

Sustainable Landscaping at Butler University

Part of the Indiana Wildlife
Federation's "Landscaping the
Sustainable Campus" program.

BUTLER
UNIVERSITY



INTRODUCTION

Butler University is a four-year private liberal arts master's granting university located on a 295-acre campus in Indianapolis, Indiana. The establishment of the Butler University Prairie in 1987 was a first step in Butler's quest to becoming a sustainably landscaped campus. Since then, Butler has developed a multi-pronged approach to managing its grounds. This report entails Butler's ongoing efforts to install rain gardens, remove invasive species, introduce best stormwater management practices, incorporate native species, and more.

ACKNOWLEDGMENTS

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I. SUSTAINABLE LAWN MAINTENANCE AND LANDSCAPING

GOAL 1: MOW HIGHER

Mow higher (only top one-third of grass) to develop and maintain a strong root system, an important aspect of healthy soil. Healthy, established turf grass decreases soil erosion and helps keep nutrients on your lawn. Also consider exploring turf grass alternatives like fine fescues and native grass mixes for low traffic areas.

GOAL PROGRESS

Butler University grounds crews set their mower deck heights in accordance with the “one-third rule” while mowing, to benefit the root systems of the turf. All grass clippings are returned to the turf, providing a source of nutrients that assists with steady growth. Returning clippings to the grass also allows Butler to cut fertilizer usage in its turf areas. Lawnmower blades are sharpened every other day, allowing for a cleaner cut and better growth of the grasses. Dull blades pull and tear grasses, which can strain their root systems and negatively influence turf health. To give grassy areas ample time to recover after a trimming, the maintenance staff maintains scheduled mowing cycles.

GOAL 2: COMPOST

Design a composting system to collect yard waste (grass clippings, fallen leaves, and branches) and recycle it as mulch. This organic material already contains nutrients that microbes can release to replenish the soil. Rich soil absorbs and filters rainfall.

GOAL PROGRESS

Both the Center for Urban Ecology (CUE) Farm and Butler University’s Maintenance Services team compost plant waste on site. Leaves and plant material from around campus are collected and used in the formation of nutrient-enriched dirt, which is then applied in many campus locations. The CUE Farm composts leaves, spent straw, weeds, and crop waste that it recycles from its own operations. The sub-acre farm produces around 1 cubic yard of compost per year with its current composting capacity, significantly reducing its need for use of external fertilizer or mulches.



PHOTOS: BRANDON EUEN



LEFT: Agrifiber composting at CUE Farm. RIGHT: Plants growing at CUE Farm are treated with farm-produced nutrient rich compost.

II. REDUCTION OF HERBICIDES AND PESTICIDES

GOAL 1: INVASIVE SPECIES REMOVAL TECHNIQUES

Identify which plants to target and determine the best eradication approach for each pest. Use spot treatment, if needed, to control weeds and insect pests.

GOAL PROGRESS

In Indianapolis, Asian bush honeysuckle (*Lonicera* spp.) requires attention as a non-indigenous, invasive pest. Butler Biology faculty and ground crews have targeted it for eradication on campus. Small honeysuckle are removed by hand; larger plants are dug out or removed with tools. Fully grown plants are cut low to the ground with a chainsaw, then glyphosate is applied to the stump. This prevents further growth of the plant while limiting the herbicide’s impact on surrounding plants. By manually removing all but the largest growths of this common pest, campus crews limit pesticide use drastically, lower costs, and reduce environmental impact.

Butler partners with Keep Indianapolis Beautiful every fall during the Lilly Global Day of Service to assist with honeysuckle removal. The Teen Works program also assists removal in summer.

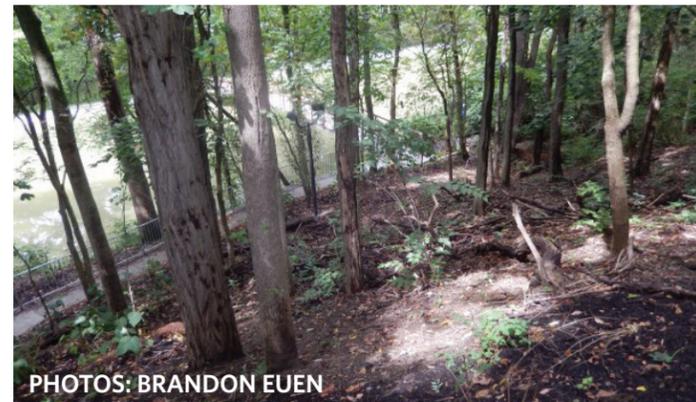
Butler University’s ash trees are threatened by the emerald ash borer (EAB), *Agrilus planipennis*. At least 20 ash trees were removed from campus last year to combat the spread of EAB. The ash trees are treated for EAB biennially. Some areas of campus are treated yearly. For all other pest issues, Butler utilizes an Integrated Pest Management plan with services provided by Bartlett Tree Experts.

