

## INTRODUCTION

Trine University is growing at an accelerated rate. The existing Student Design Center “SDC” is no longer sufficient. Trine gained preliminary architectural drawings from JICI. The group used these to design the structural system, site layout, and estimate a general cost to expand the campus.

## PROPOSED DESIGN

The 3D rendering was created by JICI and was the basis for this design.



Northwest Corner - View from Thunder Avenue

Three possible locations were considered for building the new SDC. The lots were the existing location, the lots across from FAWICK, and the Islamic Trust lots. The second two lots required Trine to purchase the properties. After thorough site investigations and cost analyses, the existing lot was determined to be the most cost effective because the utilities were sufficient, there was plenty of room for expansion, and Trine already owned the lots.



## OTHER POSSIBLE LOCATIONS



Lots across from FAWICK

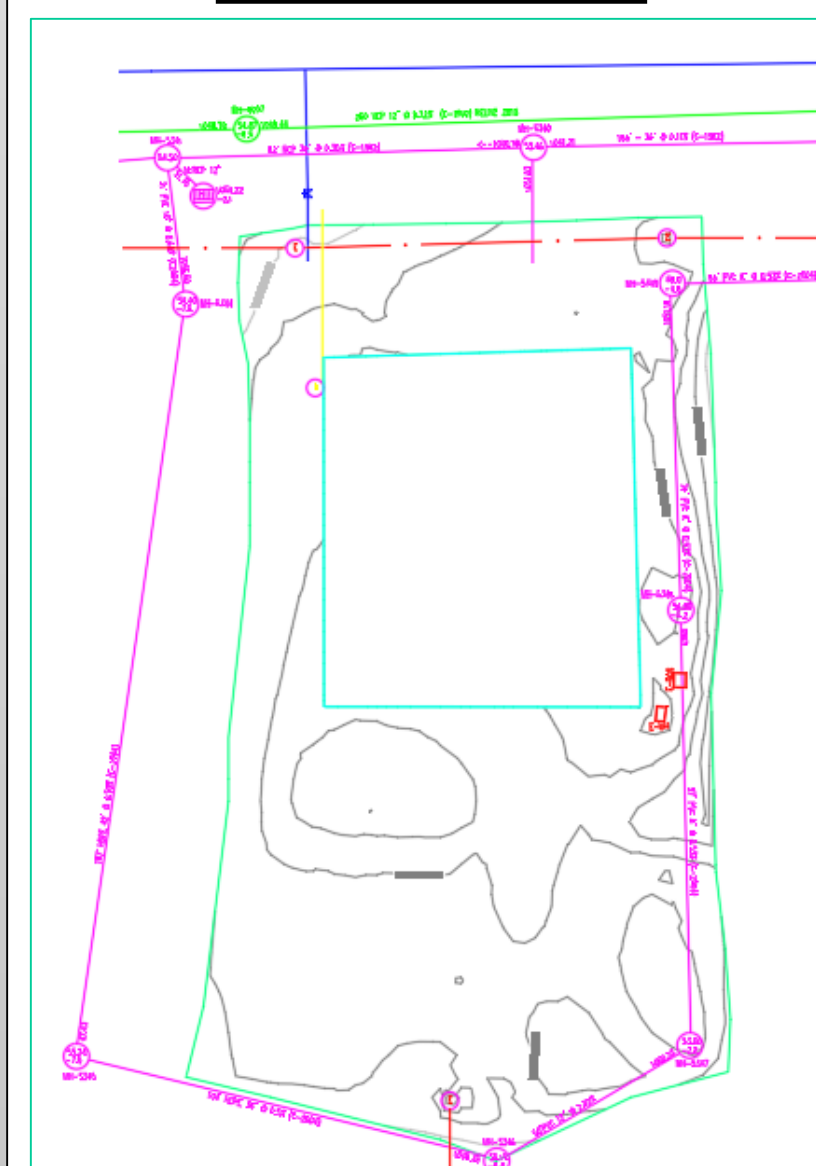


Islamic Trust Lots

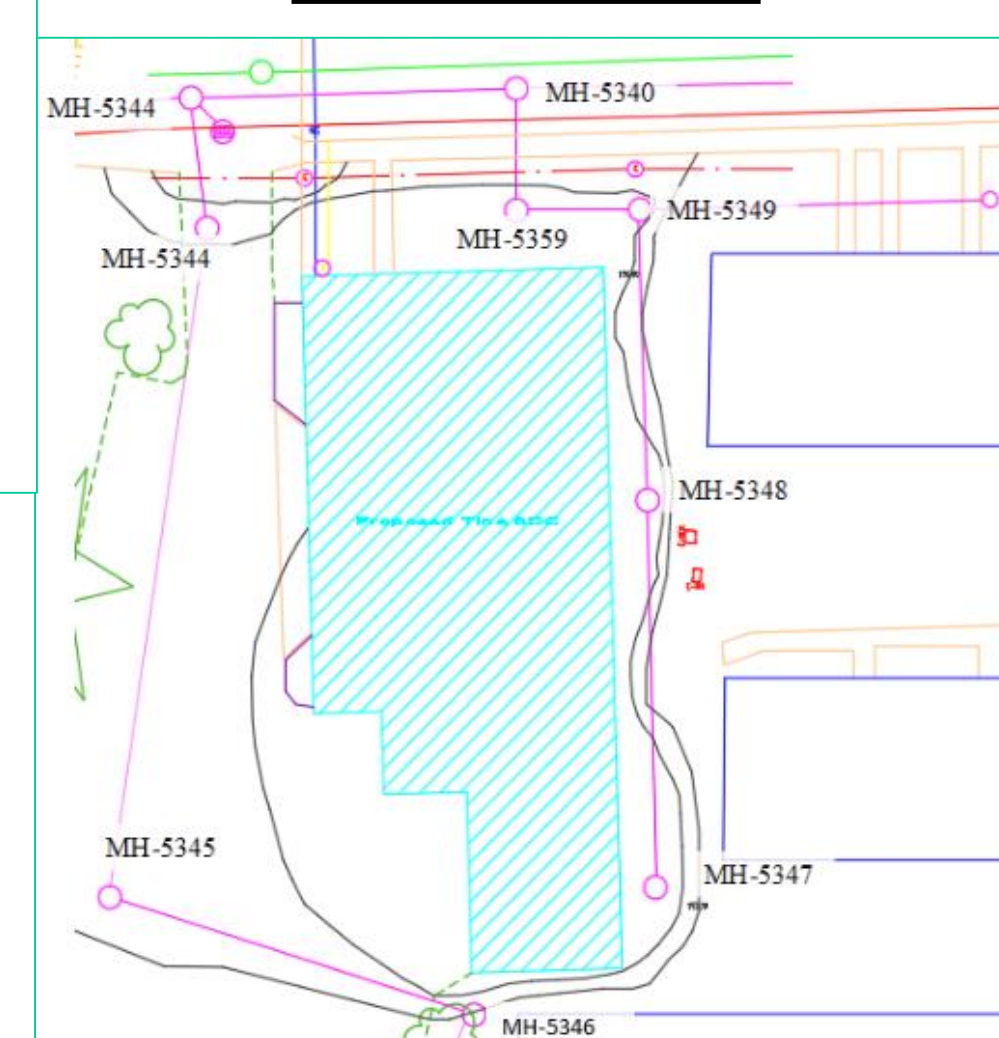
## UTILITIES

The existing utilities were all sufficient but with the expansion, there was a stormwater line that needed to be rerouted on the south side of the building.

