Tanyard branch

restoration and design studio

Summer Studio 2002
The University of Georgia
College of Environment and Design

Tanyard branch

tanyard branch

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summary and objectives

Course Objectives

- Develop a plan to transform Tanyard Branch into a clean and stable water resource that offers recreational and educational opportunities to the UGA campus and Athens community
- Propose ways to incorporate Tanyard Branch into the UGA campus master plan
- Identify sources that contribute to Tanyard's degradation and offer possible solutions
- Educate the community on the current problems with the Tanyard Branch environment, how these conditions occurred, and what improvements can be made to prevent further degradation

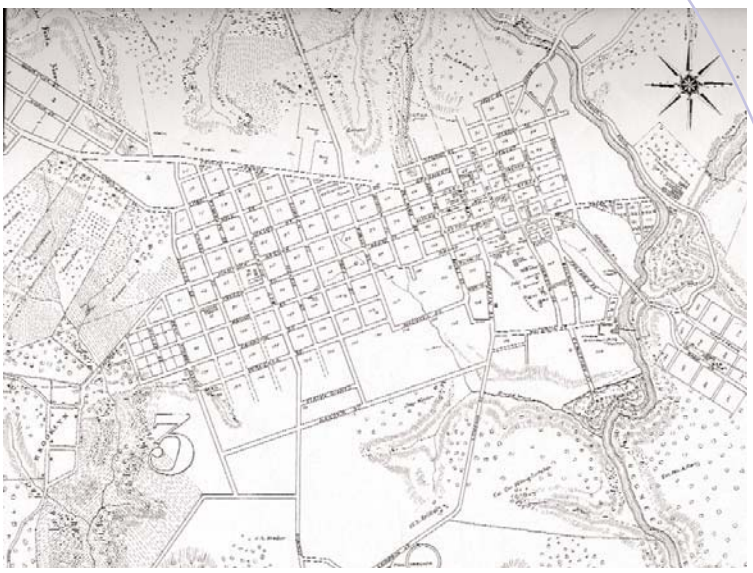
Degraded urban streams are a growing problem across the nation. Watershed and riparian deforestation, road crossings, pipes and culverts, toxic pollutants, and impervious surfaces all contribute to the threats that face our urban streams. Tanyard Branch, which runs through The University of Georgia campus and beneath Sanford Stadium, illustrates many of these problems facing urban streams. Currently, approximately 50% of Tanyard Branch is piped, the channel banks and streambed are highly eroded, the water does not meet water quality regulations, the stream has a very poor habitat for insects and aquatic life, and the stream itself is cut off from human interactions.

Students from ecology and environmental design worked together through the summer to develop a plan to transform Tanyard Branch from its current unhealthy state to a clean and stable water source that serves as a recreational, educational, and visual asset to the UGA campus and community. One of the goals of the class is to have this plan integrated into the UGA campus master plan.

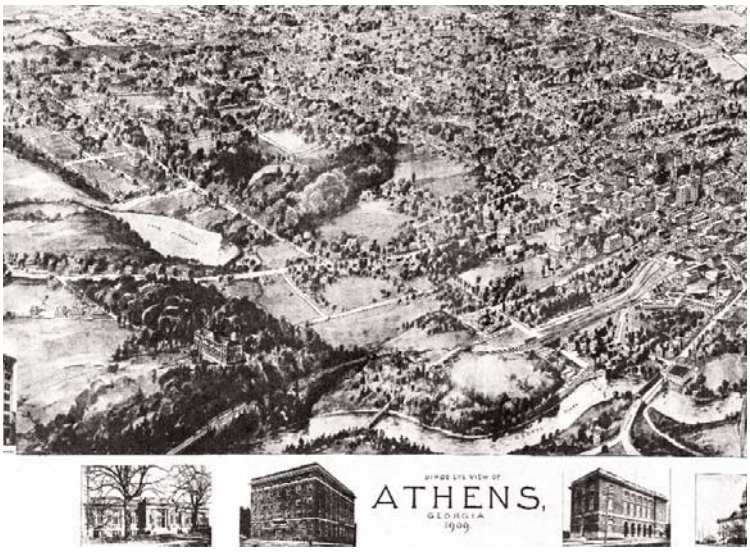
The two final design proposals include a conceptual plan for restoring all reaches of Tanyard Branch on UGA property as well as a detailed plan for restoring the main reach of Tanyard between the confluence of the two branches, located at the Baxter Street/Lumpkin Street intersection, and the Sanford Stadium culvert. Geomorphic reference data acquired from North Carolina State University's Stream Restoration Institute for southeastern piedmont streams was used to help design a new channel, and a hydrologic modeling program was used to calculate the dimensions for a 2-year bankfull channel and 100-year floodplain channel. Students also created detailed reports on monitoring plans for the creek, educational and outreach programs, greenway design ideas, stormwater management suggestions, and vegetation studies for the area. The designs incorporate ideas proposed in the UGA master plan while considering impacts to Tanyard and possible improvements to the health and quality of Tanyard Branch and its surrounding habitat.

history

The appearance and quality of Tanyard Branch has changed much over the years. A series of historic maps and aerial photos of the Athens-Clarke County region illustrate the progression from a sinuous, unrestrained stream channel to a straightened, culverted, and highly degraded urban stream. Even as early as 1874, much of the Tanyard Branch watershed had been urbanized. However, a riparian corridor was maintained and the stream was allowed to flow freely. An 1893 map shows the addition of a city reservoir on Tanyard's South Branch, where the UGA Legion pool is located today. A 1909 bird's-eye view of Athens confirms the presence of the city reservoir and a meandering stream channel. At this point, the map shows that Tanyard still maintains a natural sinuous path of waterflow. The growth of the community around Tanyard from 1909 to 1924 leads to the alteration of the stream channel. A 1924 Ben Epps aerial photo from the Iowa State University Special Collections Library Warren Manning Collection suggests that the stream was moved to the edge of the valley bottom to make room for the old UGA baseball field. By 1959, the reservoir is gone. A 1959 Athens map drawn specifically to show drainage patterns locates many first-order tributaries flowing freely into Tanyard Branch, almost all of which are piped today. The 1993 aerial photo reveals a highly urbanized watershed. Today, the historically meandering stream has been transformed into a channelized stream with a 0.782 square-mile watershed, 74% of which is covered by impervious surfaces, and only



1874 map of Athens, Georgia



1909 bird's-eye view of Athens, Georgia

21% of the area remaining forested.