GOAL 2: USE PHOSPHORUS-FREE FERTILIZER

Utilize phosphorus-free fertilizer on campus lawns and landscapes. Phosphorus pollution contributes to algae growth in lakes and waterways. Too much algae lowers oxygen levels in water and threatens wildlife that depend on those waterways.

GOAL PROGRESS

Since 2009, Butler has used phosphorus-free fertilizer everywhere on campus except flowerbeds or when a new lawn is being established.



PHOTOS: BRANDON EUEN



LEFT: One of Butler’s wooded habitats was cleared of all invasive honeysuckle using proper techniques. RIGHT: A stump from a cut and treated honeysuckle plant.

III. INVASIVE SPECIES ERADICATION

GOAL 1: PRESERVE NATURAL AREAS

Preserve natural areas owned by the University, such as prairie or wetlands, through restoration efforts, and keep them free of non-indigenous plant species.

GOAL PROGRESS

At slightly less than 300 acres, Butler University's campus is home to many natural woodland areas, including a 15-acre remnant woods of old-growth beech-maple trees. Invasive species can become problematic in these locations, so Butler University utilizes both grounds crews and community efforts to preserve these natural areas. Asian bush honeysuckle began appearing in the Butler woods and around campus, so maintenance crews were trained to identify and eliminate these plants in order to protect the native plant species and the habitat. Removal of Asian bush honeysuckle occurs year-round with extra focus during the winter months, as this is when the plants are most accessible. The Department of Biological Sciences at Butler University also educates other employees and students about bush honeysuckle, which allows them to identify the plants and notify maintenance crews of their locations. In addition to the removal of invasive honeysuckle, Butler University holds an annual "garlic mustard pull" to prevent that invasive plant from becoming a major problem.



PHOTOS: DR. REBECCA DOLAN

LEFT: A beech tree growing among several maples. RIGHT: These beech-maple woods are protected from invasive plants such as bush honeysuckle.

GOAL 2: HOST COMMUNITY STEWARDSHIP DAYS

Plan and host community stewardship days to enlist volunteer help to remove invasive species from campus, and teach community members and students about the importance of restoring habitats back to natural conditions.

GOAL PROGRESS

Butler University hosts an annual garlic mustard pull in which staff, students, and members of the central Indiana community are invited to help remove invasive garlic mustard from the campus. The garlic mustard pull is traditionally held the Sunday after Earth Day, and it has attracted 30-50 volunteers each year for the 10 years it has been conducted. Between 40 and 50 bags of garlic mustard are typically removed, but the amount pulled has been steadily decreasing each year as the pest plant becomes more controlled on campus. As well as being shown how to identify and remove garlic mustard effectively, students and community members are taught how the plant causes harm to habitats around campus. Participation in the annual pull allows students and the community to see the positive impact they can have on natural environments, and it conveys the importance of habitat maintenance and restoration.



PHOTOS: MARCIA MOORE

LEFT: Several volunteers pulling garlic mustard. RIGHT: A small percentage of the pulled and bagged garlic mustard.

IV. NATIVE SPECIES PLANT SELECTION

GOAL 1: LANDSCAPING NEWLY CONSTRUCTED AREAS

Native tree, flower, and shrub species will be preferred in landscape areas disrupted by construction or renovation projects. Native plants grow well and require little care, as opposed to non-natives, which can be problematic in foreign soils and climates. Planting natives eliminates the problems of invasive and non-native species and saves grounds crews time and money. Also, native plants provide local wildlife with better opportunities for food and shelter than non-natives can.

GOAL PROGRESS

Butler University recognizes the importance of planting native species and strives to ensure all new construction/renovation projects on campus follow native species guidelines. All recent and upcoming projects, such as the Sunset Avenue Streetscape Project, feature or will feature native species chosen in collaboration with the staff of Butler's Department of Biological Sciences and our landscaping companies. A list of plants for the Sunset Avenue Streetscape Project can be seen in Appendix A.

