

Yellow River Park Master Plans

Yellow River Park is composed of multiple parcels acquired between 1998 (initial 565 acres purchased from the Department of Public Utilities, then 1.07 ac. Spain Road tract in 2001) and 2014 (acquisition of the 125.4 acre Johnson Tract at the south end of the park).

The acquisitions through 2001 led to the first park master plan by The Jaeger Company in 2002 guiding the first phase of park development. The park's expansion in 2014 led to the jB+a master plan update of 2017. The master plan update incorporated plans for the future Johnson Greenway linking the future Centerville Park Site developments to the existing Yellow River Park improvements along Juhan Road by means of a 2.81 mile Greenway Trail with bike/ped bridge over the Yellow River. The plan update also proposed separation of trail types, with future provision for moving equestrian parking and trails east of the Yellow River, with mountain biking trails retained west of the Yellow River.

**Yellow River
Park**

**Yellow River
Park**

**Centerville
Park
Site**

Yellow River Park Master Plan



The Jaeger Company for
Gwinnett County Department of Community Services, Parks Division

April 2002

Yellow River Park Master Plan

The Yellow River Park Master Plan was prepared with the participation and guidance of the Master Plan Steering Committee members (*member names are italicized*).

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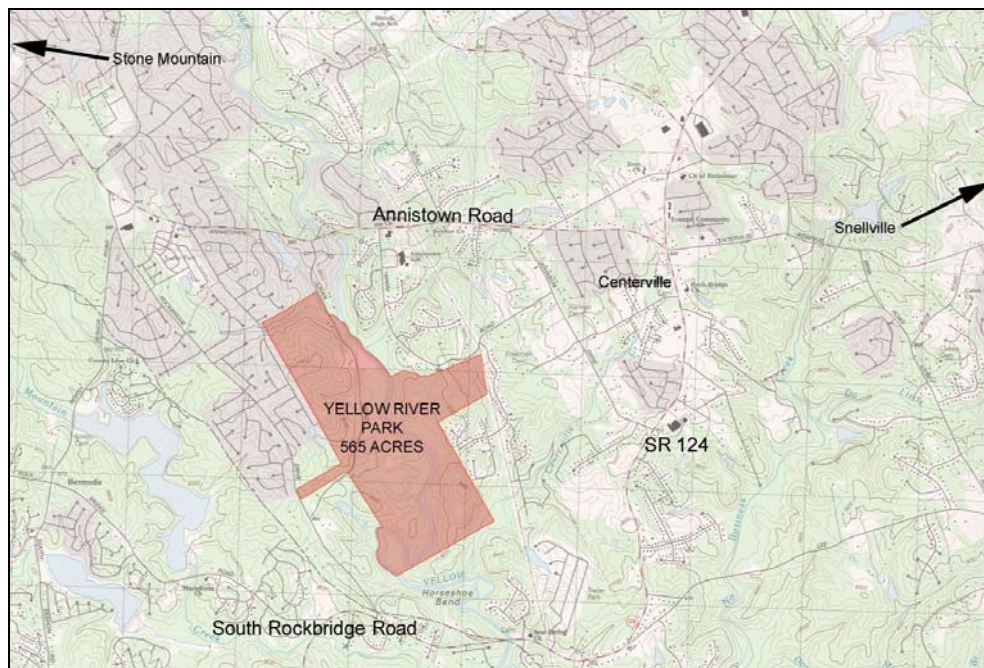
1.0 Project Goals and Objectives

At Yellow River Park, Gwinnett County is seeking to address countywide recreational needs in a manner compatible with the sustainable preservation and interpretation of unique cultural and natural resources. Additionally, this Master Plan seeks to incorporate existing park use and new land acquisitions. The principal goals of the Master Plan are as follows:

- Preserve the natural resources associated with the park.
- Provide well-built trails for mountain bikers, equestrian riders, and pedestrians.
- Provide amenity areas to service surrounding neighborhoods and a variety of user groups.
- Provide a safe, environmentally sustainable and usable environment for passive park activities.

2.0 Site Context

The 565-acre Yellow River Park site was originally assembled by the Gwinnett County Department of Public Utilities (DPU) for use as a waste water reclamation facility. In 1998 the Board of Commissioners purchased the site from DPU for use as an open space park. Prior to the county's acquisition, DPU had allowed equestrian and mountain biking groups to create trails for their use on the portion of the site west of the Yellow River, which is accessible from Juhan Road. An additional parcel was recently acquired on Spain Road, which allows for a public entry point to approximately one-third of the park site separated by Yellow River. Although this land has been inaccessible, people are finding ways in through the neighborhood and have begun to develop some rough trails.



3.0 Methodology

Using a traditional approach to the park planning process, the project progressed through a series of interim tasks to arrive at a consensus Master Plan. The sequence of tasks performed to develop the Master Plan included:

- Program Confirmation based on input of staff as well as the Steering Committee.
- Inventory and Analysis of the site, including topography, vegetation, hydrology, and soils.
- Alternative Development Concepts were prepared to test a variety of design concepts.
- A Preliminary Master Plan that blended elements from multiple concepts was developed.
- A Draft Master Plan was developed as a refined preliminary plan with a preliminary Cost Estimate.
- A final Master Plan was developed with refined, phased Cost Estimate.
- Presentation of the final products to The Gwinnett County Recreation Authority and The Gwinnett County Board of Commissioners.

The following provides additional brief description of the methodology and timeline:

Public Input Meeting (12.03.01):

The advertised public meeting was well attended, and included remarks by the Director of Parks & Recreation Project Administration and the Principal Community Planner. Attendees were invited to fill out a Community Interest Form and applications for becoming a member of the Master Plan Citizen Steering Committee. General comment was invited from all present.

Completed Community Interest forms were collected and tabulated by The Jaeger Company (*see Appendix A*). Completed Citizen Steering Committee forms were collected by the county and used to determine membership of the committee. The committee of twenty-three members represented a fair cross-section of interested parties.

Base Plan Development (December 2001):

Using DXF files obtained from the County GIS System, The Jaeger Company prepared a composite AutoCad base plan for the site.

Site Visit (12.11.01):

Members of The Jaeger Company and their sub-consultant, Pond & Company (civil engineering) met at the site to determine several feasible locations for bridge crossings on Yellow River. Based on natural features and desired trail linkage, three sites were identified that would yield the shortest crossing lengths. The engineers evaluated the hydraulic performance of Yellow River for 50, 100 and 500 - year floods and calculated

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required spans with cost implications for construction at each location. These estimates were based on an 8' wide pedestrian bridge construction with an "at grade" approach on both sides.

Scheduling (12.13.01)

The plan development process began by creating a schedule. In attendance were Rex Schuder, a representative from The Jaeger Company and Steering Committee Members who determined dates for progress meetings. Tabulated results of the community interest forms were distributed and general objectives were outlined by all present.

Site Visit (1.12.02):

The Steering Committee, The Jaeger Company and Rex Schuder performed a walking tour of the park site and made observations as to the current state of the trail systems and conditions along the river corridor. Despite inclement weather, both sides of Yellow River were explored.

Recreation Facilities Tour (1.19.02):

The Steering Committee also attended a bus tour of Gwinnett Parks as well as parks in Hall County with particular relevance to Yellow River Park. Members visited a variety of passive recreation facilities and discussed park program options including:

Gwinnett County

Mountain Park	Gwinnett County standard playground
Bethesda Park	multi-purpose trail
Pinkeyville Park	pedestrian bridge, standard pavilion, restroom

Hall County

Gainesville College	mountain bike trails
Chicopee Industrial Park	boardwalks
Chicopee Woods Regional Park	mountain bike trailhead, changing station
Elachee Nature Center	nature trails, pavilions
Agricultural Center	steep mountain bike trails
Rock Creek Park	bioengineering techniques

Inventory and Analysis (January 2002):

Aerial photographs from 1939 and 1960 were compared with recent aerial photographs to document the evolution of land use and vegetation patterns on the site. A series of graphics and tables were prepared to record the findings organized under the headings of:

Topography
Circulation
Views and Spatial Relationships

Watershed
Vegetation
Soils Diagram & Table
Issues & Opportunities

Conceptual Plan Development (2.06.02):

Three alternative concept plans were developed from a charrette held at The Jaeger Company. A variety of options were explored, resulting in diverse solutions, which satisfied the project goals and objectives, but differed principally on the basis of trail designation, amenity area locations, and access points to the site. After the options were presented and reviewed by the committee, program elements were more clearly defined and a hybrid of all three schemes was decided.

Also covered at this meeting was the interest in providing one or more bridge crossings on Yellow River for access to both sides of the park. Concept Plan Options identified where these crossing points could tie into the trail network and be best located based on topography, natural features and spacing along the river corridor. Because of assumed cost implications, The Steering Committee decided not to include the bridge(s) as part of the preliminary design development programming, (*see Appendix B for Hydraulic Bridge Analysis/Feasibility Study*).

Preliminary Master Plan (2.20.02):

Prior to the presentation, minor plan revisions were incorporated into the design. These revisions were based on comments from members of the Steering Committee at the last presentation and staff review, which emphasized using a greater percentage of existing mountain bike trails in the proposed trail alignment on both sides of Juhan Road. Other adjustments included a reconfiguration of the horse parking loop, relocating a restroom at the bike parking lot, making the multi-purpose trail exactly one-mile long, making a multi-purpose trail spur connection to bike & equestrian trails and changing the pavement surface of the Spain Road pavilion area parking from gravel to asphalt due to maintenance issues. Additions included two more designated crossing points on Juhan Road, a council ring/overlook at the perimeter of the meadow, a small shelter with picnic tables at the group camping area, water fountains, security gates and reinforced turf.

The Preliminary Cost Estimate was distributed and costs were discussed in general terms.

Final Master Plan (3.05.02)

The Final Master Plan, Cost Estimate, and Budget Analysis were presented to the Steering Committee. At this same meeting a revised Cost Estimate (prepared by The Gwinnett County Department of Parks and Recreation) was presented to illustrate how to get the costs within the budget by deleting certain program elements and costs. Steering Committee members were then able to react to the proposed cuts and make recommendations about where they would like to see some of money shifted for various

purposes. In some cases, the elimination of certain elements led to the elimination of other connected items that formed a ‘package deal.’ For example, taking out the restroom facility at the main pavilion area meant losing all its required utility services, the septic field and other program elements that would need a restroom in close proximity in order to be useful. The proposed pavilion and playground would not be viable in this location without a restroom nearby. In general, everyone agreed on the items to be removed from this phase of work and only a few adjustments were made to allow for a more strategic use of funds allocated for landscaping. In conclusion, the committee identified several things that they would like to see added back into the budget, should bids come in lower than expected or should more monies be allocated for Phase One Construction. These choices are listed below in order of importance:

1. Restroom and associated utilities at main pavilion area
2. Pavilion and playground at main pavilion area
3. Realignment of Juhan Road (if GDOT is unwilling to provide)
4. Council ring/overlook at meadow (low cost item)

4.0 Site Inventory and Analysis

The following constitutes a summary of the inventory and analysis process. Each major category of discussion is supplemented by an illustrative graphic.

Topography

Topographic information was obtained from the County GIS system and included data at a four-foot contour interval. A majority of the park is fairly steep and is divided by Yellow River. The site has a net 200-foot grade change with elevations ranging from the highest of 930 feet to the lowest of 702 feet (at the river’s edge). A majority of the site has over a 10% grade, with some areas terraced from former agricultural occupation. Naturally flat areas parallel some parts of the river in the floodplain. Also, a few acres of level ground are associated with the flat-topped ridge on the east side of the river.

Circulation

The existing vehicular circulation in the site includes Juhan Road, which runs through the west side of the park. This road serves as the primary point of pedestrian access for most park visitors. A small piece of the park touches South Rockbridge Road on the westernmost side of the park and was considered as a point of access during the design phase. Spain Road serves as a border to the easternmost access point.

Mountain Bike and Equestrian trails are well established on the site and are fairly well organized west of the river. Trails east of the river are more haphazard and were created by resident use of ATVs, pedestrians, and mountain bikers. Users on the west side of the river find a complex network of equestrian and bike trails which pedestrians share. Bike trails range in width from less than a foot to nearly eight feet. Horse trails are significantly wider in most parts, but may be as narrow as three feet wide in some areas.

Trail conditions vary. Some well-established trails meander over slopes and drain well without soil disruption. However, during rain events, some trails have low spots that collect water or soils that erode and make their way into the river. Trails that meander along the riverbank often come dangerously close to the river and erosion is a problem in many of these areas. As a general rule of thumb, all trails near the river must be a minimum of fifty feet back from the top of bank.

Views and Spatial Relationships

Despite adequate changes in elevation, view range is limited due to the dense tree cover. Natural site amenities include a stream at the north end of the park property and Yellow River, which runs through the entire park site. Trails that either traverse or follow along these water features offer opportunities for scenic views. The clearing presently supporting a parking area on the east side of Juhan Road offers the most opportunities for viewing the river because of its proximity to the water and for its level and open characteristics. A grassed clearing that presently supports a maintenance trailer on the west side of Juhan Road provides an opportunity for viewing wildlife. And finally, an existing hilltop clearing for group camping could benefit from selective clearing to create views to the river and the surrounding forest.

Watershed

The Yellow River Watershed is part of the larger Upper Ocmulgee Watershed, which also includes the South and Alcovy Rivers. The Yellow River is sourced from a number of tributaries north of the park site. Those immediately impacting the area are Pounds Creek from the northwest and Jacks Creek from the northeast. For a more complete identification of tributaries see Gwinnett County Flood Insurance Maps.

The entire site is within the Yellow River drainage basin. Nearly all stormwater drains into the river through a well-defined series of unnamed tributaries and intermittent swales (*see Illustration A*). Some swales remain dry except during rain events while others have water in them at all times and are presumably spring fed. During rain events the water level of the river can rise very dramatically.

Where proposed pavements and roofs are concentrated on site, compliance with the new County stormwater regulations will be required. All development must be limited to constitute no more than 10% of the total acreage, per county standards.

Vegetation

Yellow River Park is situated in the Upper Piedmont of Georgia. The Yellow River bisects the park from the north to the south, forming a narrow valley bordered by hills. The site is a mixture of mature mixed hardwood or late successional forest, successional forest, and managed lawn, (*see Illustration B*).

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Pastures & Fields

Few maintained open areas exist on site and are primarily used for parking, maintenance, or group camping. Less than 5% of the site contains open space. Current maintenance procedures include mowing of lawn areas as needed.

Woodland

Oak-Hickory Forest

The oak-hickory forest occurs on the drier uplands and hilltops. Southern red oak, white oak, post oak, hickory, and dogwood are characteristic of this habitat. On the drier slopes, southern red oak, post oak, and blackjack oak grow in greater abundance. The hilltops east of the river support a scattered groundcover of prickly pear.

Bluff Slope Ravine Forest

The bluff slope forest is also prevalent, especially on lower, mesic slopes. Characteristic canopy trees of this habit include american beech, tulip poplar, and white oak. The understory is composed of flowering dogwood, hop hornbeam, ironwood, chalk maple, southern sugar maple, and an occasional umbrella magnolia.

Bottomland/Floodplain Forest

The Yellow River, and some of its tributaries, creates an environment suitable to floodplain species. Indicator species include: sycamore, river birch, tulip poplar, green ash, and ironwood. The riverbank supports beautiful stands of mountain laurel, especially over sandy and rocky soils. Rivercane and river oats are prevalent near the river. Many of the larger trees of the park are found along the river's edge.

Successional Forest

Loblolly pine is an indicator of past disturbance and is a pioneer tree in the stages of succession. Successional forests in the Yellow River Park are found along the terraced uplands and hilltops. These lands were probably farmed and have encountered varying degrees of erosion.

Invasive Exotics

Invasive exotics grow in localized areas of the park especially in disturbed and floodplain areas. Privet and honeysuckle grow in moist soils, especially along streams and floodplains. Privet often takes over the woodland understory and out-competes native shrubs. Privet and honeysuckle occur in the woodland streams at the very north of the park and south of the main parking lot. **(See Photo)** Kudzu grows extensively in a clearing near the southwestern border of the park.

The southern pine beetle has killed small areas of mature pine in the successional forest. Infested areas have little or no vegetation to prevent soil erosion. Dense stands of loblolly pine are especially vulnerable to the southern pine beetle.



Invasive Privet in Floodplain Area

Soils

Soils in the Yellow River Park are distributed relative to the topography. Clay loams and sandy clay loams are generally found along the hilltops. Floodplain soils consisting of alluvial sand, silt, and clay are deposited into narrow flats along the Yellow River. Local alluvial soils along smaller streams have been washed down from the uplands. Stripped topsoil and gullies are visible remnants of past agricultural practices.

A soils map of the park was created to assess the suitability of proposed uses to the soil types present, (*see Illustration C*). A table was also prepared to summarize physical attributes of soils found on site, (*see summary chart*). Soils found unsuitable to trail usage are those prone to frequent flooding, of slopes greater than 25%, are located over a high water table, or have a surface layer hazardous to foot traffic. Soils found to provide severe limitations upon recreational building uses are those subject to flooding or are generally wet, of a slope greater than 15%, or less than three feet depth to bedrock.

Fortunately a majority of soils at the Yellow River site are sandy loams and do not pose any serious problems to any of the proposed construction. New parking lots are slated to have restroom facilities with associated septic fields. These fields will have to be properly located, according to soil permeability and natural slope for good drainage. Many existing trails are prone to erosion and flooding, but this can be attributed to inadequate grading, not the soil type. Proper trail construction techniques will be crucial to the future long-term success of the system network.

Cultural Resources

Cultural resources on site are limited to scattered remnants of former agricultural and residential use of the property. An abandoned house and a collection of several shed-like structures exist on the north end of the park property, just west of Juhan Road. Terraces for cotton farming that have succumbed to erosion are apparent on both sides of the river, within the woodland slope areas. The east side of the river contains the site of a former farmstead, with remnants of a stone building foundation. Also found on site are the scattered remains of several junked cars, which do not offer any specific aesthetic contributions. (*See Illustration D for cultural resource locations*).

5.0 Development Program

Working with the Steering Committee and DCS staff, a finalized program for park development was prepared. There was an in-depth discussion of this program with the Steering Committee in order to carefully consider the immediate and long-range goals of the park plan.

Program Elements

The park will be supported by a variety of improvements that facilitate access, visitor comfort and use of the property. The overall concept for park development will be to preserve the integrity of the park as a passive use space and enhance views of natural features. Clearing of trees will be selective and grading limited to locations designated for parking and amenity structures. Realignment of trails will be strategic, using as much of the existing network as possible, and coincide with the topography in order to minimize erosion problems. Efforts will be made to revitalize areas that show signs of stress due to inadequate design and excessive usage.

Vehicular Circulation

In general, the circulation within the park does not vary greatly from its current configuration. New parking areas will provide trailhead access for different user groups. Road spurs will provide access to these parking areas and to the existing campground clearing. A realignment of Juhan Road is proposed to create a safer intersection at the crossing point of access roads connecting to the horse parking to the west and to the bicycle parking to the east of Juhan Road.

Desired Parking Allotment for Proposed Park Facilities

<u>Facility</u>	<u>Parking Spaces</u>
Mountain Bike Trailhead	60
Equestrian Trailhead	30
West Side Amenity Area	50

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East Side Amenity Area & Pedestrian Trailhead	<u>40</u>
Total Parking Demand	180

Native hardwood shade trees planted in islands or in close proximity to the parking lots will help to cool the expanse of asphalt paving. Overflow parking at the mountain bike parking area will consist of a gravel lot with approximately 25 spaces.

Boat Access

A reinforced turf drive access route off Juhan Road will allow maintenance vehicles transporting boats to briefly traverse the open lawn space to the multi-purpose trail and drive on it until reaching the boat access point at the river's edge. An overlook will be designed with steps to allow access down to the river's edge for launching or disembarking boats.

Trail Network

The following breakdown of trails and their distance totals have not been field verified and therefore do not reflect accurate lengths or locations. Total lengths of trails may increase from the amount shown on the plan. Wherever possible as much of the existing trail network will be utilized.

Multi-Purpose Trail

An asphalt-paved, 12' wide, one-mile loop will be accessible from the west side of Yellow River parking lot, circulate through the existing open field area, along the river, and through a portion of the woodland area. Connected to the loop is a paved spur, which leads to the "shoals" area with an overlook deck structure (as mentioned above).

Pedestrian Trail, East Side of River

A natural surface trail network for pedestrian use only will occupy the entire eastern portion of the site. A northern loop consists of 2.7 miles of trails and a southern loop covers 2.5 miles. Both loops lead to an overlook area and connect in the middle of this eastern portion. Footbridges are located within the trail system to traverse swales that tend to hold water during rain events.

Equestrian Trails

Natural surfaced Equestrian Trails consist of two loops on either side of Juhan road. The western loop is 2.7 miles long and the eastern loop covers 2.4 miles. A majority of the equestrian trail system will be maintained in its current park configuration, with a few revisions needed to preserve natural features or to make connections to the new parking lot. Equestrian trails will be designated for both equestrian and pedestrian use.

Mountain Bike Trails

The natural surfaced Mountain Bike trail system encompasses areas on both the east and west side of Juhan road. East side trails total 2.7 miles and west side trails total 2.8 miles. Much of the existing network will be utilized in the new trail scheme. Portions of the trails that are too close to the river's edge, have severe erosion problems, and/or are in conflict with other user groups will be relocated. *(See Photo)*



Mountain Biker on Existing Bridge near River

Wildlife Viewing Area/Meadow Restoration

The existing open field area west of Juhan Road in proximity of the current maintenance shed will be maintained as a wildlife viewing area and meadow restoration project. Strategic plant species choices will provide appropriate food and cover for fauna, as well as maximize visitors' viewing experiences.

Council Ring

A council ring is proposed for the meadow restoration area west of Juhan Road. This circular structure would be made of stacked stone and positioned at the top of the slope just above the meadow. The intent of this structure is to provide an informal gathering place for picnics and an overlook for wildlife observation. Groups of naturalists may want to use this space as an outdoor classroom.

River Overlooks

River overlooks will provide opportunities for closer observation of the river and provide a place to rest and reflect. The overlooks will consist of elevated wooden deck structures, connected to land by wooden boardwalks and linked to the park trail system by trail

spurs. The trail spurs will be either paved or of a natural surface material (depending on which trail system they connect to) and will provide single, controlled access points to the river. Sensitive design must be a consideration for these overlooks so as not to impact the natural conditions of the river's edge more than necessary. The structures will require proper footing for under water conditions and for supporting the load of large groups. Benches or other seating should be integrated into the deck design to allow for riverside seating. *(See Photo)*



Potential Overlook Area at Shoals

Pavilions

Three different types of pavilions are proposed for the park plan. The largest would be a 2800 SF rustic-style structure located at the main parking area east of Juhan Road; a medium 600 SF rustic-style pavilion is called out for the amenity area east of the river; and a smaller 400 SF covered shelter is slated for the group camping area. All three structures will be supported on concrete pads, contain picnic tables, outdoor grills and some type of security lighting.

Other Structures

Orientation kiosks will be placed at all four parking areas. These custom kiosks will be two-sided and can support interpretive site-specific information of that particular location on one side, and contain a park map detailing trail systems, hours of operation, park rules, and general information on the other side. Notifications of trail closing due to inclement

weather, scheduled maintenance work, or special events could also be posted at these locations.

Playgrounds

Two large play areas are sited in the park to help assure a constant flow of responsible adults during daylight hours able to observe the activity within the parking lot. The play areas would be located within 300 feet of the parking areas and restroom facilities, and be partially enclosed by stone or timber seatwalls. Playground equipment will include a variety of components that appeal to different age groups and will be in keeping with the naturalistic style of proposed architectural elements. Each of these areas will also support an open lawn space and groupings of shade trees.

Restrooms and Changing Station

The county standard restroom facility of an approximate 600 SF building is specified for three amenity area locations: the main parking lot east of Juhan Road, the parking area east of Yellow River and accessed by Spain Road, and the bicycle parking lot. The bicycle parking lot restroom facility will also service equestrian and group camping. The restroom is located at the far end of the parking lot for convenience to the camping area.

Also included at the bicycle parking area is a 200 SF changing station building for bicyclists to change in or out of riding clothes.

Maintenance Area

The proposed 1800 square foot maintenance facility building will house park-related equipment and storage, with space allocated for offices and restroom facilities. A gravel parking area adjacent to the building will be for staff vehicles only and this entire area will be secured with chain link fencing.

Caretakers Residence

A caretaker's residence has been proposed for a site west of Juhan Road, on the fringes of the meadow restoration area and edge of an existing forest. The house will be tucked away for privacy with a gravel access drive perpendicular to Juhan Road. The drive will provide a high visibility location to park a police vehicle, establishing a presence of security.

Utilities

There are presently no utilities on site for park use. The addition of utility service to the park should be non-impacting to the site and existing utilities along Juhan Road should be buried to minimize the visual clutter. The water main on Juhan Road could be tapped into for providing service to new restroom facilities, drinking fountains, and hose bibs for watering horses or washing bikes. Conduit for electricity would also originate from Juhan

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Road and connect to new facilities for power. Wastewater would be handled with new septic fields located in proximity to restroom buildings. Service to the amenity area facilities east of Yellow River would be provided from Spain Road.

Furnishings

In general furnishings will be spare and modest. Six benches on concrete pads are specified for the multi-purpose trail area.

Picnic tables will be provided, including four to six at the mid-sized pavilion on the east side of Yellow River, four at the covered shelter next to group camping, and an additional ten tables placed for individual picnicking within the multi-purpose trail/open field area.

Trash receptacles will be provided only where there is already vehicular access to pick up the trash. The parking areas, picnic facilities, playgrounds, group campsite, and spots along the 12'-wide multi-purpose trail would be the only areas with refuse pick-up service. Other areas would have signage to indicate a carry-in/carry-out trash policy.

Signage

Signage indicating entrances and parking areas will be placed strategically along Juhan Road to announce park entrance. Specially crafted signage will have to be designed for trail usage separation and to prevent user conflicts. Signage will be placed at intersections of all trails and strategically along longer stretches of single-use trails, approximately every 1000 feet. *(See Photo)*



Existing Park Signage is Inadequate for Preventing User Conflicts

Perimeter Security

There is evidence of unauthorized All Terrain Vehicle traffic and unauthorized access on the east side of the Yellow River. Proposed trails for this section of the park are for

pedestrian use only. It is our hope that an official access drive to this portion of land, clearly marked trails and the subsequent presence of pedestrians on trails, will discourage other types of use. A security gate will be installed at the Spain Road access point and locked at night. In addition, security gates will be installed at all entry points to the park: two for each drive off Juhan Road to the pavilion area parking lot; one for the boat drop off/pick up drive access to river; one for the equestrian parking loop; one for the bicycle parking lot; and one for the overflow parking area (past the bicycle parking lot).

Landscape Management

Landscape Management will consist of regular mowing of open turf areas, prescribed burns or mowing of the meadow on an annual basis and general maintenance of the campsite clearing.

Forest Management

Forest Management will consist of pruning or removing trees that obstruct trails, roadways and parking lots; threaten buildings and other structures; or interfere with any other type of circulation activity. Diseased trees should be monitored and removed if the spread cannot be controlled. Efforts to preserve healthy trees will be a high priority in all areas, as well as preservation and restoration of the understory woodland shrub layer.

Streambank Stabilization

Due to the frequent water level fluctuation and high volume capacity, many locations along the river corridor have scoured banks devoid of vegetation. Erosion is also a problem where trails are too close to the top of bank, requiring the establishment of a setback and buffer zone. Efforts to stabilize these slopes with bioengineering techniques and re-vegetating with native plant species should also be explored.

Assistance from volunteer groups or other resources for removal of invasive exotics such as privet and honey suckle should be explored. Reestablishing native plant material to replace what was eradicated should immediately follow removal efforts. Acquisition of native shrubs, ground cover and other understory plants could come from plant rescue efforts coordinated through organizations such as The Native Plant Society. *(See Photo)*



Volunteer Streambank Stabilization Project at Yellow River

Park Expansion Opportunities

There is presently a portion of land on the south end of the park that is inaccessible due to a bend in the river and the close proximity of the present property line. Acquisition of the parcel just south of this would allow more room for trail expansion into this area, as well as potential future regional trail/greenway.

6.0 Alternate Development Concepts and Master Plan

A total of three alternative concept plans were explored and presented to the Steering Committee. Following this, a hybrid version to encompass all the desired elements was developed as the Preliminary Design Plan. After more refinement, the Final Master Plan was prepared.

Concept Plans A, B & C

All three concept plans (*Illustrations E, F, G*) represent the same overall program development but differ in terms of trail routing and distances; amenity and parking area locations; park entry locations; and bridge crossing points. Also explored was the possible realignment of Juhan Road.

The following comments and suggestions resulted from this meeting:

East Side of River

- Pedestrian only with no bridge crossing
- Plan B trail configuration
 - Allowing for additional future uses
 - Allowing for wildlife conservation with a wilderness experience with trail configuration to maximize habitat
- Plan B parking lot configuration (gravel drive & parking for 20-25 cars)

Interior Section of Park (West of River, East of Juhan Road)

- Amenity areas and parking as in Plan A
(Except that vehicular access to equestrian parking shall be from Juhan Road, across from the group camping/bike parking drive, creating a 4-way stop)
- Water at Equestrian Parking Area
- Realignment of Juhan Road to straighten and create better sight-lines for safer crossing point at 4-way stop
- Access for equestrians to camping area
- Multi-Purpose Trail and Pavilion Area as in Plan A
- Multi-Purpose spur to shoals overlook, sensitive to streambank environment
- Gate off camping area so access is limited
- Equestrian Trails/Pedestrian Trails combined, as in Option C
- Beginner/Moderate Mountain Bike Trails
- Cross Country Course Loop (may use part of multi-purpose trail)

West Side of Park (West of Juhan Road)

- Plan C Trail Configuration
 - Equestrian Trails/Pedestrian Trails combined
 - Advanced Mountain Bike Trails

General Park Amenities to Consider:

- Advanced Signage System
- Kiosks at each parking zone

Concept A

- Not wise to segregate the trails like this
- Eliminates literally miles of bike trails presently at park
- Concern about clearing trees for pavilion area (for security)
- Trail totals for this option:
 - Pedestrian (3.4 miles + multi-purpose)
 - Equestrian (3.6 miles)
 - Bike (3.6 miles)

Concept B

- Joint use could occur between pedestrians and equestrians
- Trail totals for this option:
 - Pedestrian (8 miles + multi-purpose)
 - Equestrian (5 miles)
 - Bike (5.5-6 miles)

Concept C

- Bathroom facility needed near campground area
- Realignment of Juhan Road would come out of park budget, if included in this phase
- Trail totals for this option:
 - Pedestrian (6.2 miles + multi-purpose)
 - Equestrian (4.6 miles)
 - Bike (5.9 miles)

Preliminary Master Plan

The Preliminary Master Plan (***Illustration H***) was presented and received the following input from the steering committee and staff, (to be incorporated in the Final Master Plan):

- Make 12' wide paved multi-purpose trail exactly one-mile long.
- Add pay phones and vending machines to amenity areas
- Add lighting from camping area to restroom building in bike parking lot
- Move restroom building closer to camping area
- Add speed bumps on Juhan Road at crossing points

Yellow River Park Master Plan

- Maintain “bail out” for bikes crossing Juhan Road at north end of the park
- Have a multi-purpose trail spur connection to the bike and horse trails from the one-mile loop
- Add a security gate to the Spain Road access point
- Consider relocating equestrian trail segment that goes through the proposed meadow restoration area – erosion concerns
- Add another sub loop to bike trails west of Juhan Road
- Add another crossing point with speed bumps on Juhan Road for pedestrians at the main pavilion area
- Allow bike access from Rockbridge Road
- Widen driveway into group camping area (from 18’ to 24’)
- Add water fountains at all 4 amenity areas
- Add an overlook/council ring at the top of meadow restoration area
- Include a 20’ x 20’ shelter w/ 4 picnic tables to the group camping area
- Add a bike wash with a winterized valve box at the bicycle parking area
- Parking area at Spain Road should be paved, not gravel
- Try to reuse more of the existing bike and equestrian trails
- East side of Yellow River for pedestrians only

Also presented with the Preliminary Master Plan was a Preliminary Cost Estimate. The steering committee was informed of what various abbreviations stood for and the following information was confirmed:

- Phase 1 Construction Budget = \$2.37 million.
- Construction Costs for an 8’ wide bridge across Yellow River = \$675,000. Fee not justified for Phase 1, especially since it only connects pedestrian trails and would not service any other types of circulation. This might be a viable project in the future if bridge and supporting trails could connect to a much greater trail system, linking multiple park sites in Gwinnett County.

Final Master Plan:

Upon presentation of the Final Master Plan and the Final Cost Estimate, the following requests were made:

- Make one final adjustment to the equestrian trail layout (west of Juhan Road):
 - Move trail to top edge (outside) of meadow restoration area
 - Create a more generous secondary loop
- Why \$9000 for landscaping at main pavilion area?
 - \$4000 retained for parking lot shade trees
 - \$5000 shifted to meadow restoration project:
 - Establish perimeter understory habitat to attract birds
 - Mulberry, blueberry, dogwoods, etc.

Yellow River Park Master Plan

- Annual mowing regime to rejuvenate meadow plants
- \$6000 more can be shifted from costs associated with Pavilion Area:

\$5000	for landscaping Pavilion Area
\$6000	for clearing and grubbing
\$11,000	Meadow Restoration Project

- Streambank Restoration – Restabilization Effort
 - Planting along river
 - Use \$ for removing privet & adding native plants
 - Small budget item - implement w/ volunteer labor

\$2000	hardwood seedlings
\$1000	mountain laurels
\$3,000	River Trail Reforestation

- After meeting with park police officers, staff requested that the final budget include additional security gates so that all entry points to the park could be locked. A total of seven security gates were included in the Final Cost Estimate, (*Appendix C*).

7.0 Development Budget Summary

(Italicized items are not included in Phase 1 Construction)

Phase 1 Construction will include rehabilitation and realignment of portions of existing equestrian and mountain bike trails for erosion control and to improve drainage. The construction of new trails will be needed in some locations, to increase safety by minimizing crossing point conflicts with other trail use types, to create linkage opportunities and to provide different challenge level experiences. Pedestrian use will be accommodated on the West side of Juhan Road with a minimal amount of new trail construction, making connections to equestrian trails for shared use. On the East side of Yellow River all trails will be for pedestrian use only. Factors for determining locations of new trails included topography, natural features, streambank preservation, linkage opportunities and ease of circulation. Designated crossing points with speed bumps on Juhan Road and security gates at park entrances have been included to increase safety. Footbridges and deck overlook structures have been incorporated to help traverse and/or observe water as a natural site feature. New signage will be an important component to the success of the trail network. Amenity areas with new parking lots have been tailored for specific user group activities and typically include an information kiosk, a restroom facility, drinking fountain, pavilion, picnic tables and a playground with seatwall.

Pavilion Area

The pavilion area comprises approximately thirty-four acres of the total park property and presently contains a large clearing with a gravel loop used for parking. This site will be

reconfigured to maintain a parking lot to be entered from Juhan Road. A reinforced turf driveway will be added to the north of this area, also off Juhan Road, for service vehicle access down to the river's edge to load or unload boats. Security gates will be installed at all entry points. The main passive recreational element for this location will be a one-mile long, twelve-foot wide, paved, multi-purpose trail loop. Connectors from the trail loop will access the parking lot, an overlook on the river and the equestrian and bike trails south of this area. Landscaping for the parking lot, picnic tables, trash receptacles, an information kiosk and signage will also be included.

The 'package deal' grouping of a large pavilion, playground and restroom facility will be developed in a future phase of construction along with associated electrical, sewer and water service, a drinking fountain and septic field. A retaining/seatwall connected to the playground, benches and an overlook/deck structure were also deducted. Demolition of existing structures in this area will be postponed.

Bicycle Parking Area

A new parking lot with an information kiosk, restroom, drinking fountain, bike wash and changing facilities will be constructed for mountain bikers. Access to the bicycle parking lot will be accommodated from a drive off Juhan Road. A maintenance compound and an overflow parking lot for campers will also be constructed in this area. An existing clearing further into the park site, that supports group camping, will be enhanced with the inclusion of a covered shelter and four picnic tables.

Equestrian Parking Area

An equestrian parking loop will be constructed west of Juhan Road in the narrow land parcel that was originally slated for property access. The access drive from Juhan Road to the loop will be paved and the loop is to be surfaced with gravel. The loop will accommodate approximately thirty vehicles with horse trailers and connect directly to equestrian trails. Also located here will be an information kiosk, signage and a hose bib for watering horses.

Spain Road Amenity Area

This amenity area will be accessed by a security-gated drive off Spain Road and will contain a parking lot for forty cars, a rustic pavilion structure, playground with seatwall, restroom facility, drinking fountain, information kiosk, signage, picnic tables, trash receptacles and landscaping.

Trails West of Juhan Road

A majority of existing bike and equestrian trails will be reused in this area. Some routing modifications will be made in order to enhance flow and for erosion control. Pedestrian use will be accomplished by a few connector links that tie into the equestrian network for shared use. A meadow restoration effort will take place in a clearing off Juhan Road,

Yellow River Park Master Plan

which is presently maintained as a lawn. Also included are several footbridges for traversing a stream and swales, and signage.

The 6' wide pedestrian trail into the park from Rockbridge Road will be added in a future phase. Costs for the meadow restoration were adjusted and the council ring was omitted from this phase. Demolition of existing structures will also be postponed.

Trails East of Juhan Road

A majority of bike and equestrian trails will be reused in this location. Some adjustments will be made to decrease user conflict and to respect an adequate setback from the river's edge. Trails will connect to the group camping area and to the new bicycle parking lot. Also included will be footbridges, an overlook structure on the river and signage.

Trails East of Yellow River

All trails on this side of the river will be for pedestrian use only. Also included are footbridges, signage and an overlook structure on the river.

Secondary trail loop connections and a second overlook have been eliminated from this phase of construction.

Trails on Juhan Road

Crosswalks with speed bumps will be added at three different locations along Juhan Road: for bike crossing at the north end of the park, for pedestrian crossing at the main pavilion parking area and for all types of user groups at the intersection for the new access road that goes to equestrian parking on the west side of Juhan Road to the bicycle parking on the east side of Juhan Road.

The potential realignment of a section of Juhan Road, to include bike lanes along Juhan Road within the park boundary, has been included in the total Master Plan budget, but not included in Phase 1 Construction.

Prioritized list of items to be added back into the budget (if bids are low):

- Restroom facility and associated utilities at the Pavilion Area (west of the river)
- Pavilion structure and playground at Pavilion Area (west of river)
- Realignment of Juhan Road (if not covered by GDOT)
- Council Ring/Overlook (west of Juhan Road)

Yellow River Park Master Plan

COST ESTIMATE SUMMARY

<i>Item</i>	<i>Total</i>	<i>Phase 1</i>
Pavilion Area	\$631,583	\$244,963
Bicycle Parking Area	\$358,334	\$358,334
Equestrian Parking Area	\$104,620	\$104,620
Spain Road Amenity Area	\$425,590	\$425,590
Trails West of Juhan Road	\$263,223	\$179,423
Trails East of Juhan Road (and west of river)	\$204,610	\$204,610
Trails East of Yellow River	\$247,224	\$176,624
Juhan Road Improvements	\$557,500	
SUBTOTAL	\$2,792,684	\$1,694,164
Contingency (15%)	\$418,903	\$254,125
Insurance, bonds, other fees (10%)	\$279,268	\$169,416
L. Arch/Eng/Arch/Survey fees (12%)	\$335,122	\$203,300
Master Planning fee	\$26,500	\$26,500
Maintenance Equipment	\$20,000	\$20,000
TOTAL	\$3,872,477	\$2,367,505
POTENTIAL ADDITIONAL CONSTRUCTION ITEMS	\$1,288,465	
Pedestrian bridge over river		
Bike lanes - Juhan Road (N. to Anniston Rd.)		
Caretaker Residence and Driveway		
Contingency, bonds, insurance, design fees		
REVISED TOTAL	\$5,160,942	\$2,367,505

A more detailed cost estimate is in the appendix.

Final Master Plan

The Final Master Plan (*Illustration I*), which incorporated all of the conclusive refinements, was presented to the Gwinnett County Recreation Authority on March 21, 2002 and to the Gwinnett County Board of Commissioners on April 16, 2002. There have been no further revisions to the plan.

Appendix A

Tabulation of Concerns from Yellow River Park Master Plan Public Meeting

Yellow River Park Regional Open Space Park Master Plan
Community Interest Form Results (Concerns and Suggestions) 12/13/01

Concern/Issue/Suggestion	Times Mentioned	Priority First	Second	Third	Fourth	Fifth	Sixth/No Priority
Habitat Conservation/Maintain Wildlife Diversity/save trees	62	10	6	6	2	1	37
Overuse/Overdevelopment/Overcrowding	26						26
Bike/Pedestrian/Horse Conflicts on Trails	15						15
Increase Security	11		1				10
Litter in Park/Along Roadway	11						11
Pet Cleanup/Obeying Pet Leash Rules	10						10
Trespassing On Private Property	7	1			1		5
Increase in Traffic on Juhan/Surrounding Roads	7						7
Don't Develop Spain Road Side/Keep as Preserve	6						6
Strangers in Neighborhood/Increase in Crime for Residents	5						5
Park Vulnerability to Budget Cuts/Administrative Changes	4						4
Illegal Hunting	4						4
Unauthorized Shortcuts	4						4
Overpaving in Park	4						4
No New Trails/Fewer Trails	4						4
Vandalism/Graffiti	3						3
Speeding through Parking Lots/Along Juhan	3						3
Rivershed Protection	3	1	1				1
Increased Noise in Neighborhood	3						3
Fences to Decrease Trespassing	2						2
Forest Fires	2						2
Police MTB Presence in Park/Maintain "Police House"	2						2
Unauthorized After Hours Activity/Loitering	2						2
Safety of Bikers Crossing Juhan	2						2
Shut Down Trails on Rainy Days	1						1
Destruction by Motorized Vehicles	1						1
Floodplain Disturbance	1						1
Remove Kirby Cruce Memorial	1						1
Too Many Deer	1						1
Determine Possible use by Adjacent Property Owners	1						1
Limit Parking	1						1
Limit Road Development	1						1
Light Pollution	1						1
Illegal Roadside Parking	1						1
Bikes Congesting Roads	1						1
No Sidewalks Present on Juhan	1						1
Keep Rural Feel of Juhan	1						1
Close Juhan to Thru Traffic	1						1
Lowering of Property Values of Adjacent Owners	1						1
Low Income Housing	1						1
Commercialization	1						1
County Liability on Trails	1						1
Disturbance of Riverbank Plants	1						1
Mountain Bikes Ruin Natural Environment	1						1
Lack of Supervision	1						1
Over-restrictiveness of Park System	1						1

Appendix B

Feasibility Study for a Pedestrian Bridge at Yellow River Park Pond & Company

**FEASIBILITY STUDY FOR A
PEDESTRIAN BRIDGE
AT
YELLOW RIVER PARK**

**YELLOW RIVER MASTERPLAN
GWINNETT COUNTY
PARKS AND RECREATION DEPARTMENT**



Prepared by

POND & COMPANY
2635 Century Parkway
Suite 800
Atlanta, GA 30345

February, 2002

PROJECT DESCRIPTION

Purpose

Yellow River Park, owned and operated by Gwinnett County's Parks and Recreation Department, is composed of approximately 565 acres. The property is bisected by the Yellow River. It is currently used as a passive park with a network of trails for hiking, mountain biking, and equestrian use. The existing main trail parallels the river bank to the west of the Yellow River. Approximately 200 acres of the park lies to the east of the Yellow River and is inaccessible from the west as currently configured. Gwinnett County, as part of future planning for the park, proposes to construct a pedestrian bridge to span the river, thus opening the remainder of the park to public use. As directed by Gwinnett County, three (3) locations for the pedestrian bridge will be analyzed.

Site Location and Considerations

The Yellow River Park is located in the southern part of Gwinnett County near the Dekalb County line just west of Centerville, between Annistown Road and State Route 124. Juhan Road currently provides the only access to the park. Roughly one-third of the park area is to the east of the Yellow River. The existing topography is relatively steep, and much of the park is wooded.

Several important factors were evaluated in determining a suitable location for the proposed pedestrian bridge. These included accessibility to the site, existing terrain, and width of the river. The bridge needed to be centrally located to increase functionality for all users. The bridge also needed to be located in areas of moderate terrain to allow smooth transitions from the bridge to the proposed trails with minimal land disturbance. Finally, the width of the river proved to be the most important factor in regards to site placement of the bridge. Gwinnett County provided direction to setting the proposed bridge above the 100-year floodplain. As the Yellow River drains roughly one-third of Gwinnett County, the floodplain elevation proved to be the overriding factor for setting the locations for the pedestrian bridge.

