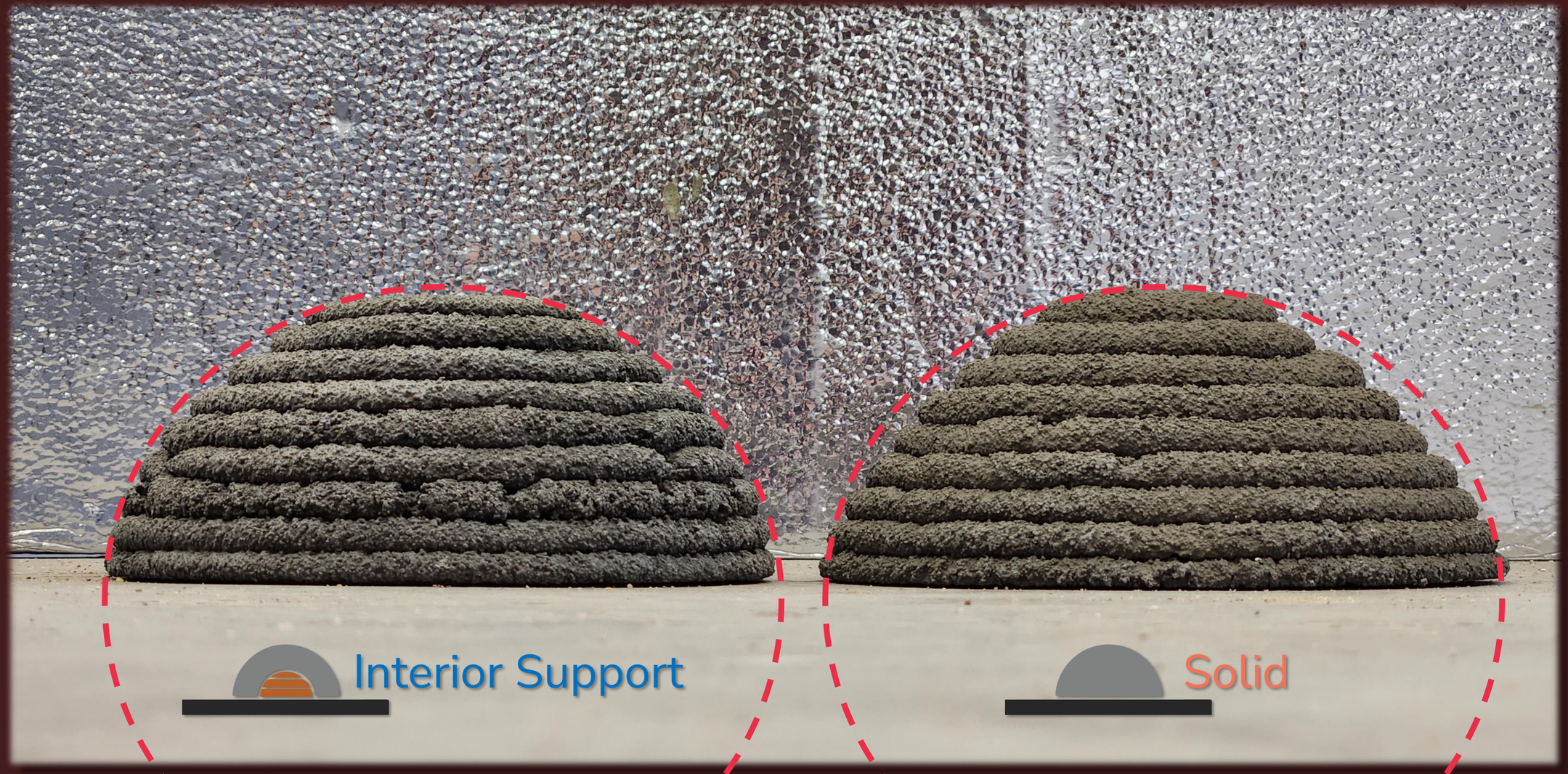

Print 3: W/C 0.38 and Increased Size

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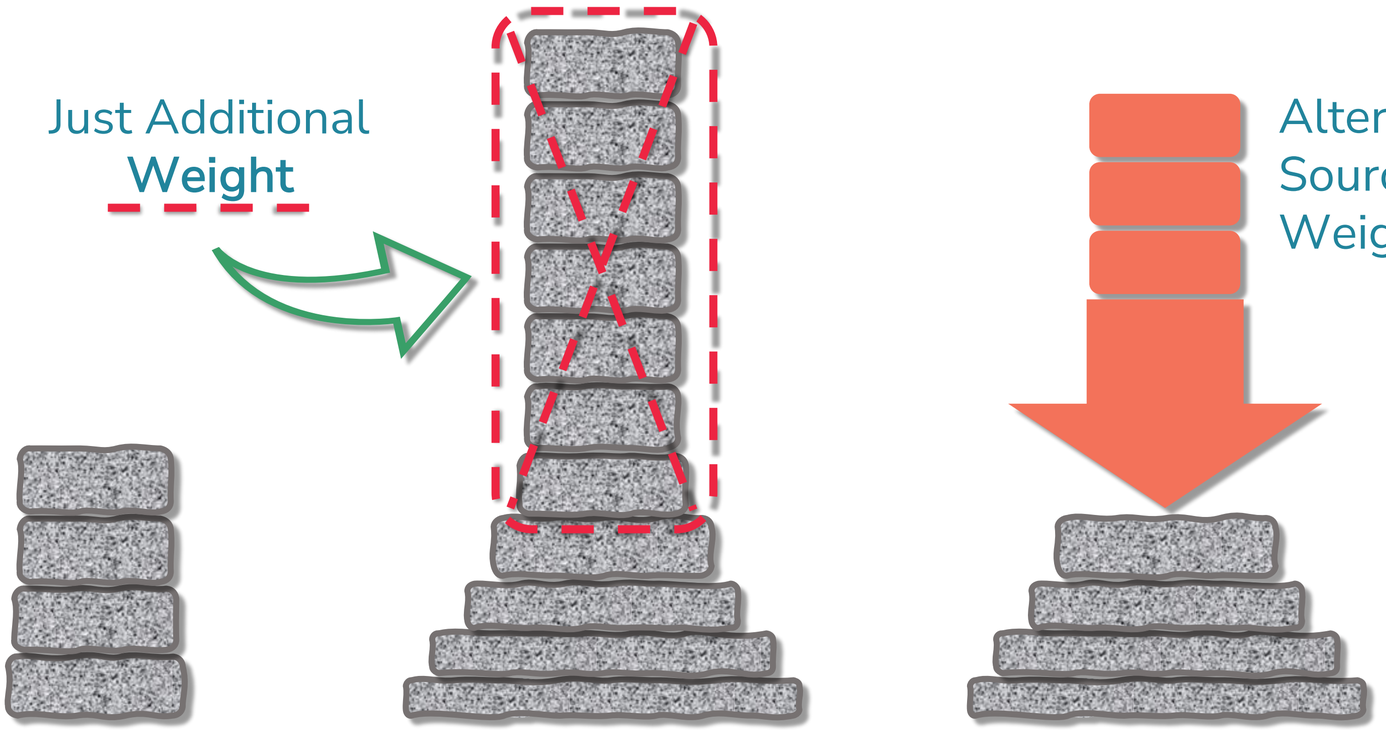

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Print 4: W/C 0.38 With Weight Applied

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Print 4: W/C 0.38 With Weight Applied

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43 lbs.
(19,600 g)

Interior Supports

52 lbs.
(23,600 g)

Exterior & Interior

Print 4: W/C 0.38 With Weight Applied

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Print 4: W/C 0.38 With Weight Applied

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Print 4: W/C 0.38 With Weight Applied