The free-flowing stream evident in the historic photos of Athens-Clarke County is now a highly channelized structure. Many of the natural curves characteristic of a healthy stream have been eliminated, creating straight paths that keep the stream away from buildings constructed near the stream bed. In addition, survey data taken by the students in this course indicated that the reach of Tanyard by the Tate parking lot is not flowing in its original channel, but was pushed to the edge of the valley against steep bluffs on the south bank to make room for campus activities. Our survey data suggests that the historical channel flowed through the center of the existing Tate Center parking lot. Our designs propose building a new channel for Tanyard in the historic location.

1993 aerial photo of Athens, Georgia and the University of Georgia campus

education and outreach

Restoring Tanyard Branch is a cooperative process involving scientific principles, ecological concerns, and public support. Education is a crucial and on-going step in the restoration of Tanyard Branch. Efforts to restore Tanyard Branch can provide a real-life example to the public, explaining why the stream is impaired and what can be done to help the situation. During the design process, a team of students developed an education and outreach plan to inform the Athens-Clarke County community about the problems facing Tanyard Branch.

Community Interaction

Encouraging community interaction is one of the key methods to maintaining the restoration activities on Tanyard Branch. Incorporating public support of the process insures the restoration process will continue over time. Personal interviews and surveys are one method of gathering information about past activities on the creek. Organized public meetings offer a means to gather input on the initial stages of the process and to continue incorporating community ideas into the project. Public support is necessary to the success of the project.

In addition to direct person to person contact, the media is another method for generating support for the Tanyard restoration project. Articles in local papers, radio advertisements describing events or walking tours, internet websites, videos documenting the process, and a project logo are all recommended methods for advertising the project. The goal should be to target the community and raise awareness of both the problems and potential solutions.

Displays and Signage

Interpretive signs, strategically placed along Tanyard Branch and in highly visible areas, play a large role in educating the public about Tanyard and the restoration process as a whole. Themes of these signs may include:

- History
- Ecology—including the function of stream ecosystems
- Biology—including aquatic, terrestrial, and plant life characteristic of the region
- Community and University life near and around the stream
- Aesthetic considerations in the design process
- Stream restoration project—including the purpose, function, and goals

School Involvement

By teaching younger children about the natural processes of a stream and the causes of harm to the system, we increase the chances of the younger generation's involvement and concern for the system as they grow into adults. A storm drain stenciling project offers a method for student clubs to participate. A "Stream Eco-kit," or packet of information, activities, and projects on stream restoration, could provide teachers with a series of activities and lessons that create a unit on streams. Work days, water quality sampling events, and stream clean-ups encourage both students and community members to participate in the restoration process.

Monitoring

To ensure the restoration efforts on Tanyard Branch are successful, it is important to monitor the changes of the water quality and stream habitat over time. UGA professors could continue to incorporate water quality analyses, invertebrate studies, and fish samplings into their curriculums each year, building a larger database for future reference. Yearly monitoring on a more basic level could take place through the elementary/middle/high school levels if a teacher includes stream restoration or stream ecology into the curriculum.

stormwater management

Stormwater management was a major concern in the design phase of the Tanyard restoration proposal process. Stormwater runoff from impervious surfaces causes significant damage to the health of a stream system. In urban settings, such as the Tanyard Branch basin, streams suffer from:

- Channel instability—eroded banks and stream beds
- Increased peak stormflows
- Reduced baseflows
- Water quality impairment, including increased temperatures, toxic pollutants (metals, petroleum, and pesticides), nutrients, turbidity, and sediment
- Habitat degradation
- Biological impairment

The traditional method of dealing with stormwater is by conveyance. Storm drains, street gutters, culverts, pipes, and outfalls all channelize rain water into pipes which carry the water to the nearest stream. These rapid conveyance methods lead to the physical, chemical, and biological degradation of streams. Detention methods, including wet detention ponds, dry detention ponds, and stormwater wetlands, can help reduce the high peak stormflows characteristic of urban streams, yet these methods do little to address water quality. Stormwater restoration, which focuses on the cause of the degradation to the stream, attempts to repair the water cycle in urban watersheds. Infiltration is the main method for shifting the balance of water in urban watersheds from surface water back towards groundwater. The Tanyard Branch restoration design proposals include several infiltration techniques, including rain gardens, porous pavers, and green roofs. A group of students researched various methods of stormwater management, ranging from detention ponds to porous pavement to rain gardens. The following paragraphs give a brief explanation of several of the methods for stormwater management proposed in the Tanyard Branch restoration design.

Porous pavement is a permeable surface which allows rainfall to infiltrate the subgrade. It reduces the quantity of surface water runoff and stream peak flows and the amount of non-point source water pollution. In addition, porous pavement increases the groundwater recharge and subsequently stream base flow increases. Not all stormwater infiltrates through the porous pavement, and some runoff will still occur. Porous pavers come in many forms and can contribute to the aesthetic appearance of a site while aiding in stormwater management.

Green roofs are vegetated external coverings (or roofs) on buildings. They can retain an average of 75% of rain water that falls in the vegetation and soil layers. When the soil reaches saturation, the excess water trickles slowly to an outlet. Excess water can be channeled into cisterns for later use. In addition to reducing stormwater runoff, green roofs reduce heat reflection into the atmosphere and help to reduce the heating and cooling costs of the building itself.

vegetation and aquatic habitat suggestions

Vegetation Suggestions

Restoring the vegetative habitat along the Tanyard riparian corridor is an important step in restoring the health of the stream environment. A team of students researched the typical plant community composition along stream corridors in the Georgia piedmont. The team developed a list of suggested plant communities for the riparian zone and uplands. The species list included at the end of this document offers a general guideline and is not an all-inclusive list of possible species to be planted within the Tanyard riparian zone.

