



# Building a Green Roof at Boston College

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## Introduction

A green roof system is an extension of an already existing roof. Green roofs provide eco-friendly heat and cooling insulation, support water drainage and water storage, increase air quality, and most importantly provide opportunities for social gathering. We are proposing that Boston College invests in eco-friendly infrastructure and builds a green roof at the new rec-center. The Green roof has the potential to be a quiet natural space on campus for people to unwind, socialize, and study. In addition, it will be an area for people to learn about sustainable infrastructure and the environment.



Until 1957, lower campus was a small reservoir, which makes it prone to flooding. This image from 2014 shows just how extensive the damage can be. A green roof could help manage some of this flooding.

## Methods

**Environmental:** We collected data from architects, botanists, and relevant case studies in order to determine which green roof design would provide optimal stormwater management, air filtration, and insulation.

**Economic:** We studied data from relevant case studies in order to conduct a cost benefit analysis to determine whether or not a green roof would reduce utility costs.

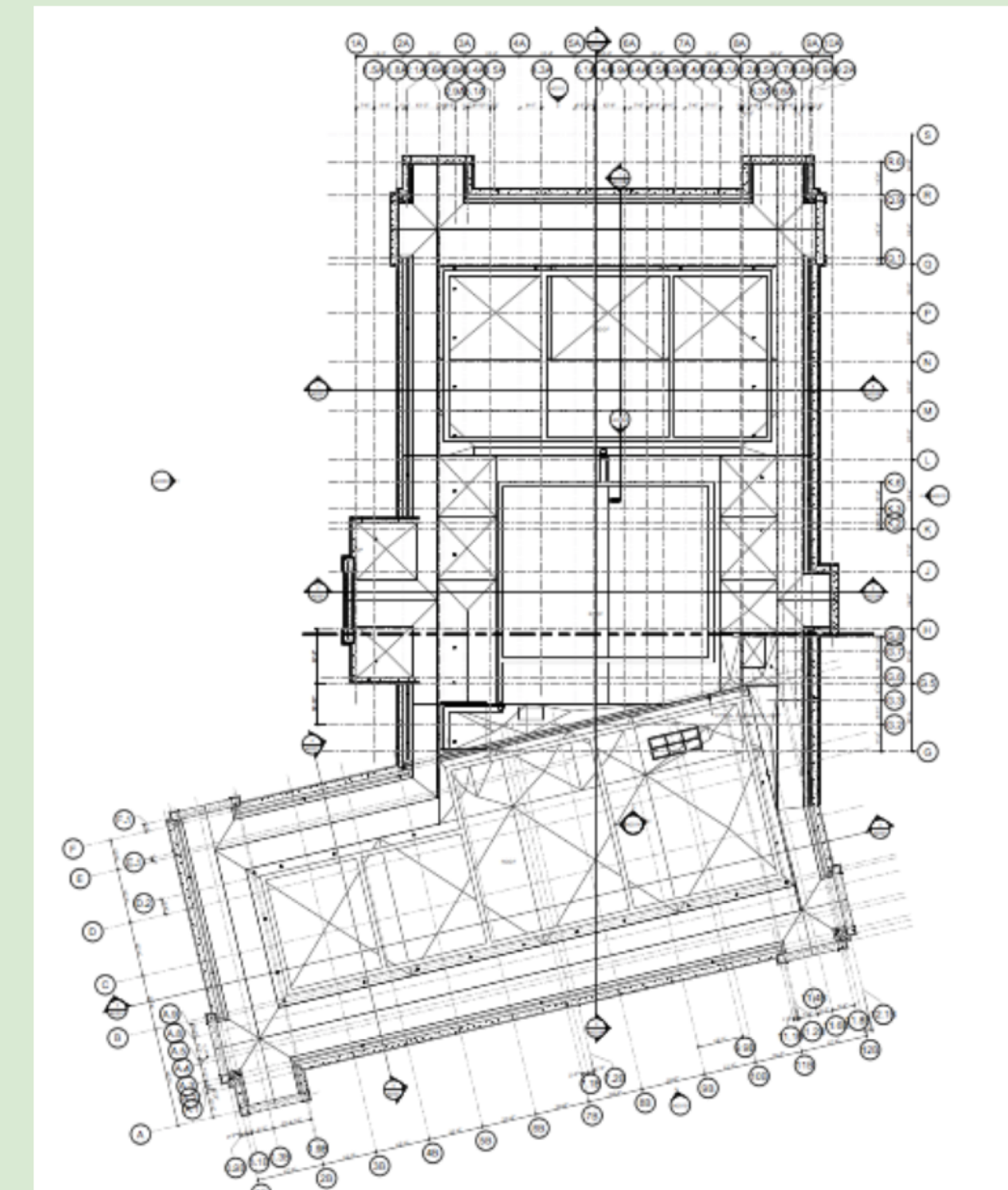
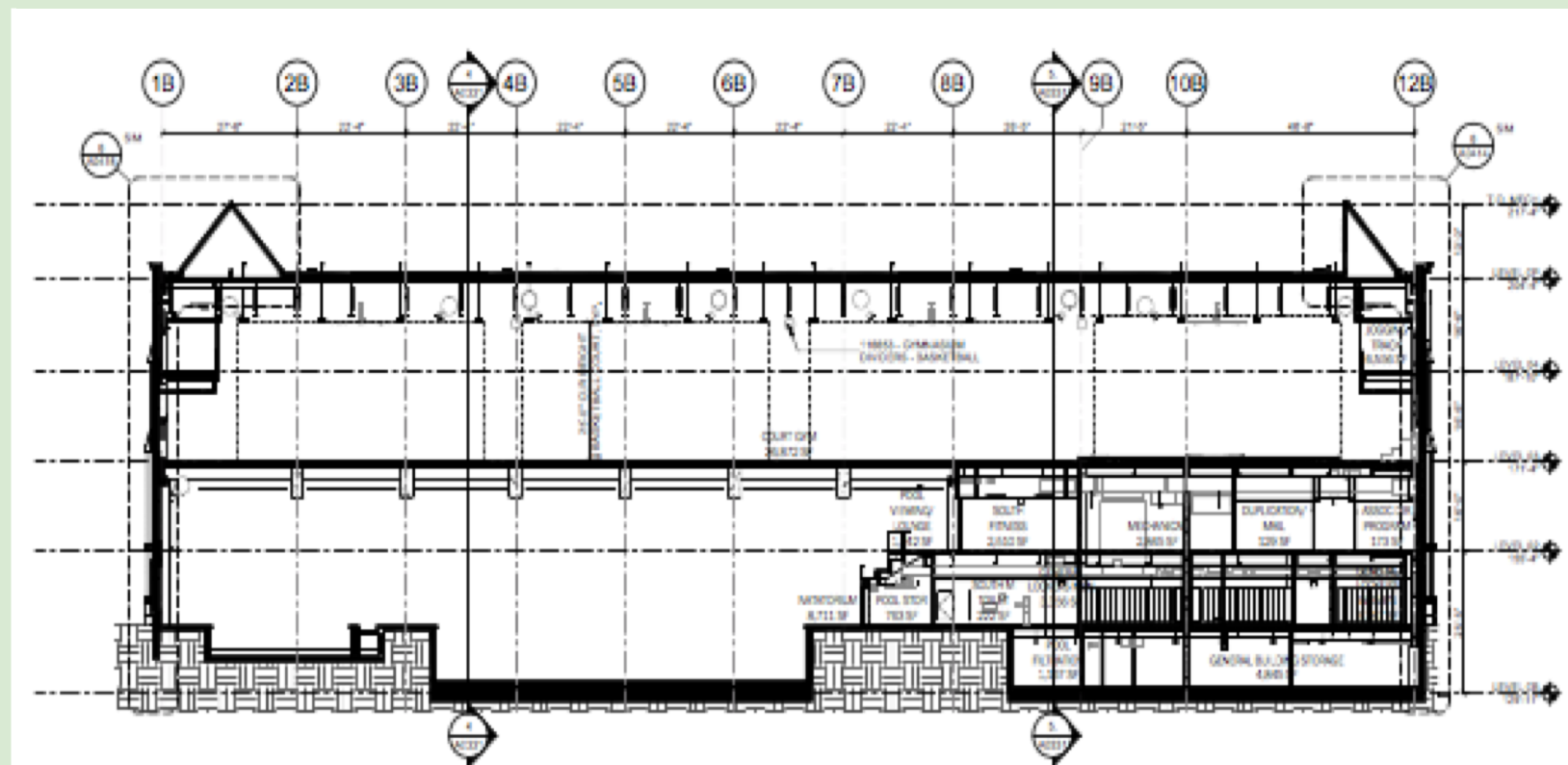
**Social:** We collected qualitative data via survey to determine the community's understanding of environmental infrastructure, whether they felt there is a need for a green space on campus, and whether or not they would benefit from spending time at the green roof. We received 120 responses, and highlighted our findings in figures 1 & 2

**Acknowledgments:** Thank you to all the participants who answered our survey. Thank you Edward Stokes, for showing us the new building and for answering our questions. And lastly, thank you to our class and professor for a wonderful year filled with discussions about a better, more sustainable future.

## Results

Below: You can see that while there are sloped parapets for visual aesthetic, the surface of the roof is in fact flat.