PEDESTRIAN BRIDGE LOCATIONS/CONSIDERATIONS

Three (3) potential bridge locations have been identified (see Appendix A for actual locations and cross sections) as requested by Gwinnett County. Elevations for all bridges are at approximately 760'. The three options are summarized below:

1. Option 1

Location: Middle of the park approx. 14,000' upstream of SR 124
Span Length: 360' +/-

2. Option 2

Location: Southern end of park approx. 10,600' upstream of SR 124
Span Length: 390' +/-

3. Option 3

Location: Most southern end of the park approx. 9,300' upstream of SR 124.
Span Length: 400' +/-

Floodplain Consideration

Pond & Company evaluated the 100-year flood elevations at each of the three potential locations. Using the Federal Emergency Management Agency (FEMA) Flood Insurance Study of Gwinnett County (see Appendix B), dated July 20, 1998, approximate elevations for the 100-year flood were determined at each location. Using these elevations and developing cross-sections at each location, an approximate preliminary bridge deck elevation could be determined which would site the bridge structure above the 100-year flood plain. Once the preliminary bridge deck elevation was known, the approximate bridge length was calculated. For all three cases, it is assumed that the bridge deck elevation will be approximately 760 feet.

Special Note

It is important to point out that this elevation may increase or decrease depending on the actual structural type of bridge used, i.e., different bridge types have different truss depths, thus affecting the necessary bridge deck elevation. It would be most desirable to have the entire structure (decking and supports) above the flood plain. This could mean a difference of approximately 5'.

It is also important to point out that an actual Flood Study may be required during the design phase of the project in accordance with Gwinnett County's regulations which includes updating the Flood Plain based on the 2020 land use map. This could have an impact on the elevation of the bridge. This could mean a difference of approximately 5'.

Other Considerations

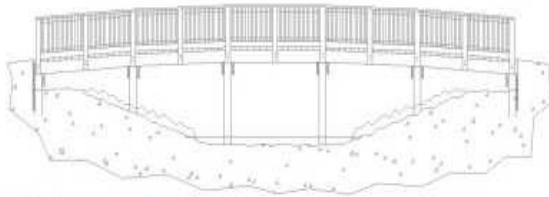
Because of the passive type use of the park, land disturbance for construction of the bridge must be kept at a minimum to reduce any damaging affects on the nature of the park.

Initial information for the pedestrian bridge was discussed with Alan Miller (678-422-2729) with the Army Corp of Engineers (ACOE). He indicated that a permit from the ACOE will not be required as long as the supports for the bridge are not located within the river itself. Permits that would possibly need to be obtained if the supports are within the river may include Nationwide 14 (minor road crossings), Nationwide 18 (allows up to 25 cy of fill in water) and/or Nationwide 25. He mentioned that if the supports are within the floodplain, it would be advisable to have a biologist verify that there will be no impacts to wetlands for construction of the supports and abutments. He also indicated that FEMA permits will be required (no rise certification as a minimum). Alan also indicated that further information for the project during the design phase should be coordinated with Gary Craig (678-422-2728) who is Gwinnett County's representative.

BRIDGE MATERIALS

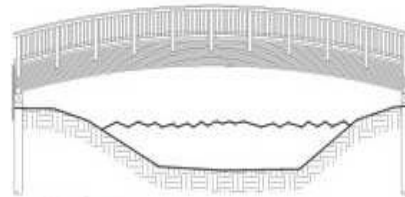
The two most common types of materials used for construction of pedestrian bridges are timber and steel.

- Timber Construction – typical materials used for construction include pressure treated, no.1 or 2 grade, southern yellow pine timber. Several configurations are used for this material as seen below. Short spans of approximately 20' are pile supported while longer spans use freespan glu-lam construction. Typical glu-lam freespans are approximately 80' in length. Most long span construction (over 100') uses a combination of pile supported and glu-lam methods. Because of the small span availability for this material, a timber bridge structure will require multiple supports for the bridge.



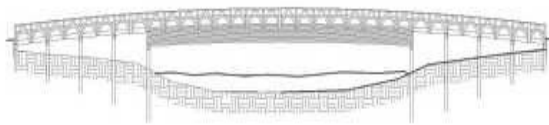
Pile Supported Timber

These bridges are supported at intervals by timber piles that have been mechanically driven into the ground. Pile supported bridges can be of any length, built to almost any height, and can be constructed from deck level to ensure minimal impact on the surrounding environment.



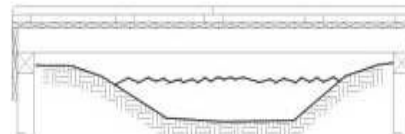
Freespan Glu-Lam

Freespan glu-lam bridges can be used in applications such as crossing sensitive ecological areas, heavy water flow situations, roadways or railways. York Bridge Concepts incorporates the use of glue laminated beams to create longer freespan bridges.



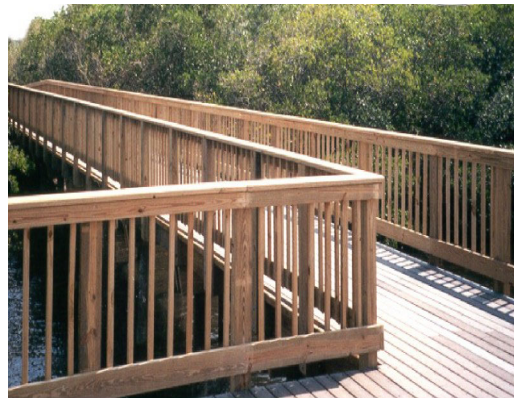
Combination Pile Supported / Freespan

Our professional design department can combine pile supported bridges with freespan sections (timber or glu-lam) to allow for greater spans and more custom applications. This cost-saving construction method allows for affordable road & large river crossings for vehicles and pedestrians.

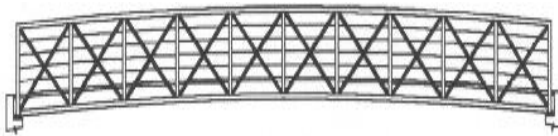


Freespan Timber

A freespan timber design allows the use of timber crossings in areas where pile supported structures are prohibited or impractical. Timber freespan bridges are a more economical alternative to freespan glu-lam structures when the spanning distance is 26 feet or less.



- **Steel Construction** – Typical materials used for construction include galvanized steel. Several configurations are used for this material as seen below. These steel premanufactured bridges can be custom fabricated with spans ranging from 50' up to 200'. The steel bridges are shipped in 70' sections due to transportation restrictions and are “spliced together” at the site for desired span conditions. It is important to point out that the longer the span the heavier the lifting crane required for installation. Because of the long free spans, construction access is an important factor in the construction process. Typical truss support configurations include:



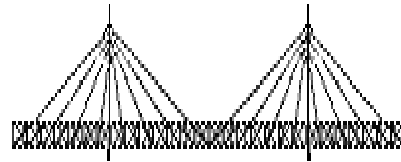
LINK STYLE BRIDGE
“X” FRAMING TRUSS SUPPORT



CAPSTONE BRIDGE
MODIFIED “BOW” TRUSS SUPPORT



KEYSTONE BRIDGE
“BOW” FRAMING TRUSS SUPPORT



CABLE STAYED
CABLE SUPPORTS



Decking

There are several types of decking materials that are used for the surface of the bridge. These include asphalt, recycled material, concrete, and timber to name a few. However, the most widely used materials used for pedestrian bridges are either concrete or timber. Concrete is the most durable and maintenance free of the two materials while timber decking gives a rustic feel for the bridge and is a must for bridges where equestrian uses are anticipated.

Supports

Supports for the pedestrian bridges are typically concrete. If aesthetics are an issue, the concrete foundations can be covered with a granite stone facing. Driven piles can also be used if access to the site can be obtained by pile driving equipment.

Handrails

Because of the potential varying use for the bridge, handrail type and height should be considered during the design portion for the project. Typical handrail installation height for pedestrian use is 42", bicycle use is 54", and equestrian use is 66". Safety rails for the bridge may include horizontal and vertical picket type railings. Chain-link fencing may be even considered for additional safety.

BRIDGE CONSTRUCTION

One of the most important aspects of the project is accessibility of equipment to the proposed construction site. As the park is heavily wooded, consists of steep grades, and has no existing roads leading to any potential site, access will be difficult. Despite the desire to keep land disturbance to a minimum, it will almost certainly be necessary to create some type of construction access to the site. This will entail clearing, grubbing, and moderate grading for a temporary access road to the proposed bridge site. This temporary road will need to provide access to construction workers, general construction equipment, concrete trucks, and cranes. Depending on the type of free span for the bridge and method chosen for installation of the spans, a temporary construction road would vary with widths of 10'-20' (15'-30' of clearance). It would be anticipated that this temporary road could be re-landscaped and restored to a trail after construction to limit its visual impact, while still serving the purpose of access to the bridge.

The critical task of construction will be lifting the bridge spans into place. The larger the freespan, the larger the equipment needed to place it. Construction methods can vary from cranes of different sizes to even helicopters or barges (although it appears that the depth of flow of the river would not support barge installation). Typical lifting capacities of a helicopter are approximately 35,000 lbs to 50,000 lbs.

The bridge sections can be shipped via truck at 70' section lengths to the site from the manufacturer. These 70' section lengths would then be spliced together in the field for the desired span. Typical delivery time ranges from 12 to 14 weeks.

YELLOW RIVER BRIDGE

Initially, it was assumed (through conversations with Gwinnett County staff) that the bridge width would be a minimum of 12 feet. Due to the height of the bridge above the water surface, its length, and the possibility of equestrian and light traffic use, 12 feet appeared to be the most desirable width. Such a bridge would have higher handrails for horses and cyclists, and could support an occasional light vehicle for maintenance and emergencies.

After initially discussing the preliminary costs for the 12' bridge with Gwinnett County staff, Pond was directed to look into a bridge width of 5 feet. After further investigations and conversations with manufacturer's representatives, we concluded the following: As a rule, the maximum length to width ratio for a bridge of the magnitude is 20:1. A 5-ft wide bridge would limit the maximum span length to 100 feet. As it is assumed that a span of 400 feet will have to be cleared, additional pilings, foundations, and supports would be necessary for a 5-ft wide bridge. Additionally, due to its narrowness, the bridge members would have to be enlarged and stiffened to prevent swaying, increasing the costs of the bridge. With this information along with discussions with representatives from premanufactured bridge companies, it was determined that a width of 8 feet would be most cost efficient and could include spans of 100' as well as 200'. An 8-ft bridge would be strictly for pedestrian use only.

YELLOW RIVER BRIDGE COSTS

The costs for pedestrian bridges can vary widely depending on the type, size, length of the bridge, availability of construction access, and construction methods. The following is a breakdown of preliminary construction costs for pedestrian bridges by material, length, and width. See appendix C for budgetary quotes from the manufacturer.

Timber Pedestrian Bridge (12' wide x 400' long – 16-20' spans with 1-80' span)

Construction Access:	\$40,000 (incl. clearing, grading, erosion control, maintenance, restoration-both side of river)
Bridge/Decking Material:	\$402,250 (incl. 7% tax, 10% mark-up, 10% contingency)
<u>Installation Cost:</u>	<u>\$150,000 (incl. erection, placement, abutments, 17 supp.)</u>
TOTAL COST:	\$592,250 (\$600,000)

Cable Stayed Steel Bridge (12' wide x 400' long – 2-200' spans – 1-135' high tower)

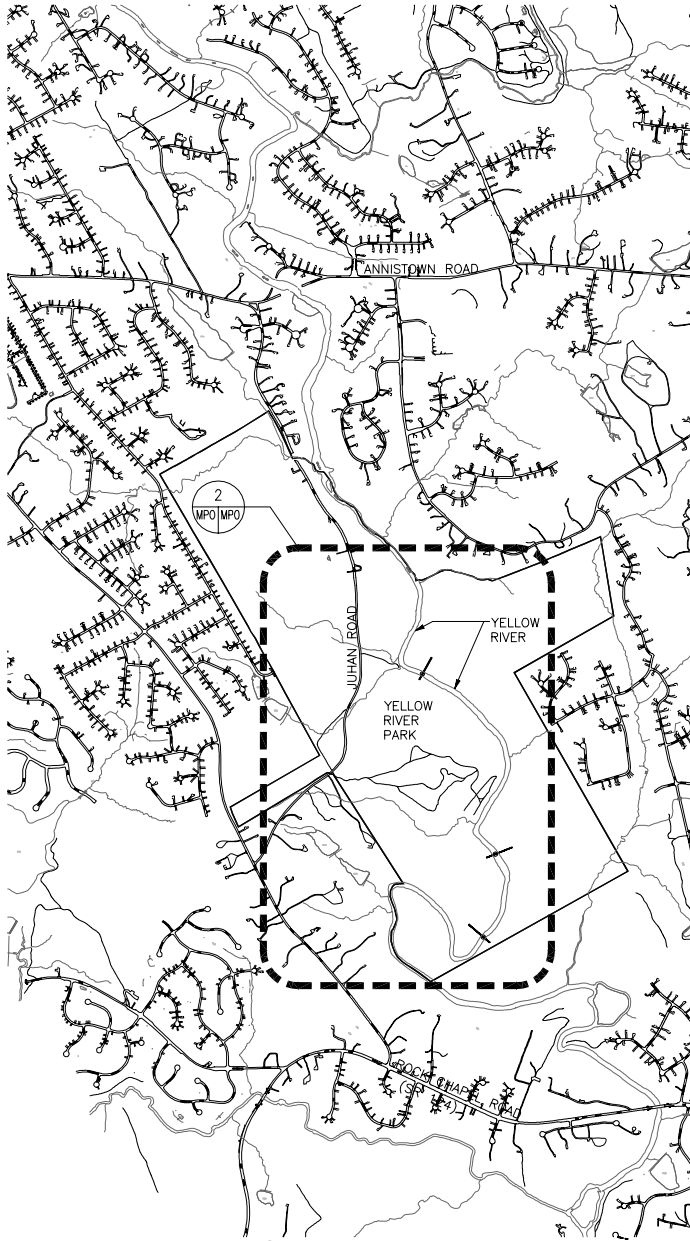
Construction Access:	\$75,000 (incl. clearing, grading, erosion control, maintenance, restoration-both sides of river)
Bridge/Decking Material:	\$542,314 (incl. 7% tax, 10% mark-up, 10% contingency)
<u>Installation Cost:</u>	<u>\$255,000 (incl. erection, placement, abutments, 1 support)</u>
TOTAL COST:	\$872,314 (\$875,000)

Steel Bridge Framing (8' wide x 400' long – 1-200' span with 2-100' spans)

Construction Access:	\$60,000 (incl. clearing, grading, erosion control, maintenance, restoration – both sides of river)
Bridge/Decking Material:	\$403,110 (incl. 7% tax, 10% mark-up, 10% contingency)
<u>Installation Cost:</u>	<u>\$210,000 (incl. erection, placement, abutments, 2 supports)</u>
TOTAL COST:	\$673,110 (\$675,000)

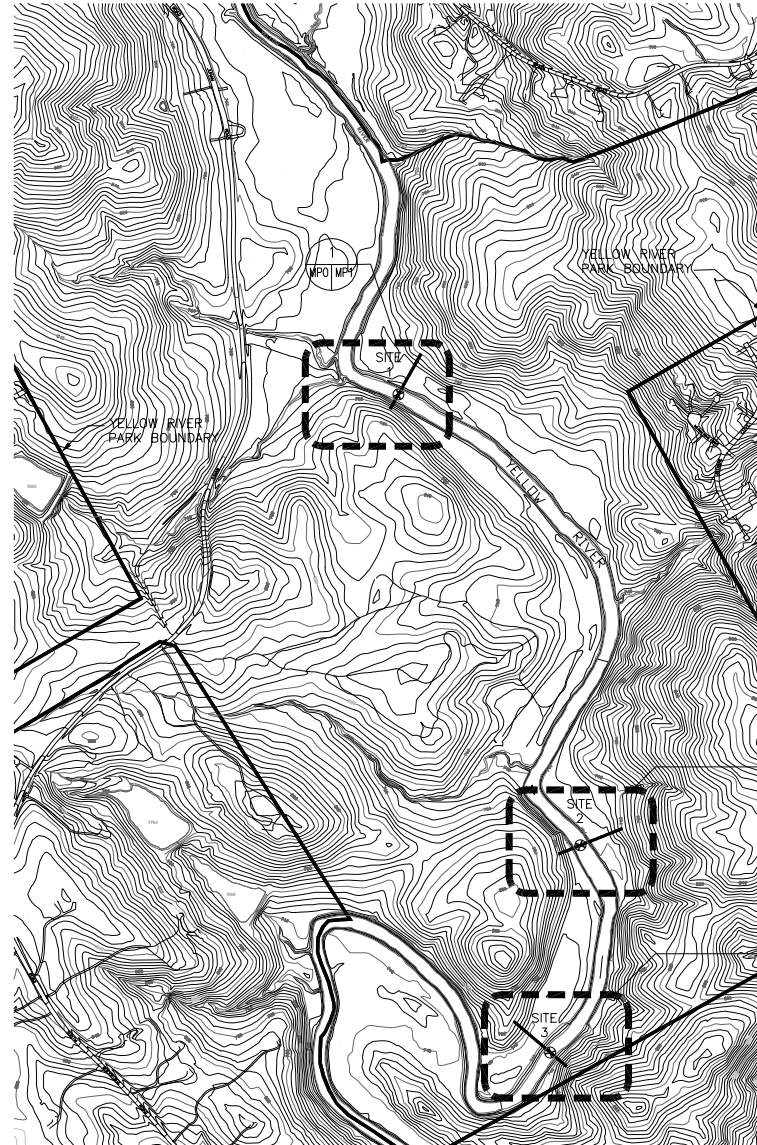
CONSTRUCTION COST FOR OTHER PEDESTRIAN BRIDGES

- **Pedestrian Bridge at Canoe/Kayak Venue, Ocoee, TN**
Bridge Manufacturer: Steadfast Bridge
Date of Construction: 1995/1996
Bridge Dimensions: 10' wide x 336' long
Total Costs: Approx. \$1.1 million
Other Information: Cable stayed design
- **Pedestrian Bridge at Life College, Marietta, GA**
Bridge Manufacturer: Steadfast Bridge
Date of Construction: 1997
Bridge Dimensions: 10' wide x 310' long
Bridge Material Costs: \$125,000-\$150,000
Installation/Incidental Costs: \$275,000-\$350,000
Total Costs: \$400,000-\$500,000
- **Pedestrian Bridge at Hemphill Knob, Blue Ridge Parkway National Park, Asheville, NC**
Date of Construction: 1998 (approx.)
Bridge Dimensions: 8.5' wide x 180' long (built in 3 sections)
Total Costs: over \$200,000
- **Pedestrian Bridge at Fisher Peak, Blue Ridge Parkway National Park, Galax, VA**
Date of Construction: 1997/1998
Bridge Dimensions: 8' wide x 110' long (built in 3 sections)
Total Costs: over \$200,000
Other Information: Galvanized steel frame, wood deck, concrete supports, stone veneer
- **Pedestrian Bridge at the Riverwalk for the City of Chattanooga, TN**
Bridge Manufacturer: Steadfast Bridge
Date of Construction: 1998/1999
Bridge Dimensions: 8' (approx.) wide x 210' long (built in 3/4 sections)
Total Costs: over \$300,000
Other Information: Built over a tributary to the Tennessee River
Steel bridge with concrete decking



1 OVERALL SITE LOCATION PLAN
MPO/MPO SCALE: 1" = 1000'

1000 0 1000 2000
SCALE: 1" = 1000'



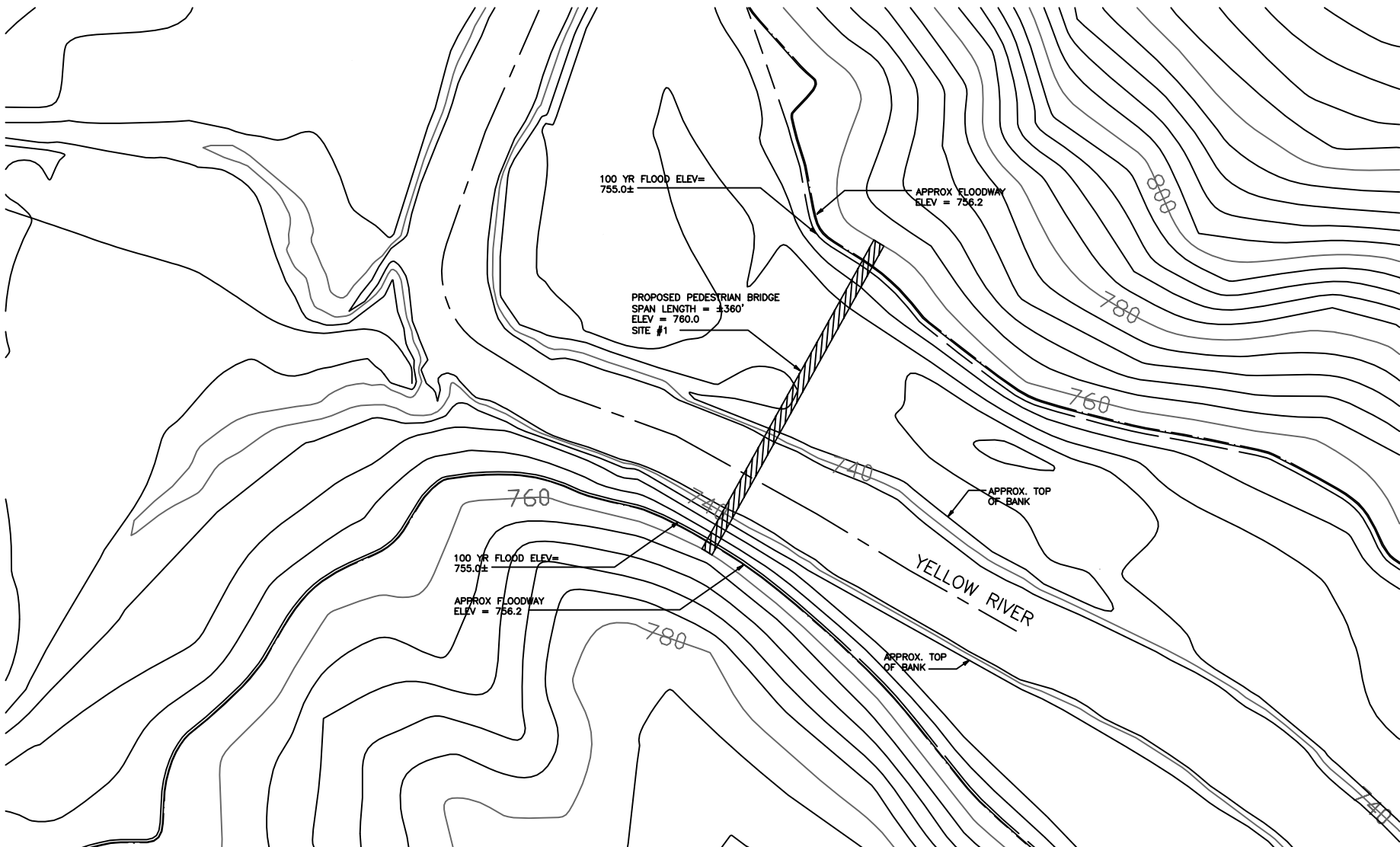
2 ENLARGED SITE LOCATION PLAN
MPO/MPO SCALE: 1" = 400'

400 0 200 400
SCALE: 1" = 400'

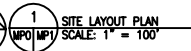
OVERALL
SITE LOCATION
PLAN

1"=500'

MPO

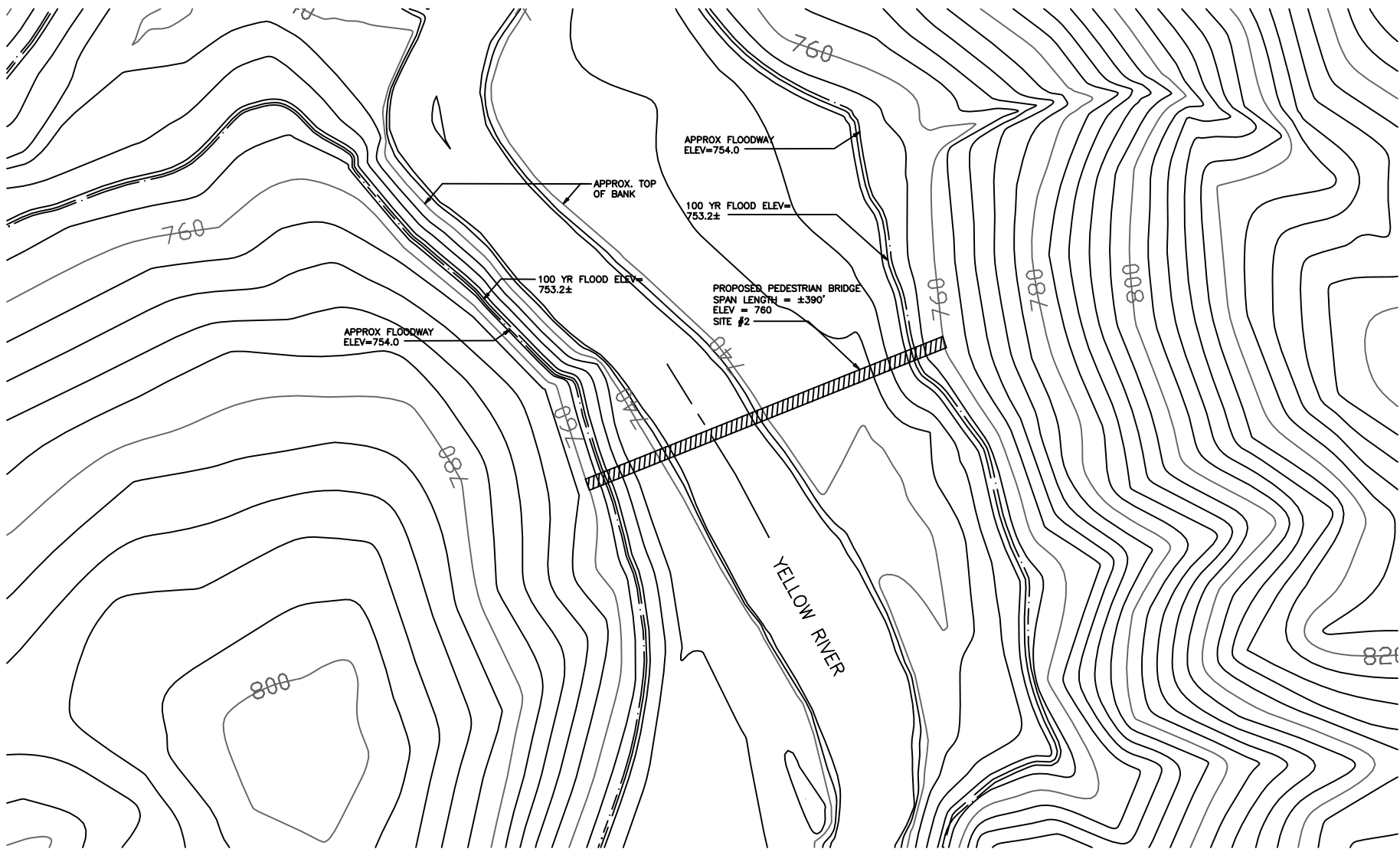


SITE LOCATION
PLAN
OPTION 1

  SITE LAYOUT PLAN
SCALE: 1" = 100'

100 0 100 200
SCALE: 1" = 100'

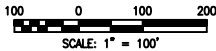
1"=100'
MP1



SITE LOCATION
PLAN
OPTION 2



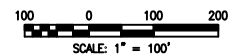
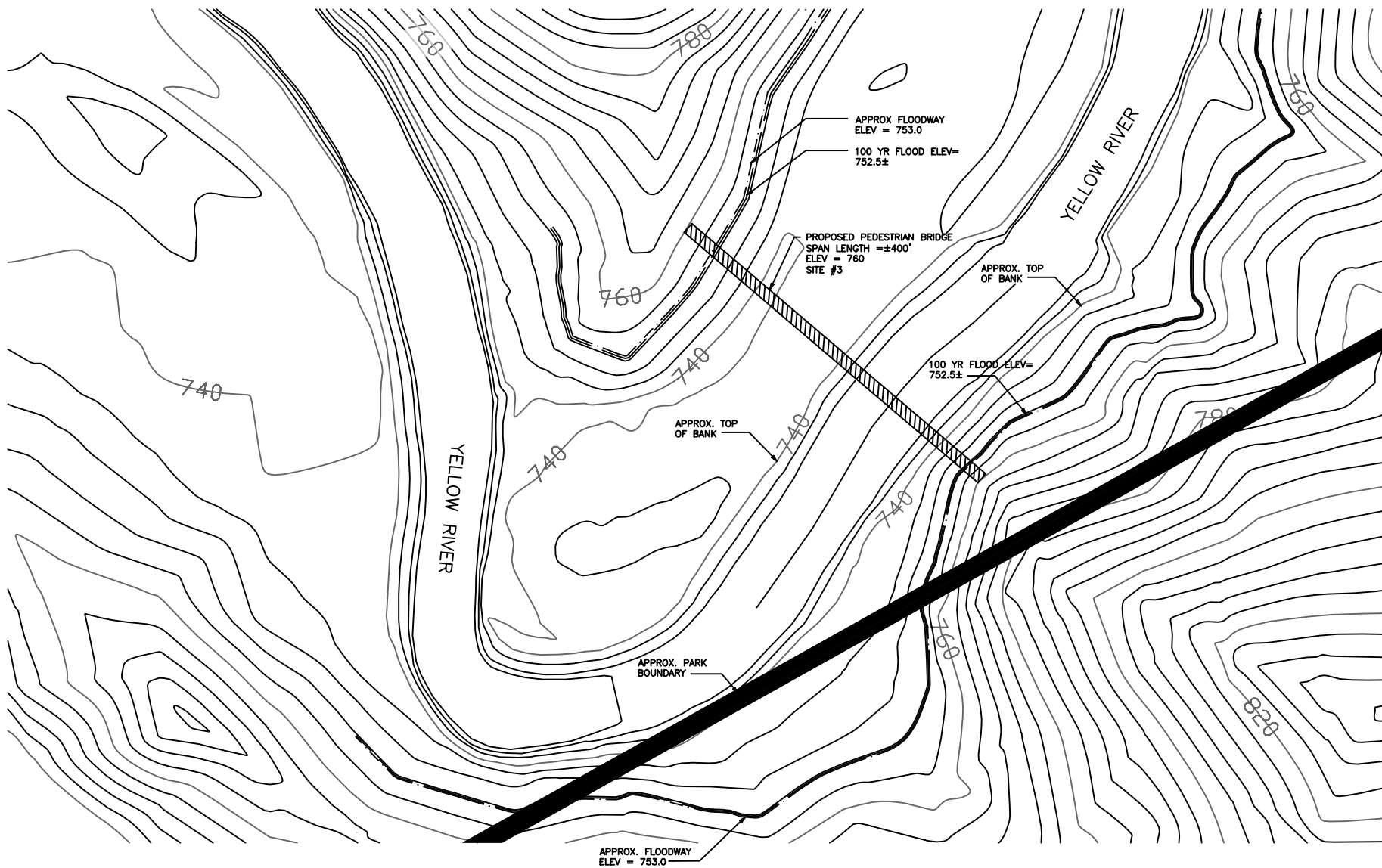
SITE LAYOUT PLAN
SCALE: 1" = 100'



SCALE: 1" = 100'

1"=100'

MP2



SITE LAYOUT
PLAN
OPTION 3

1"=100'

MP3

Appendix C

Cost Estimate

YELLOW RIVER MASTER PLAN
The Jaeger Company 03.21.02

FINAL COST ESTIMATE - PHASE 1

<i>Item</i>	<i>Unit</i>	<i>Unit Price</i>	<i>Quantity</i>	<i>Total</i>	<i>Phase 1</i>
Pavilion Area					
Multi-use trail (12' wide asphalt)	LF	\$18	5,280	\$95,040	\$95,040
Asphalt drive/parking	SY	\$18	2,778	\$50,004	\$50,004
Reinforced Turf (staff vehicle access to river)	SF	\$3	1,510	\$3,775	\$3,775
Security Gates for pkg. lot & staff access to river	EA	\$1,800	3	\$5,400	\$5,400
Striping (50 spaces)	LF	\$2	900	\$1,800	\$1,800
Curb & gutter (east side of pkg lot)	LF	\$14	481	\$6,734	\$6,734
8' wide paved connectors to 12' trail	LF	\$15	1,274	\$19,110	\$19,110
Foot bridges	EA	\$4,600	2	\$9,200	\$9,200
Playground	SF	\$10	9,793	\$97,930	
Retaining/Seatwall	LF	\$25	200	\$5,000	
Rustic pavilion structure (48' x 60')	SF	\$50	2,880	\$144,000	
Picnic tables	EA	\$1,000	10	\$10,000	\$10,000
Bench on concrete pad	EA	\$1,200	6	\$7,200	
Trash receptacle on concrete pad	EA	\$500	6	\$3,000	\$3,000
Restrooms (24' x 24')	SF	\$90	576	\$51,840	
Orientation Kiosk	EA	\$5,000	1	\$5,000	\$5,000
Overlook - deck structure	EA	\$15,000	1	\$15,000	
Clearing and grubbing	AC	\$3,000	4	\$12,000	\$6,000
Grading (includes multi-purpose trail)	LS	\$12,000	1	\$12,000	\$12,000
Erosion Control	LS	\$4,500	1	\$4,500	\$4,500
Shade Trees/landscaping	LS	\$9,000	1	\$9,000	\$4,000
Turf area (hydro-seeded)	AC	\$3,500	1	\$3,500	\$3,500
Vegetate swale/stormwater mgt.	LF	\$8	400	\$3,200	\$3,200
Electricity/Conduit	LF	\$12	350	\$4,200	
Water Service	LF	\$22	350	\$7,700	
Water Fountain	EA	\$1,750	1	\$1,750	
Sewer Waste Service, Septic Field	LS	\$11,000	1	\$11,000	
Signage (park entrance)	EA	\$1,200	1	\$1,200	\$1,200
Signage (trails)	EA	\$300	5	\$1,500	\$1,500
Demolition/removal of existing structures	LS	\$30,000	1	\$30,000	
TOTAL				\$631,583	\$244,963
Bicycle Parking Area					
Asphalt drive/parking	SY	\$18	3,558	\$64,044	\$64,044
Striping (55 spaces)	LF	\$2	990	\$1,980	\$1,980
Curb & gutter (around islands)	LF	\$14	184	\$2,576	\$2,576
Gravel drive/parking	SY	\$14	3,496	\$48,944	\$48,944
Restroom (24' x 24')	SF	\$90	576	\$51,840	\$51,840
Changing station (10' x 20')	SF	\$60	100	\$6,000	\$6,000
Maintenance building (30' x 60')	SF	\$55	1,800	\$99,000	\$99,000
Chain link fencing around maint. area	LF	\$16	350	\$5,600	\$5,600
Security Gates @ Juhan Road & overflow pkg.	EA	\$1,800	2	\$3,600	\$3,600
Clearing and grubbing	AC	\$3,000	1	\$3,000	\$3,000
Kudzu control	LS	\$2,500	1	\$2,500	\$2,500
Grading	LS	\$7,500	1	\$7,500	\$7,500
Erosion Control	LS	\$5,300	1	\$5,300	\$5,300
Vegetate swale/stormwater mgt.	LF	\$8	200	\$1,600	\$1,600
Orientation Kiosk	EA	\$5,000	1	\$5,000	\$5,000
Electricity/Conduit	LF	\$12	600	\$7,200	\$7,200

YELLOW RIVER MASTER PLAN
The Jaeger Company 03.21.02

FINAL COST ESTIMATE - PHASE 1

Item	Unit	Unit Price	Quantity	Total	Phase 1
Water Service	LF	\$22	600	\$13,200	\$13,200
Water Fountain	EA	\$1,750	1	\$1,750	\$1,750
Bike Wash w/ winterized valve box	EA	\$500	1	\$500	\$500
Sewer Waste Service, Septic Field	EA	\$5,000	2	\$10,000	\$10,000
Signage (park entrance)	EA	\$1,200	1	\$1,200	\$1,200
Covered shelter at campsite area (20' x 20')	SF	\$30	400	\$12,000	\$12,000
Picnic tables	EA	\$1,000	4	\$4,000	\$4,000
TOTAL				\$358,334	\$358,334
Equestrian Parking Area					
Asphalt drive	SY	\$18	1,965	\$35,370	\$35,370
Gravel parking	SY	\$14	1,700	\$23,800	\$23,800
Security Gate @ Juhan Road entrance	EA	\$1,800	1	\$1,800	\$1,800
Water Service (hose bibb)	LF	\$22	950	\$20,900	\$20,900
Water Fountain	EA	\$1,750	1	\$1,750	\$1,750
Clearing and grubbing	AC	\$3,000	1	\$3,000	\$3,000
Orientation Kiosk	EA	\$5,000	1	\$5,000	\$5,000
Grading	LS	\$8,000	1	\$8,000	\$8,000
Erosion Control	LS	\$3,800	1	\$3,800	\$3,800
Signage (park entrance)	EA	\$1,200	1	\$1,200	\$1,200
TOTAL				\$104,620	\$104,620
Spain Road Amenity Area					
Asphalt drive	SY	\$18	4,123	\$74,214	\$74,214
Asphalt parking	SY	\$18	2,487	\$44,766	\$44,766
Striping (40 spaces)	LF	\$2	720	\$1,440	\$1,440
Security Gate @ Spain Road entrance	EA	\$1,800	1	\$1,800	\$1,800
Rustic pavilion structure (20' x 30')	SF	\$50	600	\$30,000	\$30,000
Picnic tables	EA	\$1,000	5	\$5,000	\$5,000
Trash receptacle on concrete pad	EA	\$300	4	\$1,200	\$1,200
Restrooms (24' x 24')	SF	\$90	576	\$51,840	\$51,840
Playground	SF	\$10	9,793	\$97,930	\$97,930
Retaining/Seatwall	LF	\$25	150	\$3,750	\$3,750
Clearing and grubbing	AC	\$3,000	3	\$9,000	\$9,000
Grading	LS	\$12,800	1	\$12,800	\$12,800
Erosion Control	LS	\$7,800	1	\$7,800	\$7,800
Shade Trees/landscaping	LS	\$4,000	1	\$4,000	\$4,000
Turf area	AC	\$3,500	1	\$3,500	\$3,500
Vegetate swale/stormwater mgt.	LF	\$8	300	\$2,400	\$2,400
Orientation Kiosk	EA	\$5,000	1	\$5,000	\$5,000
Electricity/Conduit	LF	\$12	1,800	\$21,600	\$21,600
Water Service	LF	\$22	1,800	\$39,600	\$39,600
Water Fountain	EA	\$1,750	1	\$1,750	\$1,750
Sewer Waste Service, Septic Field	LS	\$5,000	1	\$5,000	\$5,000
Signage (park entrance)	EA	\$1,200	1	\$1,200	\$1,200
TOTAL				\$425,590	\$425,590
Trails West of Juhan Road					
Bicycle trail (new 40%)	LF	\$10	5,911	\$59,110	\$59,110
existing trail restoration (22%)	LF	\$5	3,050	\$15,250	\$15,250
Equestrian trail (new 33%)	LF	\$10	4,100	\$41,000	\$41,000
existing trail restoration (33%)	LF	\$5	4,213	\$21,063	\$21,063

YELLOW RIVER MASTER PLAN
The Jaeger Company 03.21.02

FINAL COST ESTIMATE - PHASE 1

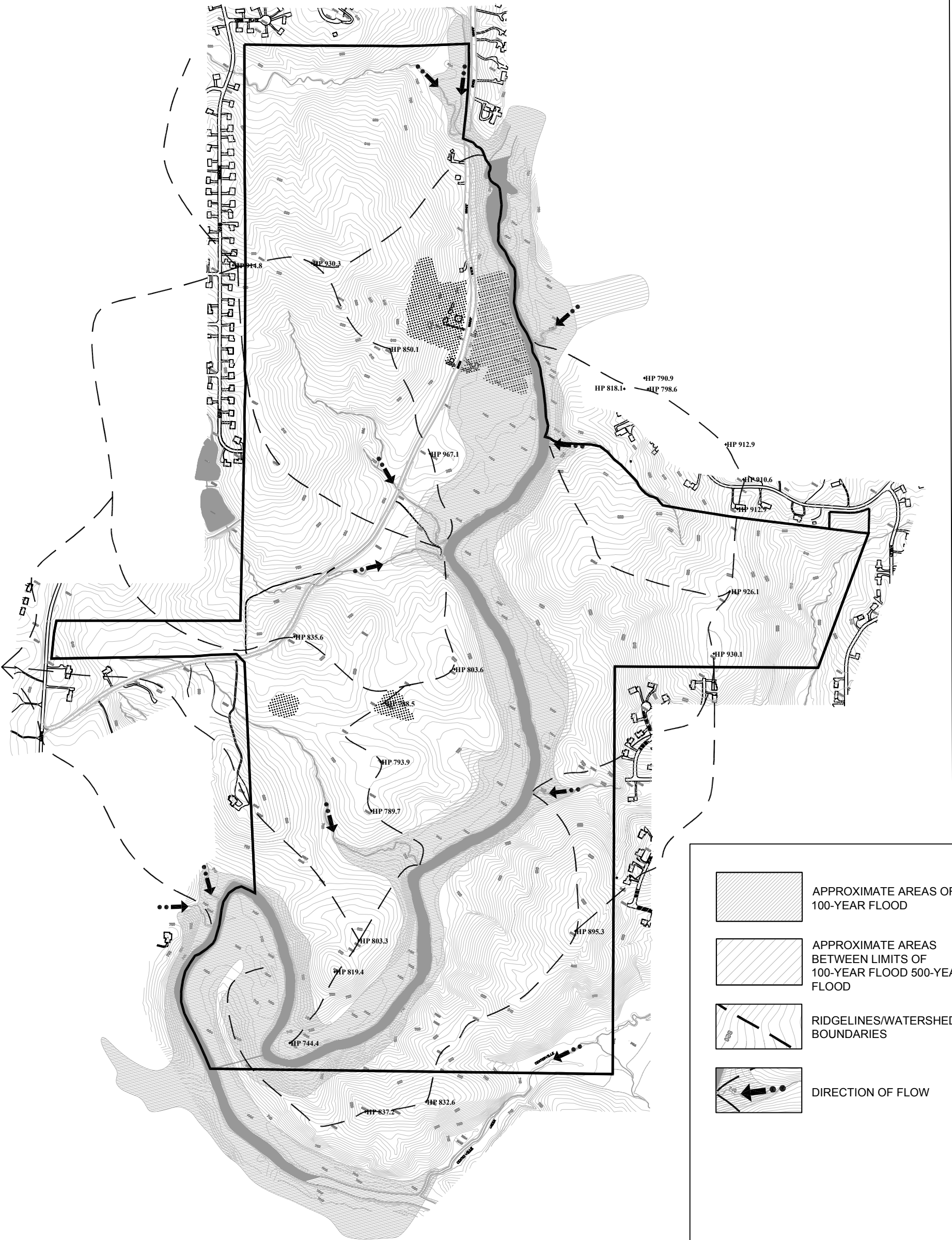
<i>Item</i>	<i>Unit</i>	<i>Unit Price</i>	<i>Quantity</i>	<i>Total</i>	<i>Phase 1</i>
Pedestrian trail (to Rockbridge Road)	LF	\$15	1,900	\$28,500	
Miscellaneous Erosion Control, trail repair	LS	\$4,500	1	\$4,500	\$4,500
Meadow restoration	AC	\$4,800	6	\$28,800	\$11,000
Picnic area/council ring	LS	\$7,500	1	\$7,500	
Foot bridges	EA	\$4,600	5	\$23,000	\$23,000
Signage (trails)	EA	\$300	15	\$4,500	\$4,500
Demolition/removal of existing structures	LS	\$30,000	1	\$30,000	
TOTAL				\$263,223	\$179,423
Trails East of Juhan Road					
Bicycle trail (new 57%)	LF	\$10	8,879	\$88,790	\$88,790
existing trail restoration (6%)	LF	\$5	820	\$4,100	\$4,100
Equestrian trail (new 33%)	LF	\$10	4,133	\$41,330	\$41,330
existing trail restoration (11%)	LF	\$5	1,378	\$6,890	\$6,890
Pedestrian trail	LF	\$8	750	\$6,000	\$6,000
Overlook - deck structure	EA	\$10,000	1	\$10,000	\$10,000
Foot bridges	EA	\$4,600	5	\$23,000	\$23,000
Signage (trails)	EA	\$300	16	\$4,800	\$4,800
TOTAL				\$184,910	\$184,910
Trails East of Yellow River					
Pedestrian trail - primary trails	LF	\$8	19,878	\$159,024	\$159,024
secondary trails/loops, connections	LF	\$8	7,575	\$60,600	
Overlook - deck structure	EA	\$10,000	2	\$20,000	\$10,000
Foot bridge	EA	\$4,600	1	\$4,600	\$4,600
Signage (trails)	EA	\$300	10	\$3,000	\$3,000
TOTAL				\$247,224	\$176,624
Trails on Juhan Road					
Removal of asphalt	SY	\$15	2,000	\$30,000	
Grading	LS	\$23,000	1	\$23,000	
Realignment of Juhan Road	LF	\$95	1,700	\$161,500	
Bike lanes - (within park)	LF	\$35	9,800	\$343,000	
Crosswalk treatment/traffic calming devices	LS	\$10,100	1	\$10,100	\$10,100
Pedestrian crossing Juhan Road (pavilion area)	LS	\$4,800	1	\$4,800	\$4,800
Bike crossing Juhan Road (north end of park)	LS	\$4,800	1	\$4,800	\$4,800
TOTAL				\$577,200	\$19,700
SUBTOTAL				\$2,792,684	\$1,694,164
CONTINGENCY (15%)				\$418,903	\$254,125
INSURANCE, BONDS, OTHER FEES (10%)				\$279,268	\$169,416
L.ARCH./ENG./ARCH./SURVEY FEES (12%)				\$335,122	\$203,300
MASTER PLANNING FEE				\$26,500	\$26,500
MAINTENANCE EQUIPMENT				\$20,000	\$20,000
TOTAL				\$3,872,476	\$2,367,504
POTENTIAL ADDITIONAL CONSTRUCTION ITEMS					
Pedestrian bridge over river	LS	\$675,000	1	\$675,000	
Bike lanes - Juhan Road (N. to Anniston Rd.)	LF	\$35	4750	\$166,250	
Caretaker Residence	LS	\$125,000	1	\$125,000	
Gravel driveway (to caretaker residence)	SY	\$14	180	\$2,520	
SUBTOTAL				\$968,770	