Aquatic Habitat

To support a healthy fish population, streams need a diverse range of habitats to handle a variety of habitat preferences or activities. There are many types of habitats found within a stream, and it is the unique combination of habitat types that makes an aquatic community successful. A group of students researched the aquatic habitat types found along the Oconee River and its tributaries. The following list describes the types of habitats needed to restore healthy fish levels in Tanyard Branch:

- Clean, large sediment, consisting of pebble and cobble, for spawning and feeding
- Bedrock for feeding and cover
- Pools, especially deep pools (relative to the size of the stream), to provide important refuge during drought or low flows
- Riffles, for feeding and spawning, are especially important for small-bodied fishes
- Woody debris for feeding and cover

geomorphic reference conditions, watershed, and hydrologic assessment

As already mentioned, the current channel for Tanyard is south of its historic location, and it is currently eroding into very steep bluffs on the south bank. The south bank is over three vertical meters of exposed clay due to this bank erosion and downcutting (incision) of the stream bed. Due to the topography and extreme problems with erosion and channel incision in this channel, it would be infeasible and perhaps impossible to restore a natural channel with floodplain connection in this unnatural channel location. Therefore, our designs propose the construction of a new channel for the Tate Center reach of Tanyard in its historic location which is in the middle of the Tate Center parking lot.

Channelization (i.e. channel straightening) is another serious problem in Tanyard Branch today. Many of the natural curves and meanders of the stream have been lost, and the stream itself is culverted and hidden from view. To construct a stable and natural stream channel design that that will improve the habitat quality in and around Tanyard, the class looked at reference data for North Carolina Piedmont streams from the North Carolina Stream Restoration Institute. The North Carolina piedmont reference stream data set included reference channel dimensions (i.e. sinuosity, width:depth ratio, and meander belt width:width ratio) useful in designing an appropriate cross-sectional channel shape and pattern (in terms of aerial view) for the new restored channel. In the future, it will be necessary to identify a stream in the Georgia Piedmont and use this information as a source of reference data for future Tanyard improvements.

To complete the hydrologic modeling process that allowed estimation of an appropriate channel size (cross-sectional dimensions) for the restored channel, the watershed area was assessed. The watershed outlet was identified as the upstream end of the Sanford Stadium culvert on the University of Georgia campus. A 1993 Digital Orthophotography Quarter-Quadrangle (DOQQ) for Clarke County from the Georgia GIS Data Clearinghouse website served as a base for the process. The watershed boundaries were drawn by hand on a digital contour map (5 foot interval), and using ERDAS Imagine GIS software, the land cover types within the watershed were classified into three categories: 1) impervious cover, which includes all pavement, concrete, and roof surfaces, 2) forest cover, and 3) shadow, a source of error resulting from the time of day in which the photo was taken. (Table 1) The Imagine program was unable to distinguish between paved surfaces and lawns/grassy areas, and as a result, the percentage of impervious surface is slightly overestimated. However, this overestimate incorporates a conservative measure into the creation of a stream channel that will be able to convey the desired design flow (a 100 year flood event) that can accommodate a small increase in future impervious ground cover as urbanization in the watershed region continues to grow.

Using watershed area and impervious cover, flood magnitudes for various flood recurrence intervals were calculated. Specifically, calculations for 2-year and 100-year floods were used in the design process of the Tanyard Branch restoration. The 2-year data was used to establish the size of the bankfull channel and allow for floodplain connectivity on an approximate biennial basis, and the 100-year flood data was used to estimate the size of the floodplain channel, thus protecting nearby structures from flood damage during large storms.

Table 1: GIS analysis results for Tanyard Branch Watershed

Watershed Parameter	GIS Analysis Results
Watershed area in square miles	0.782
Watershed % (forested)	20.7
Watershed % (impervious)	73.8
Watershed % (shadow--photo error)	5.4

conceptual design

The central theme behind the design is to establish a connection between the Athens community, the UGA population, and a restored Tanyard Branch. Paths and other designed elements are intended to connect the Athens community with the campus community, and ultimately link these two groupings back to the creek. By making the stream and surrounding habitat the focal element of central campus, students, citizens, and educators will become more aware of the problems facing an urban stream and take measures to ensure the health of the system in the future. Restoring Tanyard to a natural, healthy state is the ultimate goal of the design. Many of the buildings/architectural elements included in the conceptual and detailed plans are derived from proposals made on the University of Georgia Campus Master Plan. The Building Identification map at the end of this document distinguishes between existing structures and those proposed on the UGA campus master plan and by the summer studio course.

Physical Structures

•Elevated Pulaski extension—Based on concepts from the Campus Master Plan, this concept extends Pulaski Street straight across Baxter Street and joins with Lumpkin Street. This street extension is elevated allowing both branches of Tanyard to flow freely below the street. Paths, walkways, and a proposed greenway system around Tanyard all run unobstructed beneath this elevated street. The final section of Baxter Street is also elevated so that it intersects with the Pulaski Extension.
•Greenway system along all reaches of Tanyard.
•Alluvial fan structure to slowly infiltrate rain water back into ground.
•Rain gardens located throughout the area to collect storm runoff.

New buildings:

•Special collections library
•Additional dorm space
•Eco-dorm complex—The buildings of this dorm complex, located on the South Branch, are oriented to maximize solar energy. The buildings have green roofs, and a series of rain gardens collect any excess rain runoff.
•Education center—One of the main goals of the project is not only to restore the stream, but to show individuals what is being done and why. The center, located next to the proposed parking deck, provides direct stream access and allows for interaction with the stream. Professors in all disciplines can hold classes in the space, and the center offers a place for community clubs and organizations to hold meetings. This building can serve as a permanent monitoring station to continue gathering information from Tanyard Branch.
•Parking deck—Located off of the Pulaski Extension along the north branch of Tanyard, this parking deck has a green roof and terraced plantings along the back side of the structure facing the stream. The building itself is next to the education center and offers an opportunity to teach individuals who come to the center about the benefits of green roofs.
•Visiting professor village—These small housing units offer a location for visiting scholars, alumni, or other visitors to the UGA campus to stay. The buildings face the stream, creating a scenic site with an easy walk to the heart of campus.
•Mixed use buildings along Baxter Street—These buildings can provide housing, retail, and dining facilities.

