

EASTERN ILLINOIS UNIVERSITY
FACULTY DEVELOPMENT AND INNOVATION CENTER
FACULTY PARTNERSHIP GRANT APPLICATION

***Title = Klehm Courtyard Butterfly Sanctuary**

Applicants/Partners:

[Redacted]

[Redacted]

[Redacted]

Questions

- 1. Provide both a title and a concise description of the project. Please include how the proposed project would contribute to the development of interdisciplinary teaching and research projects and/or partnerships beyond the university.***

Title: *Development of the Klehm Courtyard Butterfly Sanctuary*

Description: The overall purpose of this collaborative research project is to convert a shared common outdoor campus space into a Butterfly Sanctuary in order to study the behaviors and activities of regional native species of butterflies in an ‘urban landscape’ setting. The project will involve a partnership of EIU faculty, staff, and students from multiple campus disciplines collaborating with the Urban Butterfly Initiative to design, establish, and maintain a butterfly sanctuary in the Klehm Hall Courtyard for the space of no more than five calendar years (January 2020 through December 2024).

Justification: In urban landscapes, natural areas – if they exist – are often essentially green islands surrounded by concrete, pavement, glass, and/or steel. For many animals, maintaining a viable population on such an ‘urban island’ is challenging and requires that their needs of space, food, shelter, etc. are sufficient within that island. What those particular needs are will depend on the species.

Areas such as the Klehm Courtyard provide an interesting opportunity to conduct a research study involving ‘urban islands’ on a small scale and within a college campus setting. Because the courtyard is surrounded by at least two levels of concrete/brick/glass on all sides, relatively little interaction occurs between the courtyard and the rest of the campus environment. Therefore, most of the animals living in the courtyard will require that all their needs be met in that space. The proposed collaborative plan is to use the Klehm Courtyard as a research laboratory to investigate whether it is possible to establish populations of butterflies within this type of limited urbanized space, comparable to other studies involving roof-top gardens, atriums, or other similar spaces common to developed, urban environments.

Butterflies are a good choice for such a project because they are important both ecologically - as valuable members of terrestrial ecosystems, providing services such as pollination, and psychologically – serving as beautiful, peaceful animals that people like to see, especially in places in which they hope to relax while seeking to reduce stress and/or rest. Butterflies are also relatively small and easier to sustain, so unlike other animals such as most birds and mammals, butterflies have higher potential to function on a small scale in a space like the Klehm courtyard.

This project will be conducted in collaboration with the Urban Butterfly Initiative (UBI), a nonprofit, community service organization that creates butterfly habitat in urban areas as a means to enhance biodiversity, educate the public, and conduct research. This project would extend successful butterfly habitat initiatives in Coles County, as earlier in 2019 [UBI recognized the city of Charleston](#), Illinois as being the ‘Butterfly Capital of Illinois’. By connecting with UBI, students, faculty, and staff that participate in this research project will be engaging in service learning and citizen science, helping the EIU community and environment while learning about biological communities, sustainability, and local conservation efforts.

2. Provide a clear statement of the objectives of the project. Please include how the proposed project will accomplish the goals of the Faculty Partnership Grants.

The objectives of this project are:

- (1) Foster research/scholarly collaboration among students, staff, and faculty of the Department of Biological Sciences, School of Technology, and the College of Health and Human Services at Eastern Illinois University.
- (2) Increase understanding of campus-based biodiversity in general and butterflies in particular for students, staff, and faculty of the participating academic units, as well as visitors of Klehm Courtyard.
- (3) Promote greater understanding of scientific methodologies and data collection for students, faculty, and staff of the participating academic units.
- (4) Use the findings from this research project in biology courses (e.g. General Biology II, Ecology & Evolution, Entomology, Conservation Biology)
- (5) Provide an opportunity for School of Technology students, in consultation with Biology faculty and students, to develop inexpensive yet important equipment specifically needed for the success of the project (e.g. rainwater collection systems)
- (6) Enhance beauty and nature-interactivity of the Klehm Hall Courtyard, resulting in a more inviting gathering place for faculty, staff, and students who are regular users or visitors to Klehm Hall.
- (7) Develop and test the effectiveness of the butterfly sanctuary model on a college campus for possible use in similar spaces and locations throughout Illinois.

This research project will involve the staff, students, and faculty from multiple campus units working together for the mutual goals of developing the butterfly sanctuary, maintaining the space, and collecting data to assess the research hypothesis. Working towards these mutual goals will enhance collaborative relationships among members of the campus community that may not ordinarily interact. Furthermore, by using the site to conduct the scientific project, all research participants involved in the development and maintenance of the landscape, and with the gathering of butterfly population data, will be engaged in a valuable campus-community research activity. Another significant outcome will be that participants will be integrating “service learning” with “academic learning” throughout the multiyear process. The use of educational signage will also inform and educate other visitors to the site. Finally, the data generated by the project will be used by students in the biology courses to determine the effectiveness of the research design, with the possibility of the results being disseminated through future research papers and presentations.