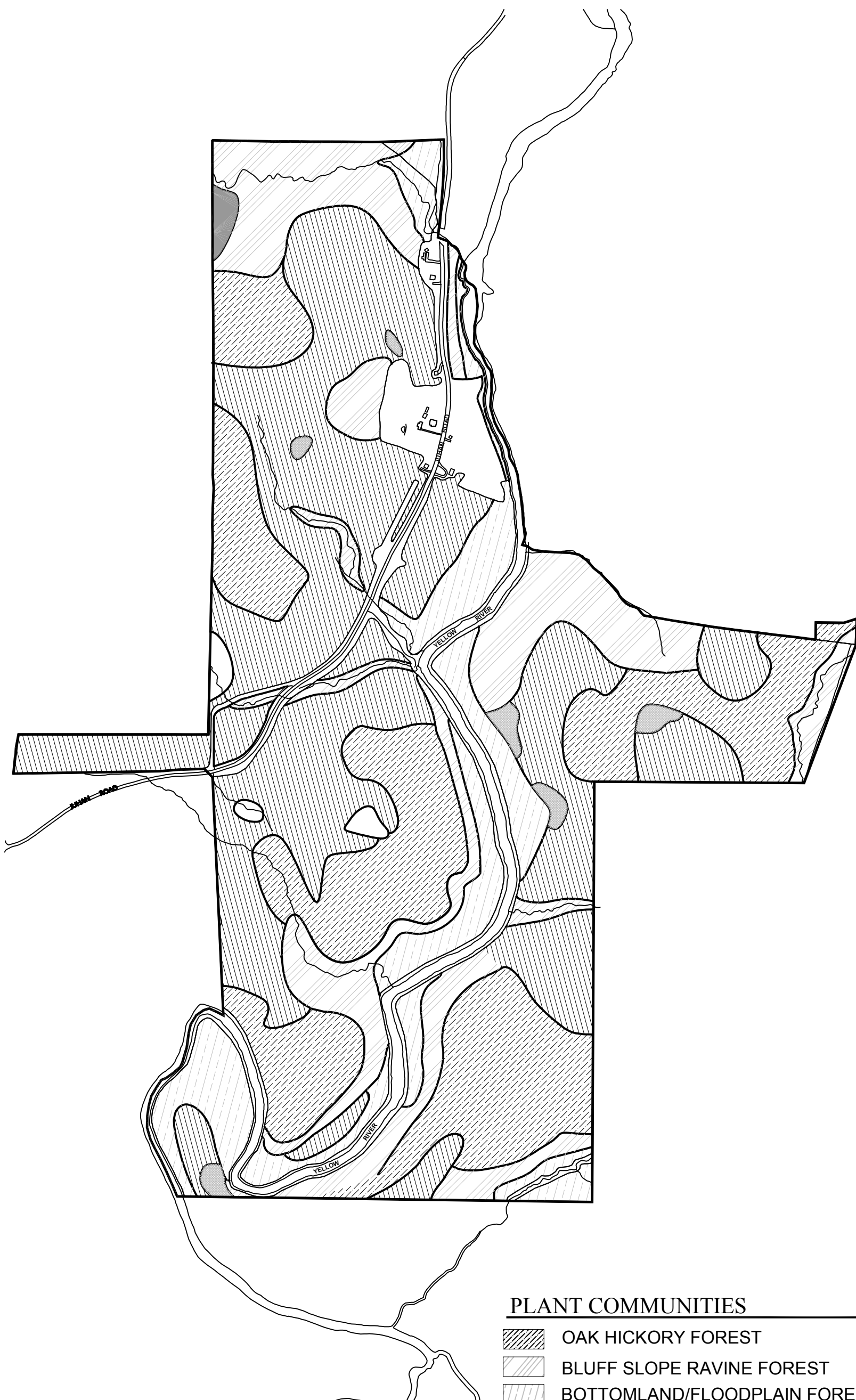
YELLOW RIVER MASTER PLAN
The Jaeger Company 03.21.02

FINAL COST ESTIMATE - PHASE 1

<i>Item</i>	<i>Unit</i>	<i>Unit Price</i>	<i>Quantity</i>	<i>Total</i>	<i>Phase 1</i>
CONTINGENCY (15%)				\$145,316	
INSURANCE, BONDS, OTHER FEES (10%)				\$96,877	
L.ARCH./ENG./ARCH./ FEES (8%)				\$77,502	

REVISED TOTAL **\$5,160,940 \$2,367,504**





PLANT COMMUNITIES

-  OAK HICKORY FOREST
-  BLUFF SLOPE RAVINE FOREST
-  BOTTOMLAND/FLOODPLAIN FOREST
-  SUCCESSIONAL FOREST
-  PINE DIEBACK

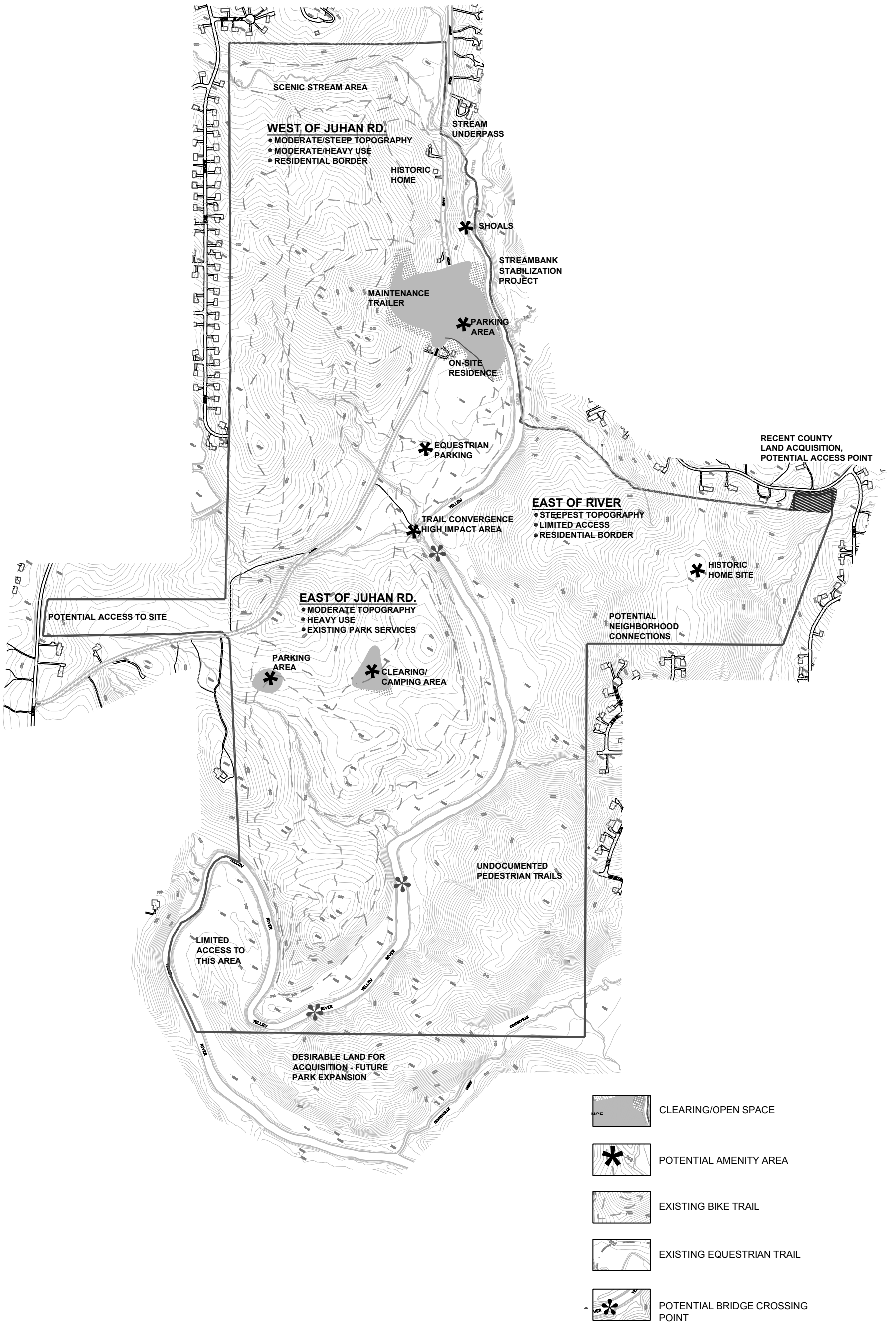


Illustration C1

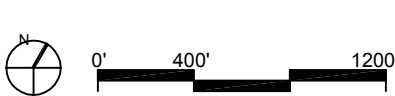
Estimated Physical Properties of Site Soils

from Soil Survey for Gwinnett County, Georgia July 1967 USDA SCS

Soil Name	Depth to	Depth to	Depth	Classification	Percentage	Passing Sieve			Permability	Reaction	Shrink-swell potential
	hard rock	seasonally	from	USDA Texture	No. 4	No. 10	No. 200				
		high water table	surface								
	FEET	INCHES	INCHES								
Appling (AmB2, AmC2, AnC2)	>8	>50	0-10	Sandy loam	95-100	95-100	20-35	2.0-6.3	4.5-5.0	Low	
			10-24	Sandy clay loam	90-100	98-100	50-60	0.8-2.5	4.5-5.0	Moderate	
			24-42	Sandy clay	95-100	95-100	60-75	0.2-0.8	4.5-5.0	Moderate	
Buncombe (Bfs)	>6	>60	0-12	Loamy fine sand	100	98-100	20-30	5.0-10.0	4.5-5.0	Low	
			12-74	Loamy fine sand	100	100	10-30	5.0-10.0	4.5-5.0	Low	
Chewacla (Cfs)	>10	0-24	0-6	Silt loam	100	95-100	45-55	0.6-2.0	4.5-5.0	Low	
			6-28	Silty clay loam	100	95-100	50-65	0.6-2.0	4.5-5.0	Moderate	
			28-42	Silt loam	100	95-100	50-70	0.6-2.5	4.5-5.0	Low	
Congaree (Cng, Cos, Cus)	>10	36-40	0-8	Silt loam	95-100	95-100	50-60	0.63-2.0	5.1-5.5	Low	
			8-40	Fine sandy loam	95-100	98-100	30-55	0.63-2.0	5.1-5.5	Low	
			40-52	Sandy clay loam	95-100	95-100	50-60	0.63-2.0	5.1-5.5	Moderate	
Davidson (DgB2, DgC2, DhB2, DhC2, DhD2)	>10	>60	0-6	Loam	95-100	95-100	50-65	2.5-5.0	4.5-5.0	Low to moderate	
			6-52	Clay loam or clay	100	95-100	65-85	0.8-2.5	4.5-5.0	Moderate	
Durham (DiB)	>6	>36	0-12	Sandy loam	95-100	95-100	20-40	2.0-6.0	5.6-6.0	Low	
			12-44	Sandy clay loam or clay	100	100	40-60	0.8-2.5	4.5-6.0	Moderate	
			44-59	Sandy clay loam	100	100	40-55	2.5-5.0	4.5-5.0	Moderate to low	
Gwinnett (GeB2, GeC2, GeE2, GgB2, GgC2, GgE2)	>6	>60	0-7	Loam	95-100	85-100	20-40	2.5-5.0	5.1-5.5	Low	
			7-35	Clay	95-100	95-100	83-90	0.8-2.5	5.1-5.5	Moderate	
			35-43	Clay loam	95-100	95-100	55-75	0.8-2.5	5.1-5.5	Moderate to low	
			43	Fractured rock							
Louisburg (LDD, LDF, LnC, LnE)	1 1/2 - 4	>60	0-6	Loamy sand	50-100	35-95	10-30	5.0-10.0	5.1-5.5	Low	
			6-13	Sandy loam	95-100	95-100	40-50	2.0-6.3	5.1-5.5	Low	
			13-29	Weathered rock							
			29	Granite & gneiss bedrock							
Madison (MhB2, MhC2, MiB2, MiC2, MiD2, MiF2)	>10	>60	0-6	Gravelly sandy loam	90-100	85-100	25-50	2.5-5.0	5.1-5.5	Low	
			6-10	Clay loam	95-100	90-100	40-60	0.6-2.0	5.1-5.5	Moderate	
			10-23	Sandy clay	95-100	85-100	70-80	0.6-2.0	5.1-5.5	Moderate	
			23-29	Sandy clay loam	95-100	95-100	40-60	2.0-6.0	5.1-5.5	Low	
			29-90	Weatherd mica schist							
Musella (MCD, MCF)	>8	>60	0-6	Cobbly loam	80-85	60-70	30-40	0.8-2.5	5.1-5.5	Low	
			6-15	Clay	70-85	70-85	60-70	0.8-2.5	5.1-5.5	Moderate	
			15-60	Broken rock							
Pacolet (PfB2, PfC2, PgB2, PgC2, PgD2, PgE2, PiF)	>6	>60	0-8	Sandy loam	90-100	80-95	35-50	2.5-5.0	5.1-5.5	Low	
			8-26	Clay	95-100	90-100	55-75	0.8-2.5	5.1-5.5	Moderate	
			26-34	Sandy clay loam	95-100	90-100	50-70	0.8-2.5	5.1-5.5	Moderate	
			34-48	Sandy loam	95-100	90-100	40-50	2.0-6.0	5.1-5.5	Low	
Wehadkee (Wed)	>10	0-15	0-6	Silt loam	100	100	60-75	0.6-2.0	4.5-6.0	Moderate to low	
			6-40	Silty clay loam	100	100	80-90	0.6-2.0	4.5-5.0	Moderate	
Wickham (WgB2, WgC2)	>10	35	0-7	Sandy loam	95-100	95-100	25-30	2.5-6.0	4.5-5.0	Low	
			7-21	Clay loam	95-100	95-100	50-60	0.8-2.5	4.5-5.0	Moderate	
			21-62	Clay loam to clay	95-100	95-100	50-70	0.6-2.5	4.5-5.5	Moderate	

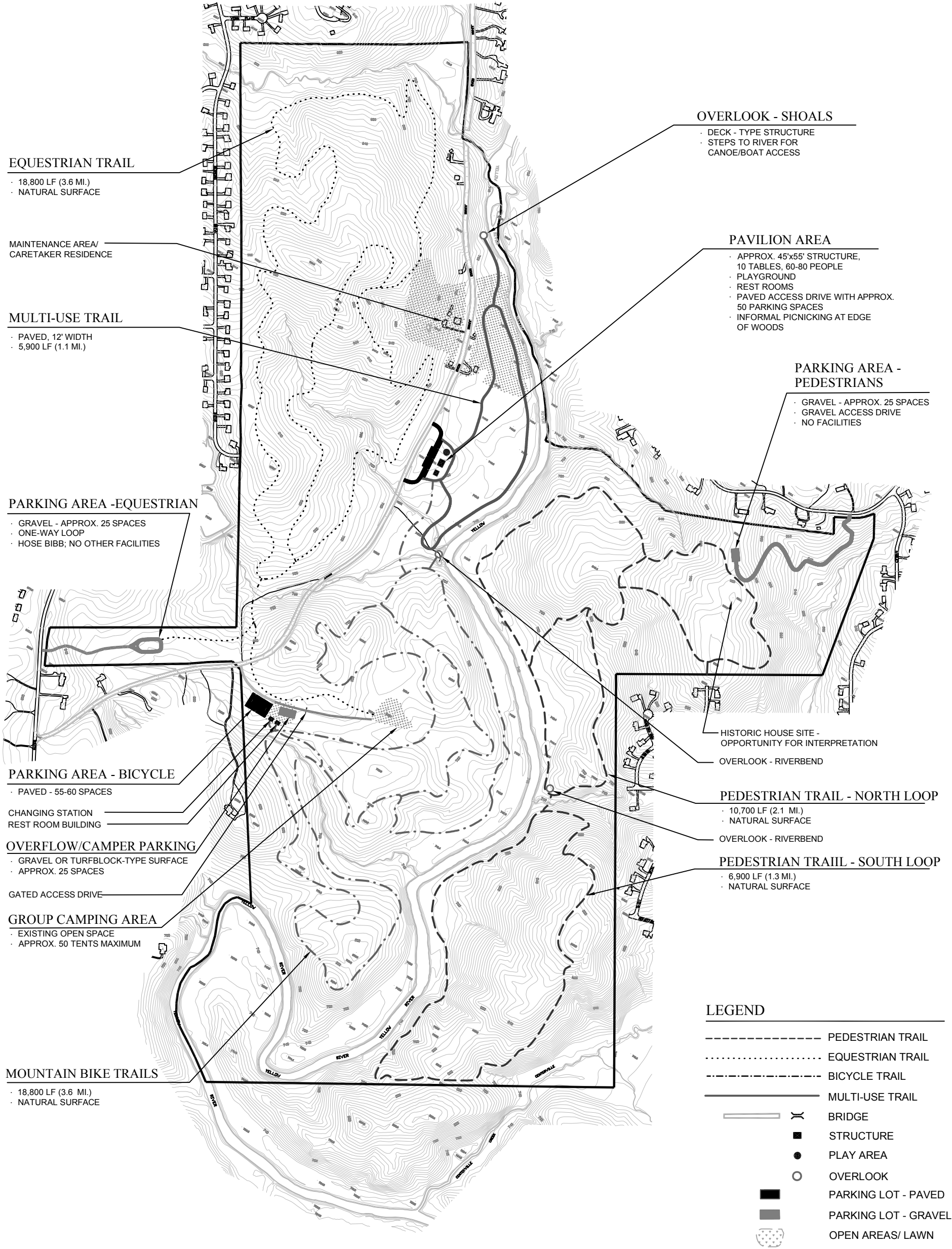


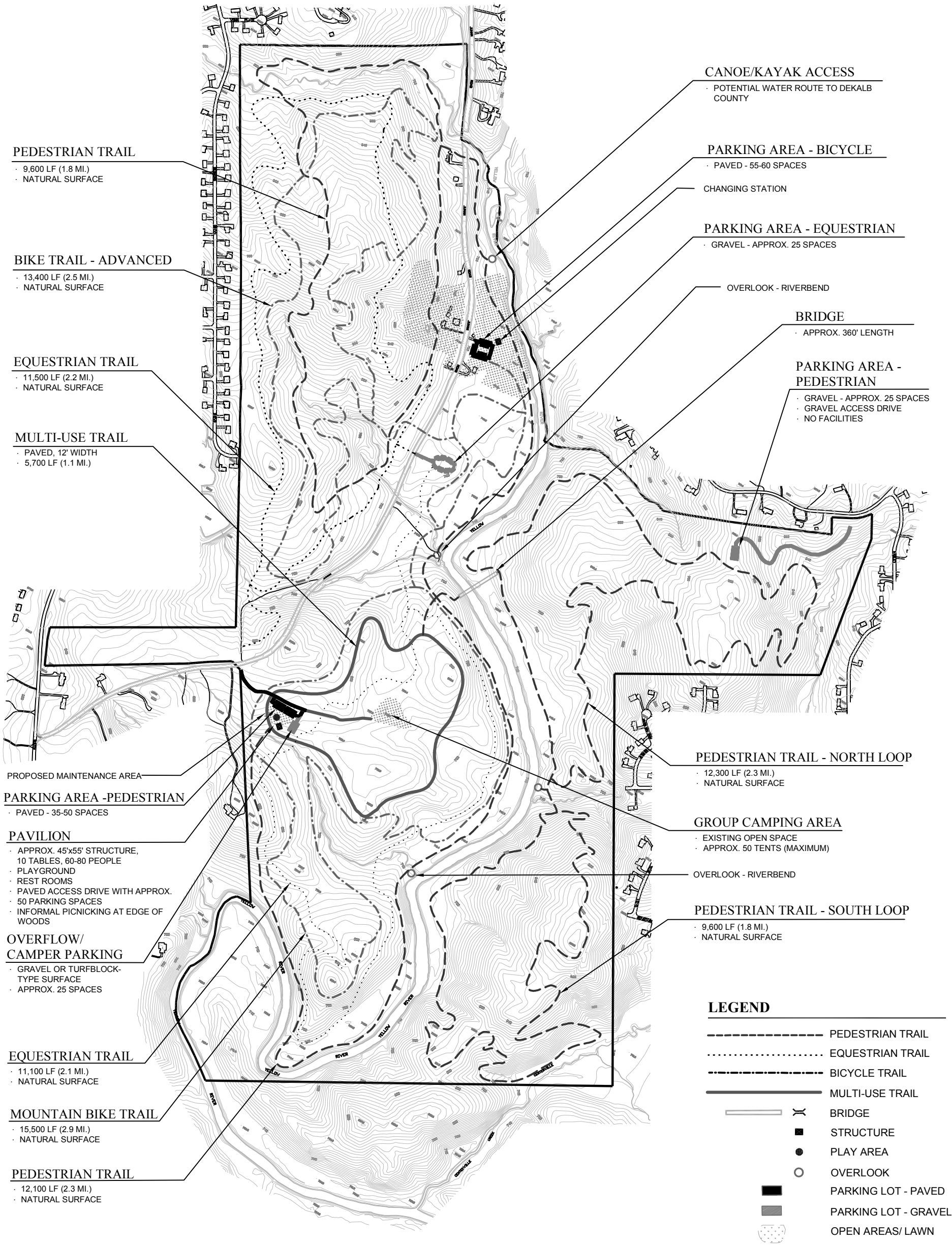
YELLOW RIVER MASTER PLAN
GWINNETT COUNTY, GEORGIA

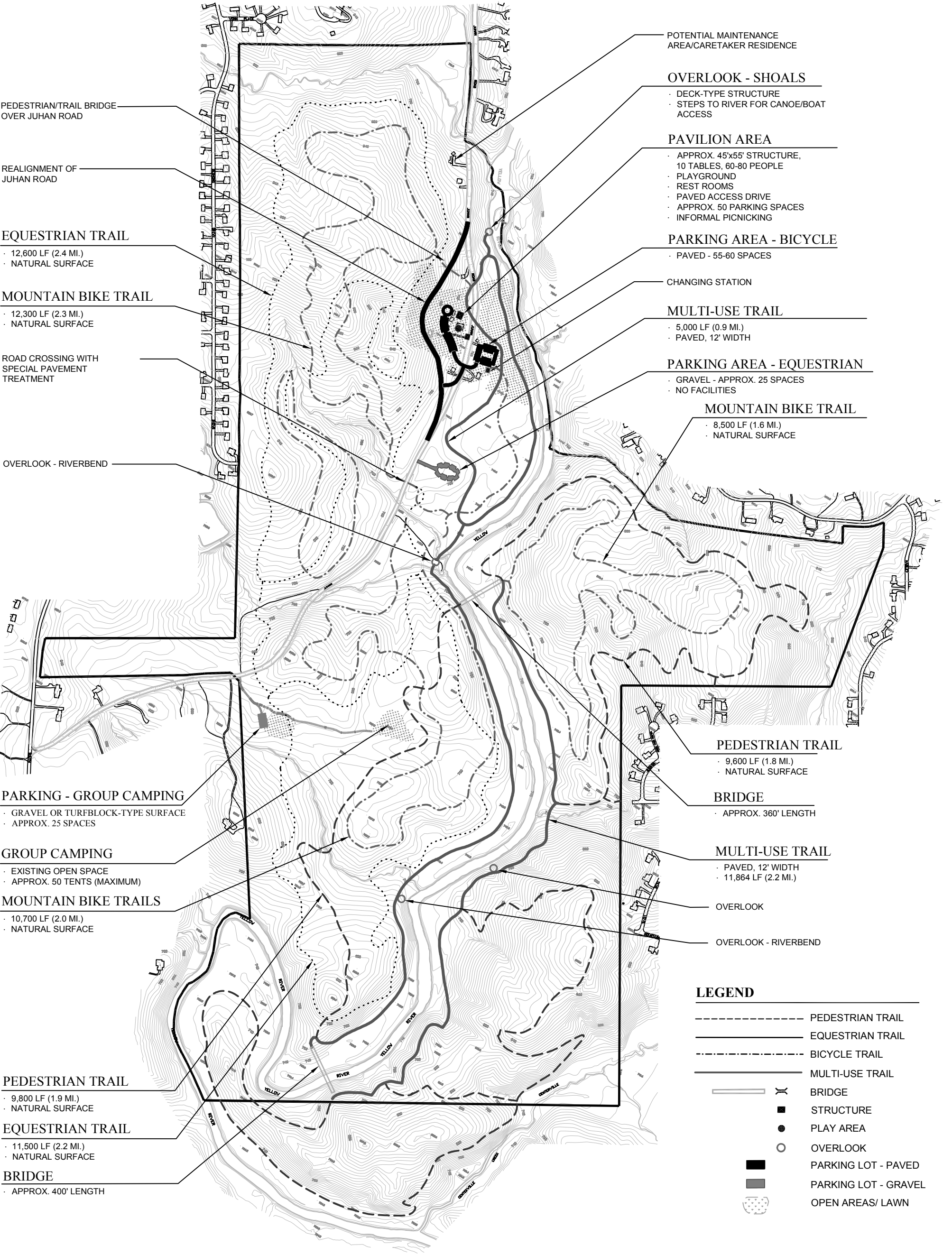


ISSUES & OPPORTUNITIES

Illustration D







PEDESTRIAN/TRAIL BRIDGE
OVER JUHAN ROAD

REALIGNMENT OF
JUHAN ROAD

EQUESTRIAN TRAIL

- 12,600 LF (2.4 MI.)
- NATURAL SURFACE

MOUNTAIN BIKE TRAIL

- 12,300 LF (2.3 MI.)
- NATURAL SURFACE

ROAD CROSSING WITH
SPECIAL PAVEMENT
TREATMENT

OVERLOOK - RIVERBEND

PARKING - GROUP CAMPING

- GRAVEL OR TURFBLOCK-TYPE SURFACE
- APPROX. 25 SPACES

GROUP CAMPING

- EXISTING OPEN SPACE
- APPROX. 50 TENTS (MAXIMUM)

MOUNTAIN BIKE TRAILS

- 10,700 LF (2.0 MI.)
- NATURAL SURFACE

PEDESTRIAN TRAIL

- 9,800 LF (1.9 MI.)
- NATURAL SURFACE

EQUESTRIAN TRAIL

- 11,500 LF (2.2 MI.)
- NATURAL SURFACE

BRIDGE

- APPROX. 400' LENGTH

POTENTIAL MAINTENANCE
AREA/CARETAKER RESIDENCE

OVERLOOK - SHOALS

- DECK-TYPE STRUCTURE
- STEPS TO RIVER FOR CANOE/BOAT
ACCESS

PAVILION AREA

- APPROX. 45'x55' STRUCTURE,
10 TABLES, 60-80 PEOPLE
- PLAYGROUND
- REST ROOMS
- PAVED ACCESS DRIVE
- APPROX. 50 PARKING SPACES
- INFORMAL PICNICKING

PARKING AREA - BICYCLE

- PAVED - 55-60 SPACES

CHANGING STATION

MULTI-USE TRAIL

- 5,000 LF (0.9 MI.)
- PAVED, 12' WIDTH

PARKING AREA - EQUESTRIAN

- GRAVEL - APPROX. 25 SPACES
- NO FACILITIES

MOUNTAIN BIKE TRAIL

- 8,500 LF (1.6 MI.)
- NATURAL SURFACE

PEDESTRIAN TRAIL

- 9,600 LF (1.8 MI.)
- NATURAL SURFACE

BRIDGE

- APPROX. 360' LENGTH

MULTI-USE TRAIL

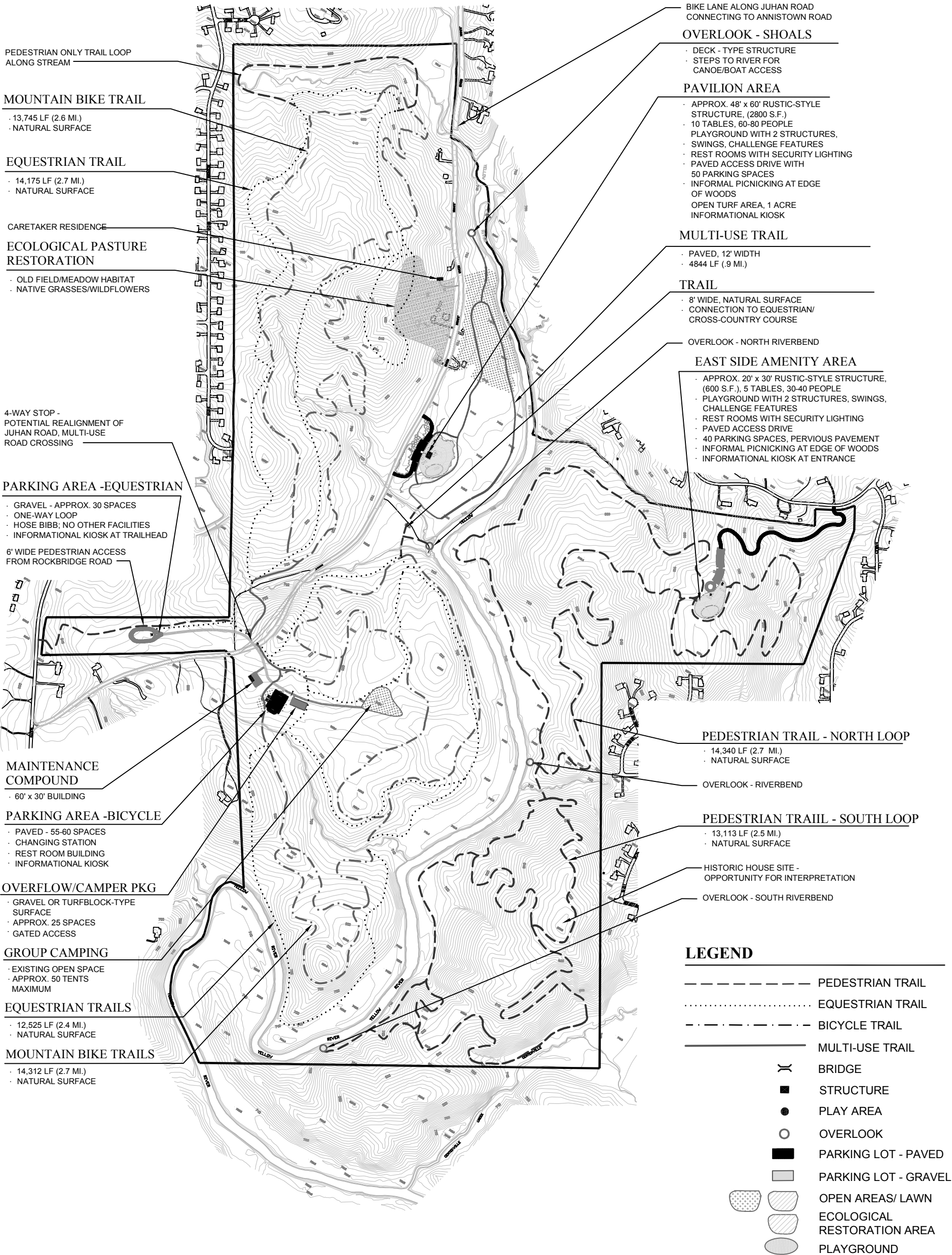
- PAVED, 12' WIDTH
- 11,864 LF (2.2 MI.)

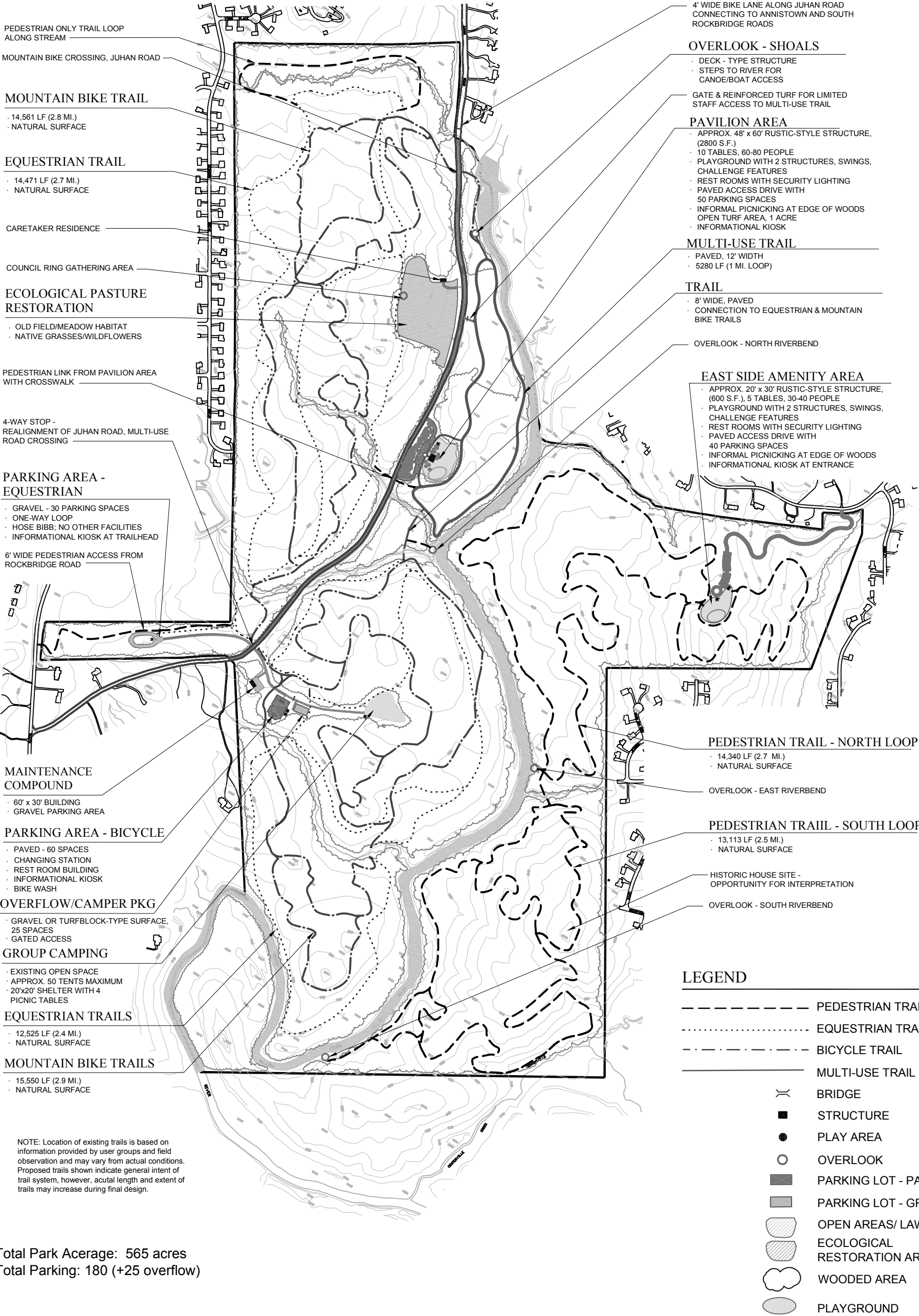
OVERLOOK

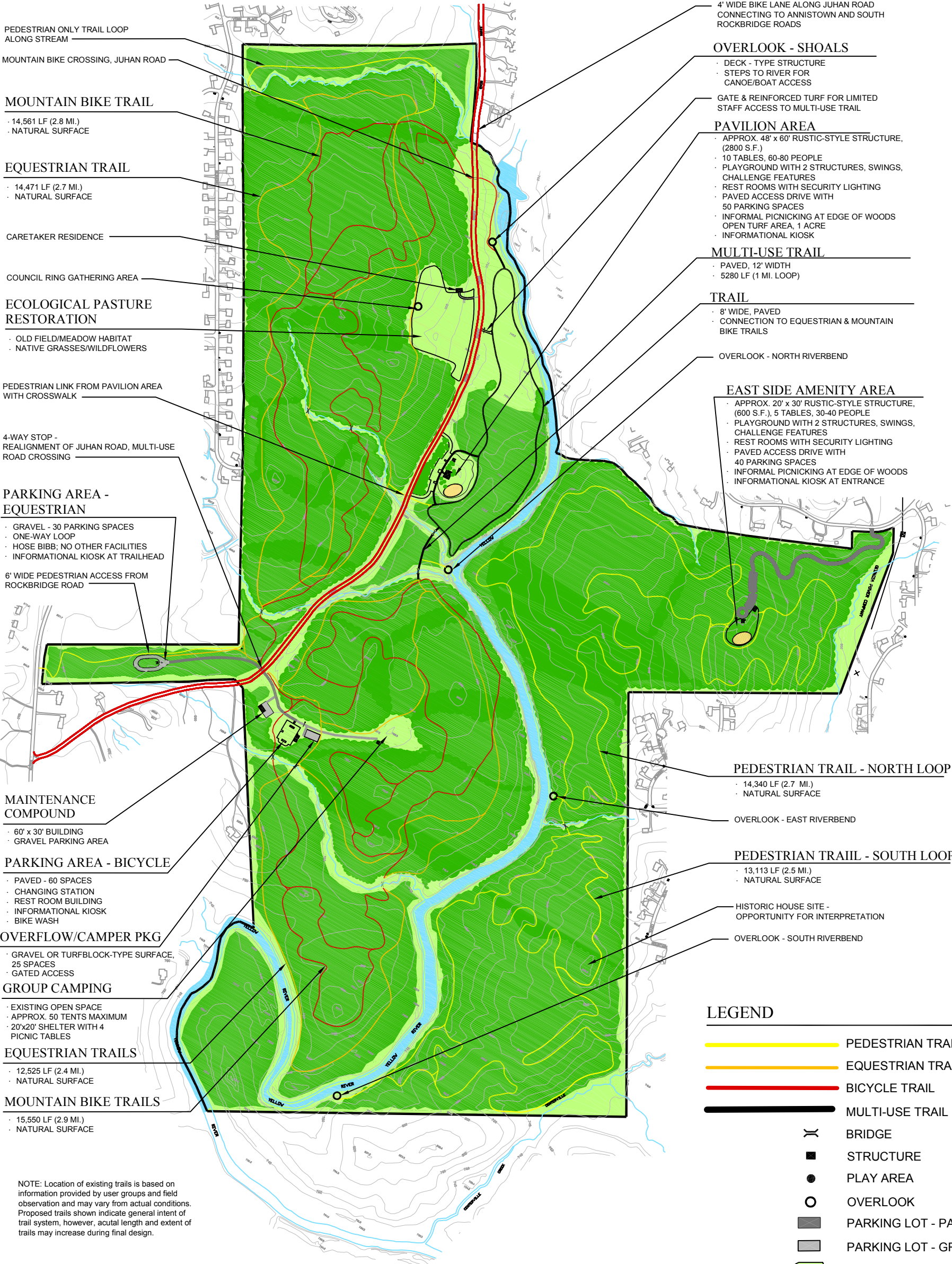
OVERLOOK - RIVERBEND

LEGEND

- PEDESTRIAN TRAIL
- EQUESTRIAN TRAIL
- - - - - BICYCLE TRAIL
- · - · - MULTI-USE TRAIL
- X — BRIDGE
- STRUCTURE
- PLAY AREA
- OVERLOOK
- PARKING LOT - PAVED
- PARKING LOT - GRAVEL
- OPEN AREAS/ LAWN







Total Park Acreage: 565 acres
Total Parking: 180 spaces (+25 overflow)

YELLOW RIVER PARK

MASTER PLAN UPDATE



GWINNETT COUNTY DEPARTMENT
OF COMMUNITY SERVICES,
PARKS & RECREATION PROJECT ADMINISTRATION
SEPTEMBER 2017

Yellow River Park Master Plan Update Gwinnett County, Georgia

Prepared For:

Gwinnett County Department of Community Services
Parks & Recreation Project Administration
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September, 2017

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SECTION PROJECT BACKGROUND

1.0 The original 565-acre Yellow River Park Site was assembled by the Gwinnett County Department of Public Utilities (DPU) for use as a water waste reclamation facility. In 1998 the Board of Commissioners purchased the site from DPU for use as an open space park. Prior to the County's acquisition, DPU had allowed equestrian and mountain biking groups to create trails for their use on the portion of the site west of the Yellow River which bisects the property. Access into the park site was at the time limited to this western portion of the site via Juhan Road. An additional parcel was acquired off Spain Road, which allowed for a public entry point to the eastern sector of the site, approximately one-third of the total property. Although the land had been inaccessible, people were finding ways in through the neighborhoods and began to develop rough trails.

In 2002 the Jaeger Company was commissioned by the County to develop a Master Plan for Yellow River Park. The principle goals of the Master Plan were to:

- Preserve the natural resources associated with the park
- Provide well-built trails for mountain bikers, equestrian riders and pedestrians
- Provide amenity areas to service surrounding neighborhoods and a variety of user groups
- Provide safe, environmentally sustainable and usable environment for passive park activities.

The master plan that was developed for this open space park provided amenities for a variety of users. The majority of the development was planned for the western side of the park due to a lack of accessibility on the eastern side. Development on the western sector of the park included: a pavilion / playground complex with restroom building, 1 mile paved loop trail and associated parking, an equestrian parking area with access to soft surface trails, a maintenance compound, a parking area with restroom and changing stations for mountain biking, group camping area, two river overlooks, approximately five (5) miles each of redeveloped and separated soft surface trails for mountain bikers and equestrians. On the eastern side of the park site an amenity area with access off Spain road was planned, however it was not constructed during the first phase of development.

At the time of the Master Plan development feasibility study for a pedestrian bridge across the Yellow River was also developed to connect the east and west sides of the park site; opening the remainder of the park to public use.

Five miles of trail is on the lower threshold for equestrians to consider it worth trailering their horses and many mountain bikers also consider five miles to be a short ride. Over the years, bike use had dropped and equestrian use was minimal within the park. As both bikers and equestrians tried to create longer trail ride experiences in the park, the separation of trail uses was no longer occurring. The development of over 10 miles of additional rogue trails were created; crisscrossing the official trails to create an excessive number of

unsigned trails. Due to safety concerns and user reductions, the Yellow River Park Trail System Assessment and Redevelopment Plan (YRTARP) was developed in 2012. The YRTARP conceptual trail plan simplified the trail system, maximized the trail experience within the park, combined some of the bike and equestrian trails into a shared use trail, and created almost 16 miles of trails for mountain bikers and nearly 5.4 miles for equestrians.

In 2014, land abutting both Yellow River Park and the Centerville Park Site was acquired by Gwinnett County. The 'Johnson Tract' consists of an additional 124 acres of mature hardwood forest, varying topography, and scenic beauty. The acquisition of the Johnson Tract expands the Yellow River Park acreage to 691.53 acres and offers the opportunity to link two conservation oriented parks; Yellow River Park and Centerville Park (Master Planned in 2015), via a meandering scenic greenway trail.

The primary purposes for the initial Master Plan update to Yellow River Park (2015) were as follows:

- Include the new park boundary revision / expansion due to the incorporation of the 'Johnson Tract'; which abuts both Yellow River Park and the Centerville Park Site,
- Update the existing natural surface trail system west of the Yellow River within the park by substituting the conceptual trail layout from the YRTARP,
- Re-plan the pedestrian trail system east of the Yellow River by incorporating a link to trailhead facilities to be constructed at the Centerville Park Site, expanding the trail system through the Johnson Tract to the east, bridging the Yellow River and extending the pedestrian trail system to both the existing Juhan Road Trailhead and the Juhan Road Pavilion Playground Complex via the "Johnson Greenway Trail".

SECTION PROJECT UNDERSTANDING

2.0 The Master Plan Update for Yellow River Park includes the addition of the 125 acre Johnson Tract which is to provide a greenway trail connection. The Johnson Greenway Trail, will connect the Centerville Park Site Trailhead and the existing Yellow River Park Trailhead on Juhan Road. The route of the 12' wide paved Johnson Greenway Trail is intended to exploit the scenic opportunities of the Johnson Property and provide a more extended experience. In addition to the Greenway Trail, a new natural surface pedestrian trail loop, a minimum of 6 miles in length, is to be designed within the Johnson Property and the portion of Yellow River Park on the eastern side of Yellow River.