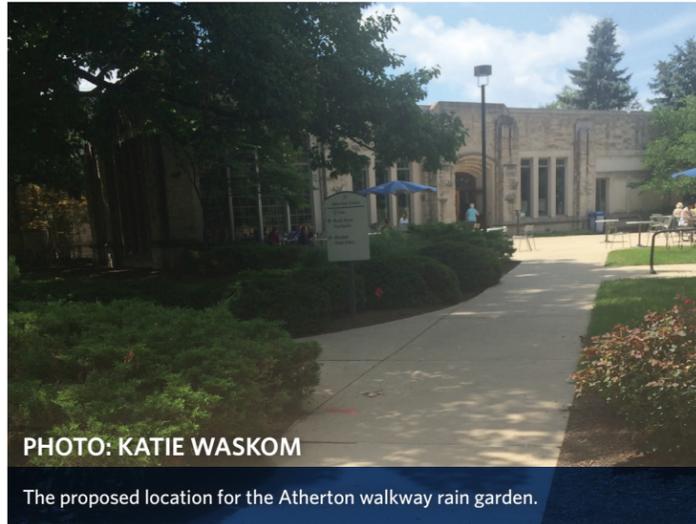


PHOTO: KATIE WASKOM

The proposed location for the Atherton walkway rain garden.



PHOTO: JOHN HAZLETT

A rain garden outside of the Butler Health and Recreation Center.

GOAL 2: CAMPUS HABITAT DIVERSITY

Add diversity to campus by planting a variety of habitats—meadow, forest, wetland—and reducing lawn area. Introduce a wide range of plant species to provide year-round food and shelter for a variety of wildlife species.

GOAL PROGRESS

In addition to naturally forested areas and the Central Canal that runs through campus, Butler University is home to a prairie habitat and a bioretention basin. Constructed in 1987 by Holcomb Research Institute and the University, the Butler Prairie functions as both a natural area and a teaching resource. In addition to providing a year-round habitat for wildlife, the prairie is also the location of more than 30 flowering plant species that bloom from spring to fall. Controlled burns are conducted as needed to maintain and control the prairie environment, and grounds crews and volunteers prevent the overgrowth of invasive species. Our campus bio-detention basin functions as a larger version of a rain garden, providing a wetland habitat for wildlife while helping to filter pollutants and curb runoff stormwater levels. More information on the Butler Prairie can be found in Appendix B.



PHOTOS: KATIE WASKOM

LEFT: The bioretention basin filters rainwater and provides a home for wildlife.



RIGHT: Flowering plants in the Butler Prairie.

V. WATER CONSERVATION, RETENTION, AND RECYCLING

GOAL 1: IMPROVE WATERING TECHNIQUES

Water turfgrass and plants only when necessary, preferably in the morning. Watering in the afternoon can lead to evaporation, whereas watering at night encourages fungus growth in lawns and beds. Use rain sensors to turn irrigation system off when rain is detected.

GOAL PROGRESS

Butler University is equipped with Hunter and Rainbird sprinklers in areas where irrigation is necessary. In order to conserve resources, about ½ of our irrigation systems have rain sensors on the buildings that will shut off the irrigation system once ½" of rain is sensed. Butler irrigation systems deliver up to 1 inch of water per week if needed in the areas they cover. Watering is scheduled for early morning hours to avoid the problems of evaporation or fungal growth.



PHOTO: BRANDON EUEN

Some of Butler's sprinklers have sensors to shut them off when rain is detected.

GOAL 2: USE SPRINKLER SHUT-OFF VALVES AND TIMERS

Install timers or quick shut-off valves on sprinkler systems to conserve water.

GOAL PROGRESS

Butler University utilizes a combination of Hunter and Rainbird sprinkler systems for irrigation needs. These sprinklers include quick shutoff valves and programmable timers that allow the University to closely regulate water use. These two features, in conjunction with careful monitoring and checking of soil conditions by grounds crews, are effective in conserving water used for campus irrigation needs.



PHOTO: BRANDON EUEN

A Rainbird sprinkler.

GOAL 3: USE POROUS PAVEMENT

Use pervious paving surfaces (e.g., paving stones, pervious concrete, and porous asphalt) to mitigate the increase of warm runoff filled with nutrients and toxins, alleviating stress on aquatic life.