3. *If the grant involves more than one applicant, provide a brief description of the role of each applicant in the proposed project.*

Role(s) = identification of appropriate plants and butterflies for the project, supervision of landscape design, propagation of plants and collection of initial butterflies, research design of

data collection, primary contact between project participants, UBI, the Biological Sciences department, and Biology students that will assist with data collection.

EIU Biology Students and Coles County Urban Butterfly Initiative volunteers

Role(s) = Assist with site development, maintenance, and data collection within the Klehm Courtyard.



Role(s) = integrate the student learning activity of designing and constructing of a water collection system for use in the Klehm Courtyard Butterfly Sanctuary into the Spring 2020 course CMG 3833 - Sustainable Buildings. All costs of materials for the project will be covered by donor funds.



Role(s) = Assist with site development, maintenance, and data collection within the Klehm Courtyard.



Role(s) = Liaison with EIU Facilities Planning and Management (FPM), assist with site development, maintenance, and data collection within the Klehm Courtyard.



Role(s) = Assist with site development, maintenance, and data collection within the Klehm Courtyard.

4. Provide an itemized cost estimate for the proposed activity and include any other monies you may be expecting towards this project.

Plant propagation (seeds & materials): Planting area = 1000 ft ² approximately Seeds and plants = \$150 Growing trays= \$150 Growing media = \$50	\$350
Pots, soil, etc. for above ground planting	\$150
Watering supplies	\$100
Educational signage	\$100

Contingency funds for annual seed/plant replacement (*if needed)	<u>\$100</u>
*Total Amount Requested	\$800
*Note - Urban Butterfly Initiative (U.B.I.) will contribute tools for landscaping, plant installation, and site maintenance.	

5. Provide a working schedule for completion.

Phase 1 = December-January 2020: Development of site plan - landscape design and selection of appropriate plant and butterfly species. (*see attached aerial sketch of Klehm Courtyard w/dimensions)

Phase 2 = March 2020: Creation of the Butterfly Habitat suitable for butterflies. Specifically:

- (1) Removal/relocation of many of the existing rhododendrons/azaleas and other non-native shrubs, which provide few resources for butterflies and other pollinators in the area.
- (2) Addition of suitable plants for the caterpillars of the three target species: asters (pearl crescent), clover (eastern tailed-blue), and cabbage sp. (cabbage white).
- (3) Addition of a diversity of nectar plants. Asters and clover will provide some nectar resources, but diversity is necessary to provide different options and season-long blooming. Additional plants would include blazingstar, butterfly weed, Bradbury's monarda, calamint, purple coneflower, prairie coreopsis, blue mist flower, zinnia, and other species, with most in the ground but some pots may be used to increase the productive area of the courtyard.
- (4) Addition of one or two small trees to provide some visual interest and additional nectar resources. Possibilities include pagoda dogwood and eastern redbud.
- (5) Area along the windows on the north side is very dry and any plants along that wall will require regular watering, either manually or with an automatic drip irrigation system. That water collection systems designed and constructed by students in CMG 3833 will be used to provide water for these plants.

Phase 3 = Late spring/early summer 2020: As soon as plants have developed well enough, male and female butterflies of the appropriate species will be captured in the wild and released within the courtyard.

Phase 4 = Summer-Early Fall 2020 and subsequent years: Data Recording begins:

Once the landscape is established, the research team can test whether some species are more likely than others to stay in the courtyard once released. These tests would consist of releasing a known number of adults into the courtyard and keeping track of their numbers over time.

The project will require regular monitoring of butterfly populations within the courtyard throughout the adult butterfly season (April-Oct), with at least one count per week. The counts will focus on the 3 target species, but other butterfly species will be recorded if observed. The research group will be able to analyze the data from those observations to track the success of the three species over time.

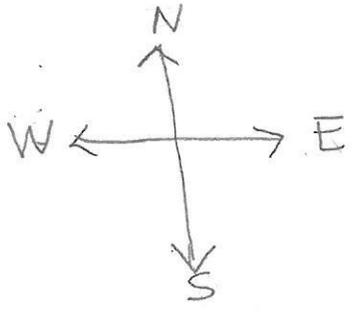
During the annual spring and fall semesters students from BIO 1550G (General Biology II), BIO 3180 (Intro to Ecology & Evolution) and BIO 4814 (Conservation Biology) will provide primary support with data collection, (ii) data analysis, and (iii) basic maintenance of the space (planting, weeding, pruning, as needed).