### Old Utilities

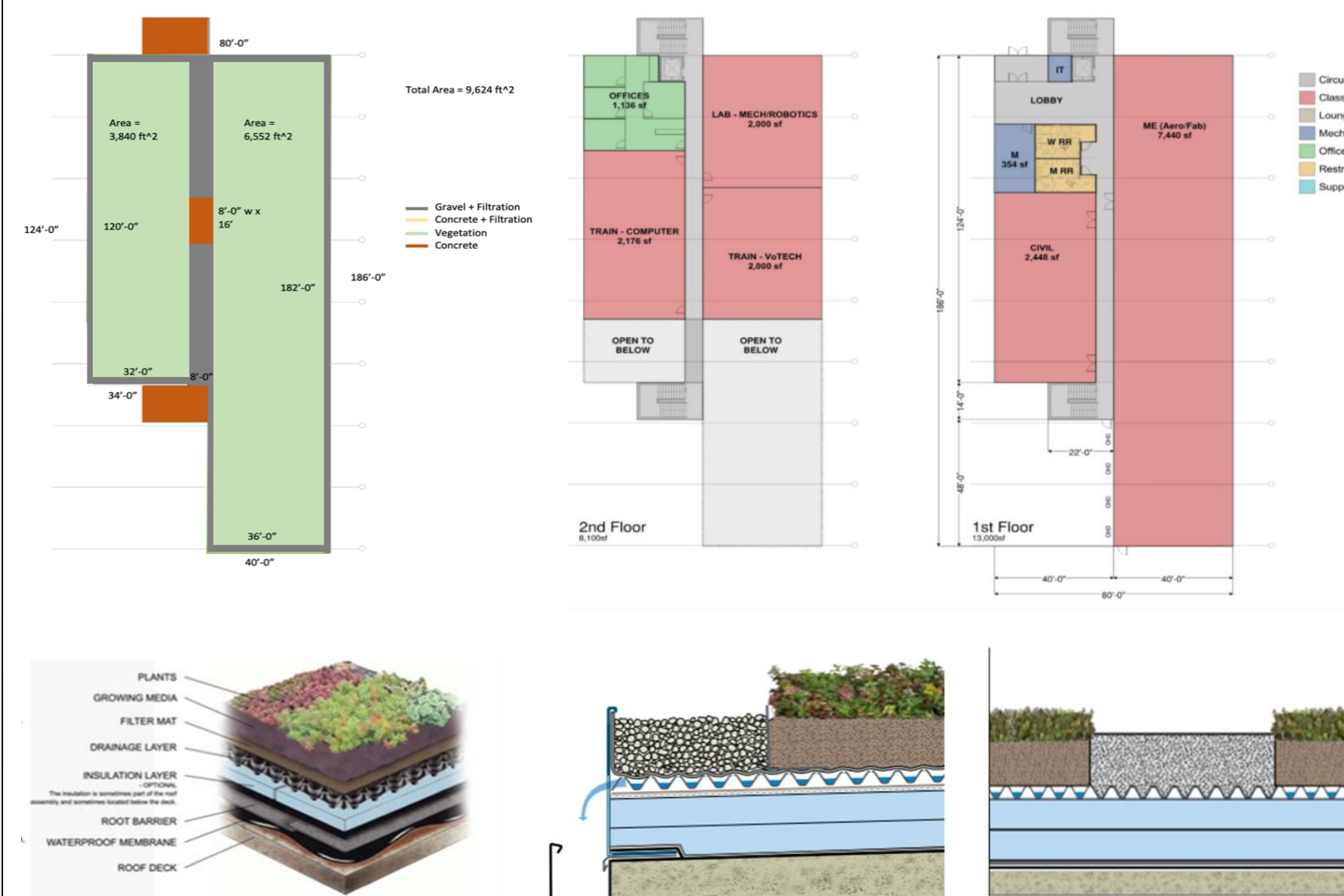


### New Utilities



## FLOOR PLANS

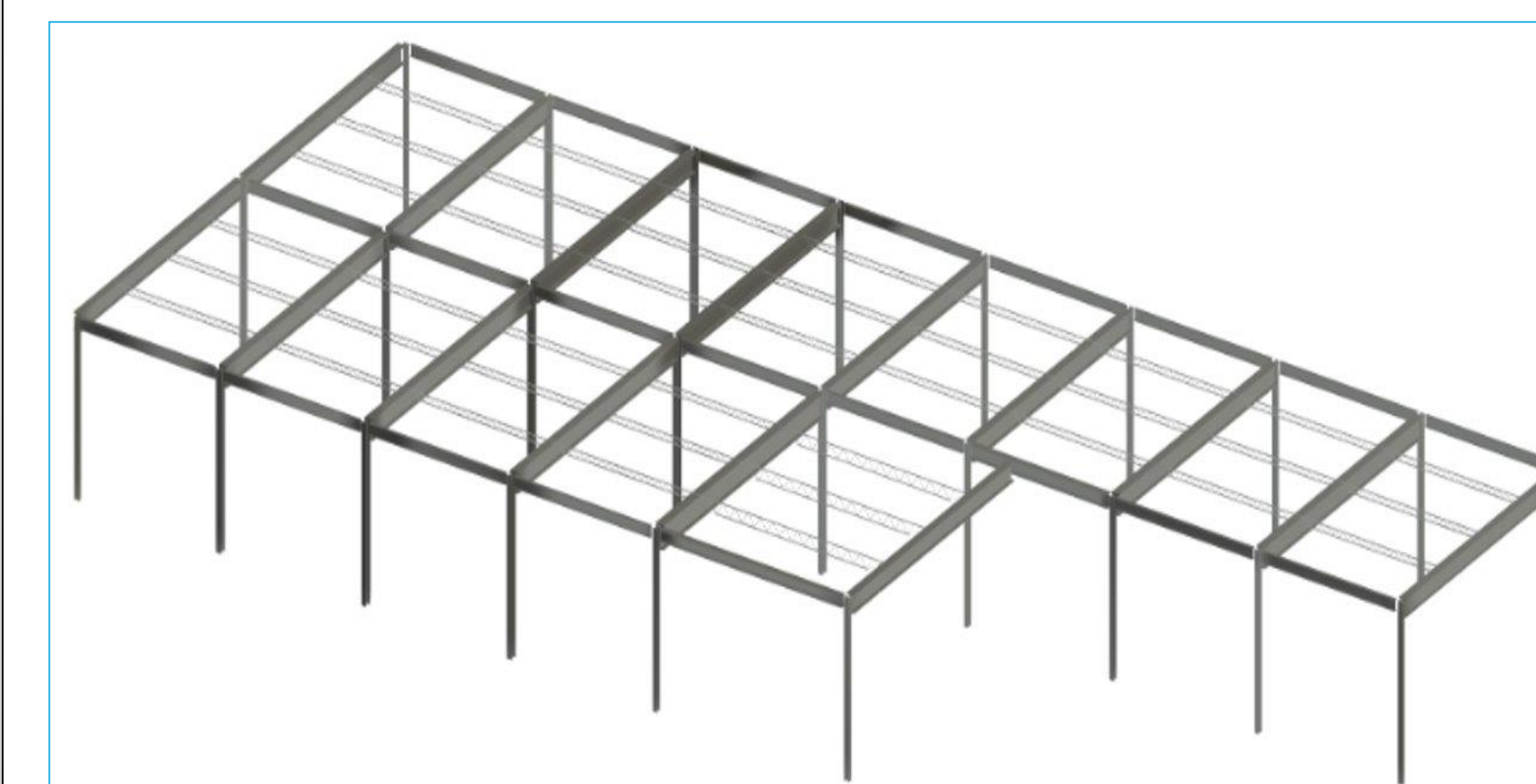
The new SDC floor plans were provided by JICI. A green roof was added to the design for a low impact development feature and to help with stormwater management.