The trail design on the Johnson Property must consider construction access for the substantial bridges needed to cross both Centerville Creek and the Yellow River, any addition-

al crossing that may be necessary to cross smaller valleys and the physical and hydrological consequences associated with construction

SECTION PROJECT APPROACH

3.0 Working directly with the Gwinnett County Greenway Coordinator and Department of Community Services Staff, the Yellow River Master Plan Update Project passed through a series of design stages before a final Master Plan was approved. The following represent the milestones completed along the way.

- Submittal of Concept layout to Gwinnett County Parks Staff
- Presentation of Preliminary Master Plan to Gwinnett County Parks Staff
- Preliminary Master Plan Public Input Meeting
- Submittal of Final Master Plan w/ Cost Estimate (September 2016)
- Refinement / Update to Master Plan w/ Updated Cost Estimate (September 2017)

The following provides a brief description and timeline of sequence of Meetings.

Site Walk with Gwinnett County Staff

jB+a, inc. and the Gwinnett County Greenway Coordinator and County Staff did an initial site walk of the Johnson Property on March 31, 2014. The intent was to gain a basic understanding of the topography of the site and investigate potential river crossing options.

Preparation of Base Information

jB+a, inc. prepared AutoCAD base information utilizing County GIS files, Yellow River Park Phase I As-built survey, Johnson Property Boundary Survey, aerial photography obtained from Gwinnett County, and digital files prepared during the Yellow River Park Trail System Assessment and Redevelopment Plan.

Site Reconnaissance

jB+a spent several days on site to get a sense of its opportunities and constraints. Utilizing a Trimble 6000 geoXH GPS unit, jB+a hiked the site to identify both positive and negative control points for the greenway layout and located existing soft surface paths. With this information, a conceptual contour route for the greenway trail was planned out.

Development of Concept Plan and submittal to County Staff for review

jB+a submitted a Concept Plan to County Staff for comment. The Concept plan illustrated the proposed layout for the Johnson Greenway Trail, proposed locations for both the Centerville Creek and Yellow River Bridge structures, and approximately 6 miles of natural surface trails. The comments made by County Staff were then incorporated into the Preliminary Master Plan.

Preliminary Master Plan

A Presentation of the Preliminary Master Plan graphic was given to County Staff on August 12, 2015 by the Consultant. The Preliminary Master Plan included the refinements requested by Gwinnett County during the Concept review.

As the Preliminary Master Plan was being developed by the Park Design Consultant, jB+a, a preliminary design report (PDR) and 50% design package was being developed by the Bridge Engineer, Parker Consulting Services. The PDR included the following: (RE: Appendix D - page 49)

- General site condition evaluation for the trail route and bridge siting
- Hydraulic evaluation for a no-rise certification or compensating volume on Yellow River and Centerville Creek
- Bridge geometry evaluation
- Bridge construction techniques and methods
- Bridge materials evaluation
- Required building and environmental permitting identification

Preliminary Master Plan Public Interest Meeting

A Public Interest Meeting was held on September 26, 2015 at the Yellow River Park Pavilion. The meeting was conducted in an open house format where park users could stop by the pavilion to view the updated Yellow River Park Master Plan. The consultant and County Greenway Coordinator were on hand to answer questions and gather feedback.

Master Plan Development

Based on comments received from the Public Interest Meeting and additional comments from the County the Preliminary Master Plan was further revised into a Final Master Plan graphic. (RE: Graphic C- page 23). An Opinion of Probable Cost associated with the development of the Master Plan was also developed.

Master Plan Update

During the initial update to Yellow River Park there was much discussion regarding the concern over shared use mountain biking and equestrian trails. County Staff reevaluated the proposed use of the eastern sector of the park. Through additional considerations further refinements to the Master Plan were requested. (RE: Graphic D - page 25).

SECTION PROGRAM OPTIONS

- 4.0 The program options for the updated Yellow River Park Master Plan include the 12' wide paved Johnson Greenway Trail, a new natural surface hiking / equestrian trail system extending through the Johnson Property and that portion of Yellow River Park east of the Yellow River, two substantial bridge crossings; a Centerville Creek Bridge and a Yellow River

Bridge, and a pump track and associated parking on the western side of Yellow River Park.

SECTION PROGRAM DEVELOPMENT

5.0 Working with the County Greenway Coordinator and County Staff, the consultant, jB+a, developed a program outline. What follows is the design stage progression from concept through the master plan design. A description of each of the stages is included.

5.1 Concept Development

Utilizing base information compiled from various data sources and a Trimble 6000 geoXH GPS unit, jB+a hiked the expanded Yellow River Park and mapped a 2.1mile conceptual greenway layout. The layout was intended to exploit the scenic opportunities of the Johnson Property and provide a more extended experience. In addition to the conceptual greenway layout jB+a hiked and mapped 8.63 miles of natural surface trails on the eastern side of the Yellow River Park Property and potential bridge crossing locations for a Yellow River Pedestrian Bridge and Centerville Creek Bridge. The data and trail alignment were submitted to the County for review prior to the development of a Preliminary Master Plan. The County requested the following inclusions for the Preliminary Master Plan:

- Include the Conceptual Trail layout developed in the 2012 Yellow River Trail Assessment and Redevelopment Plan (YRTARP) as the trail layout for the western side of the park and show tie-ins.
- Develop an enlargement illustrating a new alignment for the existing trails at the rivers edge as they would need to be adjusted to accommodate a Yellow River Bridge crossing. (RE: Graphic B - page 21)

The concept was adjusted as noted and developed into the Preliminary Master Plan

5.2 Preliminary Master Plan - Presentation to County Staff

On August 12, 2015, a preliminary masterplan update graphic was presented to the Gwinnett County Greenway Coordinator and Parks Staff for comment. Based on Staff comments the Preliminary Master Plan was revised prior to the Public Input Meeting.

Staff comments are as follows:

- Include Spain Road Tract within property boundary
- Include original Master Plan note for Meadow Restoration near Juhan Road.
- Include original Master Plan note for group camping
- Include original Master Plan note referencing Historic House Site.
- Provide dimension callout for Maintenance Compound parking area
- Eliminate reference to RV parking
- Substitute park sector terminology (Creekside, Riverside, Eastside) and include

- insert illustrating sectors
- Update park acreage
- Differentiate between the existing paved 1 mile loop trail at the pavilion and the Johnson Greenway Trail.
- Provide two (2) river overlook structures on east side of Yellow River, include pedestrian connections to overlooks.
- Include pedestrian spur trail along extending from Centerville Creek along the Yellow River
- Adjust the width of the Johnson Greenway Trail to 12' at the northern terminus path before it reaches the existing multi-use trail loop at Juhan Road.
- Make graphic adjustments to floodplain and FEMA lines for legibility.

5.3 Preliminary Master Plan - Public Input Meeting

On September 26, 2015 the Preliminary Master Plan Update Public Input Meeting was held at the Yellow River Park large pavilion. The meeting was conducted in an open house format where park users could stop by the pavilion to view the updated Yellow River Master Plan. The graphic was revised to include the comments requested by County Staff during the Preliminary Master Plan presentation on August 12, 2015. In addition, the graphic included an updated Yellow River Park boundary which incorporated the 125 acre Johnson Tract, proposed trail layout from the Yellow River Trail Assessment and Redevelopment Plan (2012), proposed location of both the Yellow River bridge crossing and Centerville Creek bridge crossing, proposed Johnson Greenway layout and proposed natural surface trail layout within the Eastern side of Yellow River Park. An illustrative graphic of the Centerville Park Master Plan was also on display to show the connection between Yellow River Park and Centerville Park via the Johnson Greenway. The Gwinnett County Greenway Coordinator and jB+a consultant were available to provide explanation of each of the plans, answer questions and address concerns from the public participants.

Several interest groups attended the public input session including members of the mountain biking community, equestrian community, hiking community, and the canoe / kayak community. Many participants offered up comments and suggestions.

Community Survey Forms were available for the public to fill out. The form included an area where participants could describe what they liked about the plan and any concerns they may have regarding future development of the park. (RE: Preliminary Master Plan - Graphic A - page 19)

Equestrian Considerations

The 2002 Yellow River Park Master Plan called for the park to be redeveloped with separated trails for horses and mountain bikes with approximately 5 miles for each. Five miles of trail is on the lower threshold for equestrians to consider it worth trailering their horses. Many

mountain bikers also consider 5 miles to be a short ride. Over the years, bike use has dropped and equestrian use is minimal within the park. As both bikers and equestrians try to create longer trail ride experiences in the park, the separation of trail uses is no longer occurring. In addition, 10 miles of rogue trails have been created crisscrossing the official trails to create an excessive number of unsigned intersections. There are currently 22 miles of trail within the park, with a majority being unmarked or incorrectly marked trails. Due to safety concerns and user reductions, the Yellow River Park Trail System Assessment and Redevelopment Plan (YRTARP) was completed in 2012. The public was invited to share their comments about the condition of the trails. The greatest like of the park's trail system was that there is an extensive network and variety of trails and the greatest dislike was the confusing navigation, signage and intersections. In response to the public's desire to maximize the trail experience at the park, the recommended trail concept plan combined some of the bike and equestrian trails into a shared trail. This created almost 16 miles of trails available for mountain bikers and 5.4 miles of trail for equestrian use.

At the Yellow River Park Master Plan Update Public Input Meeting, several equestrians voiced their concern about sharing the trails at Yellow River Park. They felt that it was unsafe for mountain bikers and equestrians to be on the same trail. The speed and the unfamiliarity of bikes can startle the horses and cause injuries. However, they were also very vocal about not wanting to lose any of the equestrian trail mileage.

This vocality and concern over the issue of shared mountain biking / equestrian trails and the additional acreage of the Johnson Tract prompted the County to consider the separation of trail uses beyond what was originally proposed. The original 2002 master plan envisioned the Spain Road access as an east side amenity area with parking, restrooms and playground area. A revised vision would create a replacement equestrian parking area in this zone east of the river with complete separation of equestrian and mountain biking trails.

After further consideration by County Staff it was determined that the user interest was not significant enough for this change to be implemented at this time.

Blueway Considerations

The 2002 Yellow River Park Master Plan called for a canoe / kayak launch to be provide near the shoals at the northernmost point of the park site. This area currently does not provide permanent parking and boat users carry their equipment from the river to Juhan Road and vice versa to launch and take out boats. An equally vocal user group attended the Public Input Meeting requesting consideration of an additional take-out within the park and potential permanent parking area. The County agreed to revisit the idea looking at the potential to have an additional take-out located near the proposed Yellow River bridge site

with access to the bicycle parking area. A permanent parking area was also considered near the old caretaker's home (demolished after the 2009 flood) with a potential vehicular turn around for pick up and drop off near the shoals put-in.

Due to steep slopes along the Yellow River banks and the liability associated with a County blue-way trail the County opted to table this option for the time being.

5.4 Master Plan, September 26, 2015 (RE: Graphic C - page 23)

The Final Master Plan graphic, with the County requested refinements of including a vehicular turn around at the Yellow River Bridge intersection to accommodate gators and maintenance trucks, was completed following the Public Input Meeting. An opinion of probable cost in association with the updated master plan was also available.

5.5 Master Plan, September 25, 2017 (RE: Graphic D - page 25)

Continued public interest and concern for the separation of equestrian and mountain biking trails prompted County Staff to reevaluate the proposed use for the eastern sector of the park. After further consideration, the County requested additional refinements to the September 26, 2015 Master Plan by the consultant. The refinements included shifting the equestrian trails and parking area to the eastern sector of the park; taking advantage of a Spain Road access point that would separate the equestrian and mountain bike uses. Realignment of the existing pedestrian trails on the eastern sector to accommodate the new entrance drive and parking area was required. In place of the former equestrian parking area a pump track was planned. In addition, trails within the Creekside Sector and Riverside Sector are to be re-signed for Biking / Hiking only.

A second study, which would consider the option of an additional land purchase along Spain Road, that would mitigate the impact of development on the eastern sector of the park site was requested by the County. (RE: Graphic E - page 27)

SECTION PROGRAM ELEMENTS

6.0 This section defines those park program elements that relate to the Yellow River Master Plan Update.

Greenway Trail

The Johnson Greenway Trail is to be a 12' wide paved asphalt trail that measures approximately 2.8 miles total (2.19 miles- East, .62 Miles - West). The route of the Johnson Greenway Trail is intended to exploit the scenic opportunities of the Johnson Property and provide a more extended experience. The trail extends from the existing Yellow River Park trailhead at Juhan Road on the western side of the Yellow River to a bridge crossing at Yellow River and then continues through the eastern side of the park crossing over a second bridge at Centerville Creek and continuing to the eastern most boundary at Centerville Park. Centerville Park is intended to serve as an additional trailhead to the Johnson Greenway

and Centerville Park's 2-mile perimeter multi-use trail extends the greenway experience.

Though the Greenway is to provide a more scenic experience through the park, the AASHTO "Guide for the Development of Bicycle Facilities" guidelines should be followed.

On the eastern side of the Yellow River the greenway trail should be widened just before the bridge to accommodate a County maintenance vehicle turn around. An overlook - the Yellow River Bridge pedestrian overlook is to be provided near the turn around. The overlook should optimize views to the bridge and the Yellow River.

Bridges

The site will need two bridges: one crossing the Yellow River and one crossing Centerville Creek. The locations selected using the high ground will keep the trail and bridge system above the flood elevation for the best longevity. The Centerville Creek Bridge will have to support construction equipment for the Yellow River Bridge and greenway trail construction. The Yellow River Bridge will provide support for pedestrian and service vehicles. Balancing cost with aesthetics and constructability, a weathered steel bridge or timber bow truss bridge with heavy timber approaches for Yellow River and a heavy timber bridge for Centerville Creek are recommended.

The required free span over the Yellow River lends itself to either a timber bow truss bridge or a steel bridge due to access and construction. The bridge size is consistent with readily available bridges from steel and timber manufacturers. A bridge constructed out of weathering steel that will provide a 50-year low maintenance structure is recommended. The bridge foundation would utilize helical piles with a poured pile cap for the steel bearing towers. The design of these helical and approach boardwalk piles will require a geotechnical investigation.

The Centerville Creek bridge will work well with a laminated beam free span bridge and heavy timber framed approaches. (RE: Appendix D - page 47)

Spain Road Access Drive

The vehicular entrance to the Eastside Sector of the park utilizes the narrow section of the park property that abuts Spain Road. The entrance is to align perpendicular to the road as per the master plan. This entrance is sited to take into consideration sight distances.

The vehicular drive is to be constructed to accommodate not just two-way directional traffic but also heavier trucks with horse trailers. The surface profile of the vehicular drive lanes will therefore be vehicular grade asphalt

The width of the park drive is to be 24' (12' lanes) with a 2' finished shoulder on either side. Due to the steep grades of the site, the entrance drive will require a series of switch backs to maintain the grade of the road at 10% or less; all efforts have been made to minimize the length of roadway at 10% grade. The internal radii of the switch backs must be 50' or greater.

Note: The County may wish to consider an alternate Spain Road entrance that would reduce the length of the vehicular drive, minimize impact to the site through grading and tree removal and reduce cost. An alternate entrance location, however, would require the acquisition of an adjacent property abutting Spain Road. Refer to the Cost Estimate and Summary of Costs for potential savings. (RE: Appexdix A - page 31 and Appexdix B - Page 37)

Equestrian Parking Area

The one-way loop drive at the equestrian parking area will be constructed of vehicular grade asphalt to accommodate heavier trucks and horse trailers. Though one-way, the drive loop is 24' in width to provide extra turning area for entering and exiting horse trailers

The parking area within the loop drive measures approximately 230 x 80, is sloped to drain at 2%, and can accommodate up to 10 horse trailers in an angled parking configuration. The parking area is to be gravel, providing a safer footing surface for horses. Two hitching areas, 6' high timber fences, are provided at the southern end of the parking area, near the Equestrian / Hiking trail connection and near the comfort station / composting toilet.

Natural Surface Trail System

Three separate natural surface trails systems are included: mountain bike (existing within the Creekside and Riverside Sectors of the park- not part of this update), equestrian, and hiking. The typical tread way of the natural surface trail system will be graded mineral soil, pitched to drain with high and low points to assure that whenever water accumulates on the trail it will shed to the down slope side before the water joins with drainage pattern parallel to the tread-way.

The trail alignment should be cleared to provide the necessary vertical clearance as described below for the type of user. The trail should be cleared of hazards, such as dead or leaning trees, which should be cut down and left in full contact with the ground to hasten decay. Small hanging branches should be chipped and spread as mulch. Roots, trunks and other trail debris may be placed as barricades to prevent users from straying too far off the intended path.

Where the trail crosses the natural drainage channels, a pedestrian bridge with handrails is to be placed. The style of bridge should blend with the surrounding environment yet meet all the County standards pertaining to pedestrian bridges.

Equestrian / Hiking Natural Surface Trails

Located only within the Eastern Sector of the park the equestrian / hiking trails include the North, South and River Front Loops. The center line of these natural surface trails will be field located / verified and flagged by a County approved professional trail designer and builder. All attempts have been made to utilize as many of the existing natural surface trails as possible to minimize grading and disturbance to the site while providing positive user experiences and sustainability. A total of 7.17 miles of equestrian / hiking trails are provided on the master plan graphic. Trails are to be 6' wide with a vertical clearance of 10-12' to accommodate 2-way traffic and equestrian riders. At the time of development, the proposed equestrian / hiking trail system, as shown on the masterplan, should be revisited on site to ascertain trail stability and adjust the trail as necessary.

Hiking / Pedestrian Only Natural Surface Trails

Pedestrian only hiking trails will be 3-4 feet wide with a vertical clearance of 6' minimum. These trails include the Centerville Creek Loop and two (2) spur trails; one connects the loop to Centerville Park, the other connects the loop to the River Front Loop (Equestrian / Hiking trail). A total of 1.89 miles of pedestrian only hiking trails are provided.

River Overlook

Three (3) overlooks are planned for the eastern sector of Yellow River Park. Two overlooks are to be sited in areas where accretion rather than erosion of river banks occur; these locations are noted on the master plan. A third overlook is planned near the Yellow River Bridge. The overlooks are to be constructed utilizing heavy timber and helical piles with poured pile cap. A standard Gwinnett County handrail is to be provided. Areas near the overlooks are to be cleared of invasive plant materials and replanted with native riparian plantings.

Composting Toilet

Two (2) composting toilet facilities are to be provided with the park; one within the pump track venue, the second at the equestrian parking area within the Eastern Sector of the park. Dual tank models are recommended to maximize the performance available from the composting toilet system.

Retaining Walls

Due to the proximity of the park to Stone Mountain, all seating walls and retaining walls are to be faced and capped with granite stone.

Directional Kiosks

Information kiosks are to be located along the Johnson Greenway; one at each end. The kiosk in the western end is to be located in the vicinity of the group camping area near the Greenway. The kiosk for the eastern sector is to be located near the property line of Yellow River Park and Centerville Park at the greenways intersection with the Centerville Park perimeter multi-use trail loop. A third information kiosk is to be located at the equestrian parking area on the in the eastern sector near the comfort station. Each kiosk should include park information and provide a site map indicating “You are here” graphics for user orientation. Kiosks should be roofed structures to provide additional shelter during inclement weather. Park maps should be UV protected.

Park Signage

Trail directional signs will be placed at intersections of all trails. Trail mileage signs will be placed along stretches of trails at .25 mile intervals. A trail route and mileage map should be included on each kiosk sign to explain the trail routes (shown in different color alignments), lengths and ability levels.

Interpretive Signage

Interpretive signage should be included along all trails, streams, wildlife habitats, and other points of interest which interpret natural, cultural and historic features or stories for park visitors. Interpretive signage may also interpret management activities within the park such as instruction on the removal of invasive species, the reforestation of slopes, or the reintroduction of native species for example.

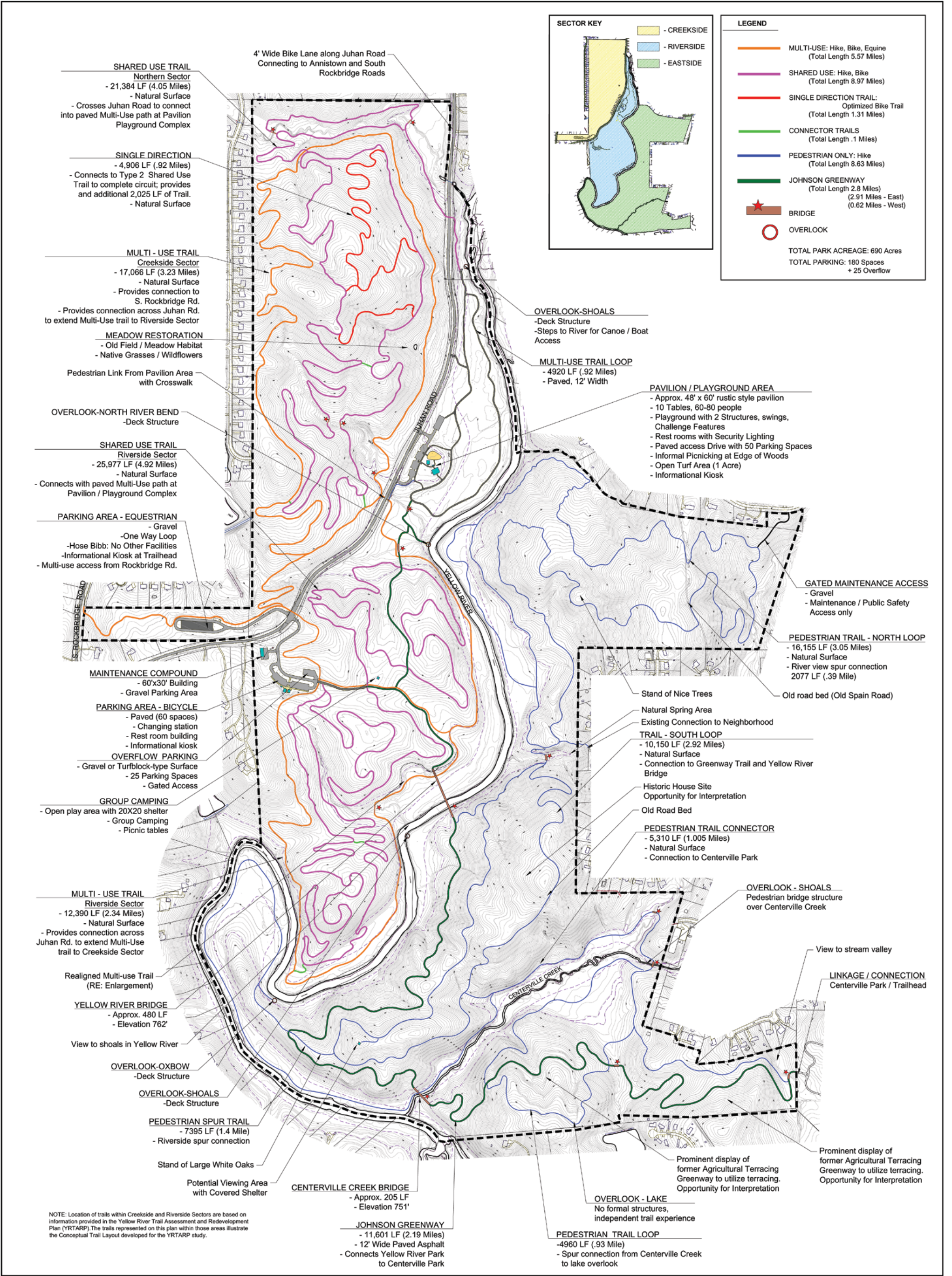
Revegetation of Greenway Trail verges

Areas along the Greenway Trail that have been disturbed for the construction of the trail should be replanted with a combination of appropriate native woodland species to aid in the reestablishment of plant materials and discouragement of erosion.

SECTION GRAPHICS

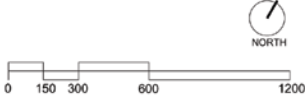
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Graphic A: Preliminary Master Plan	page	19
Graphic B: Preliminary Master Plan Enlargement	page	21
Graphic C: Master Plan (September 26, 2015)	page	23
Graphic D: Master Plan Update (September 25, 2017)	page	25
Graphic E: Option II - Spain Road Access	page	27



Prepared for:
Gwinnett County Department of Community Services

Prepared by:



PRELIMINARY MASTER PLAN
YELLOW RIVER PARK
September 26, 2015

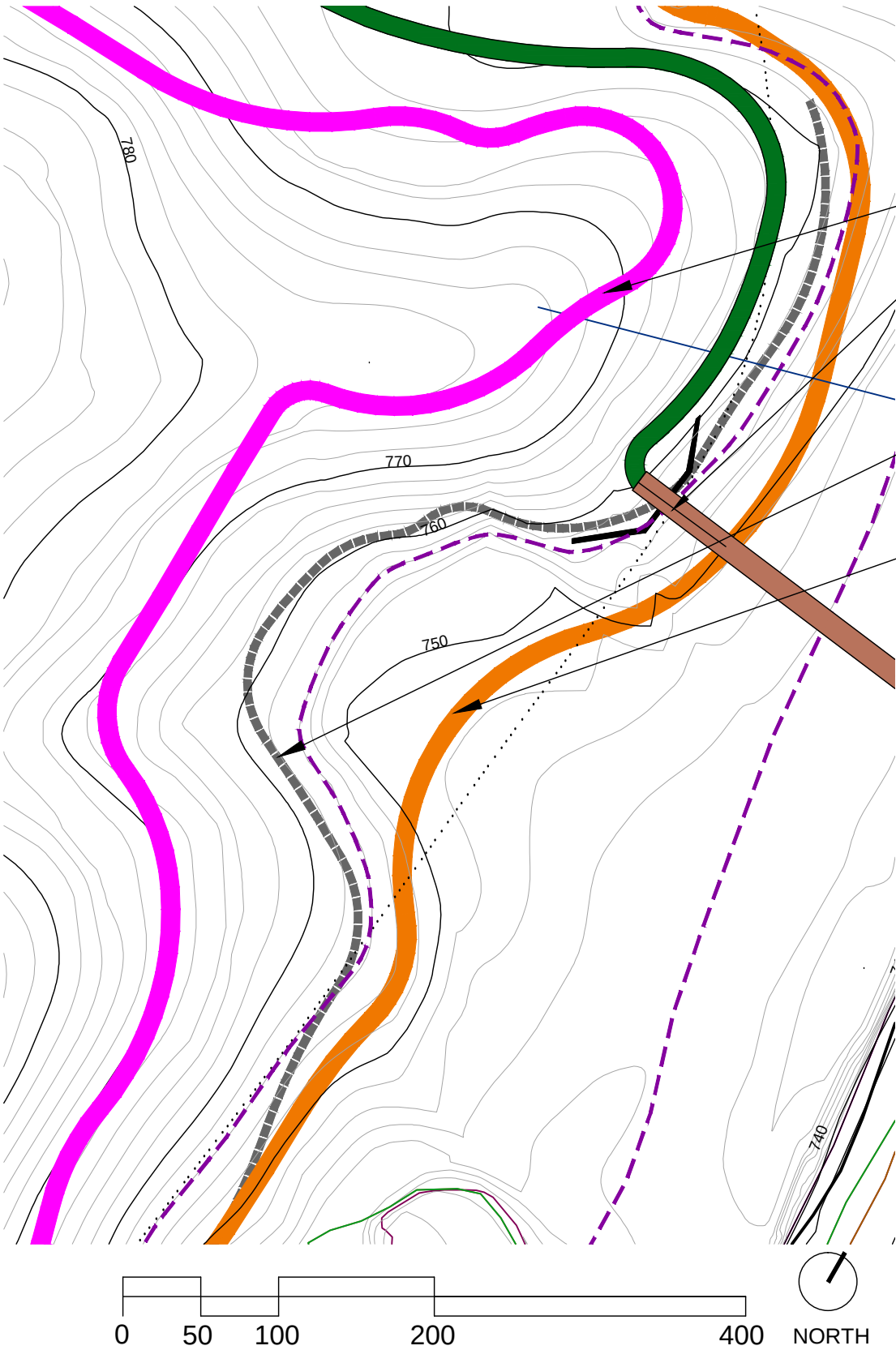
PRELIMINARY MASTER PLAN

YELLOW RIVER PARK

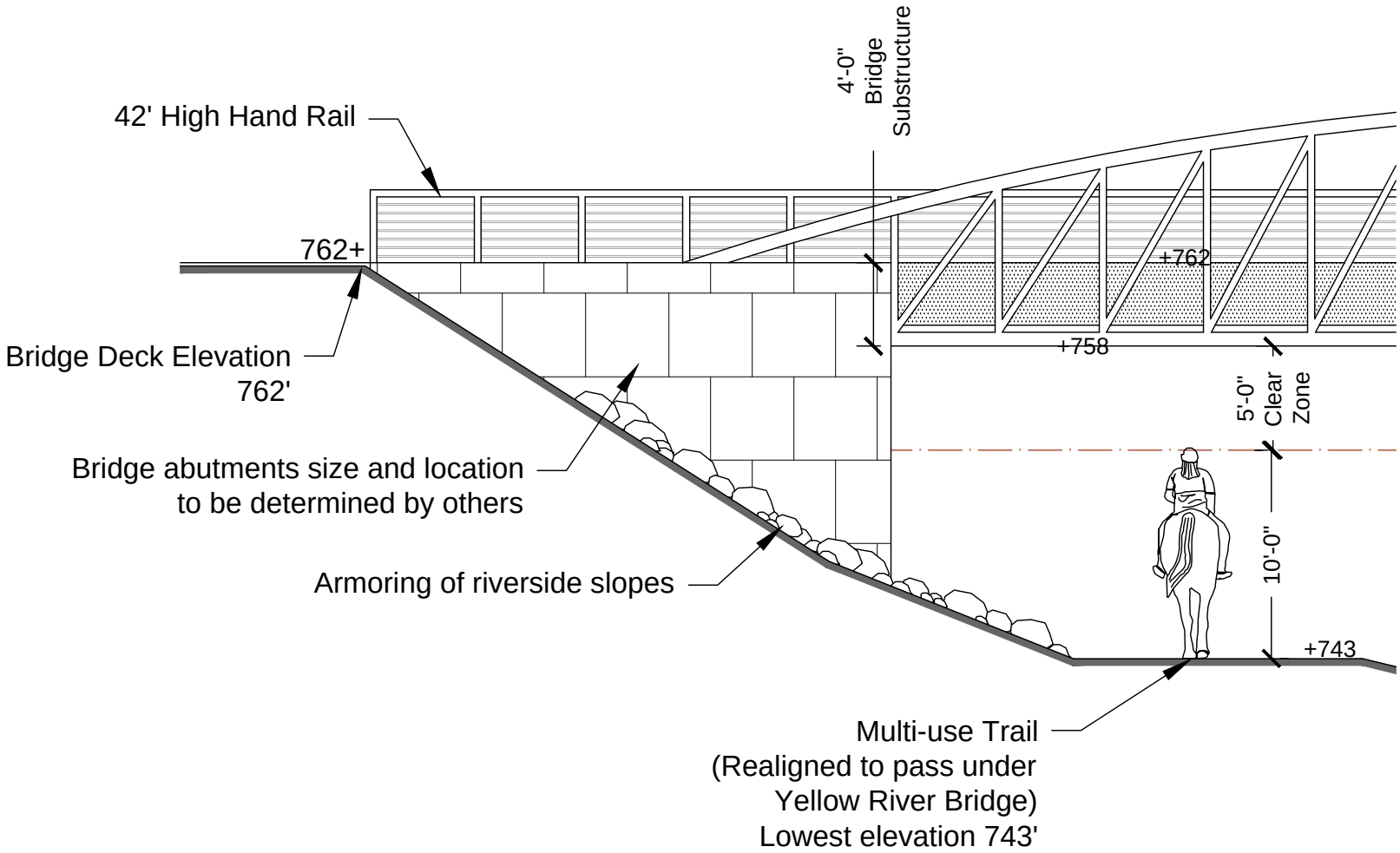
September 26, 2015

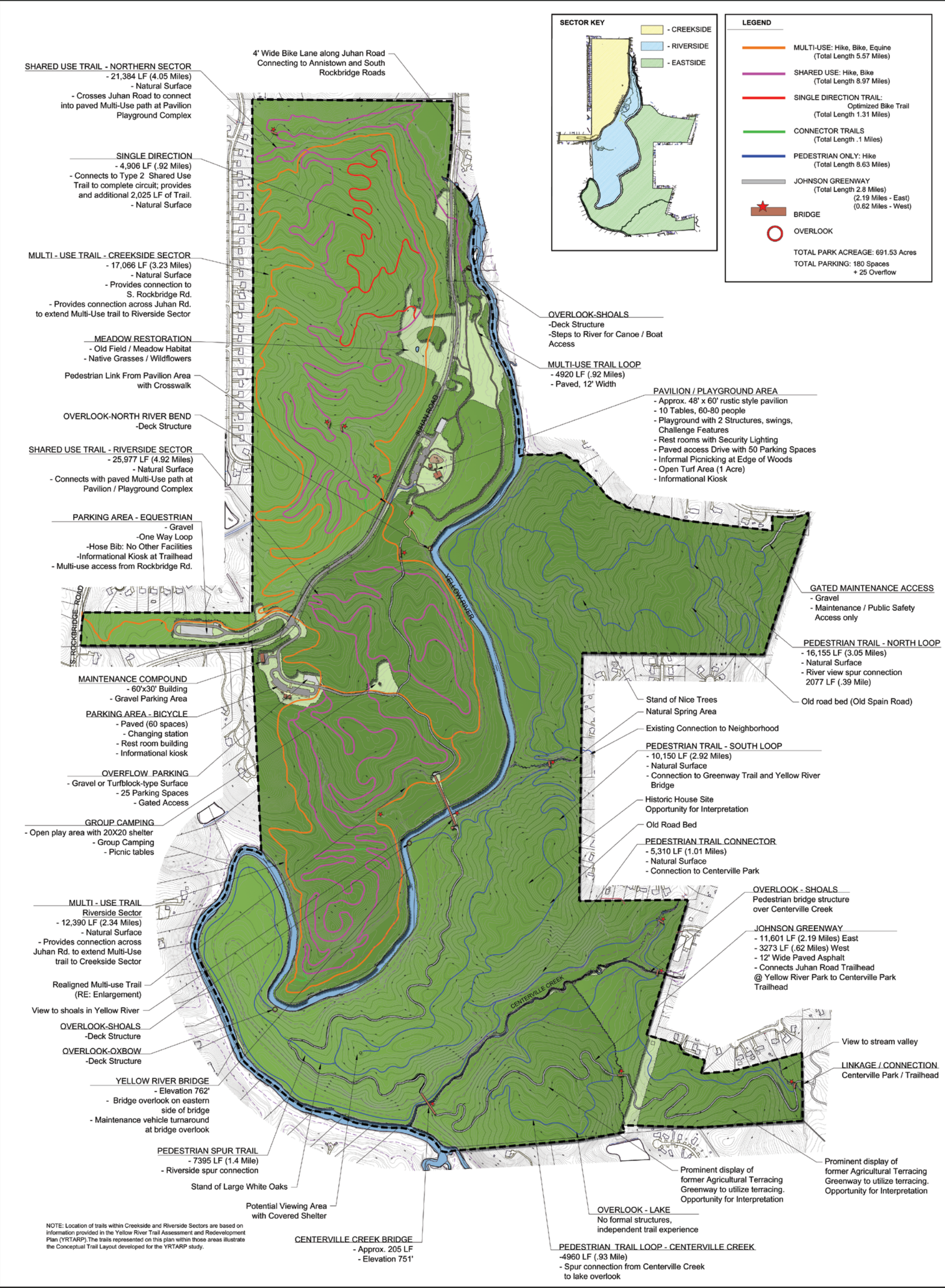
Prepared for:
Gwinnett County Department
of Community Services

Prepared by:



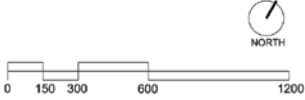
- Shared Use Trail
- YELLOW RIVER BRIDGE
- Approx. 205 LF
- Elevation 751'
- Original Alignment of
Multi-use Trail
- Multi -use Trail
(Realigned to accommodate
Yellow River Bridge)



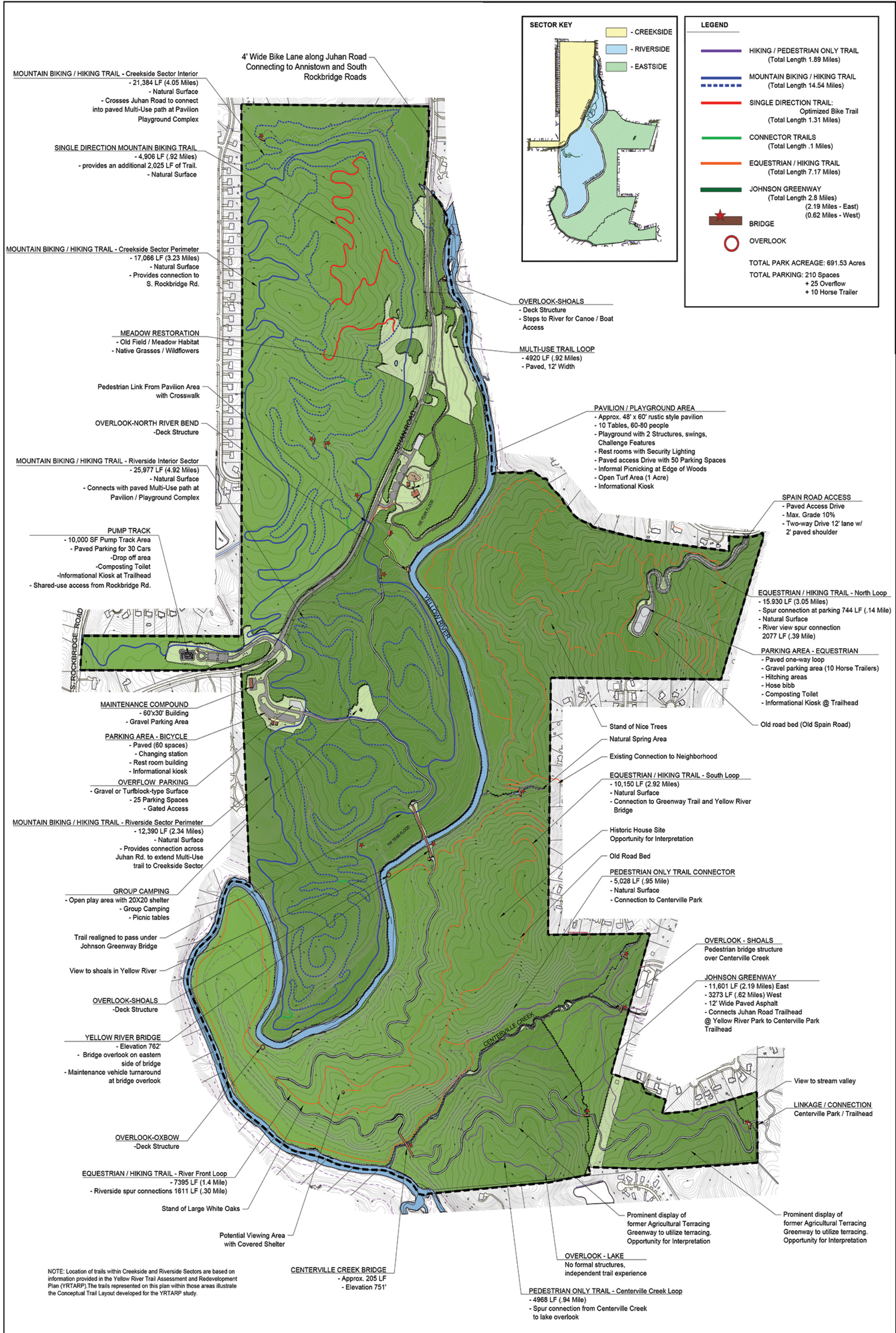


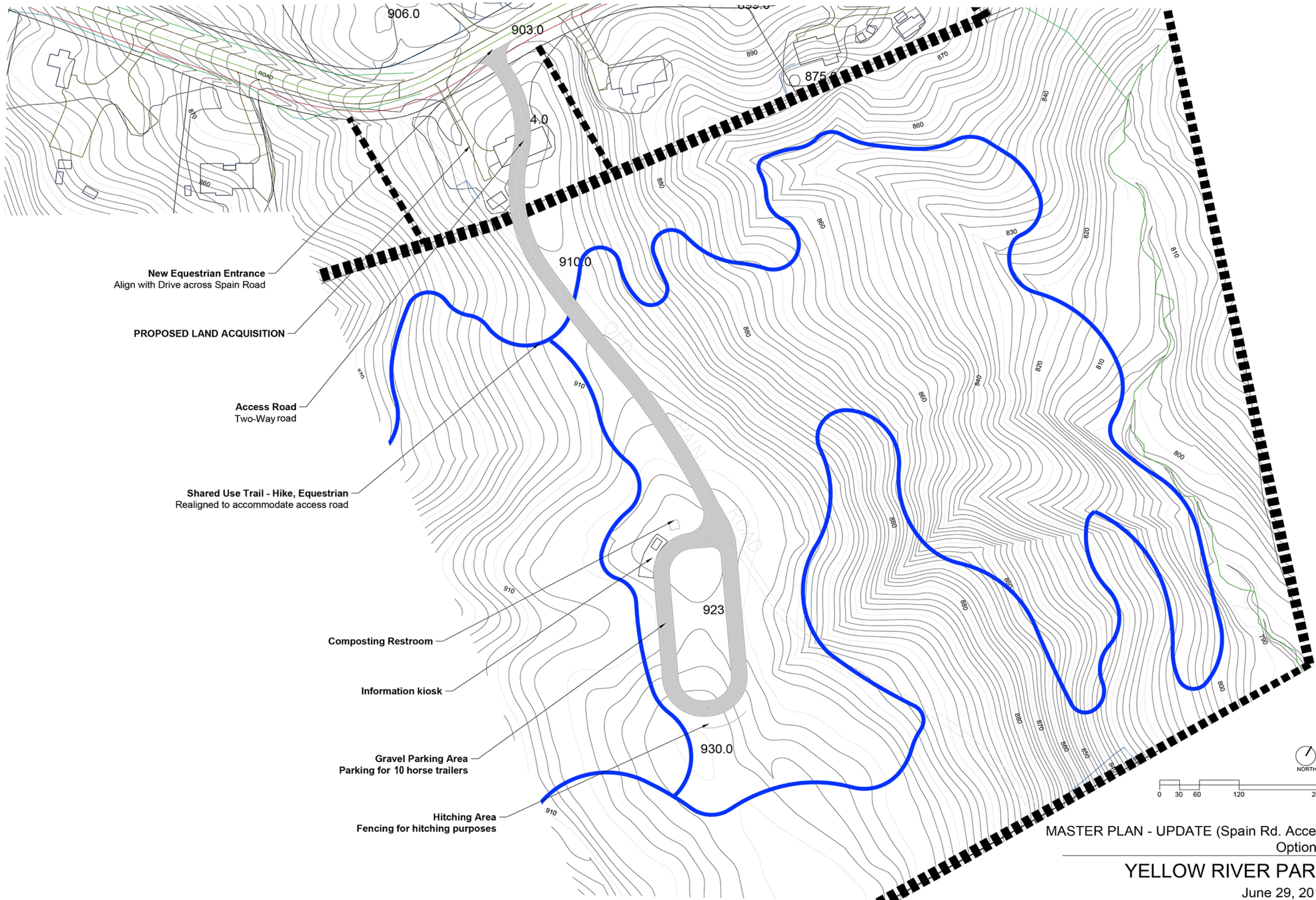
Prepared for:
Gwinnett County Department of Community Services

Prepared by:
B park design studio
planning • landscape architecture



MASTER PLAN
YELLOW RIVER PARK
September 26, 2015





New Equestrian Entrance
Align with Drive across Spain Road

PROPOSED LAND ACQUISITION

Access Road
Two-Way road

Shared Use Trail - Hike, Equestrian
Realigned to accommodate access road

Composting Restroom

Information kiosk

Gravel Parking Area
Parking for 10 horse trailers

Hitching Area
Fencing for hitching purposes

MASTER PLAN - UPDATE (Spain Rd. Access
Option 2)