Connections with the Community

•Connection to South Campus—paths connect central campus to Cedar Street and to the D.W. Brooks Pedestrian mall
•Connection to Five Points and other historic neighborhoods—greenway trails lead along the south reach of Tanyard and Cloverhurst Avenue to these neighborhoods.

conceptual design

- Connection to Big City Bread Bakery, the Bottleworks, and community spaces in northwest Athens—greenway trails along the north reach of Tanyard link to sidewalks/bike lanes along Newton, which connect to these community and public spaces.
- Connection to the central business district of Athens—the Lumpkin pedestrian walkway and bike lanes on Lumpkin Street connect to Broad Street and the downtown business district of town.
- Future connection to the Athens-Clarke County greenway along Reed Alley between Memorial Hall and Sanford Stadium.

design proposal a

General Concepts

•The intent of this design is to create a multi-use plan, making Tanyard Branch the focal point of every day activities in central campus. Individuals can view and interact with the creek on a daily basis.
•Riparian zones around the stream are protected. All buildings and large paved surfaces are outside of the 2-year and 100-year floodplains.
•All paved paths proposed in this design utilize porous paving materials.
•The overall visual concept for the design is the change from geometric to organic forms and structures. This idea gradually transitions from the very formal building elements located on the University of Georgia campus to the natural areas around the stream. Slight changes in forms from linear lines and precise angles to curvilinear forms lead the viewer's attention towards the stream. The central quad located between the Student Learning Center and proposed multi-use building (intended to house an Alumni Development Center, parking deck, and bookstore) is a very formal, geometric pattern. Evenly spaced trees line the symmetrical grassy area between the buildings with a large fountain at the west end of this quad. The fountain aligns with the paths of Lumpkin mall and walkways between two proposed dorm buildings and joins the cross paths with a circular walkway. A runnel of water extends from the outer edge of the circular walkway around the fountain. This small trail of water begins in a linear line, but gradually begins to curve and ends at a small fountain at the corner of the Lumpkin mall pathway and the "football walk," located just south of the proposed Alumni Development Center. The two colors of pavers in the football walk continue the curving pattern of the water runnel and mimic the sinuosity of the stream nearby. Columns evenly spaced along the north side of the football walk between the walk and the proposed alumni building have a very formal appearance while the trees on the south side of the football walk mimic the same formal spacing, but with a softer appearance, and the plantings take on a more natural clumping pattern as they get closer to the stream.

Physical Structures

•Water elements play a key role in directing an individual's attention towards the stream. The fountain is cone-shaped with stepped levels. Two separate sources of water at the top of the fountain flow down and around the structure in a spiraling motion. These separate sources meet approximately half way down the structure, join, and continue to flow down and around the structure as one. This mirrors the idea of the North and South Branches of Tanyard Branch, which meet and flow to the Oconee River as one main branch. The water from the fountain continues in a small runnel, leading the viewer to a small fountain at the end of the walkway. From here, the viewer can see the natural source of water flowing through campus.

design proposal a

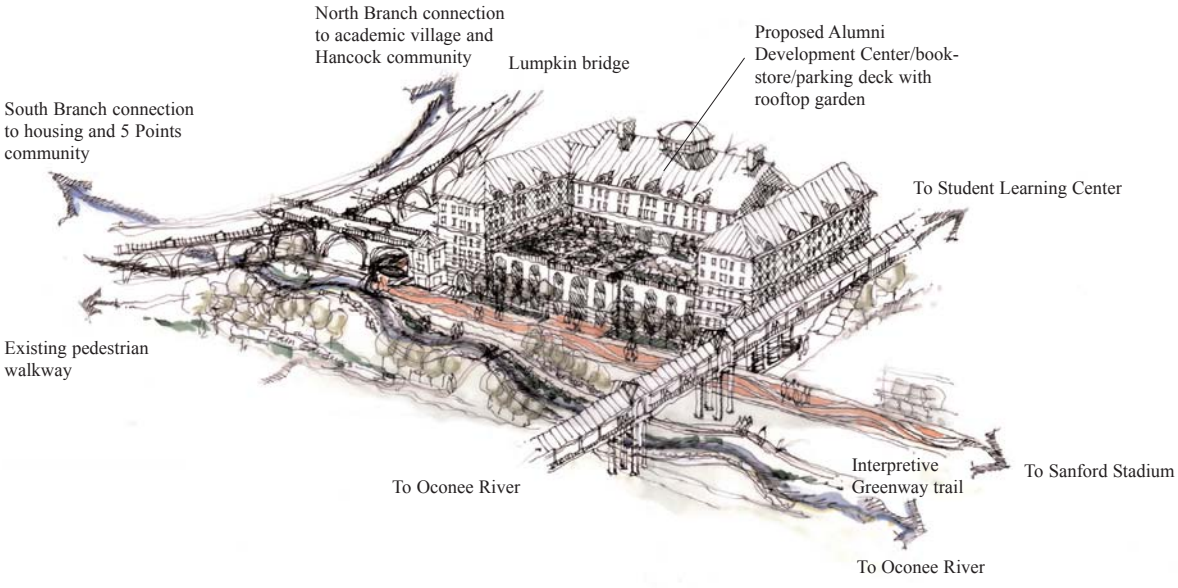
•A pedestrian bridge connects the Student Learning Center, the proposed sister building to the Student Learning Center, and a proposed dorm east of Clark Howell Hall to Sanford Drive. This "skywalk" begins at the Student Learning Center and terminates at Sanford Drive at the same level as the existing paving. Several piers provide support to the portions of the structure between the buildings. The area between the piers is arched, creating an aqueduct-like appearance that resembles the symbolic arch of UGA. Individuals standing on the quad between the Student Learning Center and the proposed sister building have a view of an arch as they look east towards the stadium and the bookstore. Individuals standing on the football walk or along the riparian corridor also have a view of a UGA arch as they look east. The football walk proceeds between the first and second pier and the stream flows between the second and third pier. In both cases, views from across the site acknowledge the symbolism of the University of Georgia.

•Proposed buildings in this design include a new dorm east of Clark Howell Hall, two new dorms west of the fountain, and the construction of the sister building to the Student Learning Center. This building may house an Alumni Development Center and bookstore. A three bay parking deck is proposed to sit beneath the building itself. The area beneath the building site slopes downward so that the garage would only be visible from the west and south sides.

Emergency Access

•Eliminating vehicular access on portions of Lumpkin Street creates problems for deliveries and emergency access to the Tate Center/Bookstore region. One method of allowing delivery trucks and emergency vehicles access to the area is along the paved Lumpkin mall path. Authorized vehicles only may drive down this paved region, around the fountain, and along the curved pathway to the football walk. Cars or trucks can then drive along the football walk to reach the Tate Center, bookstore, or stadium region.