Right: There is 80,000 ft<sup>2</sup> of usable space on the roof of the new Margot Connell Recreation Center



- We recommend an extensive roof rather than an intensive roof because of their low additional loads, and ability to be retrofitted on an existing building
- Vegetation that is specific to humid continental climate that can handle direct sunlight for a majority of the day
- A boarder zone, which is the area surrounding the perimeter filled with ballast to collect and store rainwater

## Survey Results

**94.2%** of Boston College students who took the survey believed that the university should build a green roof on campus. At least **75%** of students surveyed believed green roofs improve air quality, energy efficiency, well being, and are a good economic investment.

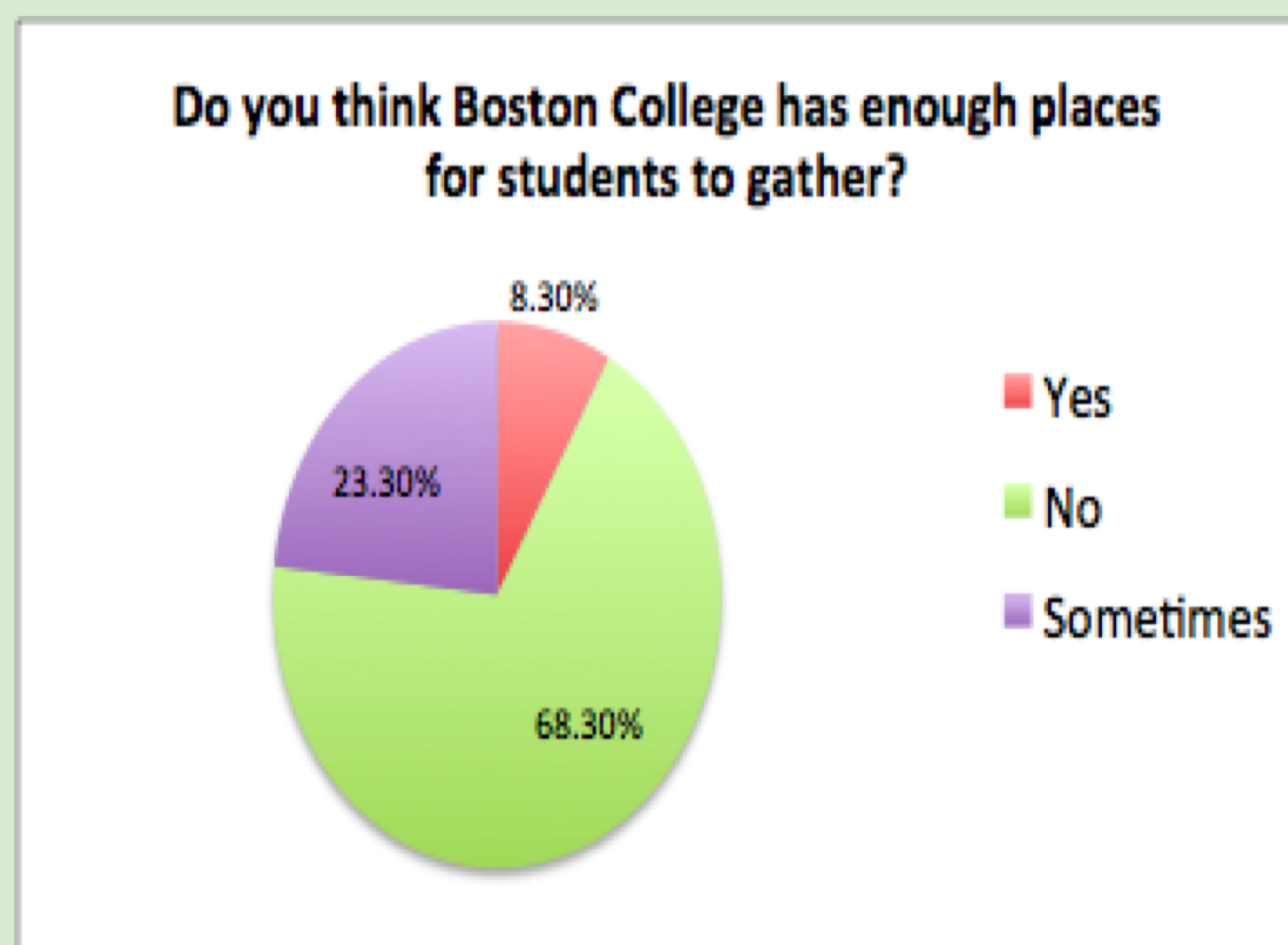


Figure 1: 68.3% of students surveyed did not believe Boston College provides enough space to socialize.