YELLOW RIVER PARK

June 29, 2017

SECTION APPENDICES

8.0

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APPENDICES

Appendix A: Cost Estimate

Refer to the attached itemized Master Plan level Spreadsheet



**COST ESTIMATE FOR
YELLOW RIVER PARK / JOHNSON GREENWAY
GWINNETT COUNTY DEPARTMENT OF COMMUNITY
SERVICES**

September 25, 2017

YELLOW RIVER PARK- WEST SIDE	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
1. RETROFITTED, SHARED-USE TRAIL SYSTEM IMPLEMENTATION				
COMPONANTS (COSTS FROM YRTARP)				
PROFESSIONAL DESIGN	1	LS	\$19,750.00	\$19,750.00
MOUNTAIN BIKING / HIKING TRAIL	1	LS	\$279,900.00	\$279,900.00
SINGLE DIRECTION TRAIL (OPTIMIZED BIKE)	1	LS	\$32,900.00	\$32,900.00
TECHNICAL TRAIL FEATURES / SKILLS AREA	1	LS	\$15,000.00	\$15,000.00
TRAIL CLOSURE / RESTORATION	1	LS	\$60,000.00	\$60,000.00
			RETROFITTED TRAIL TOTAL	\$407,550.00
2. PUMP TRACK				
TREE PROTECTION	1,400	LF	\$4.00	\$5,600.00
VEGETATIVE CLEAR & GRUB	1.50	AC	\$1,500.00	\$2,250.00
SILT FENCE "TYPE C" - (Single Row)	775	LF	\$3.50	\$2,712.50
GRADING	1,445	CY	\$10.00	\$14,450.00
STAKING	1.5	AC	\$1,500.00	\$2,250.00
ROADWAY / PARKING ASPHALT-STANDARD (Includes base)	2,025	SY	\$28.00	\$56,700.00
ROADWAY / PARKING STRIPING	1	LS	\$2,000.00	\$2,000.00
ROADWAY/ PARKING LIGHTING	6	EA	\$9,000.00	\$54,000.00
CONCRETE CURB	1,200	LF	\$15.00	\$18,000.00
CONCRETE WHEEL STOPS	30	EA	\$150.00	\$4,500.00
LANDSCAPE (Parking / Reforestation of slopes)	1	LS	\$15,000.00	\$15,000.00
10,000 SF PUMP TRACK (ASPHALT)	1	LS	\$135,000.00	\$135,000.00
PUMP TRACK LIGHTING	4	EA	\$9,000.00	\$36,000.00
6' WIDE CONCRETE SIDEWALK	5,280	SF	\$4.50	\$23,760.00
COMPOSTIBLE TOILET	1	LS	\$75,000.00	\$75,000.00
LANDSCAPE	1	ALLOWANCE	\$35,000.00	\$35,000.00
UTILITIES				
WATER SERVICE	1	LS	\$50,000.00	\$50,000.00
WATER METER	1	EA	\$1,500.00	\$1,500.00
ELECTRICAL SERVICE	1	LS	\$35,000.00	\$35,000.00
WATER MANAGEMENT / DETENTION	1	LS	\$15,000.00	\$15,000.00
			PUMP TRACK TOTAL	\$583,722.50
3. JOHNSON GREENWAY CONNECTION				
TREE PROTECTION	5,600	LF	\$4.00	\$22,400.00
VEGETATIVE CLEAR & GRUB	0.25	AC	\$1,500.00	\$375.00
SILT FENCE "TYPE C" - (Single Row)	5,700	LF	\$3.50	\$19,950.00
SILT FENCE "TYPE C" - (Double Row)	3,500	LF	\$3.50	\$12,250.00
GRADING	650	CY	\$10.00	\$6,500.00
STAKING	0.3	AC	\$1,500.00	\$375.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	39,300	SF	\$3.00	\$117,900.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -4" GAB	485	CY	\$65.00	\$31,525.00

GREENWAY TRAIL STRIPING	1	LS	\$1,000.00	\$1,000.00
REVEGETATION OF GREENWAY VERGES	1	LS	\$15,000.00	\$15,000.00
JOHNSON GREENWAY CONNECTION TOTAL				\$227,275.00
WEST SIDE SUBTOTAL				\$1,218,547.50
Mobilization, Fees, Bonds, etc. (10% Total)				\$121,854.75
Contingency for Master Plan Level Cost Estimate (12%)				\$160,848.27
Design, Engineering and Program Management (10%)				\$150,125.05
WEST SIDE TOTAL				\$1,651,375.57
YELLOW RIVER PARK- EAST SIDE	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
1. JOHNSON GREENWAY				
TREE PROTECTION	22,750	LF	\$4.00	\$91,000.00
VEGETATIVE CLEAR & GRUB	5.7	AC	\$2,500.00	\$14,250.00
SILT FENCE "TYPE C" - (Single Row)	22,750	LF	\$3.50	\$79,625.00
GRADING	4,500	CY	\$10.00	\$45,000.00
STAKING	5.7	AC	\$1,500.00	\$8,550.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	140,000	SF	\$3.00	\$420,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -4" GAB	1,730	CY	\$65.00	\$112,450.00
GREENWAY TRAIL STRIPING	1	LS	\$4,500.00	\$4,500.00
FOOT BRIDGE	2	EA	\$10,000.00	\$20,000.00
GRANITE FACED RETAINING WALL	120	LF	\$250.00	\$30,000.00
OVERLOOK STRUCTURE @ YELLOW RIVER BRIDGE	1	LS	\$75,000.00	\$75,000.00
REVEGETATION OF GREENWAY VERGES	1	ALLOWANCE	\$65,000.00	\$65,000.00
JOHNSON GREENWAY TOTAL				\$965,375.00
2. PEDESTRIAN BRIDGES (PER BRIDGE ENGINEER RECOMMENDATIONS)				
<u>CONSTRUCTION ACTIVITIES</u>				
GENERAL CONDITIONS	1	LS	\$15,000.00	\$15,000.00
SITE MOBILIZATION	1	LS	\$25,000.00	\$25,000.00
SURVEYING	1	LS	\$4,500.00	\$4,500.00
<u>SITE PREP AND GRADING FOR ACCESS</u>				
CLEARING TO BRIDGE SITE	1	LS	\$15,000.00	\$15,000.00
CONSTRUCT PAD FOR CRANE @ LIFT SITE	1	LS	\$10,000.00	\$10,000.00
CONSTRUCTION ROUTE TO RIVER FOR BRIDGE TRANSPORT	1	LS	\$17,000.00	\$17,000.00
<u>YELLOW RIVER PEDESTRIAN BRIDGE</u>				
WEATHERED STEEL STRUCTURE w/ WOOD DECKING	1,605	SF	\$250.00	\$401,250.00
BRIDGE HELICAL PILES	6	EA	\$5,000.00	\$30,000.00
BRIDGE CONCRETE FOOTER	85	CY	\$250.00	\$21,125.00
WOOD APPROACH BOARDWALK	2,595	SF	\$100.00	\$259,500.00
20' WOOD FREE SPAN APPROACH TO BOARDWALK	200	SF	\$100.00	\$20,000.00
<u>CENTERVILLE CREEK PEDESTRIAN BRIDGE</u>				
TIMBER BOARDWALK	2,340	SF	\$100.00	\$234,000.00
FREE SPAN BRIDGE	300	SF	\$175.00	\$52,500.00
RETAINING WALL	1	LS	\$15,000.00	\$15,000.00
COMPENSATION EXCAVATION	1	ALLOWANCE	\$25,000.00	\$25,000.00
CONTRACTOR O&P (15% OF TOTAL)	1	ALLOWANCE	\$171,731.25	\$171,731.25
PEDESTRIAN BRIDGE TOTAL				\$1,316,606.25

3. SPAIN ROAD VEHICULAR ACCESS / PARKING

TREE PROTECTION	3,750	LF	\$4.00	\$15,000.00
VEGETATIVE CLEAR & GRUB	3.6	AC	\$2,500.00	\$9,100.00
SILT FENCE "TYPE C" - (Single Row)	2,280	LF	\$3.50	\$7,980.00
GRADING	4,500	CY	\$10.00	\$45,000.00
STAKING	3.7	AC	\$1,500.00	\$5,475.00
<i>ENTRANCE DRIVE</i>				
ENTRANCE DRIVE ASPHALT-HEAVY DUTY (3.5" ASPHALT)	6,650	SY	\$7.50	\$49,875.00
ROADWAY BASE. - 8" G.A.B.	1,500	CY	\$65.00	\$97,500.00
ROADWAY STRIPING	1	LS	\$3,500.00	\$3,500.00
ROADWAY/ PARKING LIGHTING	20	EA	\$9,000.00	\$180,000.00
PARKING AREA - 1 WAY ASPHALT DRIVE - HEAVY DUTY	1,820	SY	\$20.00	\$36,400.00
PARKING AREA - BASE 8" G.A.B.	645	CY	\$65.00	\$41,925.00
RETAINING WALLS	575	LF	\$250.00	\$143,750.00
HITCHING FENCES - 60" HIGH TIMBER CONSTRUCTION	175	LF	\$30.00	\$5,250.00
RESTROOM w/ COMPOSTING TOILET	1	LS	\$75,000.00	\$75,000.00
PARK ENTRANCE SIGN	1	LS	\$15,000.00	\$15,000.00
INFORMATION KIOSK	1	LS	\$10,000.00	\$10,000.00
SIGNAGE	1	LS	\$6,500.00	\$6,500.00
REFORESTATION OF SLOPES	1	LS	\$35,000.00	\$35,000.00
<i>UTILITIES</i>				
WATER SERVICE	1	LS	\$105,000.00	\$105,000.00
WATER METER	1	EA	\$1,500.00	\$1,500.00
PIPE	1200	LF	\$25.00	\$30,000.00
ELECTRICAL SERVICE	1	LS	\$42,000.00	\$42,000.00
WATER MANAGEMENT / DETENTION	1	LS	\$15,000.00	\$15,000.00
SPAIN ROAD VEHICULAR ACCESS/ PARKING TOTAL				\$975,755.00

4. NATURAL SURFACE TRAIL SYSTEM

<u>HIKING / EQUESTRIAN TRAIL - NORTH LOOP</u>				
PRIMARY TRAIL LOOP	15,930	LF	\$12.00	\$191,160.00
SPUR CONNECTION TO PARKING	744	LF	\$12.00	\$8,928.00
RIVER VIEW SPUR CONNECTION	2,077	LF	\$12.00	\$24,924.00
STAKING	0.5	AC	\$1,500.00	\$750.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
FOOTBRIDGE	1	EA	\$10,000.00	\$10,000.00
<u>HIKING / EQUESTRIAN TRAIL - SOUTH LOOP</u>				
PRIMARY TRAIL LOOP	10,150	LF	\$12.00	\$121,800.00
CENTERVILLE PARK SITE SPUR CONNECTION	5,310	LF	\$12.00	\$63,720.00
STAKING	0.4	AC	\$1,500.00	\$600.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
FOOTBRIDGE	1	EA	\$10,000.00	\$10,000.00
OVERLOOK STRUCTURES	1	EA	\$50,000.00	\$50,000.00
COVERED SHELTER	1	EA	\$20,000.00	\$20,000.00
<u>HIKING / EQUESTRIAN TRAIL - RIVER FRONT LOOP</u>				
PRIMARY TRAIL LOOP	7,395	LF	\$12.00	\$88,740.00
RIVERSIDE SPUR CONNECTIONS	1,611	LF	\$12.00	\$19,332.00
STAKING	0.25	AC	\$1,500.00	\$375.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
FOOTBRIDGE	1	EA	\$10,000.00	\$10,000.00
OVERLOOK STRUCTURES	1	EA	\$50,000.00	\$50,000.00
<u>HIKING ONLY TRAIL - CENTERVILLE CREEK LOOP</u>				
PEDESTRIAN TRAIL - PRIMARY TRAIL LOOP	4,968	LF	\$12.00	\$59,616.00
PEDESTRIAN ONLY - TRAIL CONNECTOR	5,028	LF	\$12.00	\$60,336.00
STAKING	0.25	AC	\$1,500.00	\$375.00

SIGNAGE	1	LS	\$5,000.00	\$5,000.00
FOOTBRIDGE	2	EA	\$10,000.00	\$20,000.00
NATURAL SURFACE TRAIL SYSTEM TOTAL				\$830,656.00
EAST SIDE SUBTOTAL				\$4,088,392.25
Mobilization, Fees, Bonds, etc. (10% Total)				\$408,839.23
Contingency for Master Plan Level Cost Estimate (12%)				\$539,667.78
Design, Engineering and Program Management (10%)				\$503,689.93
EAST SIDE TOTAL				\$5,540,589.18
YELLOW RIVER / JOHNSON GREENWAY PROJECT TOTAL (Total West and East Development)				\$7,191,964.75
ALTERNATIVE DESIGN - YELLOW RIVER EAST				
1. OPTION II - SPAIN ROAD ACCESS				
			EAST SIDE SUBTOTAL	\$4,088,392.25
DEDUCT - MASTER PLAN SPAIN ROAD ACCESS @ CURRENT PROPERTY			\$ (975,755.00)	\$3,112,637.25
ADD OPTION II - SPAIN ROAD ACCESS				
- TREE PROTECTION	2,400	LF	\$4.00	\$9,600.00
- VEGETATIVE CLEAR & GRUB	2.2	AC	\$2,500.00	\$5,500.00
- SILT FENCE "TYPE C" - (Single Row)	2,400	LF	\$3.50	\$8,400.00
- GRADING	1,445	CY	\$10.00	\$14,450.00
- STAKING	2.2	AC	\$1,500.00	\$3,300.00
<i>ENTRANCE DRIVE</i>				
- ENTRANCE DRIVE ASPHALT-HEAVY DUTY (3.5" ASPHALT)	2,240	SY	\$7.50	\$16,800.00
- ROADWAY BASE. - 8" G.A.B.	500	CY	\$65.00	\$32,500.00
- ROADWAY STRIPING	1	LS	\$2,200.00	\$2,200.00
- ROADWAY/ PARKING LIGHTING	8	EA	\$9,000.00	\$72,000.00
- PARKING AREA - 1 WAY ASPHALT DRIVE - HEAVY DUTY	1,820	SY	\$20.00	\$36,400.00
- PARKING AREA - BASE 8" G.A.B.	645	CY	\$65.00	\$41,925.00
- RETAINING WALLS	110	LF	\$250.00	\$27,500.00
- HITCHING FENCES - 60" HIGH TIMBER CONSTRUCTION	175	LF	\$30.00	\$5,250.00
- RESTROOM w/ COMPOSTING TOILET	1	LS	\$75,000.00	\$75,000.00
- PARK ENTRANCE SIGN	1	LS	\$15,000.00	\$15,000.00
- INFORMATION KIOSK	1	LS	\$10,000.00	\$10,000.00
- SIGNAGE	1	LS	\$6,500.00	\$6,500.00
- REFORESTATION OF SLOPES	1	LS	\$15,000.00	\$15,000.00
<i>UTILITIES</i>				
- PIPE	750	LF	\$25.00	\$18,750.00
- ELECTRICAL SERVICE	1	LS	\$15,000.00	\$15,000.00
- WATER MANAGEMENT / DETENTION	1	LS	\$10,000.00	\$10,000.00
OPTION II SPAIN ROAD VEHICULAR ACCESS/ PARKING SUBTOTAL				\$441,075.00
OPTION II - EASTSIDE SUBTOTAL				\$3,553,712.25
Mobilization, Fees, Bonds, etc. (10% Total)				\$355,371.23
Contingency for Master Plan Level Cost Estimate (12%)				\$469,090.02
Design, Engineering and Program Management (10%)				\$437,817.35
OPTION II - EAST SIDE TOTAL				\$4,815,990.84
ALTERNATIVE DESIGN - YELLOW RIVER / JOHNSON GREENWAY PROJECT TOTAL (Total West and East Development)				\$6,467,366.41
ESTIMATED SAVINGS UTILIZING THE PROPOSED OPTION II - SPAIN ROAD ACCESS				\$724,598.34
**THESE FUNDS COULD BE MADE AVAILABLE TO SUPPORT THE LAND ACQUISITION NECESSARY TO CONSTRUCT THE ALTERNATIVE.				
Note: This cost estimate is the Landscape Architect's opinion of probable cost but is not guaranteed because the Landscape Architect has no control over the market, the contractor's bid or the length of time between the estimate creation and the project bid.				

APPENDICES

Appendix B: Summary of Costs

Refer to the attached summarized Master Plan level Spreadsheet



SUMMARY OF COSTS
YELLOW RIVER PARK / JOHNSON GREENWAY
GWINNETT COUNTY DEPARTMENT OF COMMUNITY
SERVICES
 September 25, 2017

YELLOW RIVER PARK- WEST SIDE (Improvements west of Yellow River only) <i>Note: Totals include costs associated with miscellaneous developmental fees and contingencies (10% of total for Mobilization, Fees, bonding, etc. 12% Contingency for Master Plan level estimate, 10% for Design , Engineering and Program Management). Included as per element for phasing implementation.</i>	
	ITEM TOTAL
1. RETROFITTED, SHARED-USE TRAIL SYSTEM IMPLEMENTATION COMPONENTS (COSTS FROM YRTARP)	\$552,311.76
Costs associated with the retrofit / realignment / improvement of existing soft surface trail system, costs extracted from the YRTARP document study.	
2. PUMP TRACK	\$791,060.73
Costs associated with the development of a 10,000sf, asphalt pump track, associated parking area, necessary utilities and composting comfort station.	
3. JOHNSON GREENWAY CONNECTION	\$308,003.08
Costs associated with the development of the 12' wide paved Johnson Greenway connection (.62 Miles) within the Riverside Sector of the park, west of the Yellow River, that will connect the existing multi-use trail loop and the bicycle parking area to the proposed Johnson Greenway Trail.	
WEST SIDE TOTAL (Total of Line items 1-3)	\$1,651,375.57
YELLOW RIVER PARK- EAST SIDE (Improvements East of Yellow River only) <i>Note: Totals include costs associated with miscellaneous developmental fees and contingencies (10% of total for Mobilization, Fees, . 12% Contingency for Master Plan level estimate, 10% for Design , Engineering and Program Management). Included as per element for phasing implementation.</i>	
	ITEM TOTAL
1. JOHNSON GREENWAY	\$1,308,276.20
Costs associated with the development of the 12' wide paved Johnson Greenway (2.1 Miles) within the Eastern Sector of the park, extending from the proposed Yellow River Bridge to Centerville Park.	
2. PEDESTRIAN BRIDGES (PER BRIDGE ENGINEER RECOMMENDATIONS)	\$1,784,264.79
Costs associated with the development of the proposed Yellow River Pedestrian Bridge (Weathered Steel structure w/ wood decking, wood approach boardwalks and Centerville Creek free span bridge)	
3. SPAIN ROAD VEHICULAR ACCESS / PARKING	\$1,322,343.18
Costs associated with the development of vehicular / equestrian access from Spain Road into the Eastern Sector of the park site. These costs utilize existing park property which abuts Spain Road, accounts for a 24' wide paved asphalt road, necessary retaining walls, site work, 1 way paved asphalt parking loop and gravel parking for 10 horse trailers. A composting comfort station and hitching areas are included.	

4. NATURAL SURFACE TRAIL SYSTEM		\$1,125,705.01
Costs associated with the development of 9.06 Miles of Natural Surface Trails (Hiking and Equestrian) within the Eastern Sector of the park; includes pedestrian bridge crossings of small streams.		
EAST SIDE TOTAL (Total of line items 1- 4)		\$5,540,589.18
YELLOW RIVER / JOHNSON GREENWAY PROJECT TOTAL (Total West and East Development)		\$7,191,964.75
Total cost of the Yellow River / Johnson Greenway Project utilizing existing property owned by Gwinnett County.		
ALTERNATIVE DESIGN - YELLOW RIVER EAST		
Note: Totals include costs associated with miscellaneous developmental fees and contingencies (10% of total for Mobilization, Fees, . 12% Contingency for Master Plan level estimate, 10% for Design , Engineering and Program Management). Included as per element for phasing implementation.		
1. OPTION II - SPAIN ROAD ACCESS		\$597,744.84
Costs associated with an alternate vehicular / equestrian Spain Road Access that would reduce the length of the vehicular drive, minimize impact to the site through grading ad tree removal. This option requires the acquisition of an adjacent property abutting Spain Road.		
EAST SIDE TOTAL (Total of line items 1-4)		\$5,540,589.18
Deduct Existing Spain Road Entrance (Line item 3)		-\$1,322,343.18
		\$4,218,246.00
ALTERNATIVE DESIGN EAST SIDE TOTAL		\$4,815,990.84
ALTERNATIVE DESIGN - YELLOW RIVER / JOHNSON GREENWAY PROJECT TOTAL (Total West and East Development)		\$6,467,366.41
ESTIMATED SAVINGS UTILIZING THE PROPOSED ALTERNATIVE DESIGN - SPAIN ROAD ACCESS OPTION II		\$724,598.34
**THESE FUNDS COULD BE MADE AVAILABLE TO SUPPORT THE LAND ACQUISITION NECESSARY TO CONSTRUCT THE ALTERNATIVE.		
Note: This cost estimate is the Landscape Architect's opinion of probable cost but is not guaranteed because the Landscape Architect has no control over the market, the contractor's bid or the length of time between the estimate creation and the project bid.		

APPENDICES

Appendix C: Meeting Minutes - Preliminary Master Plan Public Input Meeting

Refer to the attached meeting minutes for a summary of the discussion and presented materials at the meeting.

YELLOW RIVER PARK MASTER PLAN UPDATE– Public Interest Meeting

Minutes from: 092615 Public Input Meeting

Attendees: Gwinnett County Department of Community Services- Marcie Moore

jB+a, inc. - Raigan Carr

Approximately 35 Community participants

Location: Yellow River Park – Main Pavilion
Gwinnett County, Georgia

Time: 9:00am – 1:00pm

The meeting was conducted in an open house format where park users could stop by the pavilion to view the updated Yellow River Master Plan. The graphic included an updated Yellow River Park boundary which incorporated the 125 acre Johnson Tract, proposed trail layout from the Yellow River Trail Assessment and Redevelopment Plan (2012), proposed location of both the Yellow River bridge crossing and Centerville Creek bridge crossing, proposed Johnson Greenway layout and proposed natural surface trail layout within the Eastern side of Yellow River Park. An illustrative graphic of the Centerville Park Master Plan was also on display to show the connection between Yellow River Park and Centerville Park via the Johnson Greenway. Marcie Moore (Gwinnett County) and Raigan Carr (jB+a) were available to provide explanation of each of the plans, answer questions and address concerns from the public participants.

Several interest groups attended the public input session including members of the mountain biking community, equestrian community, hiking community, and the canoe / kayak community. Many participants offered up comments and suggestions.

Community Survey Forms were available for the public to fill out. The form included an area where participants could describe what they liked about the plan and any concerns they may have regarding future development of the park.

Participants that completed the survey form included: Ray Lampros, Donna Murdock, Michael Murdock, Tori McHenry, David McHenry, Susan Eubanks, Cory Pihera, Angie Pihera, Dean Burns, Nancy Loen, Tonya Brant, B. Estes, Mark Wilson, Joyce Nolter, Jim Nolter, Marianne Velker, Angel Kallini, Jason Kallini, Cheryl Kopatz, Marilyn Vanne, Karen Parham.

Comments relating to the Community Survey Form are as follows:

1. This appears to be a great addition to the park and the surrounding community.
2. Well thought out. Good layout and use of space. Took into account all users. This (today's) group input meeting for community interaction is a positive way to educate current users. Wish there was more funding other than SPLOST.
3. The master plan looks logical and well planned; it plans a reasonable separation of various user groups. It also provides for needed additional pedestrian use across

the river. Connecting Centerville Park is a great idea. Don't allow the SORBA guys to drive the conversation and demand exclusive uses.

4. The plan looks great. Priorities for me would be the bridge linking the Juhan Road side of the park to the Centerville trail and basic trails on the Centerville side. I'm always in favor of the least amount of paving possible. Please leave the park as natural as possible – it is a gem in Gwinnett County.
5. I like it all. Bike access and bike lanes along roads would be good. Would like to see meadow hill across from .95 asphalt multi-use trail kept mowed. Preserve meadow hill by mowing it! When paving avoid over clearing of land. Build road and lots under the trees.
6. We just picked up bags and bags of garbage. Need educational signs (multiple) about trash pickup and clean up. Trash goes in river to ocean. Reference to DeKalb County / Gwinnett County recycling and what recycling can do. What recycled products make, reference websites. Also need plenty of trash cans, including recycling trash cans. Why don't we have those?? Install in parks!!
7. I ride the trails several times per week and am concerned that the new renovations will be poorly done like the renovations done in the early 2000's. Please contact a local SORBA users group before adjusting current trails. Money would be better spent creating suggested routes for different user groups with signage. The trails are great as-is once you figure out the route.
8. The most recent renovation (about 10years ago) of the multi-use trail seemed to be done poorly. It is my biggest concern that someone who is experienced with renovating / building mountain bike trails is doing these renovations. I would also appreciate at least part of the trails remain open during the renovation.
9. The absence of trails dedicated to 'horses only' concerns me. As a horse owner and rider I am very familiar with the problems that arise when both horses and bikes are on the same trail. As bikes usually travel at much higher speeds than a walking horse there are bound to be incidents where the horses are spooked causing injury to both riders. Hikers on the trail generally do not cause a problem. There is plenty of time for both parties to adjust their direction and avoid a problem.
10. It sounds good. Would like to see existing trails left (especially walking). Really don't want everything too manicured. Leave as natural as possible because there are plenty of manicured, developed parks around.
11. Proposals look great! We would like to add an area to load / unload kayaks and perhaps a better trail or steps from the river to allow easier access near the entrance to the park (coming from Annistown Road). A parking area in the open field would be nice, but mostly looking for a safer / easier area for landing. Also, steps or a better access point near the second overlook (north River Bend) would be great for tubers! I'd also be interested in exploring any other possibilities for river access, since this is a river park. We love this park!
12. Congrats on the plan! Looks good! A couple of suggestions 1. Consider adding entrance area for kayaks at top end of park – place to pullover to park and unload kayaks. Big plus would be an exit point for tubers mid-park, perhaps with signage. 2. Consider birding habitat; locating native plants to provide food and cover, signs with suggestions of which birds to look for. Also perhaps informational signage on how to create birding habitats in your back yard. Think: birding habitat at Stone Mountain.
13. Consider directional trails on Creekside and Riverside: Mountain bike and pedestrian in opposite directions – reverses every other day. Visit Blankets Creek

- as an example. Consider total separation of equestrian and mountain biking. Horses can spook easily at a mountain biker.
14. It would be great to promote paddle sports and river access. River access at the upper end of the park close to Juhan Road is already easy, we just need a 'pull over' area to allow loading and unloading of canoes, kayaks and other gear, then they can park at the normal lot. A new river access point in the lower end of the park would be needed and could be just a crushed stone graded ramp. Then people can paddle or tube through the park and get out at the lower end. More and more people are buying inexpensive boats and getting on rivers. Yellow River Park can be part of that! Thanks! Great job!
 15. Big Concern!! Horse Trails are to be shared with bikes????!! That is a big accident waiting to happen!! Someone is going to be hurt. Bikes have plenty of mileage with the 'bike-only' trails. Give us horse folks our trails. Hikers sharing horse trails aren't a problem. I know land is at a premium but safety should be a concern also!
 16. Fabulous! Regarding canoe / kayak launch: overlook shoals steps to river – yes! Need parking area for canoe / kayaks. Need boat loading area. Add second launch / steps by second existing overlook. Need signs to remind people to pick up their trash!
 17. We would love a sidewalk. We watch tons of pedestrians walking Juhan Road and dodging traffic to get to Yellow River Park. We love Yellow River Park, but find it hard to safely get to the park from our house without getting in the car. Pedestrians leave trash all along Juhan Road as they walk to Yellow River Park because they use Juhan Road as part of the park. Please help the residents of this area love the patrons of Yellow River Park. Please put in a sidewalk. Otherwise we absolutely love the plans to expand our park! Thank you!
 18. Really like the bridge from Yellow River Park to Centerville Park. A little concerned about bringing more folks into the mountain bike parking lot, but at the same time more cars should make the lot safer from break-ins. Would really like to see well marked loops on Riverside to help encourage new mountain bike riders to feel safe at Yellow River.
 19. Suggest you keep horse and bike shared trails on the west side and mark them better. Bridges on west side are slippery; suggest you put something on them for better traction. Suggest east side (new trails) be horse and hiker only. If you need help, let us know we'll organize a work day for equestrians. Some horses are afraid of bikes!
 20. Please consider not combining horse and bike trails. This is planning for people to get injured. Horses have a fear of bikes and the sounds they make. Perhaps a better marking system would assist both riders to choose the correct trail. I would volunteer to assist in marking the trails. (See Form for contact info). Another possibility would be to allow horses on hiking trails, east side of the river. Bridges on west side are slippery and need something for traction.

The public input meeting concluded at approximately 1:00pm

If there are any additions or corrections to these meeting minutes, please contact Raigan Carr of jB+a at 678.247.0727.

APPENDICES

Appendix D: Preliminary Design Report

Yellow River Park - Yellow River and Centerville Creek Bridges - Bridge Engineer Report

Preliminary Design Report

YELLOW RIVER PARK Yellow River and Centerville Creek Bridges

Gwinnett County, Georgia

**Parker Consulting Services, Inc.
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March 7, 2016

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Executive Summary

The Yellow River Park, with the inclusion of the Johnson parcel, is now 659 acres. It is separated by two water bodies, the Yellow River and Centerville Creek, which traverse the park. Each of these waterways need some type of crossing to make the whole parcel accessible from Juhan Road or the Johnson parcel on Centerville Highway. The Yellow River has a base flow that would make a low water crossing unsuitable. The banks of both waterways are too steep to allow pedestrian or bicycle access on a trail that can be maintained. Therefore, these natural features will require a structure to cross the waterways.

Given the size of the floodways, placement of culverts or structures in the floodways are not feasible. The floodways are large and experience swift debris-laden flow in a flood event. Also, placement of items in the floodways will require compensating volume adding to the cost of the project and creating a maintenance issue from debris collection. Therefore, two sites have been evaluated for bridges to cross over the floodways providing a low-maintenance and easily accessible crossing for pedestrians and cyclists. The general locations were selected by jB+a and we have adjusted them based on natural features and the size of each floodway. The trails follow the higher contours above the flood elevation and the bridges' approaches will start at these points, limiting grade transition to maintain accessibility for the approaches and bridges.

The bridge selection process included review of the site features, bridge materials, construction methods, cost, aesthetics, and long-term maintenance requirements. Based on these criteria we recommend a heavy timber beam bridge on a pile foundation with 3x pressure-treated southern yellow pine decking for the Centerville Creek bridge. The crossing will support equipment for the construction of the Yellow River bridge, the long-term maintenance of the trail system, and emergency vehicles. We recommend the Yellow River bridge be a weathered steel truss bridge with steel support towers on a pile cap concrete footer on piles with 2x pressure-treated southern yellow pine decking or composite lumber. We also recommend that the approaches be heavy timber beam bridges on piles. They each have benefits and drawbacks but should be consistent with the department's maintenance protocol.

The drawings provided are close to construction documents and detail the heavy timber bridge and approaches for Centerville Creek, the heavy timber approaches for the Yellow River and the concept for the steel bridge crossing the Yellow River. A geotechnical investigation is needed for piles and concrete pile cap design. The steel bridge can be sourced from a manufacturer that can provide pre-engineered steel bridges. Their design should be reviewed to confirm it meets the loading and maintenance criteria.

Section 1: Project Scope

Parker Consulting Services (PCS) was contracted with jB+a to prepare a preliminary design report (PDR) and a 50% design package for the Gwinnett County Yellow River Park. The 565-acre park at 3232 Juhan Road is bifurcated by the Yellow River and the recently acquired 125-acre Johnson parcel is separated by Centerville Creek. Two bridges will be required to interconnect the proposed network of pedestrian, cyclist and equestrian trails across the entire park site.

The scope of services for the Yellow River Park as described in our agreement with jB+a included the following:

- General site condition evaluation for the trail route and bridge siting
- Hydraulic evaluation for a no-rise certification or compensating volume on Yellow River and Centerville Creek
- Bridge geometry evaluation
- Bridge construction techniques and methods
- Bridge materials evaluation
- Required building and environmental permitting identification

Section 2: Project Planning

The park currently has comingled equestrian, pedestrian and cyclist trails and utilization of the entire park is limited due to physical barriers of the Yellow river and Centerville Creek waterways. In identifying the need for bridges, PCS evaluated the bridge and boardwalk structures required.

Park planners have reworked the trail network to separate the pedestrian and cyclist trails from the equestrian trails. The equestrian trails will remain only on the north side of the park and utilize the existing equestrian loading area and trailer parking. The horse trails will not interconnect with the pedestrian and cyclist trails that will cross the Yellow River and Centerville Creek, therefore the bridge design need not address horse loading, guardrails or bridge wear decking for horse hooves. These factors are critical to the bridge design. The Yellow River bridge needs only to support pedestrians, cyclists, and small service vehicles.

The Centerville Creek bridge will need to support pedestrians, cyclists, small service vehicles, and heavy equipment. Heavy equipment will need to cross Centerville Creek to complete the paving between the waterways, and provide equipment access for the Yellow River bridge construction.

Section 3: Design Methodology

We have structured the design methodology to follow the design process starting with the location, loading, materials, span, type, foundation and permitting. We evaluated the design parameters based on the bridge requirements, aesthetics, and budget. For the location, we evaluated floodplain width, site access, and constructability of the bridge. We evaluated the materials based on the loading and spans. The aesthetics are a matter of taste so we are providing three distinct options with cost estimates for your consideration.

3.1 Location and Site Features

To provide access around the entire 659 acres of the park, the Yellow River and Centerville Creek need to be crossed. For long term use and low maintenance, the paved trail, boardwalk and bridge should all be above the flood elevation. Both waterways have consistent water flow and large associated floodplains, which will require large clear areas over the rivers that preclude the use of culverts or any structure that would place fill in the flood way or restrict the flow velocity. The river has a significant base flow and the potential to carry large debris in flood stage, which requires a crossing that will not impede the flow in the floodway. The river banks also have nearly vertical slopes in areas around the river. To avoid fill in the floodplain and environmental disturbance to the river banks an elevated boardwalk to the bridge will be required. The proposed trail system uses the higher ground and this will work to allow for low slope transitions from the trails to the bridges. The proposed bridges and approach boardwalks will be above the flood elevation.

The Yellow River bridge will need to cross a 72-foot wide flowing river with a 388-foot wide floodplain with the potential for swift water and flowing debris. The Yellow River crossing will start and end on the highest points on either bank of the river using the shortest span across the river span and floodplain. This river crossing location will require a free span of 140 to 160 feet and a total structure of 400 feet. This will keep the bridge free span above normal river stages and keep the abutments out of the normal river channel. The bridge free span has the biggest impact on the cost and construction material options. For the design process, we evaluated timber, steel and concrete pedestrian bridges. For a timber structure a +/- 140-foot free span timber bridge has been evaluated. Its foundation will remain out of the normal flow channel and on the higher portions of the bank. The foundations for steel and concrete bridges would be different from the timber bridge and will increase the free span to 160 feet. These foundations will also be out of the normal channel but further up the back on the south side. The Yellow River floodplain has a 3-foot gradient between the bridge site and the property boundary. This gradient and the size of the floodplain will allow a no rise certification to be completed for the bridge foundation items placed in the floodplain.

The Centerville Creek crossing has similar constraints with a 30-foot normal flow width and a 264-foot floodway. This floodway does not have the swift water or debris flow of the Yellow River. The creek water backs up from the Yellow River in a flood situation. The water surface gradient is flat so there is no capacity in the floodway to complete a no-rise certification for the flood plain. Therefore, any materials placed in the floodplain will be required to provide compensating volume. The Centerville Creek bridge was also selected using narrowest floodplain and the highest ground.

3.2 Loading

The loading of the bridges is a function of their proposed use and governing design standards. For design parameters, we referred to the American Association of State Highway and Transportation Officials (AASHTO), which dictate the design of pedestrian bridges and boardwalks. This guide sets the loading of 90 pounds per square foot (psf). The guide also requires that boardwalks 10 feet wide and greater support an H-5 (10,000 pound) vehicular wheel loading.

The H-5 standard will reduce the possible free span on the Yellow River bridge and will increase the cost of this bridge. This standard will exceed any possible future loading need. The loading standard of a 90 psf uniform pedestrian loading is applicable and should support the load from a small service vehicle like a Gator. The H-5 standard is excessive for this application and can be reduced if a traffic barrier is installed at the entrance to the bridge. Numerous readily available steel pipe style items can be installed to restrict vehicular access and can be removed for service vehicle access. The Yellow River Bridge should meet the 90 psf uniform load and the load from a 3,500-pound service vehicle. This will provide access for normal operations and maintenance; however, emergency vehicles will not be able to use the bridge. This should be addressed by the County's emergency responders with an address for the north and south side of the park.

The Centerville Creek bridge will need to support the 90-psf pedestrian load and an H-20 (40,000-pound) vehicle load. The bridge will need to support vehicular loads that will exceed the required H-5 loading because it will provide access to the trail north of Centerville Creek for trail and bridge construction equipment. This load capacity should be built-in and not be achieved through temporary measures during construction. This capacity will allow access for emergency vehicles and future construction equipment without modifications. The paved trail design should provide an all-weather driving surface for turn-around of emergency responders.

The loading and wear issues associated with horse traffic has not been considered due to the separation between the equestrian trails and pedestrian and bicycle trails. If the bridges have horse traffic, the decking surface should be two-ply with the grains running perpendicular between the plies. This provides a deck-wearing surface necessary with

horse traffic and eliminates the gaps between the boards. Horseshoes will erode wood decking and will therefore require a wear decking.

3.3 Superstructure Materials

Structural material types for the bridge and boardwalk could consist of steel, aluminum, concrete, wood, composites, or combinations thereof in the bridge components listed above. Aluminum will not be considered for main load-bearing components because of its relative lack of stiffness when compared to the other materials, its consequent tendency for uncomfortable vibrations under pedestrian loading, and its corrosive behavior when in contact with certain concrete mixes. The advantages and disadvantages, considering the cost, durability, and aesthetics of the other materials listed above, will be discussed below followed by a value-based recommendation on the materials for each bridge and boardwalk component.

The 160-foot center span for the Yellow River bridge was based on the normal flow channel and the floodplain issues dictate the depth of the superstructure and consequently set the profile or height of the bridge. This is noted only because the depth of the superstructure will vary for each structural material type, and a greater depth will slightly increase the length of the boardwalk.

3.3.1 Steel

Advantages

Steel provides the ability to span relatively long distances in the superstructure with a rather shallow superstructure depth compared to the other structural materials. When used as a substructure component, it provides high axial and lateral capacity (i.e., bridge vertical and lateral load resistance, respectively) with smaller member size than the other structural materials.

Disadvantages

Steel, by nature, is highly subject to corrosion when exposed to high humidity and water environments. Because of high routine maintenance costs, new steel bridge superstructures are generally composed of weathering steel. The weathering steel is uncoated, eliminating the need for costly coating systems that require routine reapplication. Through an initial corrosion process, the weathering steel forms a patina on its surface that provides protection from further corrosion. Although steel protection coating systems are available, they are very costly and, as mentioned above, require routine reapplications.

3.3.2 Timber

Advantages

Timber offers the advantages of ease of construction, relatively low maintenance, a pleasing appearance and is the lowest initial cost. Most woods are a renewable resource, fitting well with a park and its strong environmental theme. Wood is relatively lightweight and easily built. If approaches are of timber, and they likely will be, a timber-beamed bridge offers aesthetic continuity across the waterway.

Disadvantages

Because of the magnitude of the required vehicular load (H-20) and the required length of the spans, timber construction cannot be achieved using solely sawn timbers. Glued laminated timber (glulam) beams must be used for the main spanning elements.

Glulam surfaces which are exposed to sunshine or precipitation must be protected with a pigmented surface at least 60 microns thick. The treatment, which should be carried out in the factory or immediately after erection, can consist of one or two coats of an alkyd oil-based stain with a fungicide additive and two coats of alkyd oil-based opaque paint. It is normally necessary to renew the treatment every few years, which would be done as part of a maintenance program.

Without adequate surface protection and toxic wood preservatives, glulam beams can be subject to the greatest hazard faced by timber bridges – living or biotic agents such as decay fungi, bacteria, and insects. These agents can cause serious damage to untreated wood in a relatively short period, making it both unsightly and unsafe.

3.3.3 Concrete

Advantages

Concrete offers the advantage of longer life and the ability to span longer distances with a shallower superstructure depth than wood, and it is comparable to steel. Concrete is ideally suited to aggressive environments and, if mix-designed and delivered properly, it can potentially attain a service life of over 100 years. No protective coatings are necessary for concrete bridges when properly designed, produced, and constructed. Properly designed and constructed concrete structures do not lose strength due to moisture or pests. Concrete structures offer greater fire resistance than timber structures, and little or no maintenance is required for concrete bridges. Concrete can be used in all spanning elements of the bridge including the deck. Concrete is also inherently stiffer than the other material options, and so provides a more vibration-free walking path, which is important in some longer spans. Longer spans made of steel or

glulam wood can be forced to vibrate by pedestrians, and although they will be designed in the safe zone, vibrations may cause concern for some sensitive users.

Disadvantages

Precast concrete structural members are heavier than wood and erecting them requires larger equipment. Precast, pre-stressed concrete members, which are the most economical, only come in standard shapes. Special member shapes or finishes can cost more. Cast-in-place concrete is slow and labor intensive to construct, so the use of precast for beams is encouraged. Still, this relatively small bridge does not provide quantities that would result in significant economy of fabrication. Good quality control is required in cast-in-place concrete construction to control cracking, although certified plants normally supply this needed QC for precast elements. The initial cost of concrete can be higher than the cost of wood.

3.4 Decking Materials

3.4.1 Composite Decking – Two composite materials to consider are the brands Polyforce and Fiberforce.

Advantages

Both brands mentioned above have greater than 50-year warranties, are impervious to moisture, and do not require pre-drilling. The composites are easy to install, are available in exact lengths, and are resistant to rot and biological attack. They come in a variety of colors simulating natural or weathered wood, and a wood grain texture can be applied to the surface to improve appearance and provide limited slip resistance. They can be molded or extruded, contain UV inhibitors and a fire retardant, and resist static electricity buildup. Both are manufactured from high density polyethylene (HDPE) which consists of purified blends of recycled HPPE plastics (both pre-consumer and post-consumer, such as plastic milk and detergent bottles) combined with proprietary percentages of fiber strengthening additives.

Disadvantages

The costs for the two composite materials range from \$3 to \$11 per linear foot for 2x6, 2x8, 3x6, or 3x8 boards, which can be three to six times as costly as wood decking. The span lengths for composite materials are lower than for wood however, which would increase stringer cost. High surface temperatures have been reported under direct sun exposure, along with delamination, bubbling, and warping from thermal expansion, specifically for lower grade material. Thermal expansion of composites is greater than that of wood, and this would need to be taken into account in detailing the boardwalk.

3.4.2 Wood Decking

Advantages

The installed linear price for wood is approximately three to six times lower for pressure treated lumber than for composite materials. Wood is a green product and a renewable resource. Pressure treated lumber offers an obvious wood grain look, and is consistent with the natural feel of the boardwalk and trail. Southern Yellow Pine lumber has structural capacities that cannot be matched by composite material in the same sizes.

Disadvantages

Pressure treated southern yellow pine, as typically drawn from US timber sources, has a shorter lifespan than composite materials and requires more frequent maintenance. Maintenance for pressure-treated decking includes pressure washing and resealing every two to three years. This process would require protective measures to capture the runoff and avoid contaminating the area directly beneath the boardwalk. Pressure-treated lumber also has a greater tendency to deform (warp), possibly causing a tripping safety issue for pedestrians. The higher maintenance cost will quickly absorb the initial installation savings.

3.5 Spans and Bridge Type

The bridge type and free span for the two crossings are unique and have their unique characteristics of site topography, floodplain width, normal channel, load capacity and aesthetics. The most cost-effective bridge structure will be either a beam or a truss frame bridge. Beam and truss bridges with pedestrian loading can achieve the 140-to 150-foot spans. The beam and truss bridge, when supporting the H-20 like the Centerville Creek bridge, will be limited to 30 to 50 feet. This style bridge will provide the thinnest bridge at the most cost effective design.

The Yellow River has a floodplain of 388 feet at the crossing. This is too large to span with a traditional beam or truss bridge. To free span this floodplain would require a suspension bridge, which would cost 1.5 to 2 times the cost per square foot compared to a truss bridge. The suspension bridge will also require anchoring dead men to anchor the suspension cables, which will require clearing and grading beyond the limits of the path reducing the natural aesthetic of the park. For these reasons, a cable stayed or suspension bridge was not considered.

A timber-bow truss laminated beam bridge, a steel truss bridge or a concrete beam bridge are most cost effective in the 160-foot free span range. The laminated timber and steel truss bridges can be shipped in pieces and assembled on-site, then crane lifted into position. The concrete beam bridge will have to be shipped full length and

then placed with a crane. This requirement will increase construction costs and require additional site clearing. This may make a concrete bridge implausible.

All three options will require elevated approaches to maintain the trail above the flood elevation. These approaches can be a similar construction to the free span bridges.

The decking or wearing surface of all the bridges can be either wood or composite decking. The steel or concrete bridges could have a poured-in-place concrete deck. This may not be necessary or consistent with the timber approach, which will have a wood or composite decking.

3.6 Bridge/Boardwalk Foundation

The bridge foundations will vary depending on the superstructure selected. In the case of the timber laminated beam bridge driven wood piles are the best fit application. If a steel truss bridge is selected a steel tower on a poured-in-place cap over piles will be required. The piles below the cap would be either helical piles or micro-piles to meet the load carrying requirements. The concrete bridge foundation would be either a cast-in-place cap over piles or a cast-in-place augers pile. The least intrusive method would be to drive piles. These piles will need to be driven with a typical embedment of 8 to 15 feet below land surface. Geotechnical investigation will be required to confirm the embedment depth and the driving methodology.