GOAL PROGRESS

Butler University has implemented multiple new pervious pavement surfaces in its construction projects. Sections of both the Clowes Memorial Hall parking lot and the newly installed overflow parking lot (or I-Lot) are paved with pervious asphalt, lowering the amount of storm runoff produced and limiting the amount of pollutants washed from the lot. The Sunset Avenue Streetscape project, which is scheduled to be finished in May 2015, will also include porous surfaces. The construction will feature some of the first porous bike lanes in the city of Indianapolis, as well as porous pavers in the bus pullout sections. Plans for the porous bike lanes and porous bus pullout sections can be seen in Appendix A.

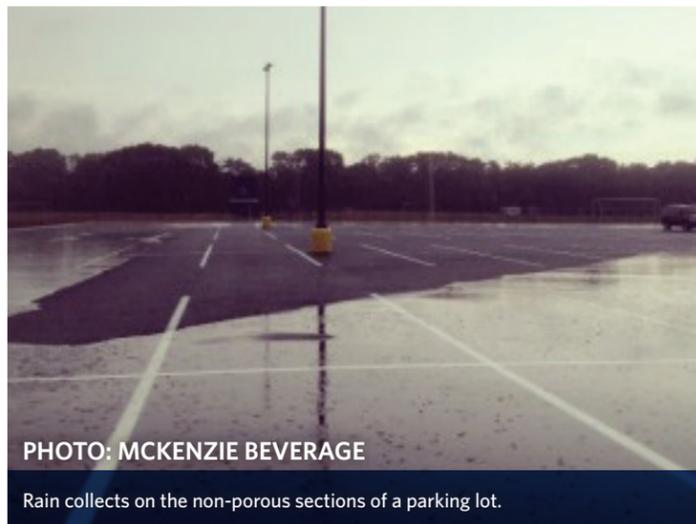


PHOTO: MCKENZIE BEVERAGE

Rain collects on the non-porous sections of a parking lot.



PHOTO: JOHN HAZLETT

Porous pavement for bike lanes in construction along Sunset Avenue.

GOAL 4: PLANT RAIN GARDENS

Build rain gardens and vegetated bioswales to slow stormwater runoff, filter chemicals, and control erosion. Redesigning areas of turfgrass and impervious surface can help keep water on the property longer, recharge groundwater resources, and decrease the frequency or severity of sewer overflow events.

GOAL PROGRESS

Butler University has several existing rain gardens, and plans to implement more with the addition of the Butler Sunset Avenue Streetscape project. The new Howard L. Schrott Center for the Arts on campus is separated from an adjacent street by a large rain garden, and it includes several more rain gardens in its parking lot. Once the rain gardens reach their maximum water capacity, excess runoff is directed into storm drains located nearby. These gardens feature eye-catching, native plants such as cardinal flower (*Lobelia cardinalis*) and mistflower (*Eupatorium coelestinum*), combining beauty and functionality in an excellent green feature for the campus. Butler hopes to have rain gardens installed next summer next to its Atherton Union building. In the future, the University will be home to several more rain gardens.



PHOTO: KATIE WASKOM

A rain garden in the Schrott Center parking lot.