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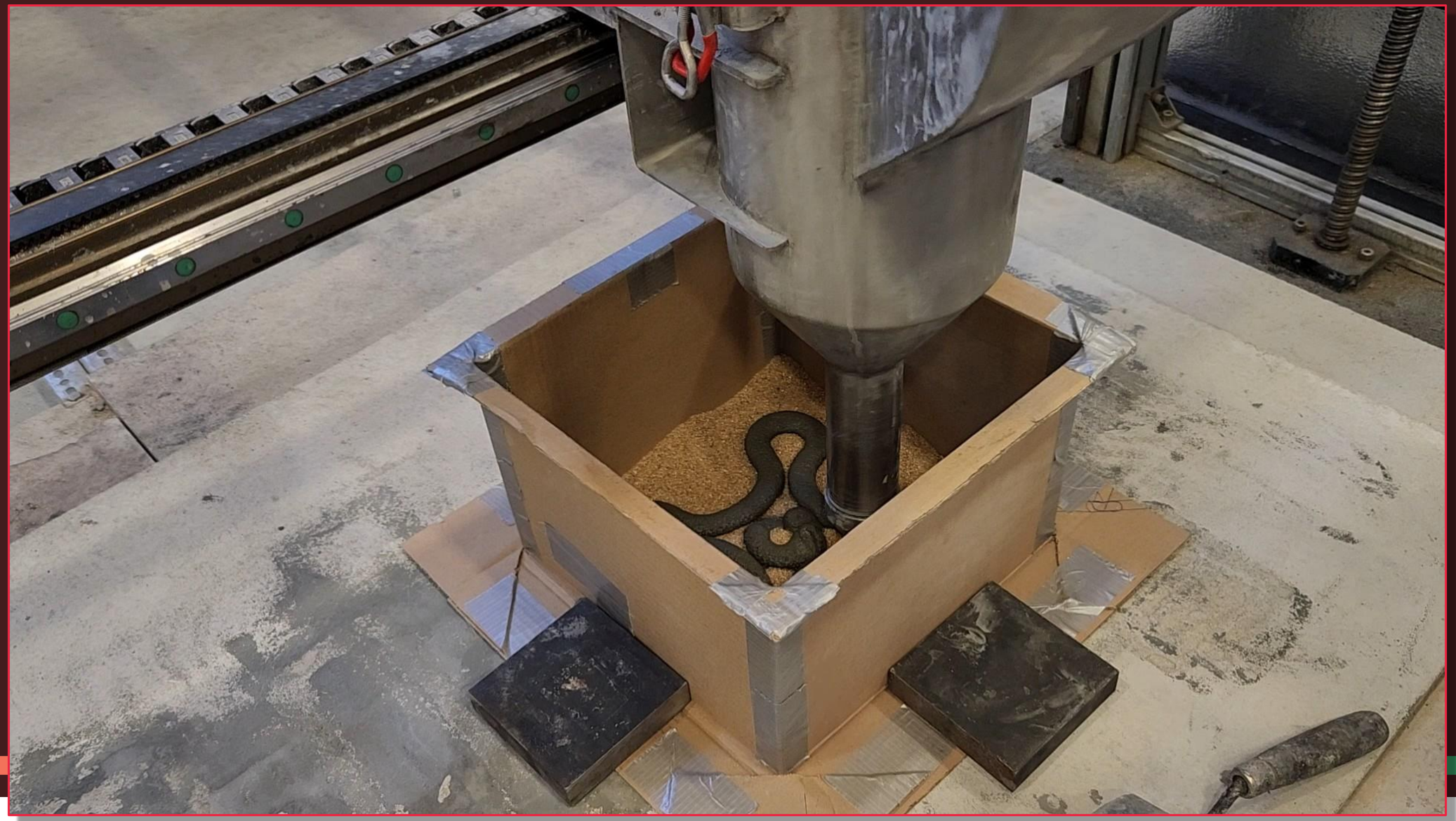