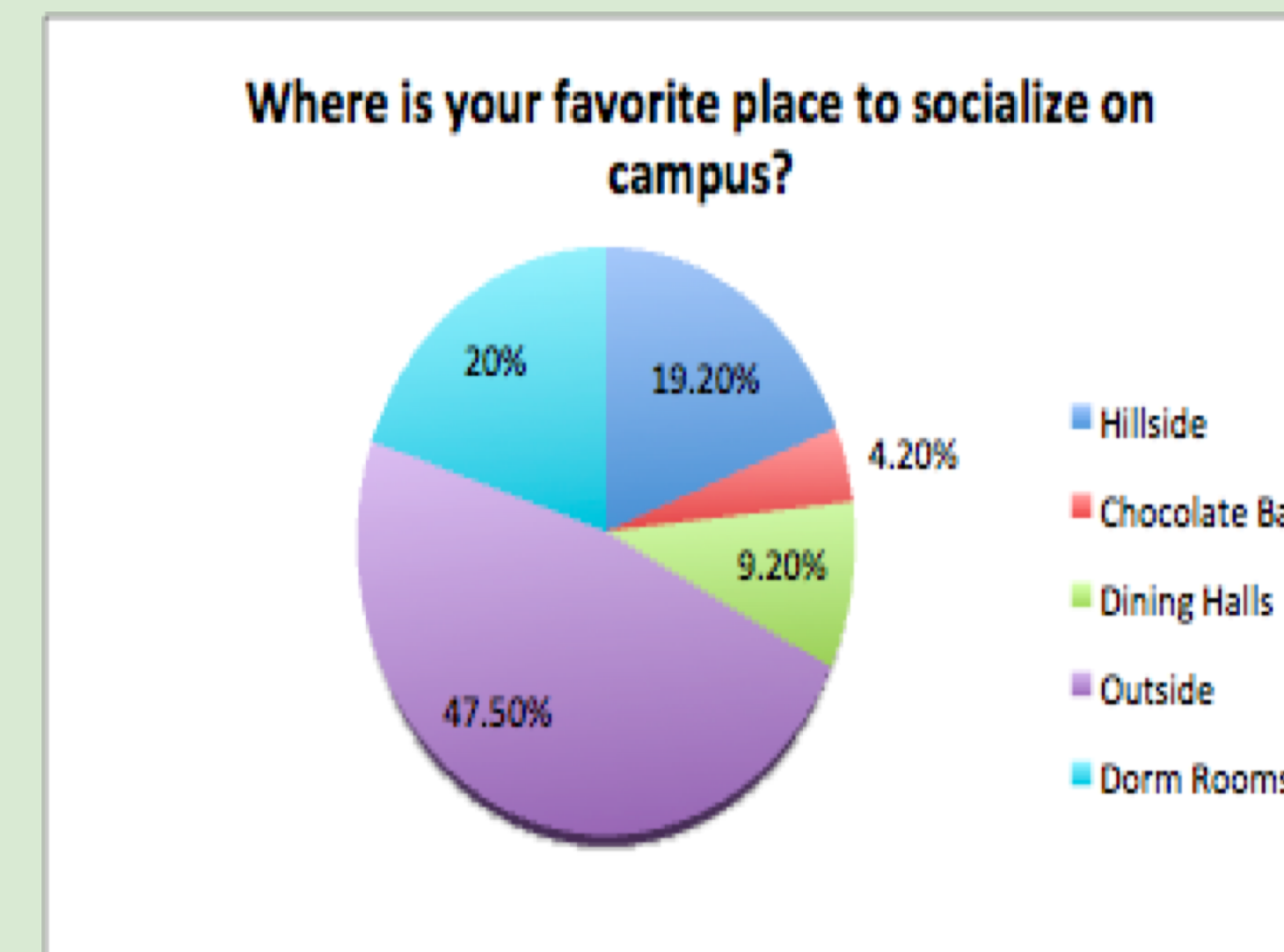


Figure 2: 47.5% of our survey sample chose 'outside' as their preferred place to hangout with friends

## Discussion

Our team believes it is in Boston College's best interest to build a green roof on the Margot Connell Recreation center. Our research concluded green roofs provide environmental, economic, and social benefits.

### Environmental

- Green roofs retain 70-90% of precipitation in the summer, and 25-40% in the winter
- Green roofs sustain plant life & provide habitat for invertebrates and bird species

### Economic

- Green roofs reduce energy demand for AC by 75%

### Social

- There's a significant need for more space for students to relax, study, & socialize (figure 1)
- Green roofs encourage social cohesion by providing a community hub, and provide a space for students to interact with sustainability

## Recomendations

Boston College should implement an extensive, or low maintenance green roof on the new recreation building. We recommend the roof be designed in a similar fashion as The Burnham Building in Boston, featuring low lying foliage that can withstand direct sunlight. In addition, we suggest installing an indirect pump rainwater harvesting system to alleviate flooding in lower campus.



## Sources

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