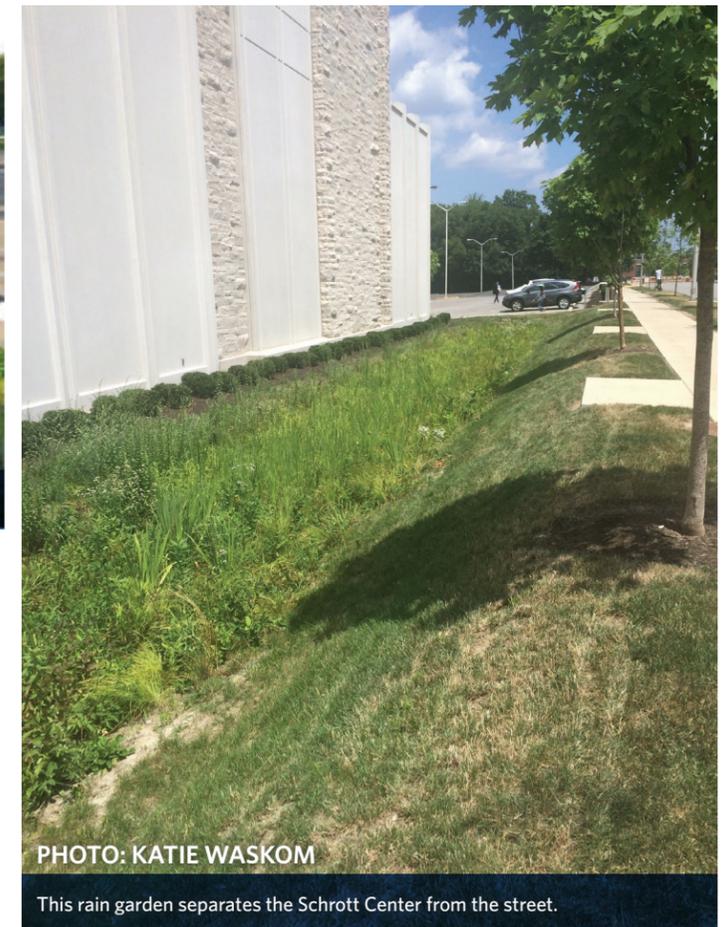


PHOTO: KATIE WASKOM

This rain garden separates the Schrott Center from the street.

GOAL 5: INSTALL GREEN ROOFS

Install vegetated “green roofs” on suitable buildings to reduce the effect of heat islands. The additional heat from dark roofs can contribute to an increase in water temperature, affecting wildlife species’ metabolism and reproduction. Other benefits of green roofs include reductions in energy use, air pollution from emissions, and human health risks.

GOAL PROGRESS

The Pharmacy and Health Sciences Building at Butler University is home to a green roof installation. Through the combined efforts of Sarah Strobl (Butler Biology student and the designer of this green roof), the Eco-Roofs Company, and the Butler Student Government Association, this 1,300-square-foot installation was hoisted to the upper levels of the building in spring 2012. Since its installation, the green roof has been protecting the roofing membrane of the building and helping to lower heating and cooling costs. The 650 trays that compose the green roof are filled with various sedum species, and they have continued to grow and flourish nearly maintenance free for two-and-a-half years since their planting.



PHOTO: KATIE WASKOM

These sedum species make up the green roof and provide a number of benefits to the Pharmacy and Health Science building.