The bridge approaches will need to be an elevated boardwalk above the flood elevation. The approaches' foundations, regardless of super structure, will need to provide a minimal footprint in the flood plain. The logical choice for these foundations will be piles.

Additional geotechnical investigation will be required to complete the design; however, regardless of soils, driven piles will be the logical choice for bridge and approach foundations. The geotechnical investigation will help to determine the depth of the pile below land surface. Access for traditional truck borings will not be possible at the bridge launch points so driving criteria in the construction document and confirmatory proof loading will be necessary.

Section 4: Environmental and Permitting Consideration

4.1 Wetlands

The bridge crossings and approach locations were selected in areas where the banks are severe and there is no wetland vegetation. The bridge abutments and piles for the approaches will be out of the normal creek and river flows. These design considerations will reduce the need for wetland mitigation for the bridge construction. The proposed approaches will have driven piles minimizing soil disturbance. The bridge abutments will require the largest amount of disturbance from the construction of the pile cap but the piles will be either helical (augured in place) or micro-piles (driven) and have very little soil disturbance.

4.2 Floodplain

The floodplain associated with the Yellow River is too large to clear span, so the structure placed in the floodway was held to a minimum. The bridge abutments need to be protected from swift water and erosion with a deep pile foundation and rip rap at the base of the foundations to control scour. From the bridge site to the northern property boundary there is 3 feet of surface gradient in the floodplain. This gradient and the larger floodplain area to the north of the bridge allowed us to complete a no-rise certification for the proposed Yellow River bridge. The proposed displacement was calculated using the wood boardwalk approach piles and steel bridge section pile cap foundation. These represent the worst case scenario for volume added to the flood plain. The no rise certification will need to be current when the project goes to construction. We will provide that report when the project goes to permitting.

The Centerville Creek floodplain width and the load capacity requirements of the bridge and boardwalk require a pile foundation. Compensating volume needs to be provided for these piles. The Centerville Creek floodplain is flat and is the result of water from the Yellow River stopping the water from Centerville Creek and staging water to a static flood elevation along the length of Centerville Creek. Since there is no gradient moving the water downstream, a no rise certification is not an option. Therefore, compensating volume for the displacement of the piles has to be provided. This required volume has been provided by excavating at the south abutment.

4.3 Permitting

Construction will require a County building permit and State of Georgia erosion control plan. There will be no construction in the waterway and no U.S Army Corps of Engineers permit will be required.

Section 5: Bridge Functional Life Expectation

Different components on the heavy timber approach boardwalks will have varying life expectancy. The decking and handrails typically last 5 to 10 years. These items are typically replaced due to aesthetics, not structural failure. The heavy timber superstructure and piles will last 50 to 80 years. As with any structure, maintenance will be critical to reach the anticipated life span of the structure. This will include cleaning, sealing or staining every two years or as needed based on exposure and use.

The laminated beams on the Centerville Creek bridge will have a similar life expectancy as the heavy timber members. However, the decking may wear sooner since this bridge and its approaches may see more vehicular traffic. Depending on the anticipated vehicular traffic, a layer of wear-decking may want to be considered. In a golf course application, the decking typically lasts 2 to 3 years due to constant cart traffic and walking traffic with golf shoes. Since the bridge will be the construction access for path construction, access temporary decking should be required in the construction documents to use during construction and new decking installed after path construction.

If the Yellow River bridge truss is steel, the finish will have to be painted or constructed with weathering steel. The paint finish will last 7 to 10 years before needing to be repainted. The weather steel is not always a lifetime finish and may require sandblasting and repair after 35 years.

Section 6: Cost Estimates

We have provided a cost breakdown detailing construction costs for budgeting and evaluating the three different concepts. Below is the estimated long-term maintenance for the three different concepts to be able to evaluate the initial cost and the maintenance requirements over the life of the bridges.

Timber Bow Truss bridge

This bridge will require staining every 2 to 3 years depending on exposure to the sun. This will be required on members that have regular exposure to the sun and wear. The undercarriage of the structure will not require regular staining. The necessary pressure washing and staining of the bridge and associated timber approaches would be approximately \$30,000. The treatment and timber will have a functional life of 50 to 75 years with proposer maintenance. This includes cleaning, preventing any vegetation growth on the bridge and maintaining the stain to provide UV protection for the wood.

Weather Steel Bridge

The weathered steel known as core 10 steel will provide a maintenance free finish for 30 to 50 years. These bridges do require annual structural inspections as with any bridge but the finish requires specific inspection every 5 years. If there is damage to the finish or excessive corrosion and in areas with these issues they will require sand blasting and painting.

Concrete Bridge

The concrete bridge will require little more than annual inspection and pressure washing as required for aesthetic removal of mold or mildew.

Gwinnett County Yellow River Bridge

Construction Cost Estimate with Steel Bridge

Construction Activities	Lump Sum	Quantity	Units	Unit Cost	Units	Activity total
General conditions	\$15,000.00					\$15,000.00
Site mobilization	\$25,000.00					\$25,000.00
Surveying	\$4,500.00					\$4,500.00
Site preparation and grading for access						
Clear path to bridge site	\$10,000.00					\$15,000.00
Build pad for crane at lift site	\$8,500.00					\$10,000.00
Route to river to transport bridge	\$15,000.00					\$17,000.00

Yellow River Bridge

Weathered steel structure wood decking	1,605	square feet	\$250.00	per sq ft	\$401,250.00
Bridge helical piles	6	piles	\$5,000.00	per pile	\$30,000.00
Bridge concrete footer	84.5	cubic feet	\$250.00	per yard	\$21,125.00
Wood approach boardwalk	2,595	square feet	\$100.00	per sq ft	\$259,500.00
20' wood free span in approach boardwalk	200	square feet	\$100.00	per sq ft	\$20,000.00

Centerville Creek Bridge

Timber boardwalk	2,340	square feet	\$100.00	per sq ft	\$234,000.00
Free span bridge	300	square feet	\$175.00	per sq ft	\$52,500.00
Retaining wall	\$15,000.00				\$15,000.00
Compensation excavation	\$25,000.00				\$25,000.00

Subtotal					\$1,144,875.00
Contactor O & P 15%					<u>\$171,731.25</u>
Project Estimate					\$1,316,606.25

Gwinnett County Yellow River Bridge

Construction Cost Estimate with Timber Bridge

Construction Activites	Lump Sum	Quantity	Unit	Unit costs	Units	Activity total
General conditions	\$15,000.00					\$15,000.00
Site mobilization	\$25,000.00					\$25,000.00
Surveying	\$4,500.00					\$4,500.00
Site preparation and grading for access						
Clear path to bridge site	\$10,000.00					\$10,000.00
Build pad for crane at lift site	\$8,500.00					\$8,500.00
Route to river to transport bridge	\$15,000.00					\$15,000.00
Yellow River Bridge						
Timber bow truss bridge structure wood decking		1,605	square feet	\$200.00	per sq ft	\$321,000.00
Bridge timber pile clusters		8	piles	\$2,500.00	per pile	\$20,000.00
Wood approach boardwalk		2,595	square feet	\$100.00	per sq ft	\$259,500.00
20' wood free span in approach boardwalk		200	square feet	\$100.00	per sq ft	\$20,000.00
Centerville Creek Bridge						
Timber boardwalk		2,340	square feet	\$100.00	per sq ft	\$234,000.00
Free span bridge		300	square feet	\$150.00	per sq ft	\$45,000.00
Retaining wall	\$15,000.00					\$15,000.00
Compensation excavation	\$25,000.00					\$25,000.00
Subtotal						\$1,017,500.00
Contactior O & P 15%						<u>\$152,625.00</u>
Project Estimate for Timber						\$1,170,125.00

Gwinnett County Yellow River Bridge

Construction Cost Estimate with Concrete Bridge

Construction activities	Lump Sum	Quantity	Units	Unit Cost	Units	Activity total
General Conditions	\$15,000.00					\$15,000.00
Site mobilization	\$25,000.00					\$25,000.00
Surveying	\$4,500.00					\$4,500.00
Site preparation and grading for access						
Clear path to bridge site	\$20,000.00					\$20,000.00
Build pad to staging	\$10,000.00					\$10,000.00
Build pad for crane at lift site	\$15,000.00					\$15,000.00
Route to river to transport bridge	\$20,000.00					\$20,000.00

Yellow River Bridge

Concrete bridge with wood decking	1,605	square feet	\$450.00	per sq ft	\$722,250.00
Bridge concrete footer	105	cubic feet	\$250.00	per yard	\$26,250.00
Bridge helical piles	12	piles	\$5,000.00	per pile	\$60,000.00
Wood approach boardwalk	2,595	square feet	\$100.00	per sq ft	\$259,500.00
20' wood free span in approach boardwalk	200	square feet	\$110.00	per sq ft	\$22,000.00

Centerville Creek Bridge

Timber boardwalk	2,340	square feet	\$100.00	per sq ft	\$234,000.00
Free span bridge	300	square feet	\$135.00	per sq ft	\$40,500.00
Retaining wall	\$15,000.00				\$15,000.00
Compensation excavation	\$25,000.00				\$25,000.00

Subtotal					\$1,514,000.00
Contactor O & P 15%					<u>\$227,100.00</u>
Project Estimate					\$1,741,100.00

Section 7: Bridge Recommendations

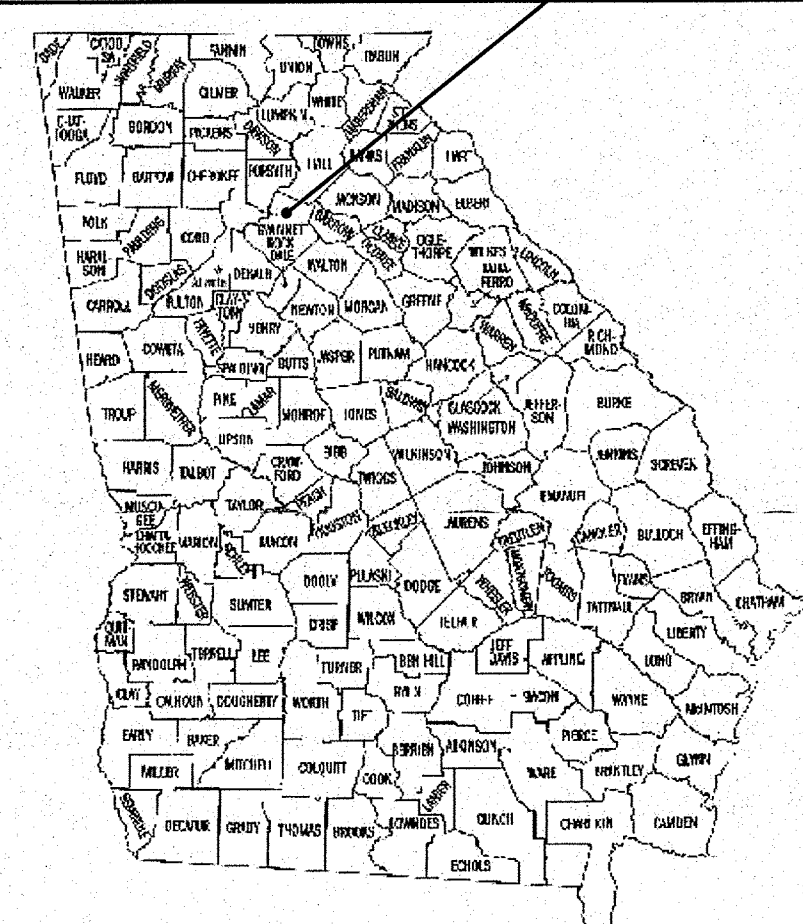
The site will need two bridges: one crossing the Yellow River and one crossing Centerville Creek. The locations selected using the high ground will keep the trail and bridge system above the flood elevation for the best longevity. The Centerville Creek bridge will have to support construction equipment for the bridge and trail construction and the Yellow River bridge will provide support for pedestrian and service vehicle. Balancing cost, aesthetics and constructability, we recommend a weather steel bridge or timber bow truss bridge with heavy timber approaches for Yellow River and a heavy timber bridge for Centerville Creek.

The required free span over the Yellow River lends itself to either a timber bow truss bridge or a steel bridge due to access and construction. The bridge size is consistent with readily available bridges from steel and timber bridge manufacturers. We suggest a bridge constructed out of weathering steel that will provide a 50-year low maintenance structure. The bridge foundation would be helical piles with a poured pile cap for the steel tower bearing. The design of these helicals and approach boardwalk piles require a geotechnical investigation along the trail.

The Centerville Creek bridge will work well with laminated beam free span and heavy timber framed approaches. The design is close to construction documents but will require geotechnical investigation.

PRELIMINARY DESIGN FOR YELLOW RIVER AND CENTERVILLE CREEK BRIDGES GWINNETT COUNTY, GA

PROJECT VICINITY



VICINITY MAP

DESIGN CRITERIA
-ANSI / AF&PA NDS-2001 ASD MANUAL FOR ENGINEERING WOOD CONSTRUCTION
-ASCE 7-10 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES", PUBLISHED BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS
-2012 INTERNATIONAL BUILDING CODE, WITH 2014 & 2015 GEORGIA STATE AMENDMENTS
-AASHTO / AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

DESIGN LOADS
AASHTO- DESIGN GUIDELINES FOR THE DESIGN OF PEDESTRIAN WALKWAYS

DECK: LIVE LOAD - 90 PSF
DEAD LOAD - 7.5 PSF

WIND LOAD CRITERIA
WIND LOAD PER AASHTO GUIDELINES FOR PEDESTRIAN WALKWAYS

BEAMS AND GIRDERS 50 PSF

GENERAL NOTES
1. ALL TIMBER PILES TO BE SOUTHERN YELLOW PINE (SYP) PRESSURE TREATED WITH 19% MC BEFORE TREATMENT. ALL FRAMING LUMBER TO BE #2 OR BETTER SYP PRESSURE TREATED WITH 19% MC BEFORE TREATMENT. ALL DECKBOARDS HANDRAILS AND HANDRAIL POSTS TO BE #1 SYP PT WITH 19% MC BEFORE TREATMENT.

2. ALL DECK AND HANDRAIL SCREW FASTENERS TO BE STAINLESS STEEL. ALL NAILS, BOLTS, THREADED RODS, NUTS, WASHERS, CLIPS AND STRAPS TO BE HOT DIPPED GALVANIZED STEEL.

3. ALL WORK TO BE COMPLETED IN ACCORDANCE WITH THE AFPA (AMERICAN FOREST PRODUCTS ASSOCIATION) AND THE GEORGIA BUILDING CODE.

4. ALL PILINGS SHALL MEET THE REQUIREMENTS AS SET FORTH BY THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) UNDER THE PROVISIONS OF D25 (LATEST EDITION), STANDARD SPECIFICATIONS FOR ROUND TIMBER PILES. TOLERANCE IN DIAMETER OF PILINGS SHALL BE 1" TAPER IN 10 LINEAR FEET.

5. 8" Ø PILES TO HAVE A AXIAL COMPRESSIVE CAPACITY OF 10,000 POUNDS (10 KIPS) AND A LATERAL CAPACITY OF 2,800 POUNDS (2.8 KIPS)

6. 10" Ø PILES TO HAVE A AXIAL COMPRESSIVE CAPACITY OF 10,000 POUNDS (10 KIPS) AND A LATERAL CAPACITY OF 3,600 POUNDS (3.6 KIPS)

7. BOARDWALK TO BE BUILT TOP DOWN.

DRAWING INDEX

C-0:COVER SHEET

C-1: SITE PLAN

C-2:SITE PLAN

S-1:YELLOW RIVER BRIDGE & BOARDWALK

S-2:BOARDWALK DETAILS

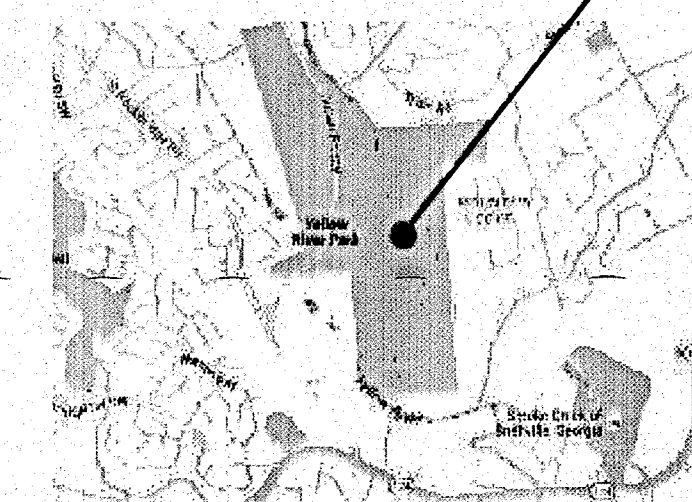
S-3:BOARDWALK DETAILS

S-4:CENTERVILLE CREEK BRIDGE & BOARDWALK

S-5:BOARDWALK DETAILS

S-6:BOARDWALK DETAILS

PROJECT LOCATION



LOCATION MAP

Lumber Specifications

Dimension	Location	Species	Grade	Treatment
2" x 8"	Handrail Cap	SYP	# 1	0.40 ACQ.
2" x 8"	Decking	SYP	# 1	0.40 ACQ.
3" x 8"	Decking	SYP	# 1	0.40 ACQ.
2" x 6"	Handrail Overlay	SYP	# 1	0.40 ACQ.
4" x 6"	Handrail Post	SYP	# 1	0.40 ACQ.
4" x 4"	Handrail Post Blocking	SYP	# 1	0.40 ACQ.
3" x 12"	Stringer	SYP	# 2	0.40 ACQ.
4" x 12"	Stringer	SYP	# 2	0.40 ACQ.
9 1/2" x 30"	Laminated Beam	SYP	UC5C	0.40 ACQ.
3" x 12"	Stringer Blocking	SYP	# 2	0.40 ACQ.
3" x 12"	Abutment Boards	SYP	# 2	0.60 ACQ.
10" x 10"	Pile Cap	SYP	# 2	0.60 ACQ.
12" x 12"	Pile Cap	SYP	# 2	0.60 ACQ.
18" x 18"	Pile Cap	SYP	# 2	0.60 ACQ.
2" x 6"	Cross Bracing	SYP	# 2	0.60 ACQ.
10"/12"	Pile	SYP		0.80 CCA
6"	Pile Blocking	SYP		0.80 CCA

CONSTRUCTION NOTES

- 1.) CONTRACTOR TO CONTACT 811 OR OTHER UTILITY LOCATOR BEFORE COMPLETING ANY EXCAVATION ON-SITE OR IN THE R.O.W.
- 2.) ENGINEER CERTIFICATION THAT ALL BENCHMARKS AND ELEVATIONS ARE BASED ON MEAN SEA LEVEL AND THAT ALL LINES AND GRADES ARE BASED ON FIELD SURVEY INFORMATION.

OWNER: GWINNETT COUTY PARKS AND RECREATION
75 LANGLEY DRIVE
LAWRENCEVILLE, GA 30046
PH. (678-277-0900)

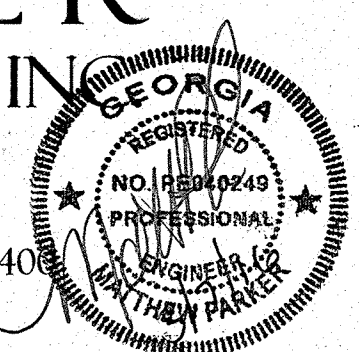
ENGINEER: PARKER CONSULTING SERVICES, INC.
5301 CAPITAL CIRCLE SW
TALLAHASSEE, FLORIDA 32305
PH. (850) 877-8400

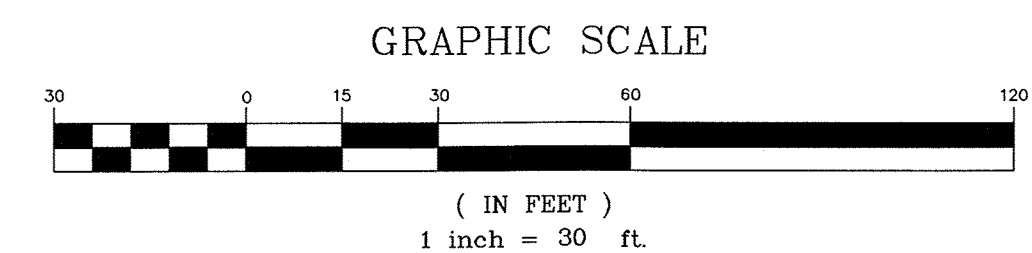
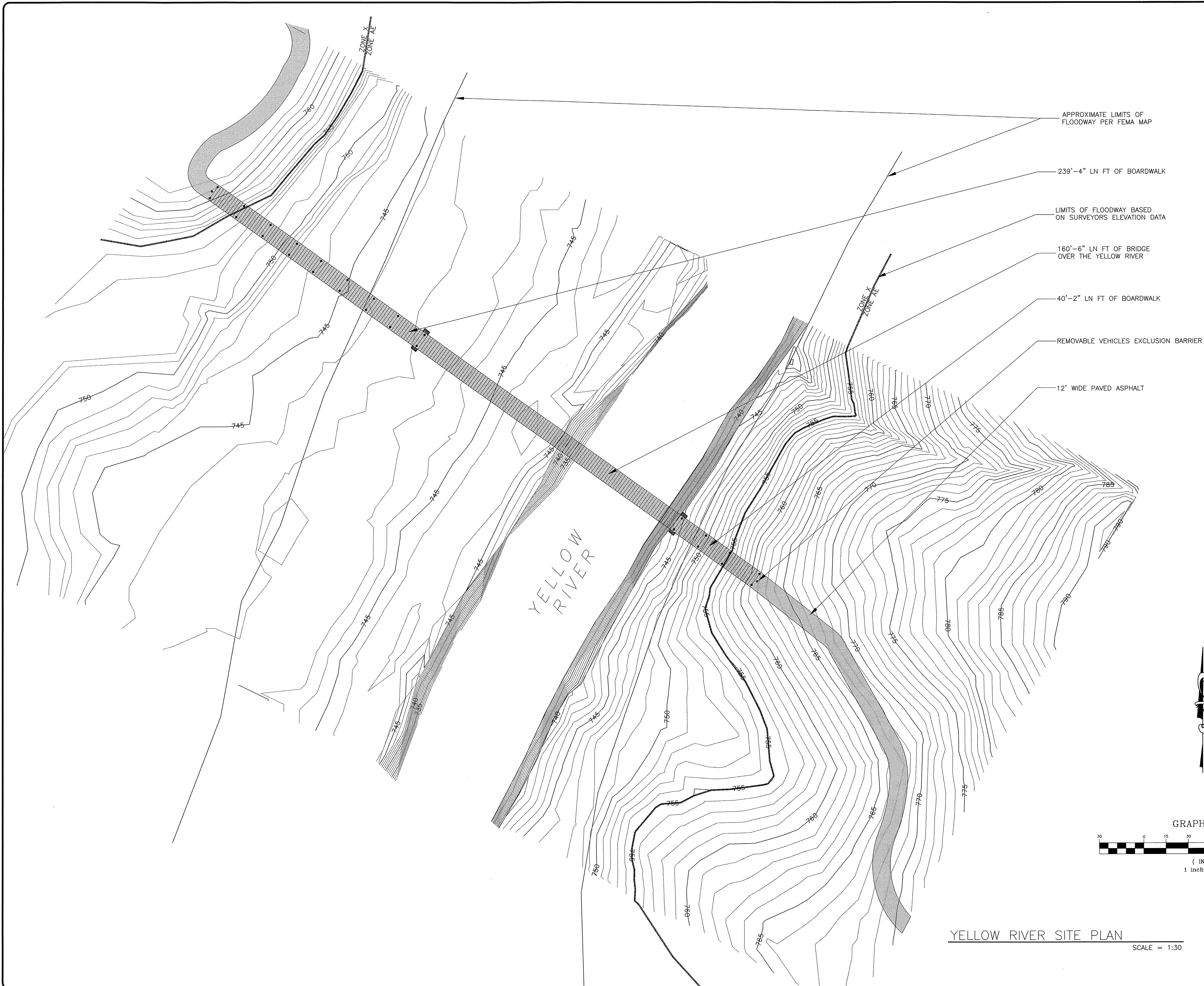
CONTRACTOR: TBD

MARCH 2016

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PARKER
CONSULTING SERVICES, INC.
CIVIL ENGINEERS
5301 CAPITAL CIRCLE SW
TALLAHASSEE, FL 32305 PHONE: (850) 877-8400
MATTHEW PARKER G.P.E.# 040249





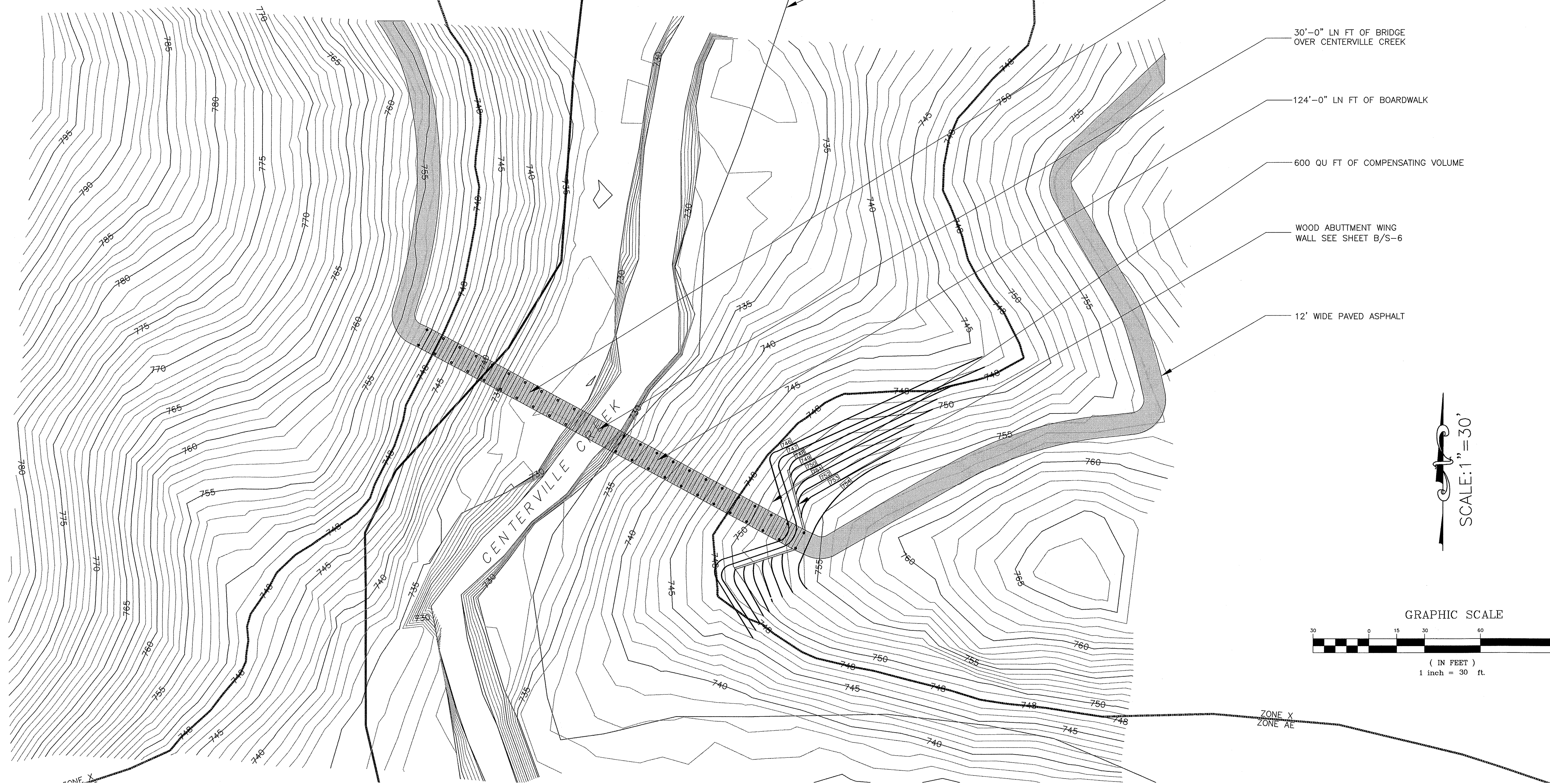
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YELLOW RIVER SITE PLAN

SCALE = 1:30

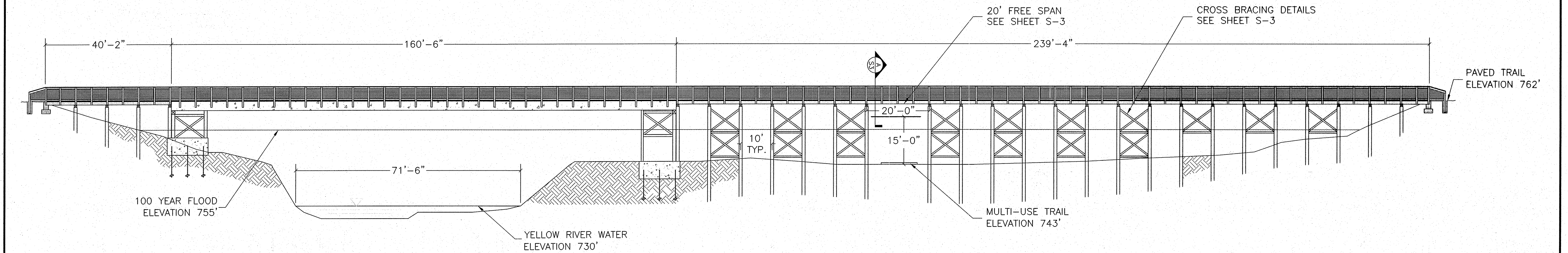
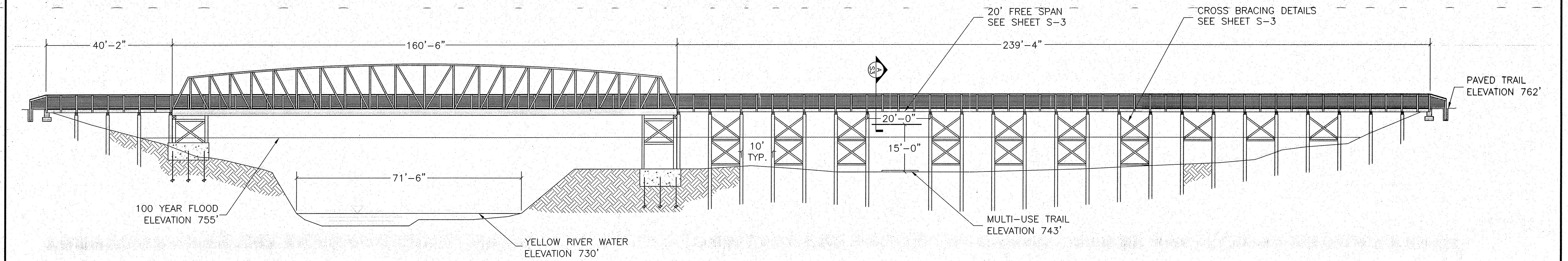
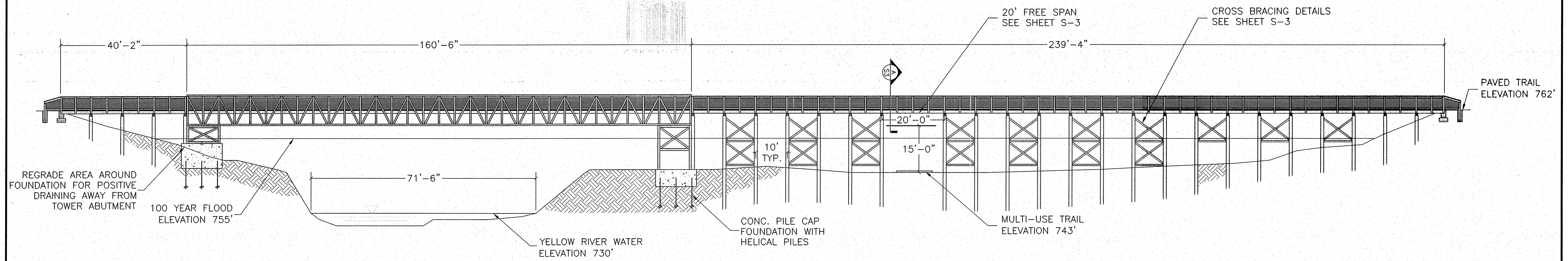
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FOR CONSTRUCTION

 PARKER CONSULTING SERVICES, INC. CIVIL ENGINEERS 5301 CAPITAL CIRCLE SW TALLAHASSEE, FL 32305 PHONE (850) 877-8400 MATTHEW PARKER P.E. #0249	YELLOW RIVER PEDESTRIAN BRIDGE YELLOW RIVER PARK	
	GWINNETT COUNTY YELLOW RIVER PEDESTRIAN BRIDGE	
	YELLOW RIVER SITE PLAN	
	C-1	



CENTERVILLE CREEK SITE PLAN
SCALE = 1:30

NOTE:
PRELIMINARY NOT
FOR CONSTRUCTION

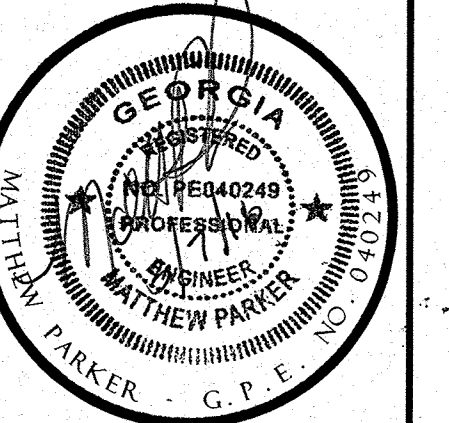


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CONSULTING SERVICES, INC.
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TALLAHASSEE, FL 32305 - PHONE (850) 877-8400
MATTHEW PARKER, P.E. 000219

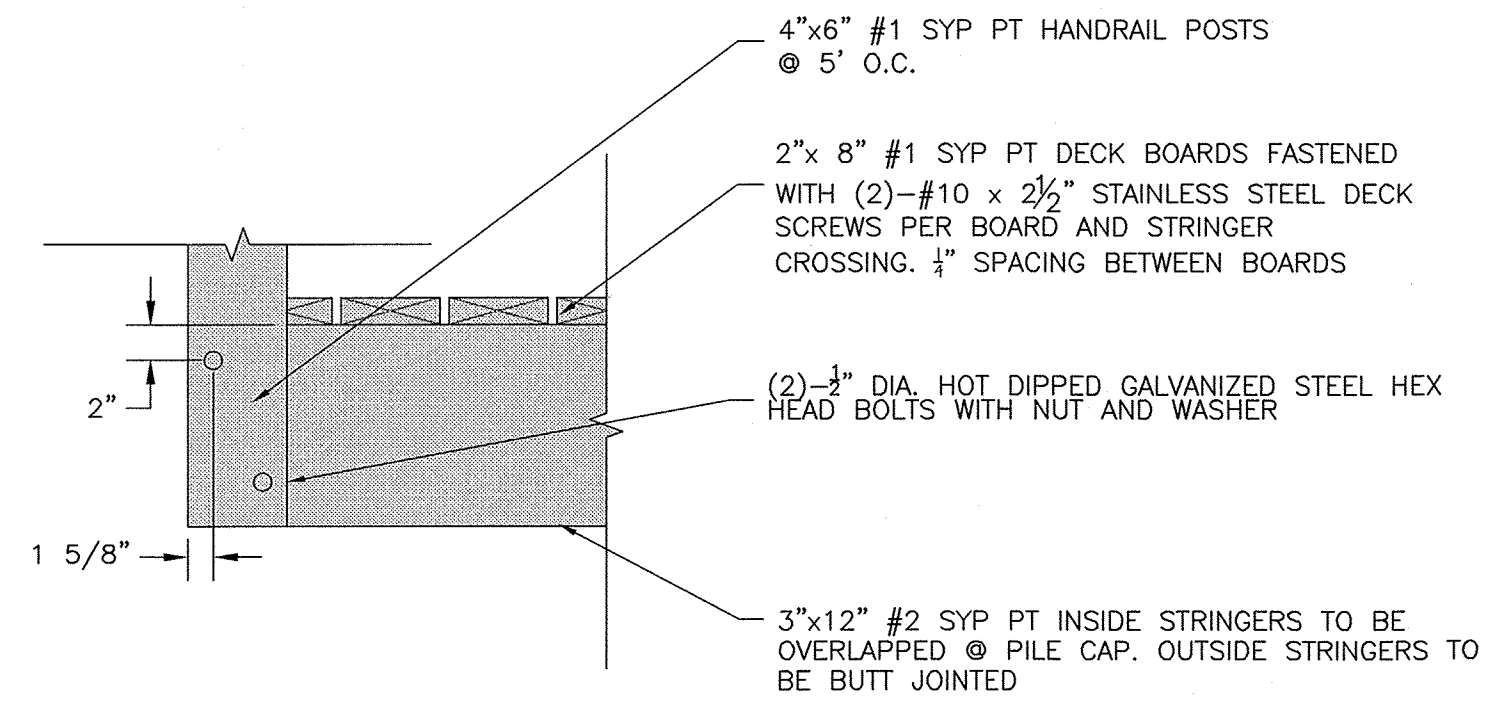
**YELLOW RIVER
PEDESTRIAN BRIDGE
YELLOW RIVER PARK**

**WINNETT COUNTY
YELLOW RIVER
PEDESTRIAN BRIDGE**

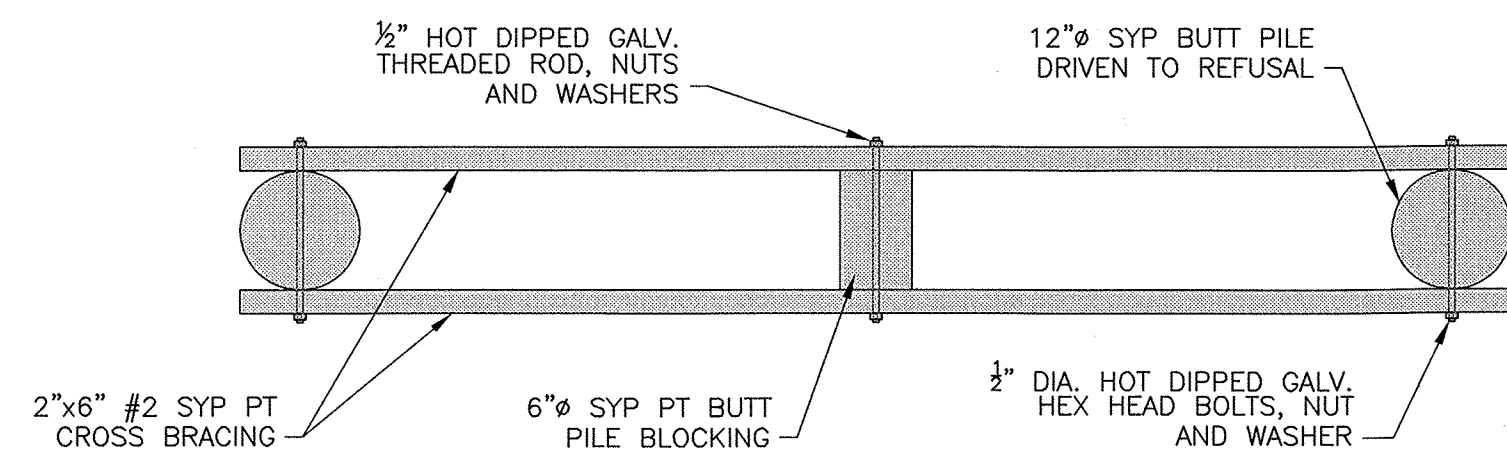


**YELLOW RIVER
BRIDGE &
BOARDWALK**

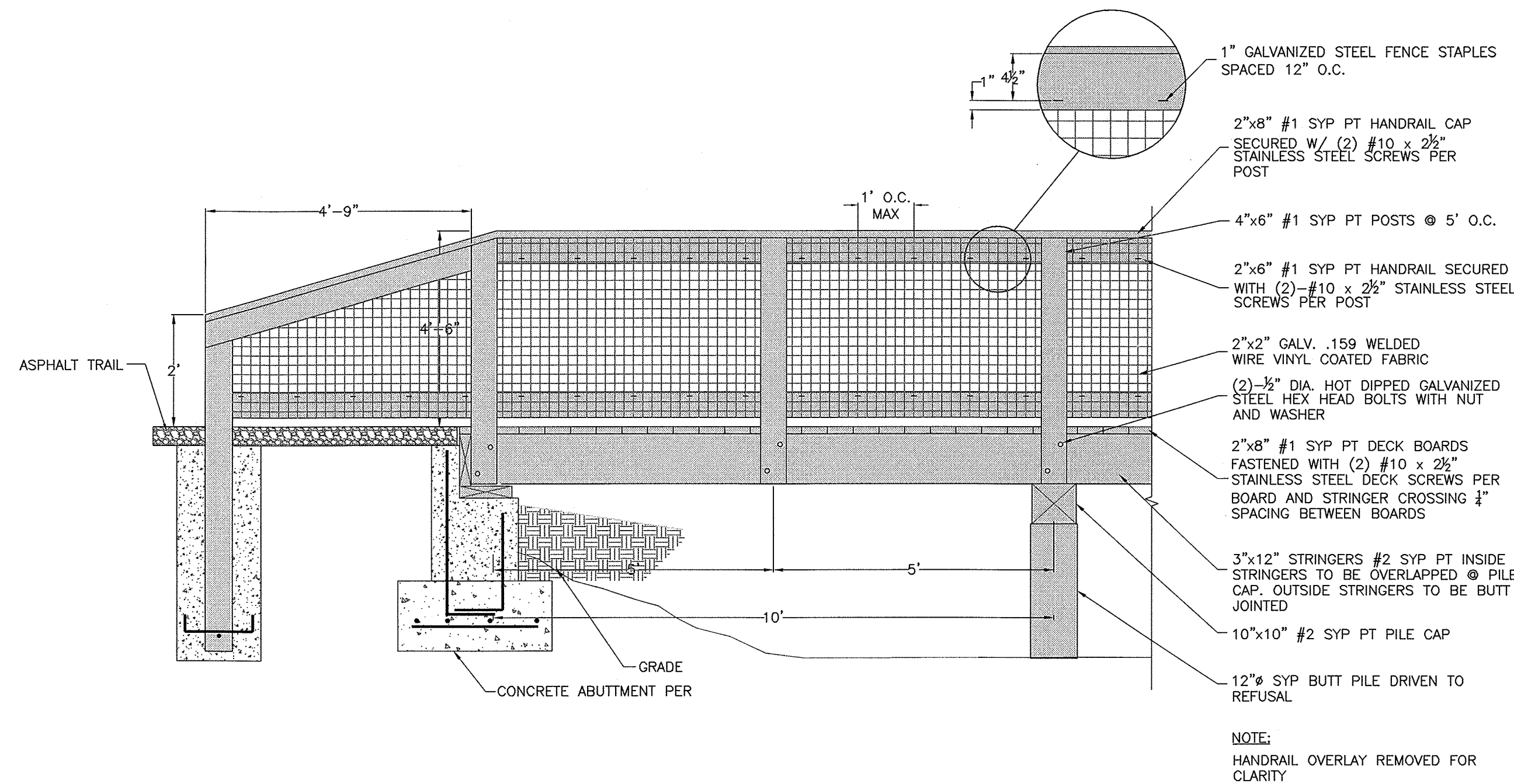
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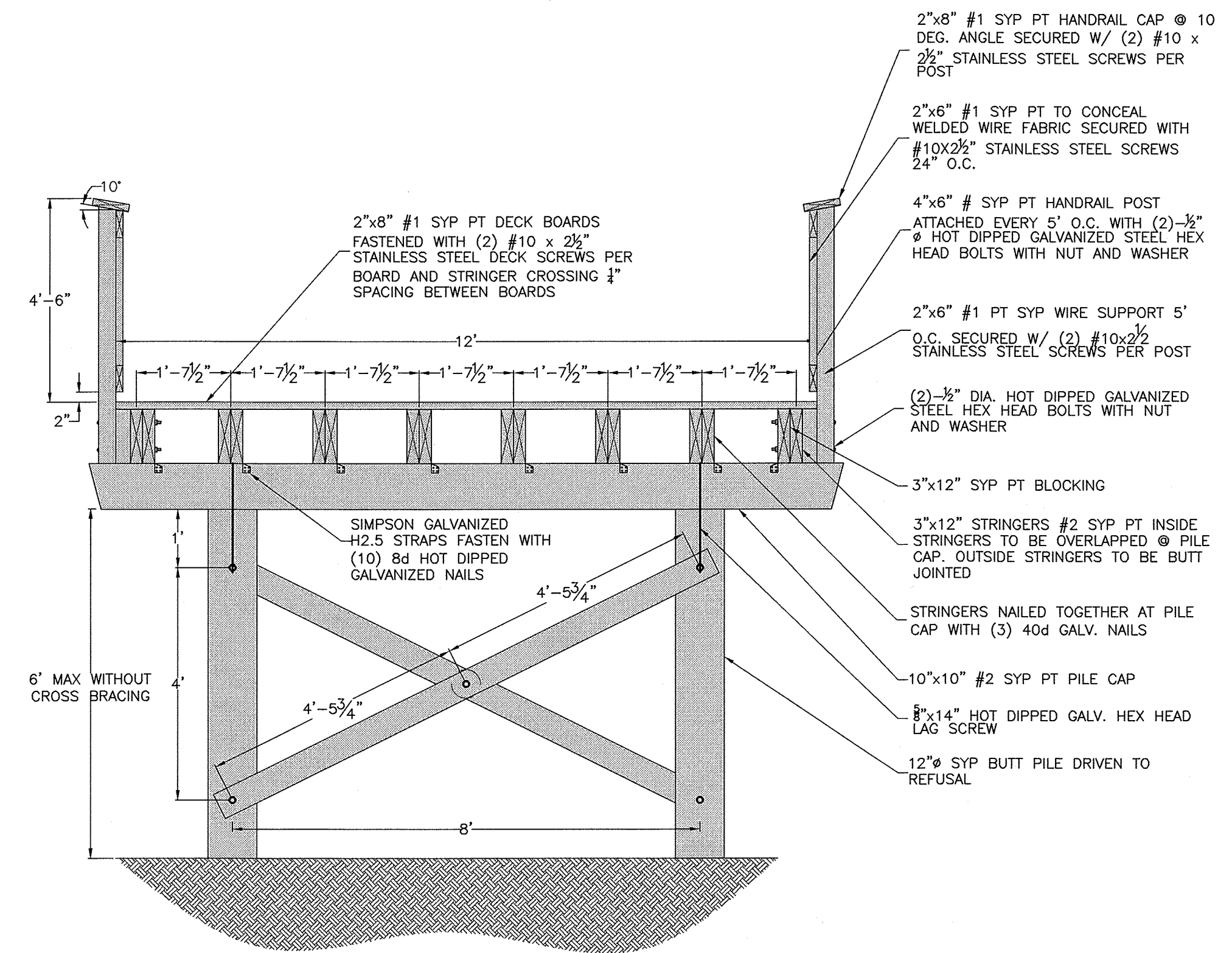
TYPICAL HANDRAIL BOLT DETAIL
3/4"=1'-0"