During the summer months, research assistants from the School of Technology and College of Health and Human Services who have offices in Klehm Hall will provide data collection support.

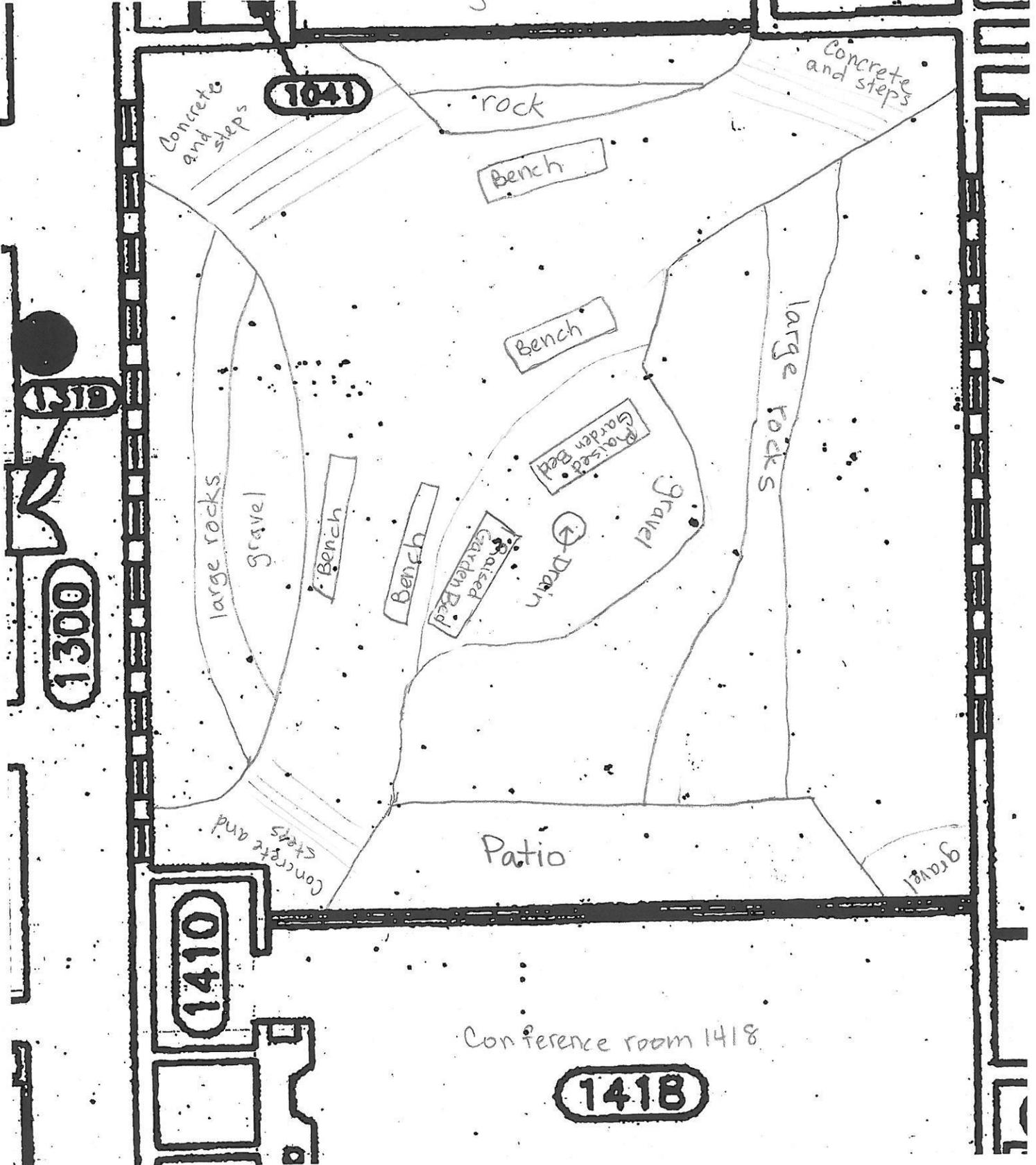
Phase 5 = On an annual basis each spring, necessary plants and butterflies will be added to the courtyard butterfly sanctuary (*as needed).

Phase 6 = Fall 2024 – evaluate annual and multi-year research findings to identify research conclusions and to decide whether to continue or conclude the research study examining butterfly behaviors and activities in the Klehm Courtyard Butterfly Sanctuary.