•Another method of vehicular access is through the parking garage. Emergency vehicles can enter the parking garage through the elevated entrance off of the Pulaski Extension Bridge. All vehicles enter



onto the middle bay of the parking deck. This central bay slopes downward, and authorized vehicles only can exit the deck at the bottom of this slope at the opposite end of the garage. A paved path exits the garage, curves to the right, and joins with the football walk. From here, the vehicle can reach the stadium, bookstore, and other lower buildings

Stormwater Considerations

- The proposed location of Tanyard sits in a newly designed stream channel. Instead of filling in all areas of the old channel, portions can be converted into rain gardens to collect stormwater runoff from nearby surfaces.
- To manage the expected large amounts of storm water runoff from the elevated Pulaski extension, a series of rain gardens are located below the bridge. Water collected from the road above is transferred through a conveyance system in the piers supporting the bridge. They release the water into a series of rain gardens in the partially wooded area below.
- The rooftop garden above the proposed Alumni Development Center creates a way to retain some of the storm water running off the building.
- Water not retained by the Alumni Development Center rooftop garden is collected in a series of cisterns located beneath the pedestrian bridge. The cisterns are out of the way of the main traffic patterns, yet are still visible to pedestrians walking between the Tate Student Center and the Alumni Development Center. Water collected in the cisterns can be used to irrigate designed portions of the site. This reduces the need to rely on city water resources and offers an educational opportunity to teach student and community members about storm water management opportunities.

Stream Accessibility

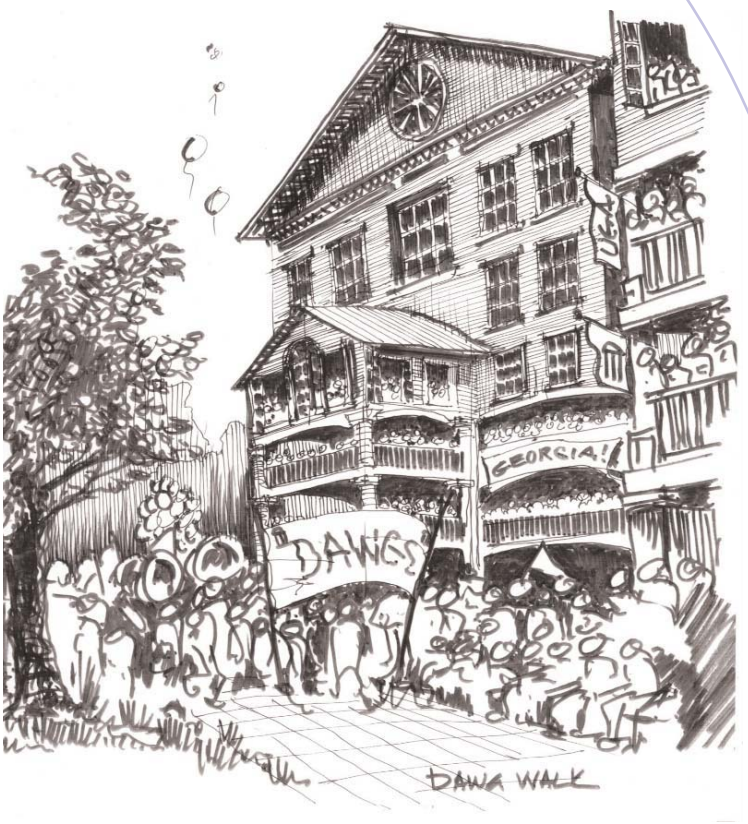
- Paved paths along the stream (located within the 100 year floodplain) create a trail for accessible to all students and community members to walk along the stream and observe the natural vegetation of a healthy riparian zone without causing extensive damage to the area. Porous paving material is recommended. This area will be subject to flooding; the path provides a location for community members to observe the changes both before and after a large storm. Pavement in this area creates a space where bikes, strollers, and wheel chairs can view the creek without difficulty.
- Mulch and dirt paths coming off of the paved paths in the floodplain region provide a location for students to make direct contact with the water. These access points give students the opportunity to study the stream, take water samples, and observe the type of wildlife and vegetation characteristic of the region.
- Paths along the stream throughout the greenway corridor are marked with educational signs and kiosks. As individuals travel along Tanyard Branch, using the path systems as either a recreation destination or a means of getting from one location to another, they learn about stream restoration, types of vegetation, and problems facing urban streams. These signs and kiosks will be located all along the creek in all three branches and should not be confined to the Main Branch.

Football Accommodations

- Football plays a large roll in any UGA student's life and the lives of many alumni and members of the Athens community. Through the inclusion of a football walk, this design option acknowledges the importance of football to the school by accommodating the school's traditions while still raising awareness of the stream and natural features on campus.
- The walk is wide enough to accommodate the band members and football players as they process into Sanford Stadium. Bricks used to create the pavement surface should be some form of porous paving material, available in two different colors.

design proposal a

- In order for the football players to reach the ceremonial football walk, the circular paved area around the fountain features creates a drop-off point. Authorized vehicles may drive around the circular paved area, drop off the players, and drive along the paved Lumpkin Mall back to Broad Street.
- A series of free-standing columns line the area between the football walk and the proposed Alumni Development Center. These columns provide a place to list the names of famous and important UGA faculty, alumni, athletes, or other students. Individuals who walk along the football walk will be reminded of the accomplishments of these important individuals. Trees on the opposite side of the walk are aligned with the columns and create a balanced feel to the space while establishing a transition from structural to more natural forms.
- Reinforced grass (i.e. grass pave) south of the Tate Center on the opposite side of the football walk prevents serious damage to the grassy surface. This provides an ideal location for tailgate parties and picnics on game days, but also an open area that can be used at any point during the year.
- The paved area immediately south of the Tate Center offers a smooth surface for additional tailgating parties and cookouts.
- Above the football walk, the pedestrian skywalk offers a different view of the football walk. Individuals can stand on the walkway and look down as the players process into the stadium.
- Several proposals have been made to expand the size of Sanford Stadium.



This design acknowledges the probability that the stadium expansion will occur and leaves the area untouched. Any construction in this proposed expansion region will not affect the design of the new stream channel or surrounding riparian zone.