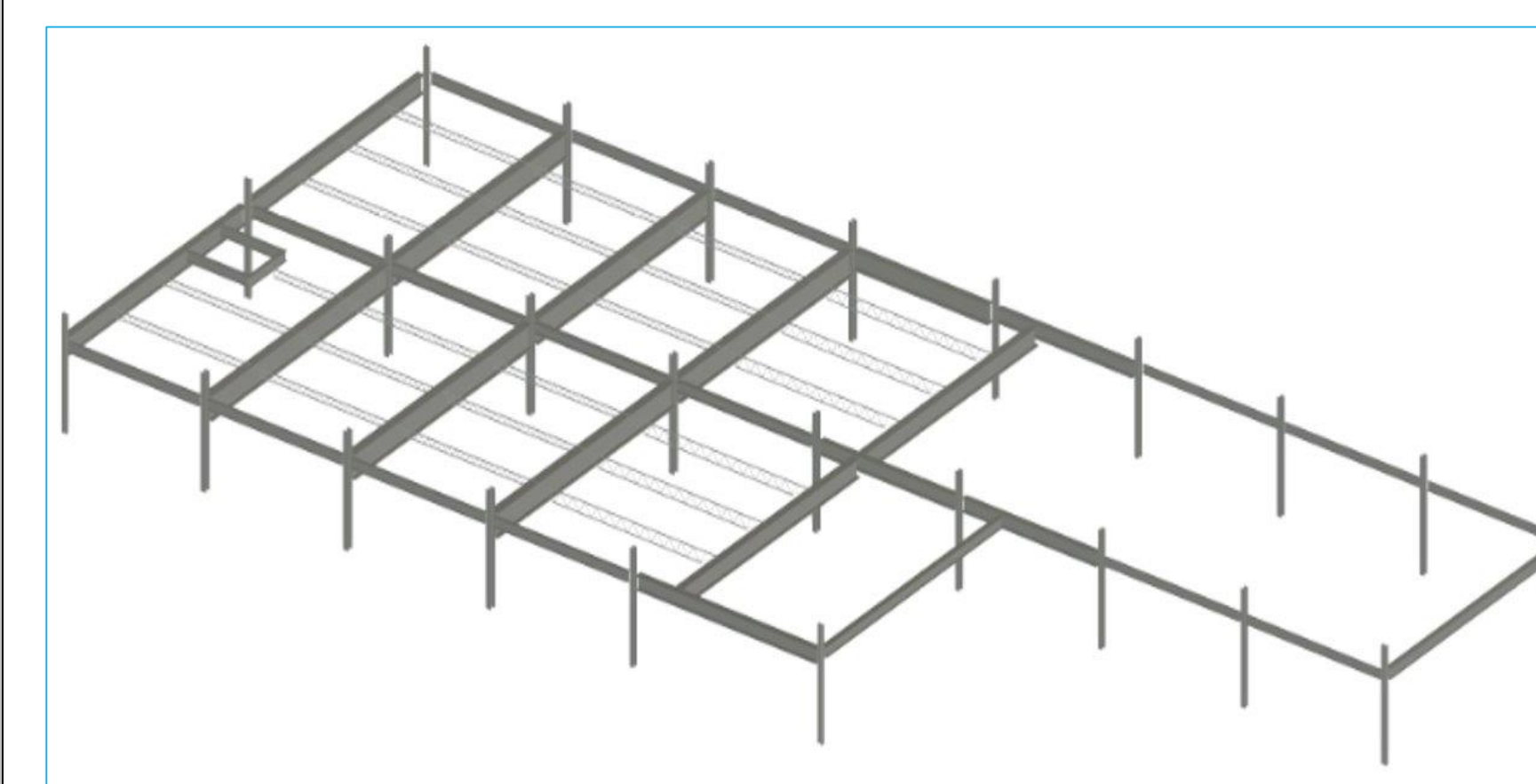
## STEEL DESIGN

Indiana Building Code, ASCE 7-16, and the Steel Manual were all used to determine the loads acting on the structure and to size the steel members.