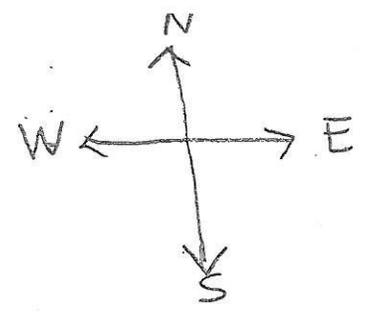
Layout



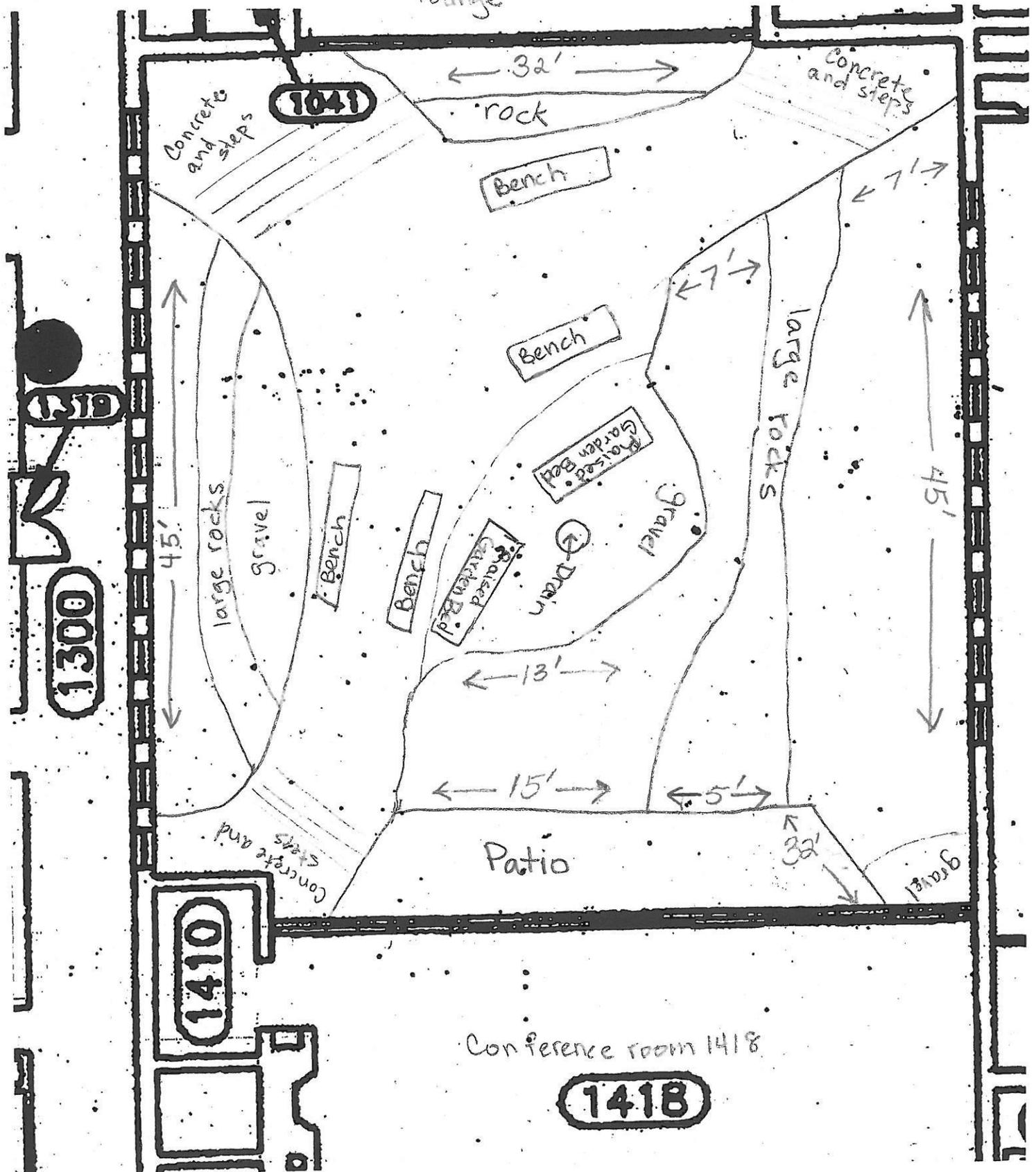
Student lounge



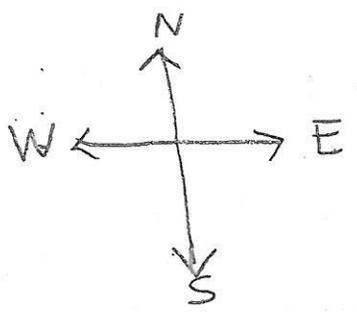
Parameters



Student lounge



Widths



Student lounge

