

## **Thesis Portfolio**

3D Printable Rebar Free Concrete Members  
(Technical Report)

The Effects of 3D printed Construction on the Labor Market  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
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Bachelor of Science, School of Engineering

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## Table of Contents

Sociotechnical Synthesis.....	3
Rebar Free 3D Printed Concrete.....	4
<i>Introduction</i> .....	5
<i>Mixture Design</i> .....	8
<i>Mechanical Testing</i> .....	18
<i>Geometry Optimization</i> .....	29
<i>Future Work</i> .....	38
<i>Conclusions</i> .....	39
<i>Acknowledgements</i> .....	40
<i>References</i> .....	41
Ethics of 3D Printed Construction.....	43
<i>Introduction</i> .....	44
<i>Literature Review</i> .....	45
<i>STS Framework and Research Method</i> .....	47
<i>Data Analysis</i> .....	52
<i>Discussion</i> .....	53
<i>Conclusions</i> .....	57
<i>Bibliography</i> .....	58
Thesis Prospect.....	60

## **Sociotechnical Synthesis**

The technical report and STS report here are intrinsically linked to the future of the construction industry and, in some ways, the entire manufacturing industry. The technical element asks how to improve the technical feasibility of 3D printed concrete being used in large construction projects. This is done through use of alternative fiber reinforcement methods that attempt to increase concrete's tensile strength in a printable form without need to add rebar in the process, dramatically increasing the possibility of it being a viable production method. The STS portion analyzes the effects this may have on industry, especially the manual labor market within construction who may be displaced by a rapid change in labor demands. The aim of analyzing these two facets is to advance the technology of 3D printed concrete, which brings tremendous benefits in cost, time, and design complexity, while also not ignoring the individuals and families whose livelihood depends on the construction industry. Similar situations to this are occurring in many industries within manufacturing, and in markets like retail, have already occurred with automated systems replacing unskilled laborers. In combination, this seeks to create a new construction industry where more complex designs are produced more quickly, but also that remains inviting to new workers who can build careers not just in design or management, but also in manual labor. Through efforts here, this future seems feasible, but requires that executives take responsibility to both use technology and to be responsible with their use of it.