### Roof Framing

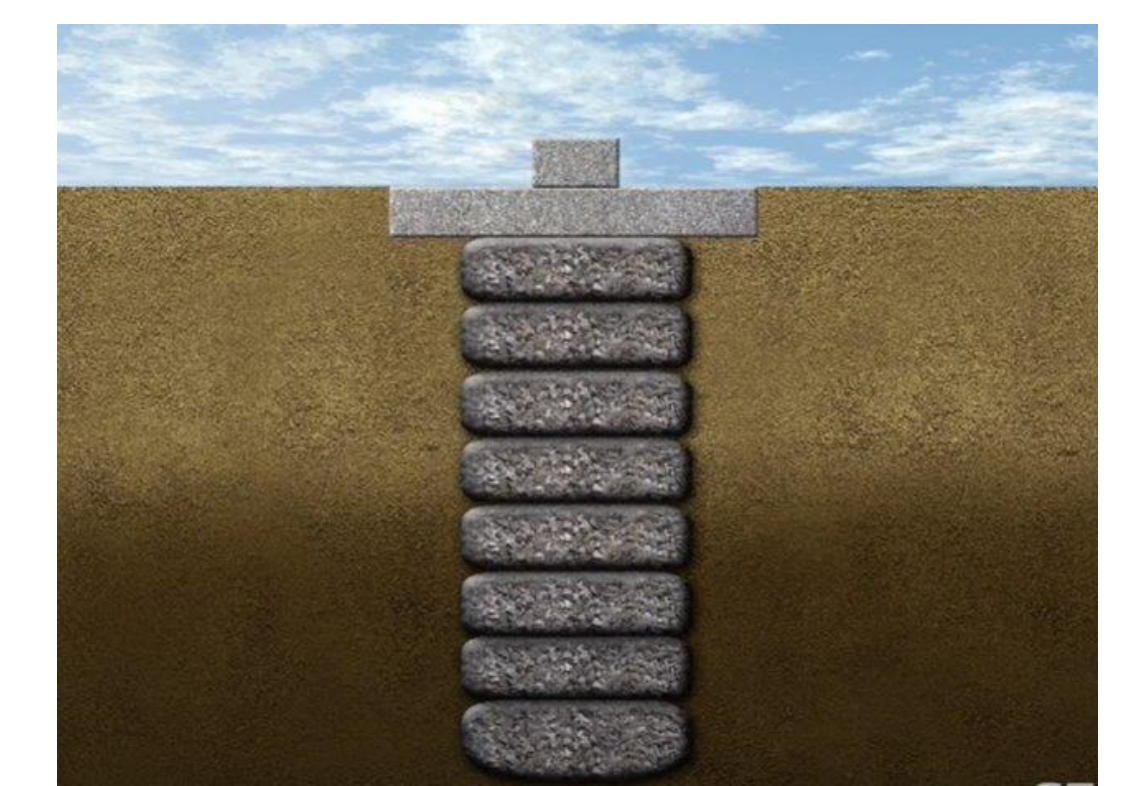
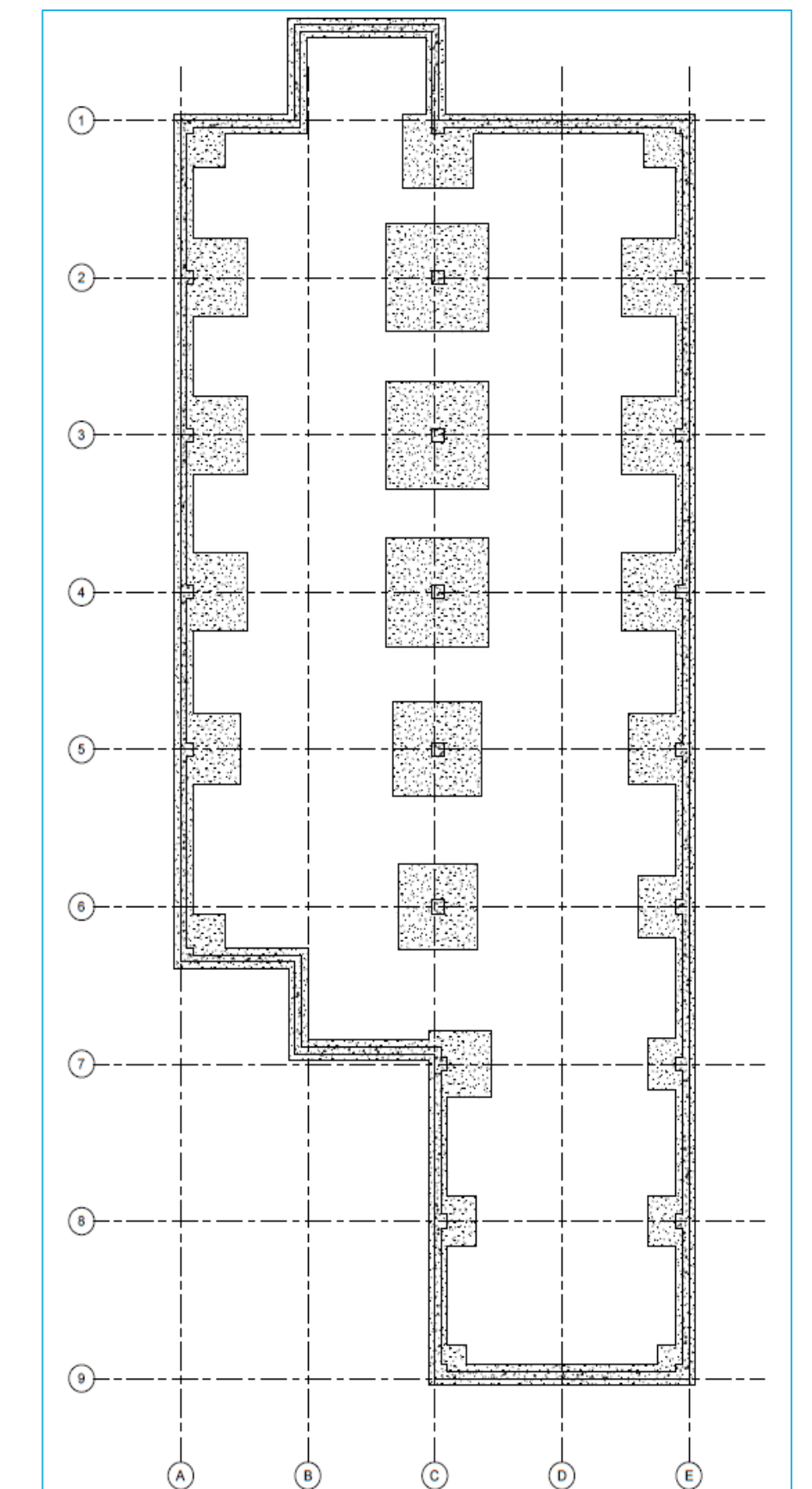


### Second Floor Framing



## FOUNDATION DESIGN

Because of the buildings usage, there were some large loads calculated. Coupled with poor soil conditions, typical shallow footings were insufficient. Geopiers were the most cost efficient option.



## COST

The cost of construction was estimated to be around \$2.3 million.

Total Cost	\$	2,307,177.51
Steel	\$	1,493,815.09
Green Roof	\$	288,720.00
Masonry	\$	315,684.00
Demolition	\$	156,269.40
Concrete	\$	52,689.02