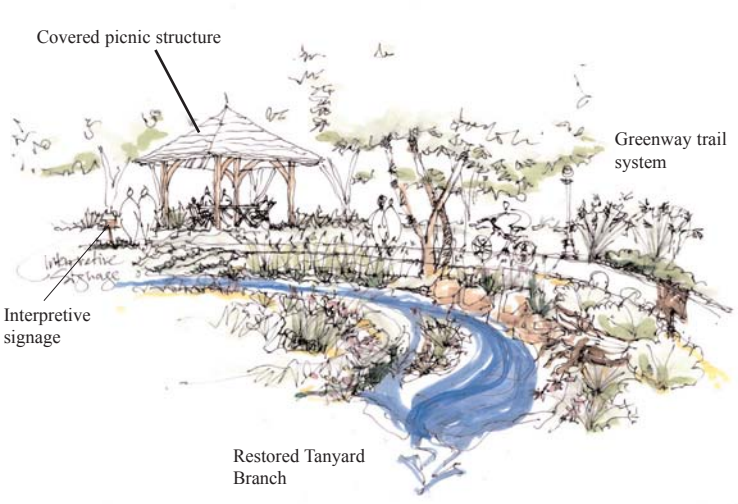
design proposal b

General Concepts

- The overall concept of this design is to make the stream a destination. Everyday traffic will not occur directly along the stream banks. The region around the stream will become a lightly wooded park space for students and community members alike to come walk, run, or relax.
- Riparian regions around the stream are protected. All buildings and large paved surfaces are outside of the 2-year and 100-year floodplains.
- All paved paths proposed in this design utilize porous paving materials.

Physical Structures

- The location of Sanford Drive is realigned so that it is closer to the Geography building and other existing buildings in the area. Realigning Sanford Drive creates more room for a series of new dorm buildings, a new quad, and additional greenspace.
- New buildings proposed in this design include a sister building to the Student Learning Center, two new dorms west of Geography and Sanford Drive, and a dorm east of Clark Howell Hall. The sister building to the Student Learning Center may house an Alumni Development Center, bookstore, and a two-bay parking deck. The parking deck would sit beneath the building and would only be visible from the west and south sides. The entrance to the deck is a raised entrance coming off of the Pulaski Extension roadway.
- The U-shaped form created by Clark Howell Hall and the adjacent dorm establishes a more secluded park space, with Tanyard Branch as the northern boundary. This area is a lightly wooded region. Multiple gravel paths wind through the area around the stream and up the slope towards Clark Howell Hall, and one path travels along the creek itself in the 100 year floodplain. Three bridge structures provide access to the buildings on the opposite side of the creek. Numerous covered picnic shelters are located throughout the park to provide places for group picnics and cookouts.
- A raised pedestrian skywalk connects the Student Learning Center, its proposed sister building, and the new dorm adjacent to Clark Howell Hall. The bridge has the same arch/pier system described in design proposal A. The walkway terminates at a semicircular platform level with the realigned Sanford Drive. A path leading into Tanyard Park also meets at this platform.
- Similar to design proposal A, a fountain feature makes reference to the merger of the North and South reaches into the main Tanyard Branch. A walkway extends in four directions from this feature, including a wide walkway that serves as the "football walk" on game days.
- Design proposal B acknowledges the placement of "old Lumpkin Street." The path along Lumpkin mall connects with the fountain and continues under the entrance to the parking garage. While this path takes on a curvilinear shape, matching the shape of the paths in the park, a straight line of trees continues the line of the Lumpkin mall path/old Lumpkin Street until it meets up with the intersection of the elevated Pulaski Extension and existing Lumpkin Street.



design proposal b

Emergency Access

•Multiple paths allow access to the central areas of design. Emergency or authorized vehicles can travel around the fountain structure, under the entrance to the parking garage, and along the path south of the proposed Alumni Development Center to reach the stadium, Tate Center, or bookstore.

Stormwater Considerations

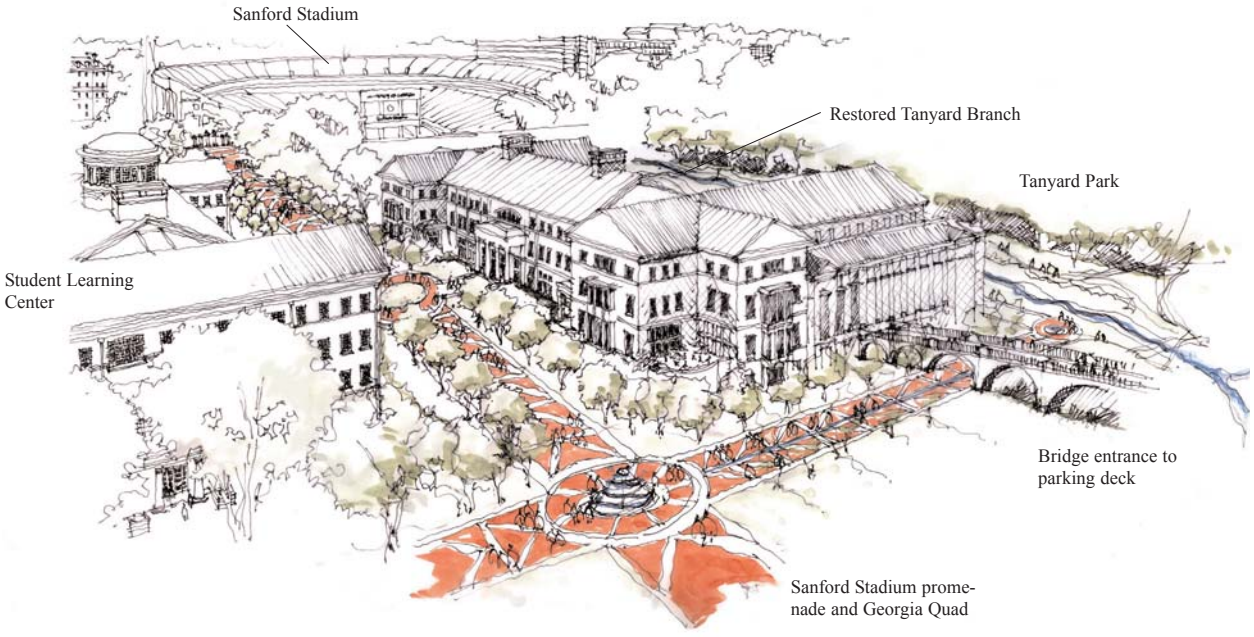
•Proposals for storm water management are similar to those of design proposal A. Tanyard Branch sits in a new stream channel; portions of the old channel can be converted into rain gardens to collect excess storm runoff. This design also includes the cisterns, rooftop garden, and porous pavement discussed in design proposal A.