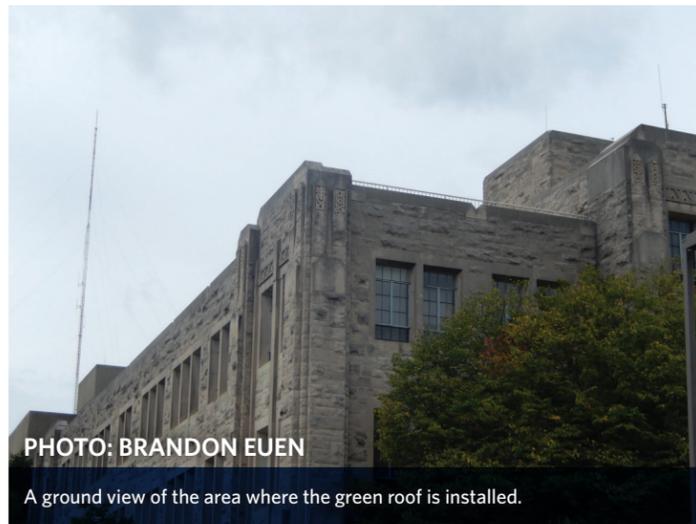


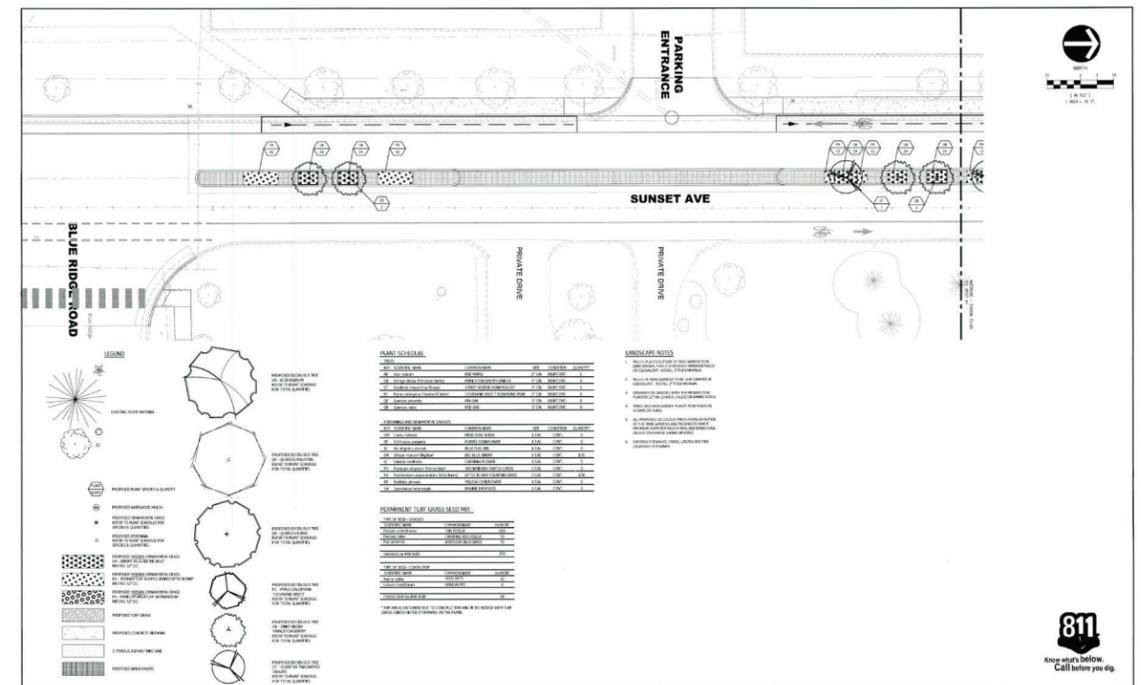
PHOTO: BRANDON EUEN

A ground view of the area where the green roof is installed.

APPENDICES

APPENDIX A: SUNSET AVENUE STREETScape PROJECT

Below is a sample page from the Sunset Avenue Streetscape construction plans. The 20-page construction report has been included with this submission and can be viewed for more details, including plant species, proposed plant locations, and information on the porous bike lanes and bus pullout pavers.



APPENDIX B: BUTLER PRAIRIE SPECIES INFORMATION

Additional information about the Butler Prairie can be found at the following website:
legacy.butler.edu/herbarium/prairies

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Herbarium » Prairies » Prairie Species Search

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The Butler Prairie

The Butler University Prairie combines elements of several different prairie types in its planting design. The west half of the prairie was sown with a mixture of tall grasses, while the east half was sown with a mix of shorter grass species. In time the forbs will spread throughout the entire prairie. The Prairie is home to many beautiful spring and summer blooming plants. Begin your search by clicking on the "Prairie Species Search" button to the left. To search for other

APPENDIX C: BUTLER UNIVERSITY CAMPUS MAP



BUTLER CAMPUS MAP

- | | | | | | |
|----------------------------------|---|---|--|---|--|
| 1. Alpha Chi Omega | 13. Delta Delta Delta | 22. Health and Recreation Complex | 31. Irwin Library | 42. Pharmacy and Health Sciences Building | 53. South Mall (Atherton Mall) |
| 2. Alpha Phi | 14. Delta Gamma | 23. Hinkle Fieldhouse | 32. Jordan College Annex | 43. Phi Delta Theta | 54. Tennis Courts |
| 3. Apartment Village | 15. Delta Tau Delta | 24. Holcomb Building | 33. Jordan Hall | 44. Phi Kappa Psi | 55. University Terrace Apartments |
| 4. Atherton Union | 16. East Mall (Butler Way Mall) | 25. Holcomb Gardens | 34. Kappa Alpha Theta | 45. Pi Beta Phi | 56. West Campus/Butler Athletic Fields |
| 5. Bookstore/Starbucks | 17. Efroymsen Center for Creative Writing | 26. Holcomb Memorial Carillon | 35. Kappa Kappa Gamma | 46. President's House | 57. West Mall |
| 6. BU Police Department | 18. Eidson-Duckwall Recital Hall | 27. Holcomb Observatory and Planetarium | 36. Lambda Chi Alpha | 47. Residential College (ResCo) | |
| 7. Butler Bowl | 19. Facilities Management | 28. Holcomb Pond | 37. Lilly Hall | 48. Robertson Hall | |
| 8. Butler Campus Farm | 20. Fairbanks Center for Communication and Technology | 29. Howard L. Schrott Center for the Arts | 38. New Parking Garage and Mixed-Use Retail (Coming Summer 2015) | 49. Ross Residence Hall | |
| 9. Center for Faith and Vocation | 21. Gallahue Hall | 30. Indianapolis Greenway Canal and Path | 39. New Student Housing Facility (Coming Fall 2016) | 50. Schwitzer Residence Hall | |
| 10. Clowes Memorial Hall | | | 40. Norris Plaza | 51. Sigma Chi | |
| 11. Cornerstone Plaza | | | 41. North Mall | 52. Sigma Nu | |