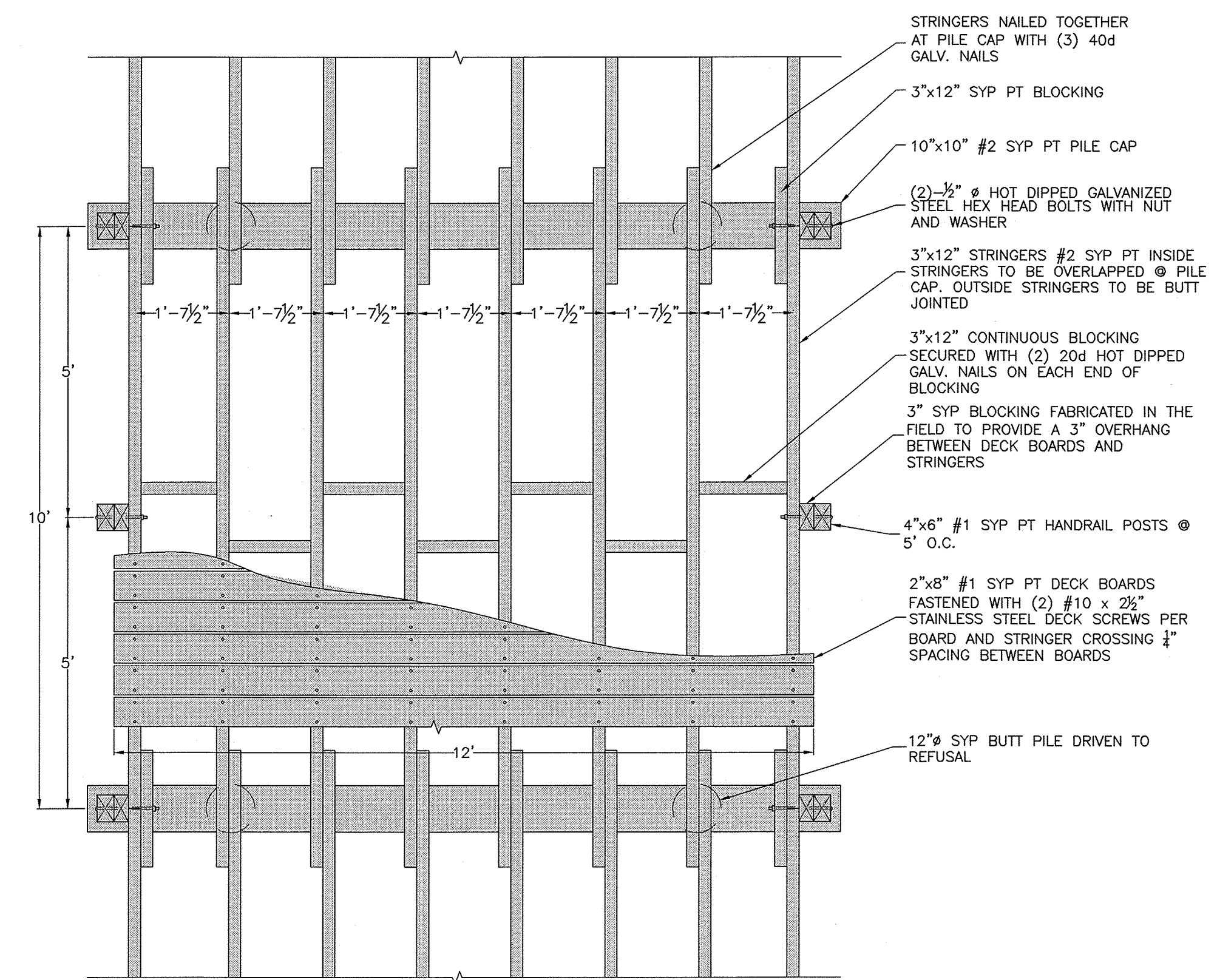
TYPICAL CROSS BRACING DETAIL
3/4"=1'-0"



TYPICAL BOARDWALK HANDRAIL ELEVATION
1/2"=1'-0"

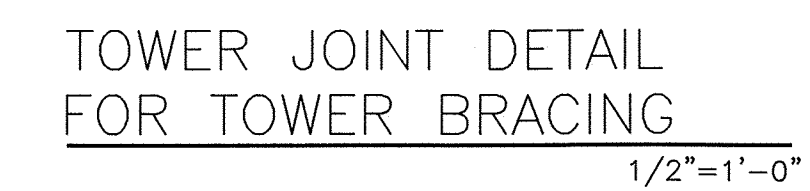
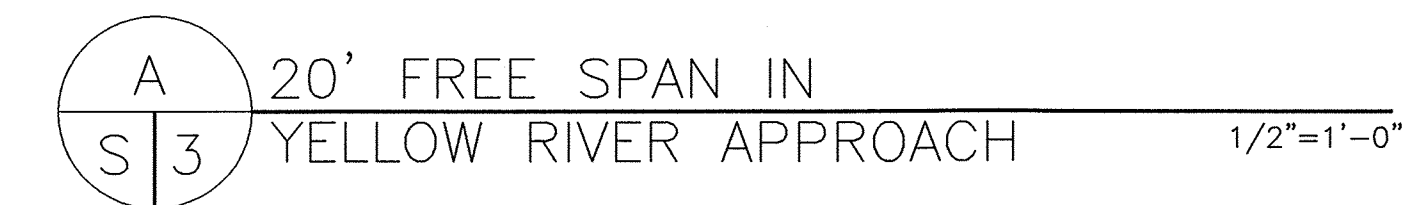


TYPICAL BOARDWALK SECTION
1/2"=1'-0"

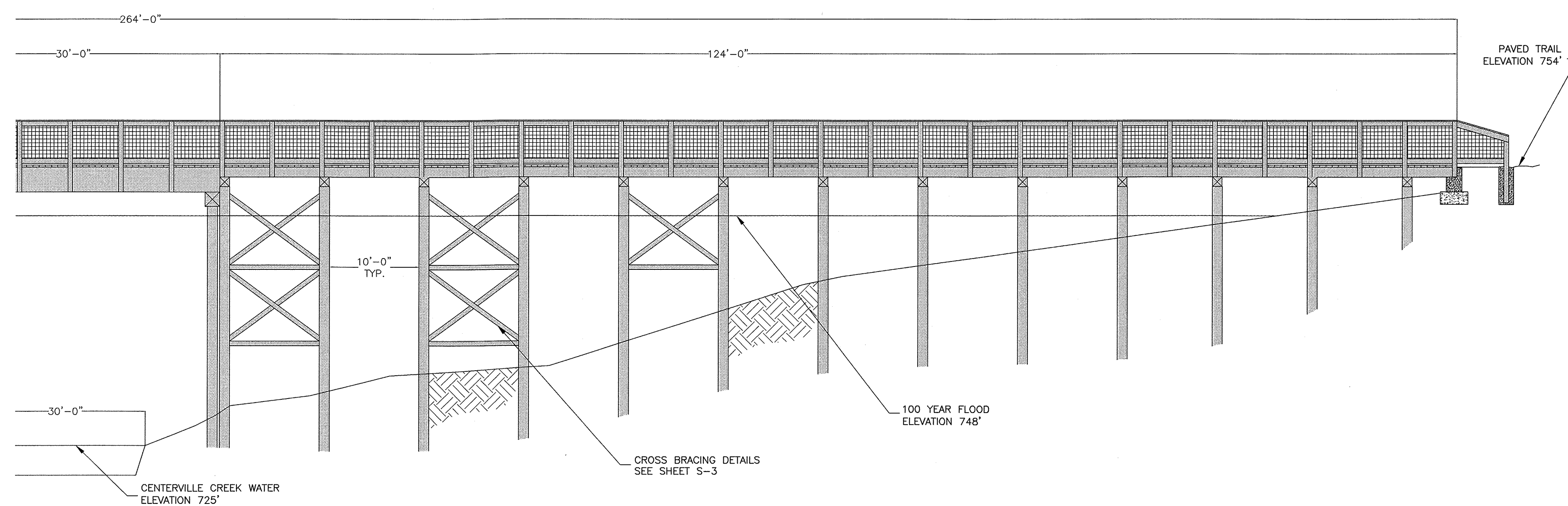
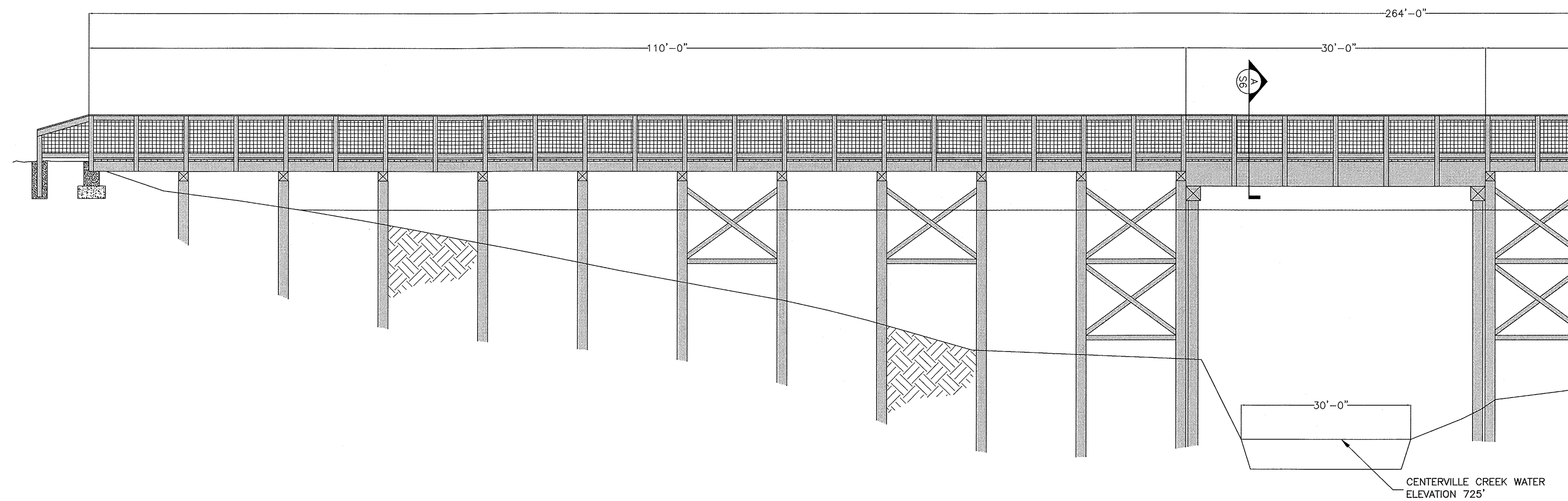


TYPICAL BOARDWALK PLAN VIEW
1/2"=1'-0"

NOTE:
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FOR CONSTRUCTION



NOTE:
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FOR CONSTRUCTION



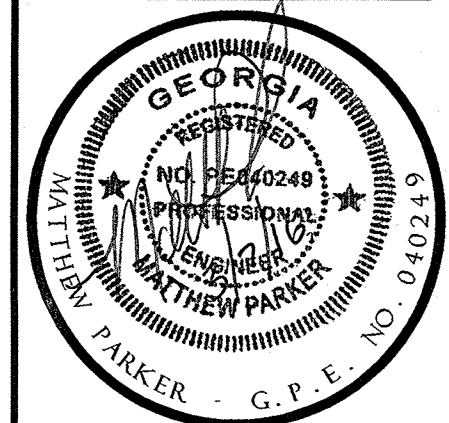
CENTERVILLE CREEK BRIDGE
1/8"=1'-0"

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CONSULTING SERVICES, INC.
CIVIL ENGINEERS
5300 CAPITAL CIRCLE SW
TALLAHASSEE, FL 32305 PHONE (850) 877-8400
MATTHEW PARKER, P.E. # 040249

CENTERVILLE CREEK
PEDESTRIAN BRIDGE
YELLOW RIVER PARK

WINNETT COUNTY
YELLOW RIVER
PEDESTRIAN BRIDGE

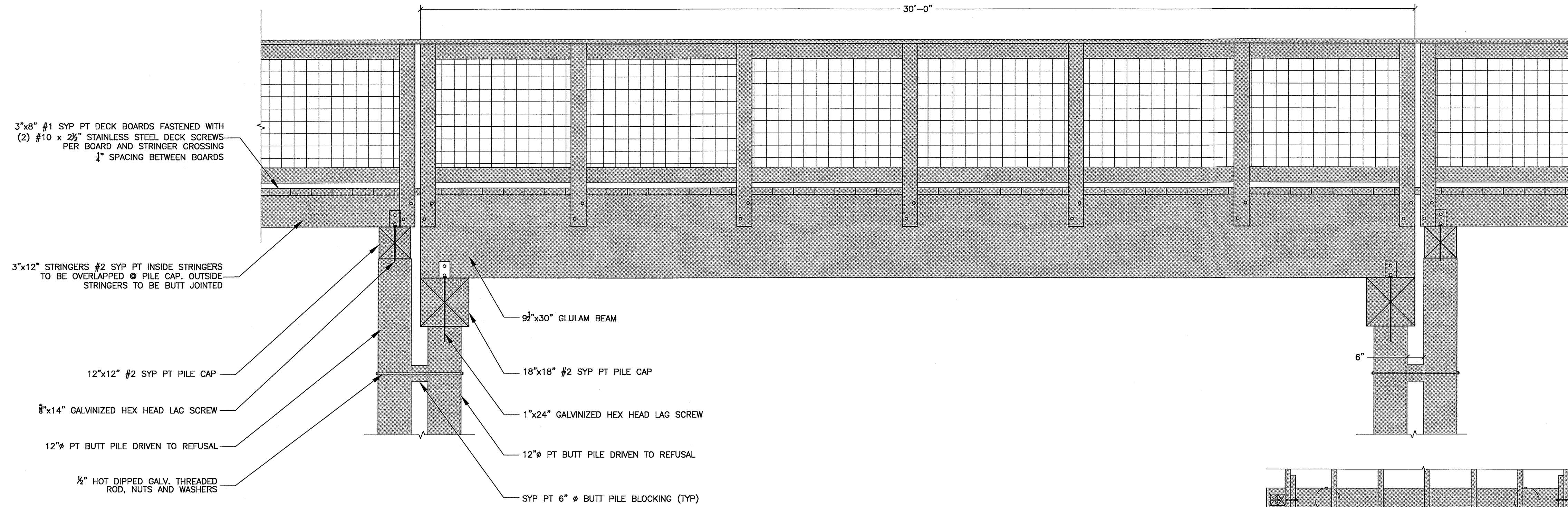


CENTERVILLE
CREEK BRIDGE
& BOARDWALK

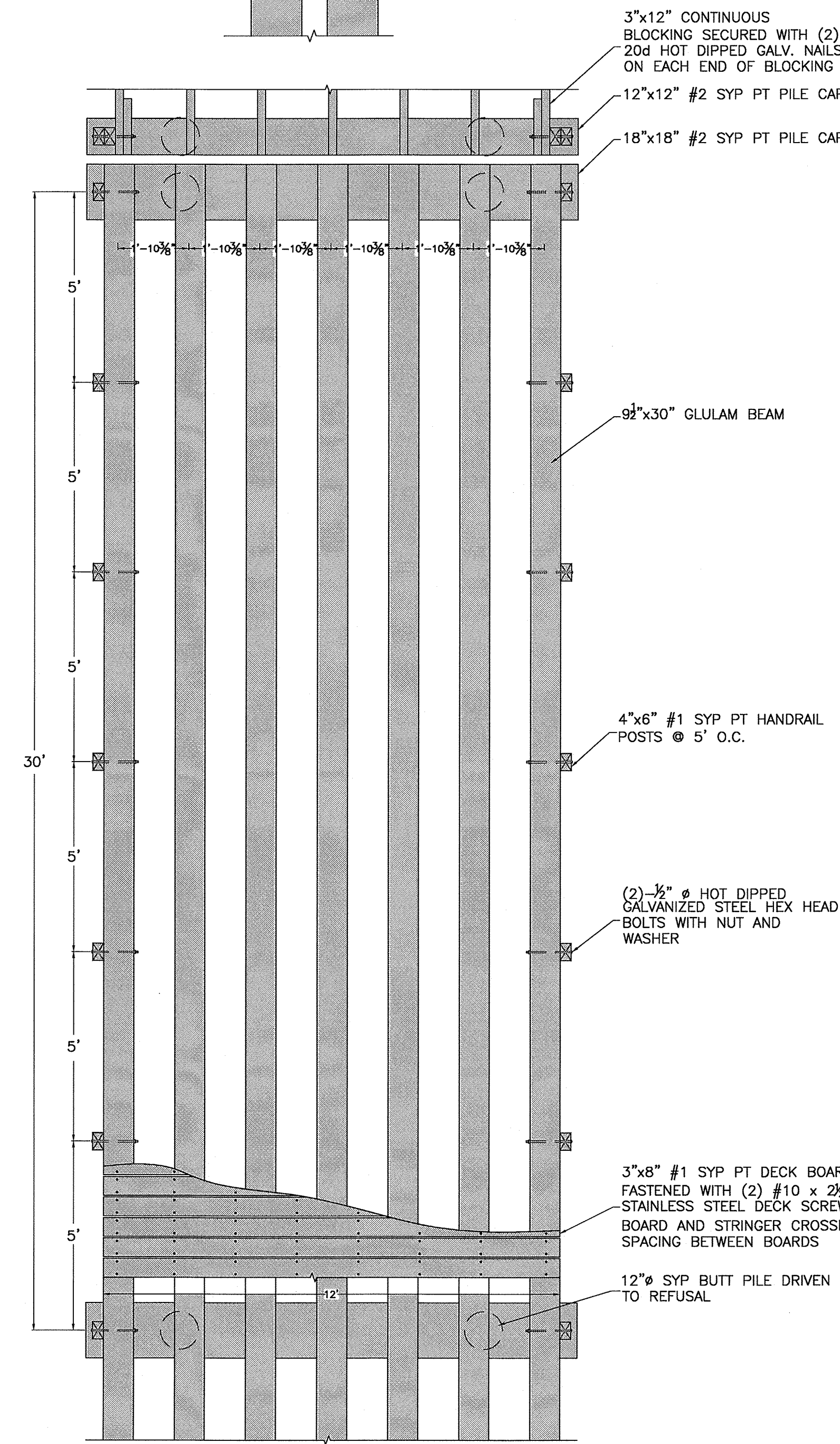
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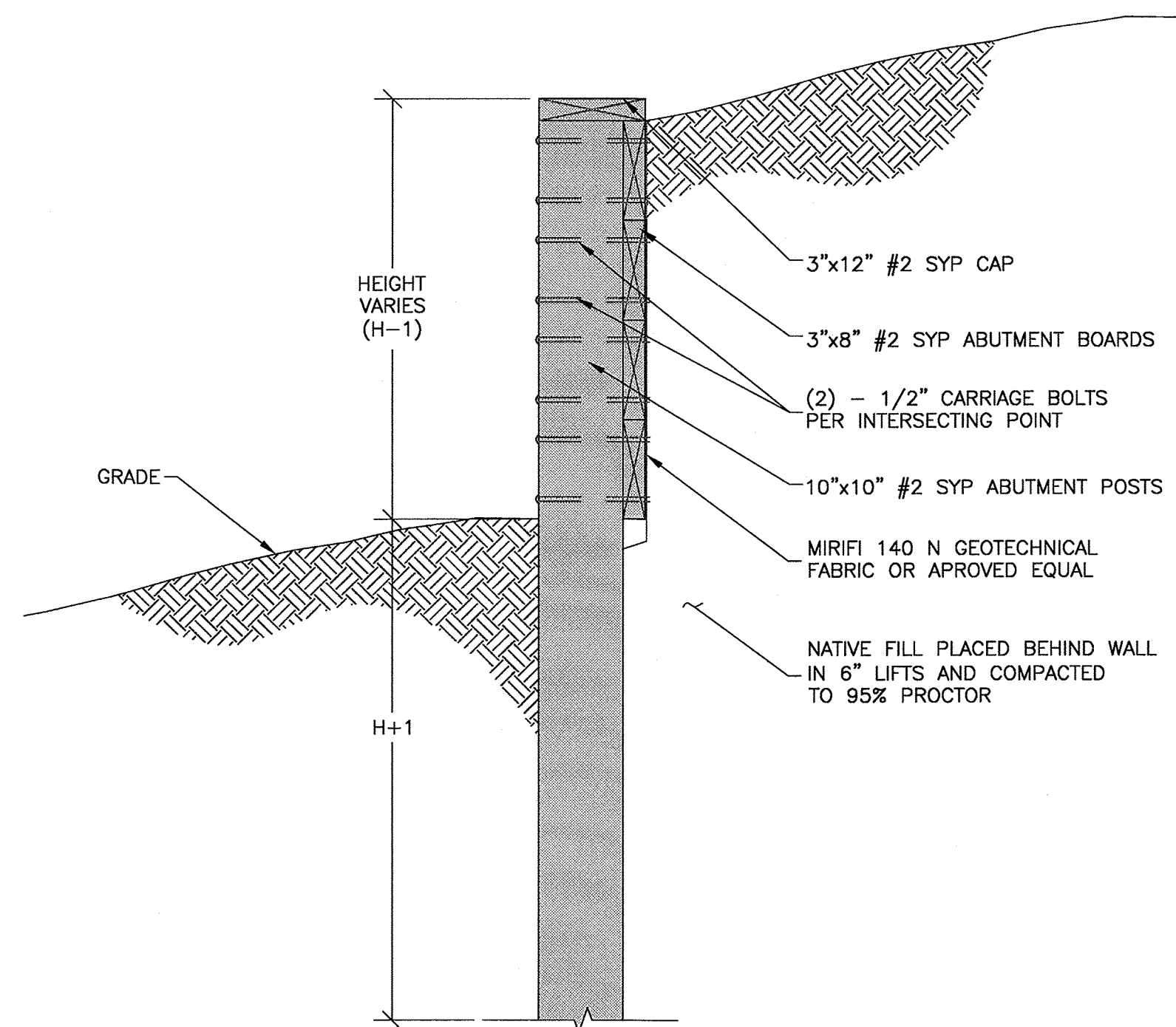


A 30' FREE SPAN BRIDGE IN
S 6 CENTERVILLE CREEK APPROACH 1/2"=1'-0"

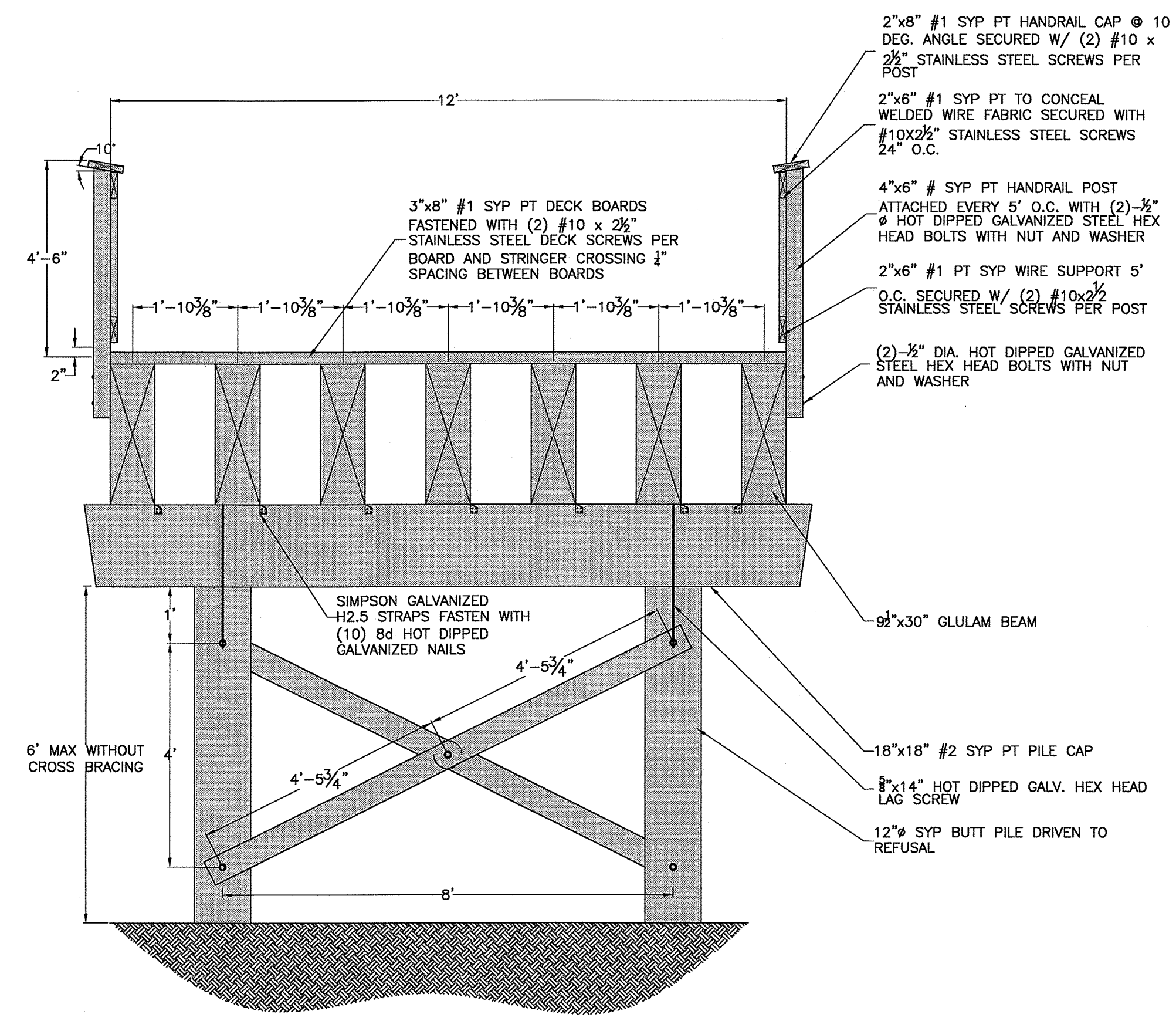


30' FREE SPAN BRIDGE PLAN VIEW 3/8"=1'-0"

NOTE: PRELIMINARY NOT FOR CONSTRUCTION



B ABUTMENT WALL DETAIL 3/4"=1'-0"



30' FREE SPAN BRIDGE SECTION 1/2"=1'-0"

APPENDICES

Appendix E: Cultural Resources Investigation Report

Refer to the attached report for a summary of the Historical and Archaeological Investigations conducted for the Johnson Tract and surrounding areas.



**CULTURAL RESOURCES INVESTIGATIONS OF THE
CENTERVILLE PARK TRACT AND THE JOHNSON PROPERTY,
GWINNETT COUNTY, GEORGIA**

FINAL REPORT

March 2015



**CULTURAL RESOURCES INVESTIGATIONS OF THE
CENTERVILLE PARK TRACT AND THE JOHNSON PROPERTY,
GWINNETT COUNTY, GEORGIA**

FINAL REPORT

Submitted to:

jB+A, inc.
2625 Cumberland Parkway
Suite 150
Atlanta, GA 30339

Submitted by:

TRC
4155 Shackleford Road
Suite 225
Norcross, Georgia 30093

TRC Project #231903

A handwritten signature in blue ink, reading "Price K. Laird", is positioned above a horizontal line.

Price K. Laird, RPA, Principal Investigator

Authored by
Price K. Laird and Jeffrey L. Holland

March 2015

ACKNOWLEDGEMENTS

TRC would like to thank the Livsey and Mason families for providing information about the project area and the Centerville community. The staff at the Gwinnett County Historical Society was also extremely helpful in uncovering sources of information and sharing their own knowledge. Thanks also go to Rex Schuder at Gwinnett County Parks & Recreation for responding quickly to all requests for information and guidance.

Vince Macek at TRC produced the graphics for the report, and Alvin Banguilan provided in-house review.

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I. INTRODUCTION

The current cultural resources investigations were undertaken by TRC to assess the potential for prehistoric archaeological sites and document evidence of historic land use at two sites planned for development as parks by Gwinnett County Parks and Recreation. The results of the investigations are intended to inform and guide the planning process with respect to protecting and highlighting cultural resources at the Centerville Park tract and Johnson Property in south Gwinnett County. The location of the two tracts is shown in Figure 1. The two sites collectively are referred to in this report as the project area.

The investigations consisted of three parts: a literature and records search to inventory previously identified cultural resources; historical research to document the ownership and physical history of the project area, as well as the historical context of the surrounding community; and an archaeological reconnaissance survey to inspect areas of high probability for prehistoric archaeological sites and document site conditions relevant to the existence and preservation of sites within the project area. The results of these investigations is presented below.

No previously identified archaeological or historical resources are located within the project area. Five historic resources (standing structures) are located within a half-mile of the project boundaries. The project area is located in the Rockbridge/Centerville community on the Hightower road, an important Native American trail and later wagon road accessing the upcountry of Georgia and the Cherokee Nation. Prior to the Civil War, two large plantations developed around the Rockbridge crossing of the Yellow River. After the war, the plantations were broken up and smaller family farms established. Centerville emerged as an important African American enclave during the late nineteenth and early twentieth centuries, and a number of black families acquired farms.

The properties that make up the project area were primarily owned by white families that were prominent in the area, but in the late nineteenth century, the Johnson Property was owned by two African American farmers. Land in the project area has been used primarily for agriculture and forestry during the historic period, with evidence of agricultural terracing as well as extensive timber harvesting. Old road beds and other remnants of human activity exist in the project area as well. The project area possesses definite potential for interpretation of historic and prehistoric occupation.

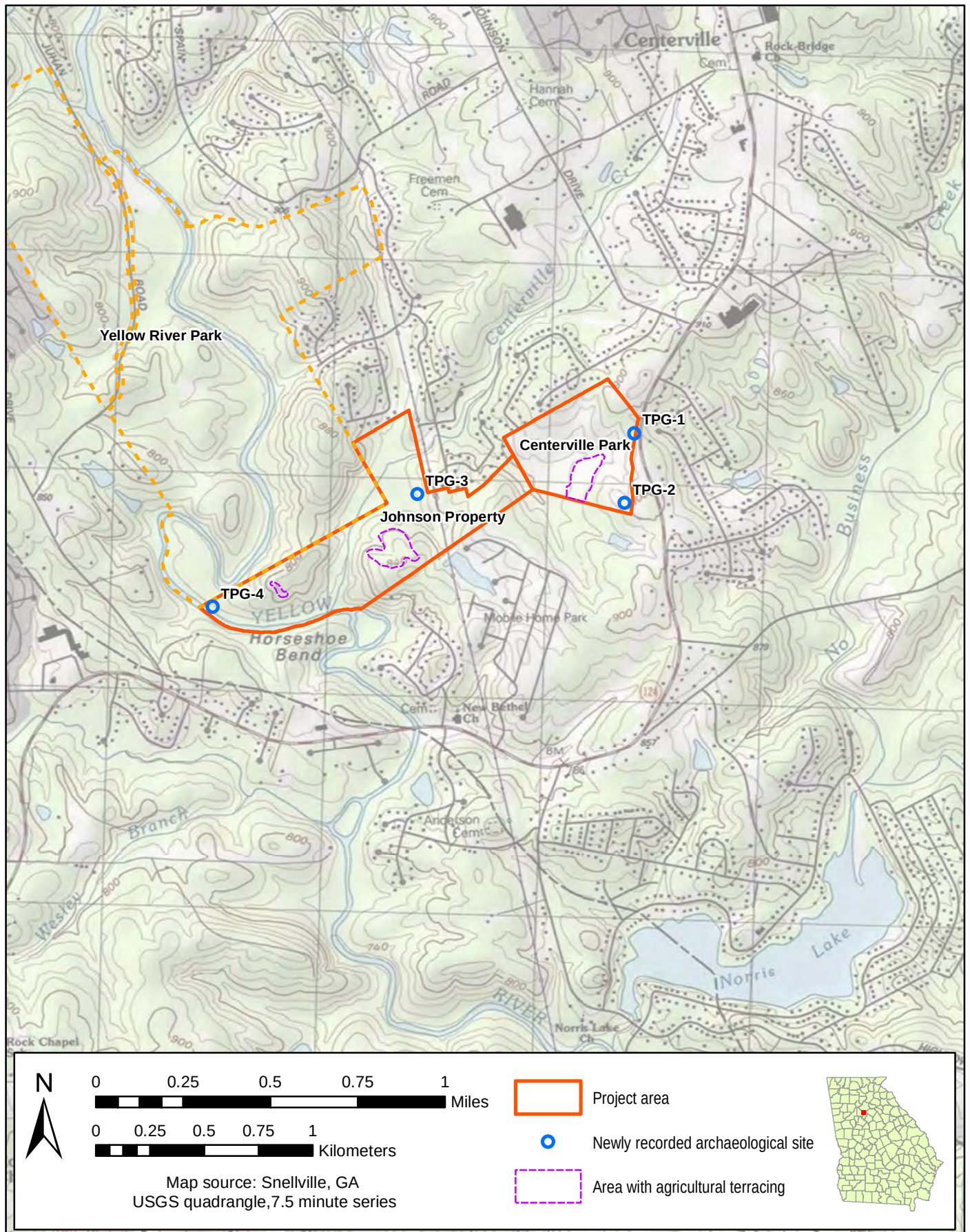


Figure 1. Location of Centerville Park tract and Johnson Property and cultural resources identified during field survey.

II. LITERATURE AND RECORDS SEARCH

PREHISTORIC BACKGROUND RESEARCH

An assessment of the potential of the project area to contain intact prehistoric archaeological sites was conducted as part of the cultural resources investigations. A review of the Georgia Natural, Archaeological and Historical Resources GIS (GNAHRGIS) database found that no previously identified archaeological sites are located within a half-mile of the project area. However, geographic and environmental features suggest that the area was frequented by prehistoric and protohistoric groups. Historic land use was also studied to determine the effects of agricultural and industrial land use on prehistoric sites.

HISTORICAL RESEARCH

TRC conducted documentary research to establish a historical context for the development of the project tracts and the surrounding community. Deed and probate records at the Gwinnett County Courthouse were used to establish as complete a chain-of-title as possible for the two parcels that make up the project area. Although a courthouse fire in 1871 destroyed county records prior to that date, some tax records and other documents are available for the period prior to that date. Federal census records and agricultural statistics for 1860 through 1880 were used to supplement the information from the deeds and other county records. By studying these records, a chronological accounting of the land use history of the project areas was established.

Historical research was also conducted at the University of Georgia libraries and the Gwinnett Historical Society using vertical subject files, maps, aerial photographs, agricultural and economic data, newspaper articles, published histories, and manuscripts. The research effort focused on establishing a historical context for the Centerville community and identifying the owners of the project tracts. Local residents were also contacted for information on the community and the project area. Thomas Livsey, whose father purchased the Promised Land house in the 1920s, and was an important source of information.

Information on previously identified historical resources was collected from the Georgia's Natural, Archaeological, and Historical Resources GIS (GNARGHIS). Four resources are located within 0.5 miles of the project tracts. A fifth resource, Thomas Maguire's Promised Land plantation house, is outside of the half-mile boundary, but is closely identified with the Rockbridge community and the project area. These resources are summarized in Table 1, and their locations are shown in Figure 2. David Anderson's Pleasant Valley plantation, located a half-mile west of the project area, was another important landmark in the community and may also have been associated with the project area. New Bethel AME Church Cemetery is located near the original Rockbridge crossing of Yellow River, just south of the project area. The church has since been relocated across the river to DeKalb County, but the cemetery remains. The oldest marked grave in the cemetery dates to 1920, around the time that Centerville emerged as a prominent African American community. Two houses on Anderson Livsey Lane to the southwest of the project area date to the early twentieth century. None of these properties have been assessed for eligibility for

listing in the National Register of Historic Places, although a nomination was prepared for the Maguire Plantation (Street 1993).

Table 1. Previously identified historic resources within 0.5 miles of project area.

ID No.	Resource type	Name	Address	Notes
201669	Cemetery	New Bethel AME Church Cemetery	4769 Centerville Highway (SR 124)	Earliest marked grave, 1920
201673*	Dwelling	Promised Land (Thomas Maguire)	4530 Anderson Livsey Ln	Ca. 1830
201674	Dwelling	E. J. Mason home place	4303 Anderson Livsey Ln	Ca. 1900
201675	Dwelling	Mason's Nursery	4018 Anderson Livsey Ln	Ca. 1910
201574	Dwelling	Pleasant Valley (David Anderson)	3690 S. Rockbridge Rd	Ca.1835

*Located 0.65 miles south of project area

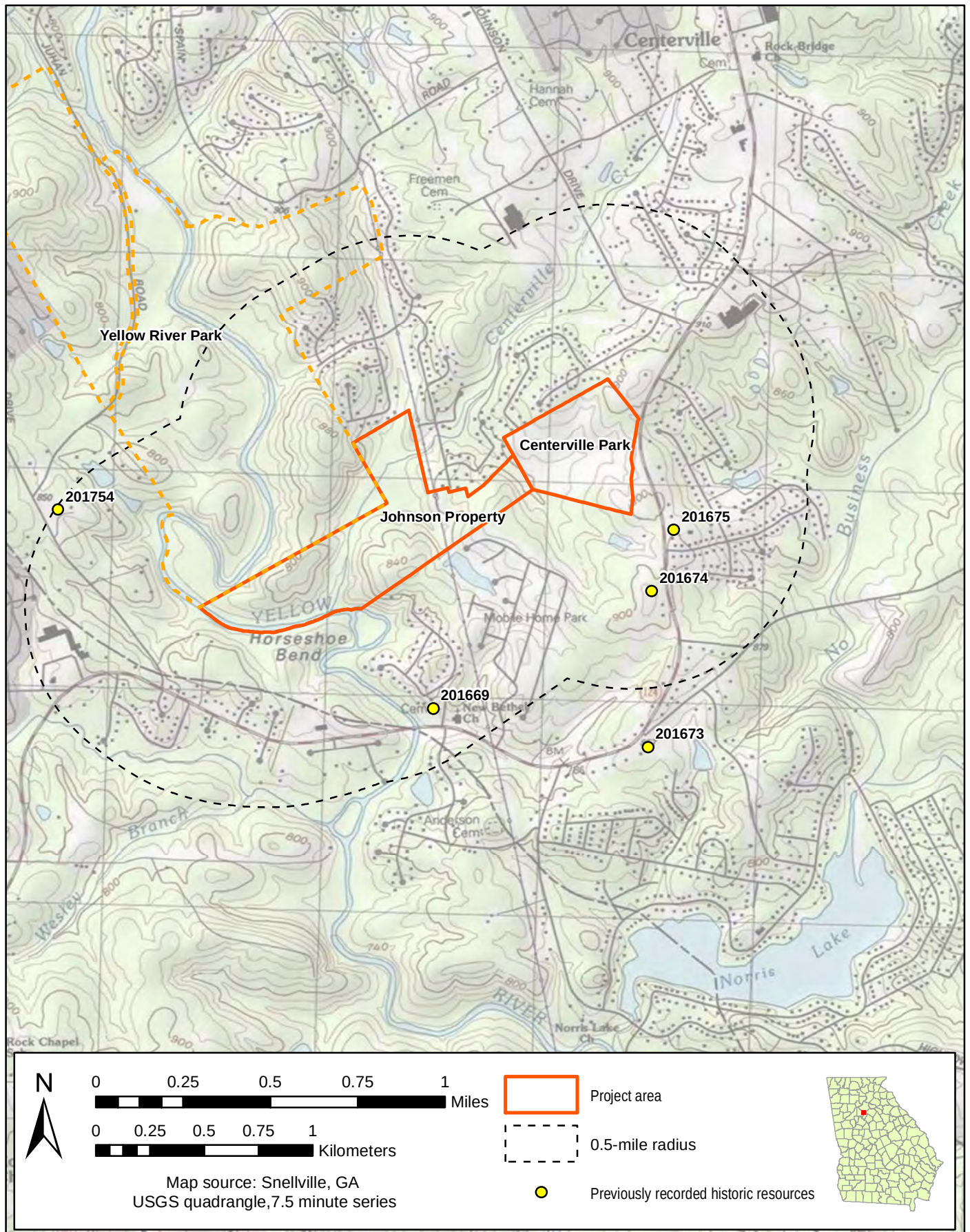


Figure 2. Previously identified historic resources within 0.5 miles of the project area.

III. CULTURAL CONTEXT

The prehistory of Georgia begins ca. 9000 B.C. and ends with the de Soto entrada of A.D. 1540. Archaeological evidence indicates that humans have periodically visited the project region for at least 10,000 years (Caldwell 1958; Fairbanks 1954; Hally and Rudolph 1986; Wauchope 1966).

BRIEF PREHISTORIC OVERVIEW

Paleoindian Period (ca. 10,000–8000 B.C.)

The Paleoindian period marks the beginning of human occupation in the New World. Exactly when the first human populations permanently settled the western hemisphere is uncertain; most archaeologists believe it was sometime between 20,000 and 14,000 years ago, in the last stages of the Pleistocene glaciation. The end of the Paleoindian period coincides with the Pleistocene/Holocene transition and in most areas of the Southeast is given an arbitrary terminal date of 8000 B.C.

Examples of Paleoindian lithic tool types include flake tools, formal side and end scrapers, graters, denticulates, specialized hafted unifacial knives, large bifacial knives, and specialized lanceolate projectile points, which were sometimes fluted. The best known of these is the Clovis point, the earliest recognized projectile point type in the western hemisphere (dating 9800–9000 B.C.). Formal variation in projectile point morphology began to emerge in regions of the Southeast by about 9000 B.C. These new forms include the Cumberland, Suwannee, Simpson, Beaver Lake, and Quad types (Anderson 1990; Justice 1987:17–43; Milanich and Fairbanks 1980).

In the Eastern Woodlands, the majority of Paleoindian sites consist largely of diffuse lithic scatters at open locations, with more intensive occupations in rockshelter or cave settings. No conclusive evidence for permanent structures or long-term encampments has been located for this time period in the Southeast. There is a general consensus among archaeologists involved in Paleoindian research regarding Paleoindian settlement patterns. Groups were probably each comprised of four or five extended families and counted 25–50 individuals. Primary social groups very likely met at predetermined locations with other groups at specific times of the year to cooperate in large-scale food acquisition (nut harvesting, fishing, shellfish gathering, etc.) and/or lithic resource extraction, as well as to exchange information, renew or create alliances, fulfill social obligations, find mates, and perform rituals. For most of the year, however, primary groups appear to have dispersed into loosely defined habitual use areas. They probably exploited a wide variety of economic resources, moving often to take advantage of seasonal resources. It is also possible that they periodically established logistical base camps and used them as staging areas for special activity forays.

The end of the Paleoindian period (ca. 8000 B.C.) is associated with the end of the Wisconsin Ice Age and the onslaught of new environmental conditions, which influenced how humans organized their society and coped with the environmental and social pressures that came about during the climatic transition. New settlement and subsistence patterns were established and regional technological innovations were developed. These trends are associated with the subsequent Archaic culture period.

Archaic Period (ca. 8000–1000 B.C.)