Stream Accessibility

•This design uses the same general system of pathways and signage described in design proposal A. A gravel path sits on the south side of the creek within the 100 year floodplain, allowing views of Tanyard Branch. Three bridges cross the creek and provide easy movement from one side to the other. Educational signs and kiosks should be placed all along the North, South, and Main branches of Tanyard Branch.

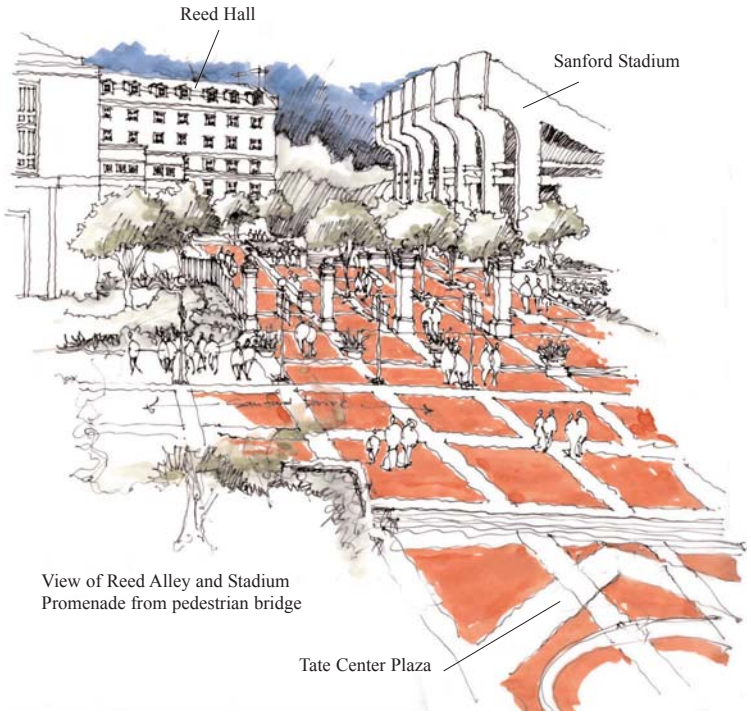
Football Accommodations

•Design proposal B also accommodates the school's long-standing football traditions while recognizing the importance of and maintaining a healthy stream.
•This design shifts the location of the football walk. The pathway leads between the Student Learning Center and its proposed sister



building. It continues between the Tate Center and bookstore (the sheltered roof between these buildings is removed) and terminates at a large plaza space. Players, band members, and fans can walk down the steps at the end of the plaza and enter the stadium. The decision to locate the path between the buildings keeps the main traffic flow away from the stream and protects the habitat during large populous events such as football games.

- Recommendations made in this design also reflect the likelihood of Sanford Stadium's expansion. This area was left undeveloped on the plan; any additional structures in this space will not affect the health of Tanyard Branch or the surrounding habitat.
- Picnic shelters located within the Tanyard Park create a game day tailgating region. These shelters could be rented out to various individuals or groups for use specifically on football game days.



View of Reed Alley and Stadium
Promenade from pedestrian bridge

vegetation suggestions

Suggested Tree Species

Scientific Name	Common Name
Acer negundo	Boxelder
Asimina triloba	Pawpaw
Betula nigra	River Birch
Celtis laevigata	Sugerberry
Cercis canadensis	Eastern Redbud
Cornus florida	Flowering Dogwood
Fraxinus pennsylvanica	Green Ash
Halesia caroliniana	Carolina Silverbell
Liriodendron tulipifera	Tulip Poplar
Magnolia grandiflora	Southern Magnolia
Morus rubra	Red Mulberry
Ostrya virginiana	Eastern Hophornbeam
Oxydendrum arboreum	Sourwood
Platanus occidentalis	American Sycamore
Prunus serotina	Black Cherry
Quercus alba	White Oak
Quercus nigra	Water Oak
Quercus prinus/montana	Chestnut Oak
Robinia pseudoaccacia	Black Locust
Ulmus alata	Winged Elm

Suggested Shrub Species

Scientific Name	Common Name
Aesculus sylvatica	Georgia Buckeye
Asimina parviflora	Smallflower Pawpaw
Callicarpa americana	American Beautyberry
Calycanthus floridus	Sweetshrub
Cornus ammomum	Silky Dogwood
Euonymus americanus	Strawberry Bush
Hammamelis virginiana	Witch Hazel
Hydrangea quercifolia	Oakleaf Hydrangea
Leucothoe axillaris	Doghobble
Rhododendron canescens	Wild Azalea
Viburnum acerifolium	Mapleleaf Viburnum

Suggested Herbaceous and Vine Species

Scientific Name	Common Name
Arundinaria gigantea	Switchcane
Athyrium filix-femina	Southern Lady Fern
Dicanthelium spp.	Panic Grass
Gelsemium sempervirens	Yellow Jessamine
Juncus effusus	Soft Rush
Lobelia cardinalis	Cardinalflower
Lonicera sempervirens	Trumpet Honeysuckle
Panicum virgatum	Switchgrass
Rudbeckia hirta	Black-Eyed Susan
Vitis rotundifolia	Muscadine