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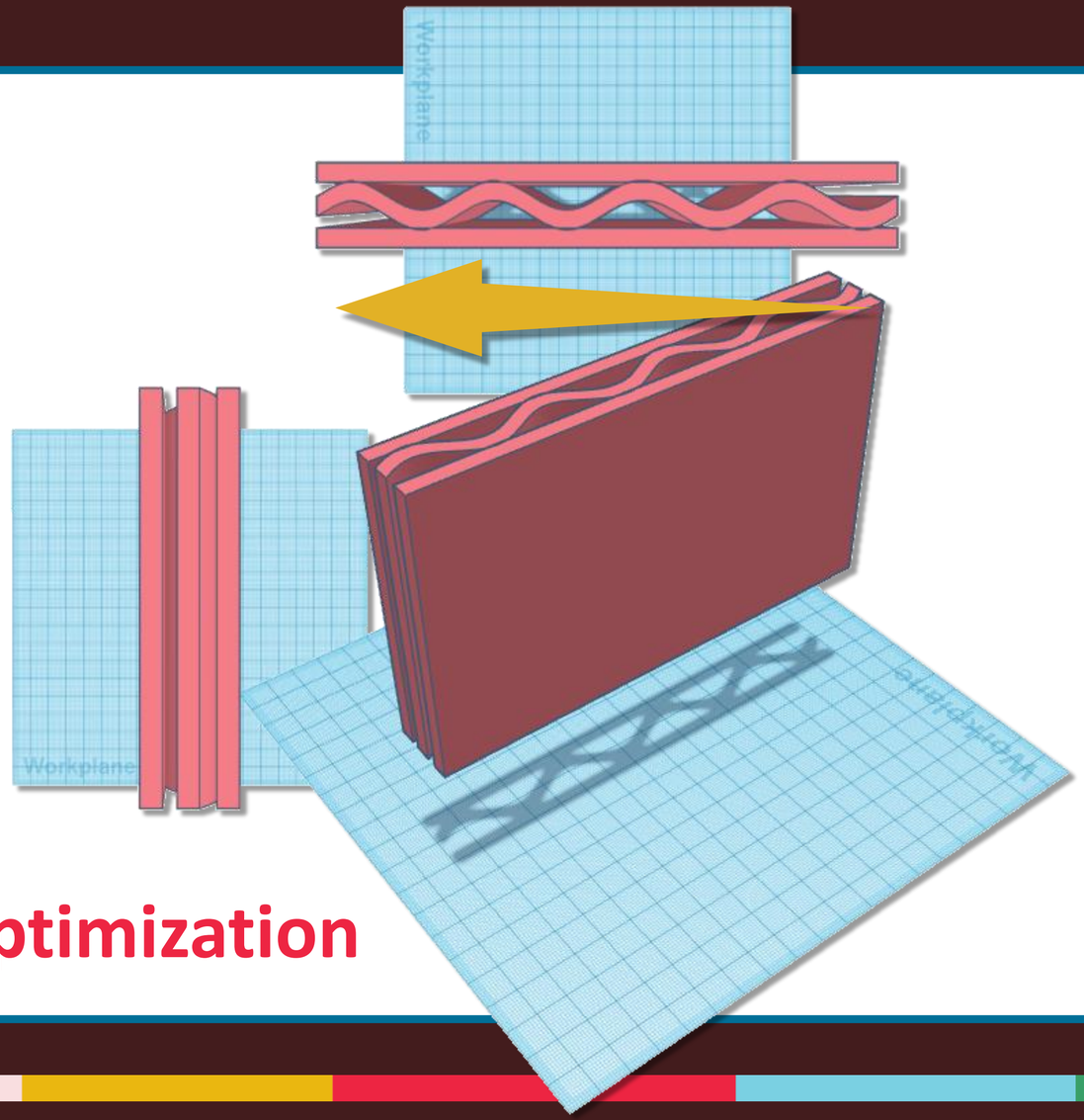
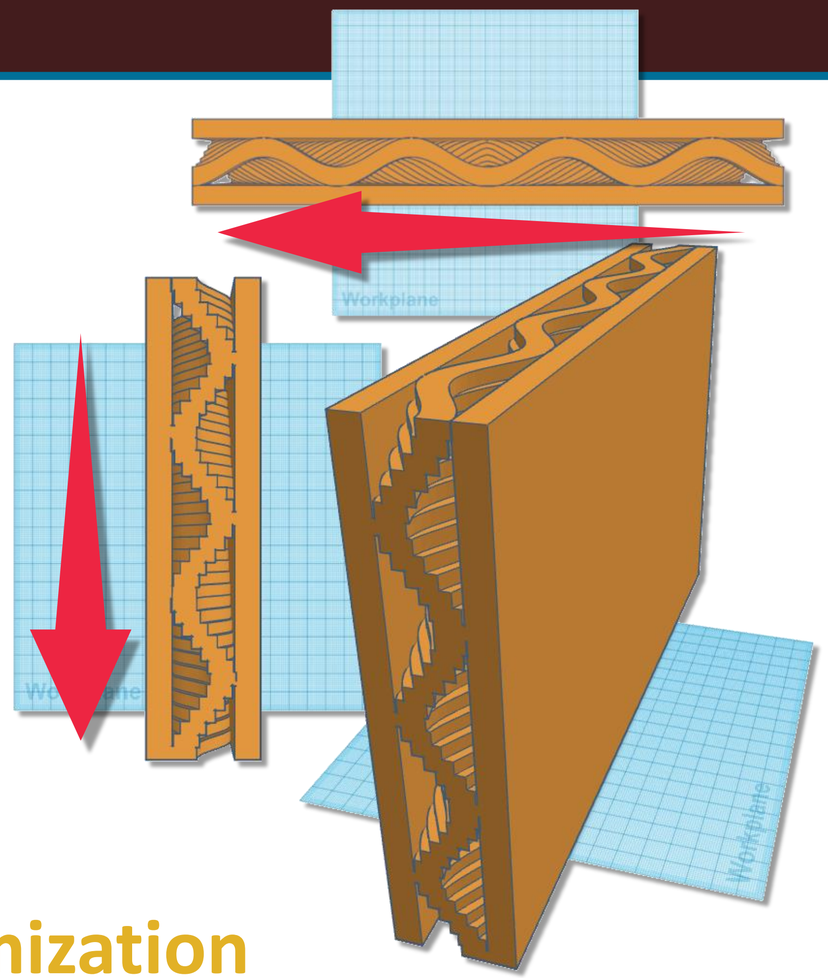
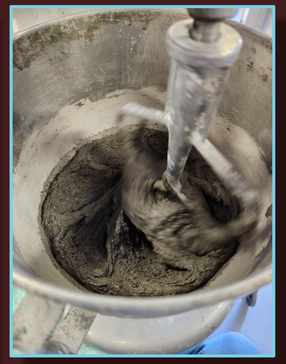


2D Optimization



3D Optimization



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