building identification

Existing Buildings

Buildings proposed on the campus master plan

Buildings proposed by Tanyard studio

Roadways

Major pedestrian walkways

Sidewalks

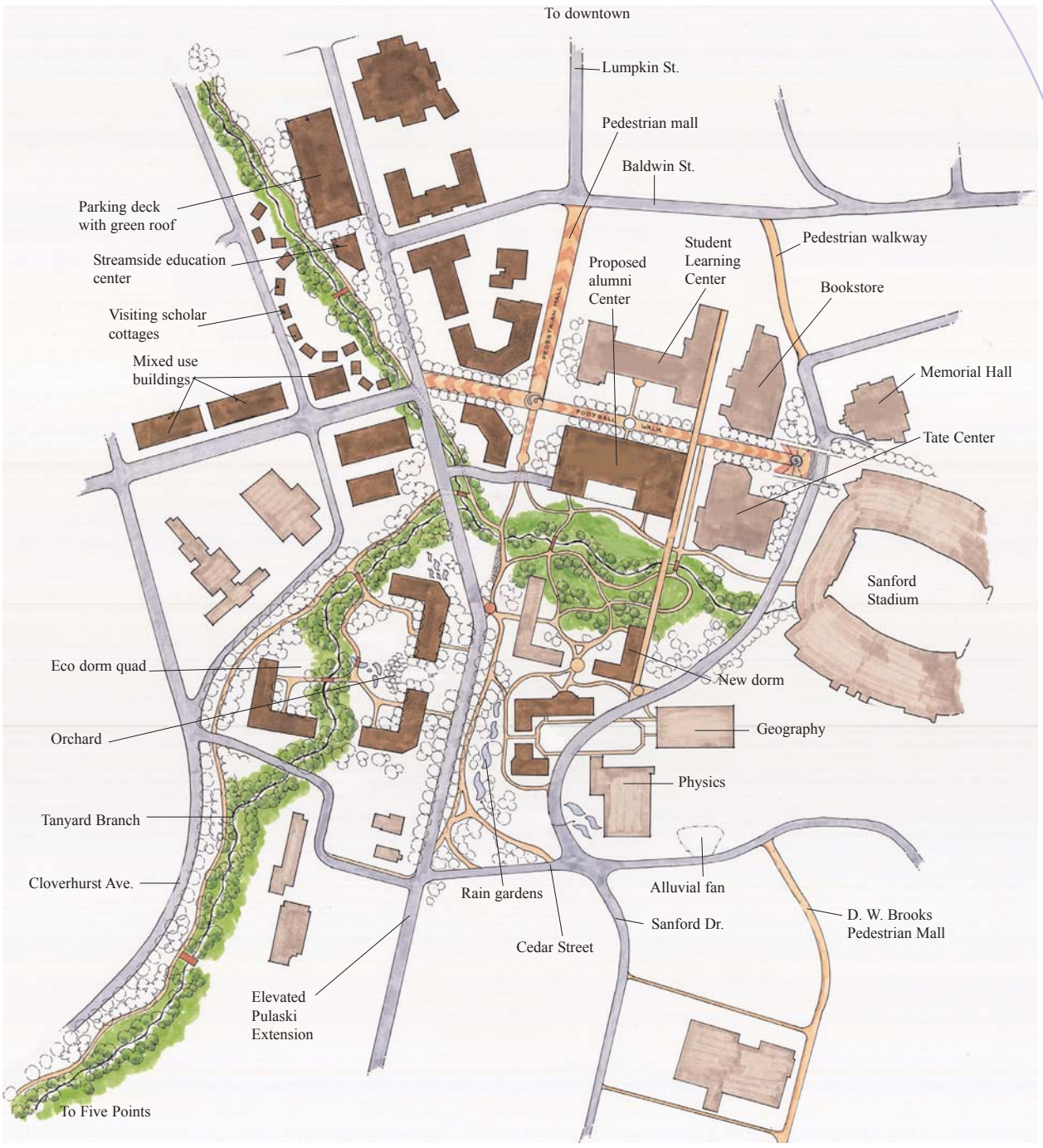
Tanyard Branch

1. Special Collections Library
2. Parking Deck
3. Education Center
4. Visiting Professor Village
5. Mixed-use Buildings
6. Dorms
7. Student Learning Center
8. Multi-use Building with Parking Deck
9. Bookstore
10. Tate Center
11. Memorial Hall
12. Sanford Stadium
13. Dorm
14. Eco-Dorm Complex
15. Geography
16. Physics

design proposal a
conceptual plan

design proposal a
detailed plan

design proposal b
conceptual plan

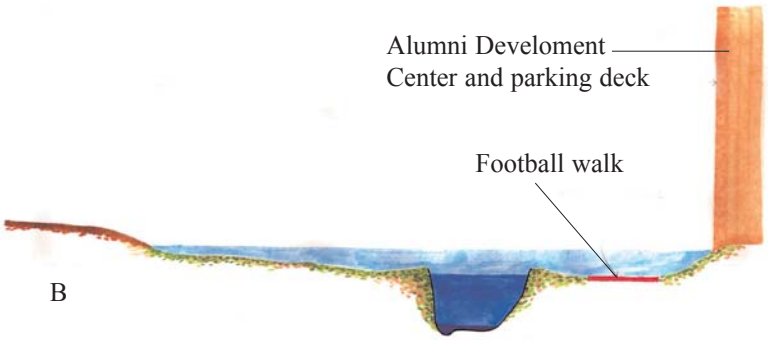


design proposal b
detailed plan

floodplain cross sections

These cross sections correspond to specific regions of Tanyard Branch on the design proposal A detailed plan map. The overall concepts depicted apply to both proposals A and B.

A



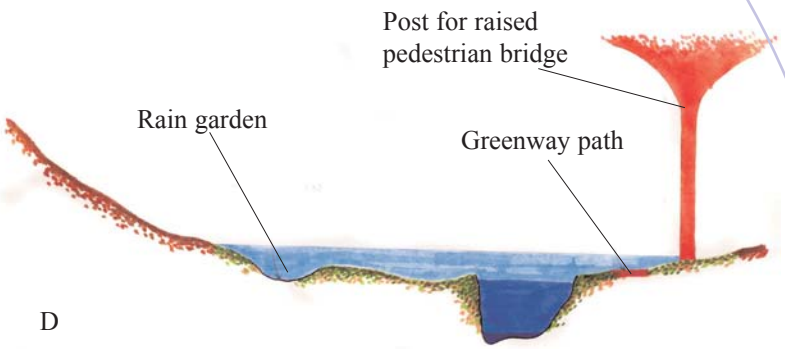
B

Key

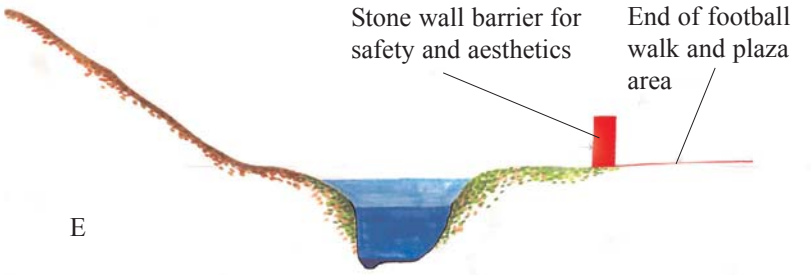
- 100-year floodplain
- 2-year channel
- Low flow
- Dry terrace

C--Meander bend reach
Unconstrained floodplain

floodplain cross sections



D



E

Key

- 100-year floodplain
- 2-year channel
- Low flow
- Dry terrace