In Georgia, the transition from Paleoindian to Archaic has been arbitrarily designated as 8000 B.C. In addition to rapid changes in environmental conditions that were nearing completion by 8000 B.C. (Delcourt and Delcourt 1985), and the changes in utilitarian technology that were developed to cope with those changes, population demography and diversity in social organization distinguish the Archaic experience. A tripartite scheme, dividing the Archaic period into Early, Middle, and Late sub periods, is traditionally used to demarcate some of the important developments of this time.

Tool assemblages associated with the Early Archaic period are similar to those of the preceding Paleoindian period, although a variety of ground stone tools first appear at this time. Notched and/or stemmed hafted bifaces replace lanceolate forms by 8000 B.C. in the Southeast. Big Sandy, Palmer-Kirk series, Kirk Corner Notched, Kirk Stemmed, and several bifurcate styles are the Early Archaic types known in the project region. Wear patterns suggest that these tools were used for activities such as killing, butchering, and skinning game, as well as woodworking.

The Early Archaic life way is represented by social, settlement, and subsistence strategies designed to take advantage of the biotic diversity of the early Holocene environment, and also to cope with movement restrictions placed upon some Early Archaic populations because of increased population. Hardwood primary forests and extensive palustrine swamps provided large and small game as well as a variety of plants for medicine, subsistence, clothing, and shelter. Rivers were used as travel corridors and provided fresh water, fish, and shellfish. The only areas of low productivity would have been the pine stands that began to emerge in the uplands by about 6000 B.C. (Delcourt and Delcourt 1985).

In general, it is hypothesized that Early Archaic societies in Georgia and the Carolinas were organized into band-sized communities (population 25–50) whose main territory surrounded a segment of a major river (the Ocmulgee, for example). These bands are postulated to have been organized into larger “macro-bands” that gathered on special occasions for community food harvesting, rituals, and the exchange of mates and information. Two types of settlements have been especially noted: small, short-term “camps,” and large, densely occupied areas that appear to have been base camps or congregation sites.

The Middle Archaic period tool kit was, for the most part, expedient and manufactured from locally available raw materials. Quartz, which is ubiquitous in northern Georgia, was the preferred source of lithic raw material in the region during this period. Diagnostic bifaces dated to this period include the Stanly, Morrow Mountain, Guilford, and MALA types. Unremarkable quartz ovate hafted bifaces are common as well. Although all of these are known to occur in Georgia, the Morrow Mountain styles are the most frequently encountered diagnostic hafted bifaces in north and north-central Georgia.

Upland Middle Archaic sites have been described as small, randomly distributed occupations exhibiting very little intersite technological variability. Local raw materials were used almost exclusively, and the vast majority of tools were technologically expedient (Blanton and Sassaman 1989; Sassaman 1993a). In terms of social organization, small hunting and gathering bands of 25–50 people probably still formed the primary social and economic units. Residences were moved

frequently, subsistence was generalized, and social groups were small, mobile, and likely co-residential. Long-term investments and social obligations were probably kept to a minimum, insuring that there were very few restrictions on group movement or fissioning (Sassaman 1993b).

The hafted biface most commonly associated with the Late Archaic period in Georgia is the Savannah River point. Other Late Archaic varieties include Appalachian Stemmed, Elora, Kiokee Creek, Limestone, Otarre, and Paris Island (Bullen and Greene 1970; Cambron and Hulse 1983; Chapman 1981; Coe 1964; Elliott et al. 1994; Harwood 1973; Keel 1976; Sassaman 1985; Whatley 1985). These are characterized by triangular blades, straight or slightly contracting stems, and straight bases.

The Late Archaic period witnessed several significant changes that anticipated the cultural developments of the following Woodland period: the development of ceramic technology¹; greater involvement in plant husbandry; and changes in settlement patterns. Information gathered from hundreds of Late Archaic period sites in northern and central Georgia present a fairly clear picture of demography and settlement: Seasonal single-household occupations and special activity camps related to those occupations dotted the uplands throughout north-central and northeast Georgia, as well as the western Carolinas, while large and intensively occupied special-purpose aggregation and multi-seasonal village sites are associated with the central Savannah River basin. The end of the Archaic period and beginning of the Woodland era is an arbitrary demarcation created by archaeologists. It is a consensus that recognizes the widespread adoption of an improved ceramic technology by 1000 B.C.

Woodland Period (ca. 1000 B.C.–A.D. 900)

The Woodland period, like the preceding Archaic, is divided into three subperiods—Early, Middle, and Late—based upon major demarcations in general social patterns.

Early Woodland occupations are thought to reflect a more or less unchanged continuation of Late Archaic life ways, except for the widespread adoption of a much-improved ceramic technology. Soapstone, a popular raw material in the Late Archaic period, was reduced to a very minor constituent of the overall Early Woodland artifact assemblage. It was used to make utilitarian items such as line weights and gorgets, and as a medium for decorative or ritualistic art.

A diagnostic tool that first appeared in the Early Woodland is the triangular hafted biface. This tool form was popular throughout the Southeast until the Contact period. Early Woodland specimens are generally large and sometimes have incurvate bases or small “ears.” Nondescript isosceles triangular hafted bifaces associated with the Early Woodland period have a variety of parochial names.

Villages with permanent structures have been reported (Bowen 1989; Garrow 1975), mostly in the floodplains of rivers and creeks. Burial mounds, a hallmark of Middle and Late Woodland

¹ Steatite (soapstone) bowl fragments are common at Late Archaic sites in this region, and fiber-tempered ceramics are uncommon. Fiber-tempered ceramics were produced mainly on the coast in the Late Archaic period (Sassaman 1991, 1993a). There is, however, a soapstone quarry and bowl-manufacturing site in western Gwinnett County (D’Angelo 2003).

mortuary practices, appear to be lacking in the Early Woodland. One major subsistence preference in the Early Woodland was for a variety of nut crops, especially acorns. Nut processing and roasting pits are much more common at Early Woodland sites than at any other type of site (Bowen 1989; Wood and Ledbetter 1990). Numerous Early Woodland sites have been recorded in northern Georgia (Wauchope 1966), with many examples along the Etowah River in the Allatoona Reservoir area (Caldwell 1950).

Two Middle Woodland cultural traditions are recognized in the project area, Cartersville and Swift Creek. The earliest cultural expression is Cartersville, which is identified by ceramic assemblages dominated by plain, simple, and check-stamped vessels. Intricate complicated stamped surface designs are the hallmark of Swift Creek pottery.

There is no clear typology for Middle Woodland projectile points in northern Georgia. Large triangular, “waisted” triangular, and stemmed varieties co-occur in Middle Woodland artifact assemblages, and all are found in both Cartersville and Swift Creek components. Other projectile point types such as Coosa and Bakers Creek are more common in the project area (Cambron and Hulse 1983).

Data on settlement, architecture, and subsistence in the Middle Woodland period in northern Georgia has been obtained from many Cartersville and Swift Creek sites in the region. Middle Woodland structures have been identified at several sites. For example, at the Hickory Log site (9CK9), at least a dozen Cartersville structures have been identified to date. All of the structures are round and exhibit single-post architecture. Horticulture is thought to have assumed an increasing role in the Middle Woodland subsistence economy; marsh elder and maygrass cultivation apparently began at this time (Cantley and Joseph 1991). Despite these nascent horticulture practices, subsistence almost certainly still depended largely on broad-spectrum hunting, fishing, and gathering.

Many aspects of the Late Woodland period in the Southeast are enigmatic, especially in terms of social organization. Several general themes pertaining to the cultural processes are evident, however. The decline in importance of the Hopewellian mound centers throughout the Midwest and Southeast and the apparent fragmentation of long-distance, large-scale trade networks into more localized spheres of interaction by A.D. 500 signify the beginning of the Late Woodland period in the Southeast. Late Woodland subsistence practices continued to focus on broad-spectrum hunting, fishing, and gathering. Botanical foodstuffs and a variety of terrestrial, palustrine, riverine, and lacustrine fauna—white-tailed deer, turkey, fish, and shellfish, for example—were important to the subsistence base (e.g., Hally 1970; Hally and Rudolph 1986; Stanyard and Baker 1992). It was not until late in the period (ca. A.D. 700–900) that maize horticulture began to play a significant role in sociopolitical developments in the region (Muller 1983). In northern Georgia, maize does not appear to have been economically important until sometime after A.D. 1000.

Settlement patterns varied among Late Woodland groups according to environmental setting, socioeconomic organization, locational preference, and other factors. Broadly speaking, however, there was a time-transgressive trend from a seasonal settlement pattern focused on exploiting small to medium-sized tributaries and their associated upland environments, to one of more permanent settlements on the floodplains and bottomlands associated with large rivers and drainages. Small

mound complexes and fortification architecture suggest a relatively complex political landscape. From the architectural evidence, it is evident those populations were becoming more centralized, and that there was a threat, either real or perceived, of political aggression during the later stages of the Late Woodland period.

Diagnostic lithics of the Late Woodland period are primarily small triangular hafted bifaces, often called Hamilton points. These types were manufactured until historic times and are only diagnostic when recovered in context. Ceramics are generally used for identifying Late Woodland components in the region. Late Swift Creek and Napier ceramics have been the traditional markers of the Late Woodland in northwest Georgia (Rudolph 1991). Late Swift Creek ceramics are identified by curvilinear complicated stamping, often in combination with the rectilinear designs associated with Napier and Woodstock ceramics (Rudolph 1991; Snow 1975). Napier surface designs consist of plain, fine-lined rectilinear, and, occasionally, curvilinear complicated stamping.

Mississippian Period (ca. A.D. 1000–1600)

The Mississippian period marks the appearance of chiefdom-level societies in the southeastern United States. The cultural traits characteristic of Mississippian society include (1) earthen platform mounds arranged around central plazas; (2) continued population increase centered in more stable settlements; (3) dependence on cultivated plants such as maize and beans; (4) increased territoriality and warfare; and (5) socially stratified, chiefdom-level sociopolitical units (Chapman 1985:74–89). Three subdivisions, Early, Middle, and Late, are recognized for the Mississippian period in northern Georgia.

In northern Georgia, the Early Mississippian period is characterized by the advent of sustained maize horticulture, permanent settlement of floodplains along large river drainages, and centralized political control administered by an elite class from large mound centers. In north-central Georgia, archaeologists term this era the Etowah culture, named after the mound complex of the same name near Cartersville, Georgia. At the beginning of Etowah culture (ca. A.D. 1000–1050), the geographical distribution of early Etowah ceramic assemblages was concentrated around the eastern Etowah and Chattahoochee river drainage systems, which span five counties in north-central Georgia. Through time, the sphere of Etowah influence appears to have shifted eastward, coalescing around the central Etowah and Oostanaula river drainage systems by about A.D. 1150. By ca. A.D. 1200, Etowah culture was concentrated around an approximately 50-km stretch of the Etowah River in Bartow, Cherokee, and Floyd counties. By this time a polity had formed, known in archaeological terms as the Wilbanks phase of the subsequent Savannah culture, and centralized political control over the region was administered from at least four mound sites: Etowah, Two Run Creek, Free Bridge, and Raccoon Creek (Larson 1971; Wauchope 1966; see Hally and Rudolph 1986:58–59).

Early Etowah is represented archaeologically by ceramics exhibiting bold-lined rectilinear surface decorations, the most common of which consists of line block and nested diamonds bisected by two or more horizontal lines. By about A.D. 1100 this design type became less popular, while “barred diamonds” were more popular. The addition of a wide array of surface treatments and an increase in the use of shell as a tempering agent accompany this change in complicated stamped design. New design types include Etowah Red Filmed, Etowah Polished Plain, Etowah Polished

Black, and Sixes Plain (Hally and Rudolph 1986:39). The latest portion of Etowah culture is characterized by the addition of Savannah Complicated Stamped designs, such as figure nine, filfot cross, and herringbone, to the ceramic inventory.

Etowah domestic architecture consisted of both wall-trenched, rectilinear structures with a central hearth, and wattle and daub structures with a single post construction and central clay hearths (Hally and Rudolph 1986; Wauchope 1966). Platform mounds began to be constructed at political centers, such as the Etowah mound complex in Cartersville, by at least A.D. 1150. Buildings were constructed on the mound summits and were probably used for ritual purposes as well as residences for the elite.

In Georgia, the Middle Mississippian period is called the Savannah culture. During this time, the project area was probably most heavily influenced by the Wilbanks phase of the Savannah culture, a polity focused around a political center at the Etowah River mound complex (see above).

Excavations at Etowah suggest that Wilbanks-phase society was stratified and ruled by an elite class that inherited their social position (Larson 1971). Evidence for this includes buildings atop platform mounds (possibly associated with ritual activities and/or residences for the elite) and the analysis of burials, which indicates differential mortuary treatment. Although many individuals were buried with few or no grave goods, some burials associated with the Wilbanks phase at Etowah contained elaborate grave furniture associated with the “Southern Cult,” or Southeastern Ceremonial Complex. Items associated with the Southeastern Ceremonial Complex include bilobed arrows, ceremonial chert blades, ground stone axes, batons/maces, embossed copper plates, copper gorgets, large stone statues, and various items of shell (see Galloway 1989). They are interpreted as prestigious ceremonial accouterments owned by members of the elite class and used by them to perform important rituals.

Ceramic surface designs consist of Etowah Complicated Stamped (filfot, barred diamonds, and herringbone), Savannah Complicated Stamped (concentric circle, two-bar circle, and two-bar cross circle), and Savannah Check Stamped. A Savannah Plain ware is also recognized. Shell tempering and handled jars occur in ceramic assemblages from northwest Georgia (e.g., Bell Field Mound in Murray County), but these features are rare elsewhere in the state, including those associated with the Wilbanks phase (Hally and Rudolph 1986:53).

Mound construction peaked during the Wilbanks phase, and earth lodges began to be constructed as well. Earth lodges were probably used for important meetings and rituals. Domestic architecture appears to be similar to that of the preceding Etowah culture.

The Late Mississippian period is known as Lamar culture, named after the Lamar site, near Macon, Georgia (Kelly 1935). Excavated by James A. Ford and, later, A. R. Kelly in 1933 and 1934, the Lamar site investigation was the first modern excavation of a site dating to this time period (see Williams and Shapiro 1990: 11).

Early Lamar ceramic surface designs continued to exhibit complicated stamped decorations like those of the Savannah culture. Rims, however, are thickened and decorated with punctations, pinches, or appliqué. By about A.D. 1450, incising became a popular surface design motif. Incising becomes finer, and the number of lines that constitute the design increases through time.

Tempering is also chronologically sensitive, becoming coarser through time. Diagnostic features of later Lamar ceramics include bowls with sharply incurving rims (cazuela bowls), cane-punctated rims, and rim effigy adornos.

Lithics are rare at some late Lamar sites, especially the small occupations in the hinterlands, even though small (Hamilton-like) and large triangular projectile points were being mass-produced at locations such as the King site (Jennifer Freer, personal communication 1993).

Many large villages and small hamlets attributable to Lamar occupations in Georgia have been excavated, and more is known about Lamar culture than any other culture phase or period. Some villages were large; perhaps several hundred people lived at the largest ones. The King site (Hally et al. 1975) in Floyd County and Ruckers Bottom (Anderson and Schuldenrein 1985) in Elbert County are two such sites, though neither is associated with a mound. Mounds continued to be built, however, and were the locations where the administrative activities of the elite were conducted.

Although political control was still centralized, widely scattered hamlets of one to five homesteads each were ubiquitous across the north Georgia landscape. Many of these small hamlets were far from political centers, and it is unclear how much control the ruling class could exercise over everyday activity in the hinterlands. It is possible that some tribute, mostly in the form of food and goods but perhaps in community or military service as well, was paid to indicate and reinforce allegiance to those in control.

The subsistence economy was heavily focused on maize, bean, and squash horticulture, although wild plants and nuts were consumed as well. The most important resource, in terms of animals, was the white-tailed deer. A wide variety of other animals, including small mammals, turkey, reptiles, fish, and shellfish, were also exploited on a seasonal basis (Rudolph and Hally 1985; Shapiro 1983).

Domestic architecture during Lamar times has been detailed from evidence at several sites. Structures were usually square with slightly depressed floors and wall trench entrances. Walls were constructed from vertically set posts and were covered with clay, thatch, and possibly bark (see Hally and Rudolph 1986:69). They were likely occupied throughout the year, though evidence suggests that some domestic activities were conducted in open-air structures, probably in the summer months (Hally et al. 1975). At the King site, a large Contact period site mentioned earlier, domestic structures were grouped around small open spaces and may represent groupings of small nuclear families (Hally and Rudolph 1986:70; Hally et al. 1975). The existence of central plazas at Lamar sites is well documented at the King (Hally et al. 1975), Dyar (Smith 1981), and Little Egypt (Hally 1980) sites. Ritual activities are assumed to have taken place in these areas, which were surrounded by domestic and public buildings.

Some of the late Mississippian manifestations such as Lamar are known to have continued into the period of European exploration and early colonization known as the Contact Period. However, Native American societies were rapidly transformed by disease, warfare, and forced population movements as a result of Euro-American contact and settlement.

HISTORIC PERIOD IN GWINNETT COUNTY

Most of the territory that is now Gwinnett County was acquired through the Cherokee land cession of July 8, 1817, and the Creek cession of January 22, 1818. (These treaties granted the same lands, which were secured from both tribes because of disputed boundaries between them). Although Gwinnett County was not an official county until 1818, many settlers were illegally squatting on this land before that date. Following the formation of the county, settlement was officially permitted and encouraged in the area that includes Gwinnett County (Flanigan 1995 [1943]:1–2, 1984 [1959]:5).

After the final removal of the Creek and Cherokee Indians in 1821, settlers from Virginia, the Carolinas, and other parts of Georgia began to move into the area in large numbers. Subsistence farming, supplemented with one or two cash crops and livestock, was practiced by most of the residents prior to the Civil War. Corn, wheat, rye, fruit, and vegetables were the most common crops. Small communities developed at crossroad centers to serve the needs of the agricultural population. These communities might contain no more than a store, but often included a post office, church, mill, and possibly a cotton gin. Some became the core of regional towns that emerged after the Civil War. Others remained small and decentralized, or simply faded away over time.

As the number of settlers in the county increased, new roads were cleared and ferries were established on the Chattahoochee River to facilitate transportation and communication. A system of railroads was in operation in the region by the 1840s, and several towns, including Lawrenceville, became important in the southeastern trade network (Flanigan 1995 [1943]:173-174). By 1850, post offices in Gwinnett County included Lawrenceville, Auburn, Cains, Choice's Store, Orrsville, Pinkneyville, Rock Bridge, Suwanee, Sweet Water, and Yellow River (White 1854:483).

Most of Gwinnett County escaped the military actions associated with the Civil War. The closest the war came to the area was during the Battle of Atlanta in the summer of 1864. On July 20, 1864 the Union forces were closing in on Atlanta and a Union detachment was sent to burn the bridges over the Yellow and Alcovy rivers and to destroy the Georgia Railroad in that area. They burned cotton, wagon trains, stores, hospitals, and destroyed the railroad in Decatur, Covington, Lawrenceville, and Loganville.

After the Civil War the newly freed African American population in the South was incorporated into the agricultural economy through the tenant system, which could take a variety of forms, but most often involved the landlord taking a percentage share of the tenant's crops, in exchange for providing the land and much of the equipment necessary to produce the crop. In areas where the plantation system was not strong, such as Gwinnett County, tenancy among white farmers before the Civil War was common, but increased after the war. In 1860, an estimated 32.6 percent of the farm population were tenants. By 1880, that figure had increased by about a third to 42.1 percent (Bode and Ginter 1986:126, 149-152).

The collapse of the plantation system did not seriously threaten the dominance of the cotton economy, as the high price of cotton following the war encouraged a "cotton fever" throughout the South. Despite fluctuating prices in the late nineteenth and early twentieth centuries, cotton

remained the chief product of agriculture on Gwinnett County farms throughout the first four decades of the twentieth century, although other products were pursued as well, including corn, dairy products, and cattle. Beginning with the boll weevil infestation of the 1920s, a number of factors resulted in the decline of the cotton economy, including a nationwide agricultural depression, changing global markets, increased industrialization, and U.S. involvement in World War II. By the late 1950s, crop production emphasized a multi-crop system including corn, vegetables, livestock, and poultry. The chief crops grown were corn, cotton, small grain, hay, and forage. Livestock and livestock products, and poultry and poultry products were the chief sources of farm income (Tate 1967).

Although agriculture remained the backbone of Gwinnett County's economy for many years after the Civil War, technological advancements and an improved system of railroads encouraged investment in industry. Although the number of manufactories declined from 79 to 12 between 1880 and 1935, the number of people employed in the factories increased exponentially, from 191 to 1,563. Among the more significant industries in the county prior to World War II were Bona Allen, Inc., makers of leather goods, and the Alford Brothers Plow Factory (University of Virginia Library 2007; Flanigan 1995:281).

The trend toward urbanization continued after World War II, spurred by transportation improvements. By the early 1960s, Gwinnett County was closely tied to the Atlanta metropolitan area, while at the same time experiencing growth in manufacturing, trade, and transportation industry jobs. Today the rapid expansion of Atlanta and its suburbs has resulted in the urbanization of much of the southern and western parts of Gwinnett County, while the northern and eastern portions of the county are characterized by suburban development with significant commercial centers.

IV. HISTORY OF CENTERVILLE COMMUNITY AND THE PROJECT AREA

Cultural resource investigations of the proposed Centerville Park property and Johnson Property revealed a number of features related to the historical development of a rural community in the nineteenth and early twentieth centuries. The preservation of this relatively undeveloped land in the rapidly growing county of Gwinnett presents the opportunity for both active and passive cultural resource management and historical interpretation within the boundaries of the park. The historical context developed here is a summary of the social, political, and economic history of the park property as seen in relation to the surrounding area and the broader developments of the period.

ESTABLISHING THE PHYSICAL ENVIRONMENT OF THE PROJECT AREA

The project area is located on the east side of the Yellow River in the southernmost part of Gwinnett County. The Yellow River joins with the Alcovy River and South River in southern Newton County to form the Ocmulgee River, one of Georgia's five major river systems. A major Native American transportation route, the Etowah or Hightower Trail, passed by the park property. The road connected the major Native American political centers at Augusta, on the Savannah River, and Etowah, on the Etowah River. It later served as the dividing line between DeKalb and Gwinnett counties. The trail crossed the Yellow River just south of the park property. The crossing was referred to in historic times as Rock Bridge or Rockbridge, a name that was given to portions of the old road, as well as a community that developed around the crossing. Stone Mountain, a few miles west of the crossing, was an important Native American landmark and meeting place. The area was rich in natural resources, including abundant fish and game, productive soils adjacent to the river, and potential water power sites. Another early road in the area led from Jug Tavern (now Winder, in Barrow County) to Rockbridge on the Yellow River (Brack 2012:98–99).

The project area is located in the region known historically as the Upcountry, part of the Upper Piedmont, a transitional area between the upland cotton plantations of central Georgia and the self-sufficient frontier farms of the Appalachian Mountains. Settled primarily by white yeomen farmers of Scots-Irish descent, the Upcountry produced little cotton before the Civil War and had a small slave population. Cotton production increased in the region after the Civil War, as it was drawn into the postbellum cotton economy (Hahn 1983:9, 29, 32–33). However, the focus was generally on supplying the household rather than selling on the market, with surplus crops used as an exchange currency with kin, neighbors, and storeowners to acquire those items that could not be produced on the farm. The spatial organization of homes and communities reflected the upland settlement pattern found throughout the backcountry. Dispersed farms, close kinship ties, and indistinct local communities organized around a crossroads store, a church, or a mill were the defining characteristics of the landscape. County seats served as political centers and marketing entrepôts. Residents of rural areas made occasional trips to the county seat to tend to legal matters such as the buying and selling of land, or the collection of debts. More frequent trips were made to the closest commercial center or railroad stop to purchase supplies and sell farm products. Residents of the Rockbridge District often traveled to Lithonia, on the Georgia Railroad in DeKalb County for such purposes. After the Civil War, this region increasingly became a part of the cotton monoculture of the central part of the state. This change was due in part to high prices for cotton

and in part to improved transportation that allowed farmers to more easily get their products to market (Messick et al. 2001:25–26).

HISTORICAL DEVELOPMENT OF THE ROCKBRIDGE-CENTERVILLE COMMUNITY AND THE PROJECT AREA

The portion of Gwinnett County in which the project area is located was officially opened to settlement in 1820. However, a number of people had already taken up land there following the Creek cession of 1818. Rockbridge Baptist Church was founded in 1819, and Zoar Methodist Church may be even older than that (Brack 2012:98). In 1820 the land was surveyed into 250-acre land lots that were distributed by lottery to qualified citizens of the state. Land Lots 5, 6, 7, and 11 of the Sixth District contains the project tracts. Lot 7 was not drawn in the lottery because it was a fractional lot. Lot 5 was drawn by Henry L. Coon of Twiggs County and Lot 11 was drawn by David Dunn, Jr., but there is no indication that they ever took up residence in the county. Lot 6 was drawn by Henry Dunn, Sr. of Hancock County. He appears in Gwinnett County records, including the 1830 census where he reported owning three slaves (Flanigan 1995:94,151,170). It is not clear if he resided on the property that he drew.

Among the early settlers in the Rockbridge District was Elijah Anderson, who came to the area in the 1820s. Anderson died in 1840 and his land passed to his son, David. David Anderson built up a prosperous plantation on the west side of the Yellow River, which encompassed 670 acres and included 17 slaves in 1860. The operation was known as Pleasant Valley and included a church, general store, cabinet shop, blacksmith shop, cotton gin, and planing mill (Brack 2012:99). His house is still extant and is located at the intersection of South Rockbridge Road and Juhan Road about 2.5 miles west of the Centerville Park tract.

Another early settler of Rockbridge was Thomas Maguire, who arrived in Gwinnett County from Ireland about 1825 and settled on the east side of the Yellow River about two miles from the Anderson plantation. Maguire became close friends with David Anderson and married his sister Jane in 1830. They had three children before her death, after which Maguire married Jane's sister, Elizabeth, who bore him seven more children (Harrison 1949). Maguire's plantation was called Promised Land, which on the eve of the Civil War included 956 acres and was worked by 26 slaves. Maguire's slaveholdings were the tenth largest in the county (Brack 2012:99; Flanigan 1995:180–184). The main house of the plantation is still standing and is located about 0.75 miles south of the Centerville Park tract on the old State Road 124 (Anderson-Livsey Lane).

Thomas Maguire served as the postmaster of Rockbridge from its inception in 1839 until it was discontinued in 1865, with the post office at his residence. Maguire kept a journal of his activities for the years leading up to and through the Civil War that provides a glimpse into the workings of a Piedmont plantation during slavery. The plantation included facilities for blacksmithing, tanning, carpentry, milling, grinding cane, and brickmaking. Maguire raised hogs, cattle, chickens, and sheep and produced cotton, corn, wheat, sorghum, fruit, garden vegetables on his farm (Harrison 1949).

The 1850 census of Rockbridge District recorded 100 households containing about 588 white residents and approximately 85 slaves held by 14 slaveholders (U.S. Census Bureau 1850). The

1860 tax digest for Rockbridge District of Gwinnett County records 62 taxpayers, of whom only 16 (26 percent) did not report any real estate. About half (47 percent) were slaveholders. Maguire was by far the largest slaveholder with 26, followed by W. N. Duren with 19 and David Anderson with 17. Seborn Davis, with 13, was the only other person in the district with more than 10 slaves. Over two-thirds of all slaveholders (68.9 percent) owned fewer than 5 slaves (Gwinnett County Tax Rolls 1860).

No fighting took place in Rockbridge District during Union General William T. Sherman's Atlanta Campaign, but foraging expeditions passed through the area taking corn, flour, livestock, and any other items that the army could use. In July 1864, troops hit Thomas Maguire's plantation. In October, after Atlanta had fallen, Maguire wrote that three of his slaves had gone missing, perhaps crossing the Union lines seeking protection. Anticipating another foraging raid, Maguire began hiding food and supplies in hopes of keeping them out of Union hands and available to his family over the winter. On November 1, Confederate soldiers took "nearly all" of his corn from five of his fields, but the worst was still to come. Sherman's March to the Sea began November 15. On the 16th, Maguire wrote that the Yankees were on the way. He stashed tools, a horse and buggy, and other items and went to David Anderson's just before the troops arrived at Promised Land. He and Anderson hid in the woods, where they observed the wholesale slaughter of Anderson's livestock. The next day Maguire returned to his plantation to find it almost entirely in ruins. The gin, barns, syrup boiler, corn cribs, fences, and three bales of cotton were destroyed, as were his carriage and wagon (Harrison 1947). His house was spared, perhaps because of his Masonic affiliation.

After the Civil War, large plantations like the Anderson and McGuire operations typically were no longer viable, and most were divided up and sold to smaller farmers who employed their own families and sometimes black laborers. Emancipation meant a new labor system was necessary that would keep lands in production but maintain the social order between whites and blacks. For a brief time, a federally enforced wage-labor system was used, as well as gang and squad labor. This is evident in the 1870 census of Rockbridge District, where former slaves are found living with or near their former owners and laboring on their farms. By 1880, however, Southern farmers and former slaves had come to favor a variety of tenancy arrangements, in which a tenant worked the owner's land for a fixed payment or, more commonly, a share of the crop (Orser 1988:50–59). This system allowed African American farmers a measure of autonomy, while keeping the land in the hands of whites. In the nearby Harbins District of Gwinnett County, informants recalled two basic tenancy arrangements before World War II—halves and thirds. Under halves, the landlord provided all of the seed, fertilizer, and tools, and taking half of the cotton and half of the corn at harvest time. Under thirds, the landlord supplied one-third of the seed and fertilizer and received one-fourth of the cotton and one-third of the corn (D'Angelo et al. 2004).

The 1880 agricultural census of Rockbridge District gives a snapshot of the post-Civil War agricultural landscape. Of the 174 farm operators in the district, 112 (63 percent) owned their farms. Of the remaining 62 farm operators, 55 were sharecroppers and seven were cash renters. Together these farmers cultivated 8,210 acres for an average of about 47 acres per farm. Very little land was devoted to pasturage. Although cotton was the principal cash crop, slightly more acreage (2,768 to 2,569) was devoted to corn, which provided food for livestock, as well as the family. The 1,123 bales of cotton represented a yield of under half a bale (0.44) per acre. The median farm

value was \$420, although as mentioned above, a little over a third (36 percent) were not owner-operated (U.S. Census Bureau 1880a).

The sharecropper system, along with institutional racism, created a significant hurdle to landownership for the African Americans in the post-bellum South, but in some places, particularly where lands were marginal, African Americans were able to acquire land of their own in the late nineteenth century. The Shady Grove community in the Harbins District of Gwinnett County is a good example of this, as documented in the cultural resources investigation for Harbins Park (D'Angelo et al. 2004). The Rockbridge District emerged as a center of African American landholding as well. In the 1870 census, African Americans working on farms are all reported as laborers rather than farmers, and none owned land. However, by 1880, the agricultural census records at least 23 African American farmers in Rockbridge District, four of whom—Morris Anderson, Franklin Anderson, Jesse Knight, and Columbus Webb—were landowners. Two of the farm operators rented their farms for cash payments. The remainder were sharecroppers, with 10–20 acres in cotton that produced 2–9 bales. African Americans working as hands on the farms of others were recorded as farm laborers (U.S. Census Bureau 1880a, 1880b).

Gwinnett County tax records reveal that the number of African Americans owning land in Rockbridge District increased steadily during the late nineteenth and early twentieth centuries. Nine black families in the district owned land in 1889, including Morris Anderson (200 acres), Franklin Anderson (100 acres), Frank Baxley (100 acres), Columbus Webb (145 acres), Willis Hutchins (90 acres), and Barry Hudson (80 acres). These farms formed the nexus of a vibrant African-American community that developed in Rockbridge District in the twentieth century. By 1905 there were 13 black families that owned land in the district, including Sam Lucas, who acquired the Promised Land home place that was later purchased by Bob Livsey (Gwinnett County Tax Assessor [GCTA] 1888, 1889, 1898, 1905; Thomas Livsey, personal communication 17 February, 2015).

The 1920 census records 18 African Americans in Rockbridge District who owned their homes or farms. Among these were members of the Echols, Lucas, Lyons, Webb, and Anderson families (U.S. Census Bureau 1920). Later, Dr. Ben Anderson, who may have been a son of early African American landowner Franklin Anderson, acquired land in the Rockbridge District on the Yellow River, along with members of the Livsey, Blackmon, McDaniel, and Hammonds families. These black farmers resided among white farmers in the area, including the Mason, McCullers, Davis, and Johnson families. Members of the Mason family were significant landowners in the district, at one time owning properties all along SR 124 from Rockbridge to Snellville. Winston Mason was instrumental in the growth of Snellville (U.S. Census Bureau 1920; Thomas Livsey, personal communication 17 February, 2015).

The agricultural depression that preceded the Stock Market Crash of 1929 appears to have taken a toll on the farm population of Rockbridge District. The 1930 census recorded 193 farm-based households (accounting for 96 percent of the total), of which two-thirds (66 percent) were renters. The black and white farm populations were equally affected, with whites (67.7 percent) actually slightly more likely to be tenants than blacks (63.6 percent). Among the 33 African American farm families, 12 reported owning their home (U.S. Census Bureau 1930).

Efforts to develop the Yellow River in Rockbridge District for industrial purposes has met with mixed results. Both Thomas Maguire and David Anderson operated grain mills that likely served the surrounding community, and other such mills were common in the nineteenth century. To the north of the project area, where Annistown Road crosses the river, there were a number of mills constructed over a period between the 1830s and 1908. Richard Holt, who moved to Gwinnett County in 1819, constructed a merchant mill at the site of the earlier Ballard Mills. A short distance upstream, Robert Eckles operated a mill that was purchased by William Fain after the Civil War. Two sons of Thomas Maguire established a mill complex at the site of Holt's Mill by 1880 that included a sawmill, flour mill and gristmill. The operation produced \$10,000 worth of meal and 150,000 feet of lumber in 1879. Maguire's mills operated until sold in 1897, after which several efforts were made to establish a cotton manufacturing operation at the site to take advantage of the abundant supply of raw material grown in the surrounding community. However, financial problems, a flood, and a fire doomed these ventures. The Annestown Cotton Mills Corporation, which acquired the mills in 1900, operated only briefly and left little but its name on the now vanished community (Messick et al. 1998:10–18).

The community of Centerville (called Sneezer before the Civil War) was located to the northeast of Rockbridge. A post office was established at Centerville in 1879 with T. J. Minor as postmaster (Flanigan 1984:119–120, 140). A few industries developed at Centerville in the late nineteenth century. The bustling little town had a population of 150 in 1879, and an 1881 directory recorded two general stores, a cotton gin, a wagon maker, a carpenter, a stone cutter, a furniture manufacturer, a cotton merchant, a gin and sawmill operated by Daniel Olds, and the flour mill operated by the Maguires on the Yellow River. By 1886, John Maguire is listed in a business directory as the sole proprietor of a chair factory, a cotton gin, a gristmill, and a planing mill (Sholes 1879; Standard Directory Company 1881, 1886). A U.S. Geological Survey (USGS) map from 1888 shows Centerville, as well as a settlement at Rockbridge. Maguires Mills is also shown on Yellow River (USGS 1888). It appears that the mills active in Rockbridge District primarily served to process raw products from the local community. Efforts to develop manufacturing on a industrial scale were largely unsuccessful.

The persistent rural character of Rockbridge District is reflected in the population, which increased only 17 percent between 1870 and 1940, from 851 to 994 inhabitants (Flanigan 1984:137). Farmers in the Rockbridge District, like other farmers in the Georgia piedmont during the first half of the twentieth century, pursued an agricultural regime of cotton, corn, sorghum, and livestock, mixed with efforts at vegetables, fruits, and grasses. By the early twentieth century, organizations like the Georgia Agricultural Society, the U.S. Department of Agriculture, and the Georgia Agricultural Experiment Station were having an impact on farming practices, convincing farmers to construct agricultural terraces to prevent erosion, rotate crops to preserve soil nutrients, and fertilize fields to increase yields (Flanigan 1959:137; Messick et al. 2001). The effects of agricultural terracing can still be seen in the project area.

In the 1930s, Centerville contained a gas station, a store, a school, two churches, and a seasonal industry that was likely a cotton gin (State Highway Board of Georgia [SHBG] 1938). The Rockbridge community shown on the 1888 map seems to have faded by 1938. A sawmill and an abandoned store are the only non-residential structures shown in that area. However, in the second half of the twentieth century, the Livsey family and others established businesses at the intersection of Anderson Livsey Road (old SR 124) and Lee Road. In the 1970s, Thomas Livsey opened a

diner, a barber shop, a car wash, and a gas station. By 1990, there were approximately a dozen businesses operating in the section of SR 124 that would become Anderson Livsey Road (*Atlanta Constitution* 1990).

Suburban development reached the Rockbridge District in the 1980s, leading to increased traffic along SR 124. By 1992, the Georgia Department of Transportation had begun planning to widen and straighten the road, bypassing the businesses in the Promised Land community (*Atlanta Constitution* 1992). That work was completed by 2002 (USGS 1988–2002).

Centerville Park Tract

Table 2 presents a summary of the ownership history of the Centerville Park tract. The property is a 60-acre parcel located on the west side of Centerville Highway (SR 124), about 1 mile east of the Yellow River. The earliest deed that could be located for the property was in 1873, when Thomas Maguire sold approximately 121 acres that included the Centerville Park tract to his son James H. C. Maguire (GCSC 1873: DB N:410). It is not known when Thomas Maguire acquired the property since Gwinnett County deeds prior to 1871 were destroyed in a courthouse fire, but it was likely part of the Promised Land plantation that he assembled prior to the Civil War. From his farm diary, we know that Maguire named his plantation fields and would inspect them periodically. In June 1862, he wrote:

After dinner took a walk around the plantation through the Trail Field, the Ford Field, up the creek to the little bottom to the big bottom where the hands were at work, stayed with them some time, then over the hill to the new ground through the Ford Field cross the Farmer [field] to the Moore Field then back home. (Harrison 1949:24)

Unfortunately, there is not enough information available to determine which part of the plantation included the Centerville Park tract.

Table 2. Ownership history of the Centerville Park tract.

Grantor	Grantee	Year	Book & Page	Description
Thomas Maguire	Jas H C Maguire	1873	N:410	121 acres
Jas H C Maguire	A M Minor	1887	X:433	121 acres
A M Minor	E J Mason	1890	27:20	121 acres
E J Mason heirs	J P Mason	1932	54:497	160 Acres. Old E J Mason home place. Occupied by R E Mason, 1934
R E Mason	W T Davis	1946	77:303	80 acres. Includes a 6-room frame dwelling and a 5-room concrete block dwelling.

W T Davis	Barney Shannon	1955	117:333	80 acres
Barney Shannon	Family Enterprises, Inc.	1959	150:529	77.8 acres
Supply and Equipment Co.	J M Henson, Jr., Mrs. Jean H. Smith, Mrs. Ann H. Matheson, Jr.	1971	438:78	77.8 acres
J M Henson, Jr	W Sam Smith, J Dan Matheson	1979	1187:106	77.8 acres. Partial interest.
Jean Smith	Sam Smith	1989	5822:141	77.8 acres. Partial interest.
Doctors Diversified Investors	Gwinnett County	2002	28860:54	60 acres. Subject to conservation covenant.

James H. C. Maguire was a resident of Florida by 1884, and in 1887 he sold the 121-acre property to A. M. Minor for \$900. Minor was also a resident of Florida, so the land was unoccupied or occupied by a tenant until 1890, when Minor sold it to Elery J. Mason for the same \$900 he paid for it (GCSC 1883: DB R:22, 1887: DB X:433, 1890: DB 27:20; GCTA 1884). According to Brack (2012:99), the property included a house, where the Mason family for many years held reunions. Figure 3 shows the tract purchased by E. J. Mason as well as the current Centerville Park tract superimposed on a 1956 USGS quadrangle map. The farm complex shown at the south end of the property is the residence that came to be known as the E. J. Mason home place (Steven Starling, personal communication, 24 March 2015). It was documented in 2006 as a historic structure dating to ca. 1900 (Resource ID 201674), but tax records indicate the house was built in 1865 and thus was on the property when Mason purchased it. Mason added 40 acres to the south side of his farm, which included 160 acres at his death in 1928 (GCSC 1973: DB 668:55).

In 1932, the heirs of E. J. Mason sold his old home place, consisting of 160 acres on the northwest side of Rock Bridge Road (SR 124), to J. P. Mason (GCSC 1932: DB 54:497). The property was occupied by R. E. Mason in 1934, according to a deed made to clarify the conveyance by E. J. Mason's heirs to J. P. Mason (GCSC 1934: DB 54:542). A county highway map from 1938 (SHBG 1938) shows at least two farm complexes (represented by filled-in squares) that appear to be located on the E. J. Mason tract. One is just east of the Centerville Park tract on the old SR 124 (Figure 4). To the south, a second farm is located away from the road and likely corresponds to the Mason home place. A third dwelling and a sawmill (represented by a filled half circle) are located south of the home place and may have been located on the 60-acre parcel added by Mason before 1928. Mr. Thomas Livsey recalls that the sawmill was on the Livsey property but was operated by the Mason family. Water for the mill was pumped from the Yellow River or Centerville Creek to the sawmill by a hydraulic ram pump or water-powered pump (Thomas Livsey, personal communication 17 February, 2015).

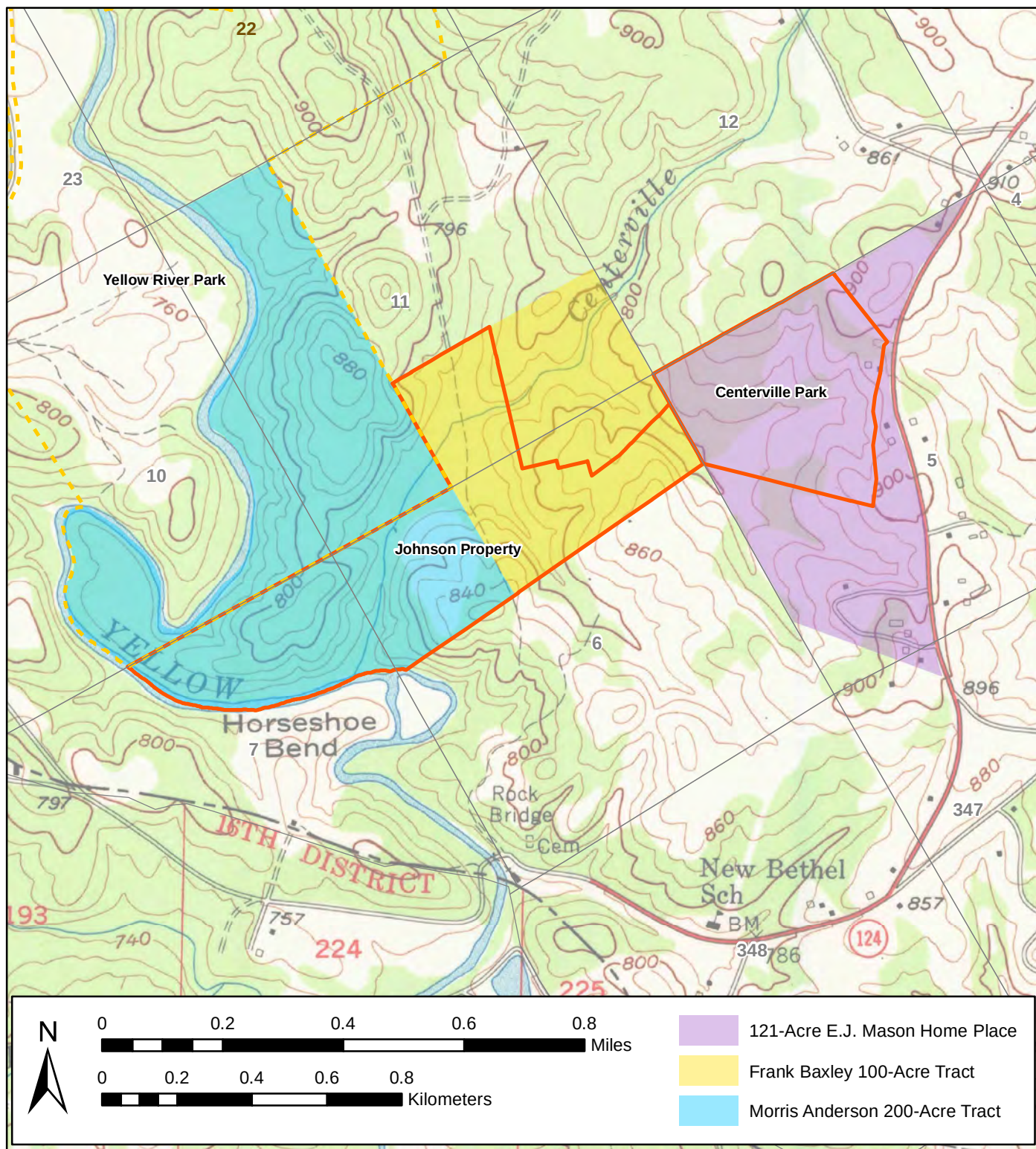


Figure 3. Landholdings around the project area in ca. 1890.

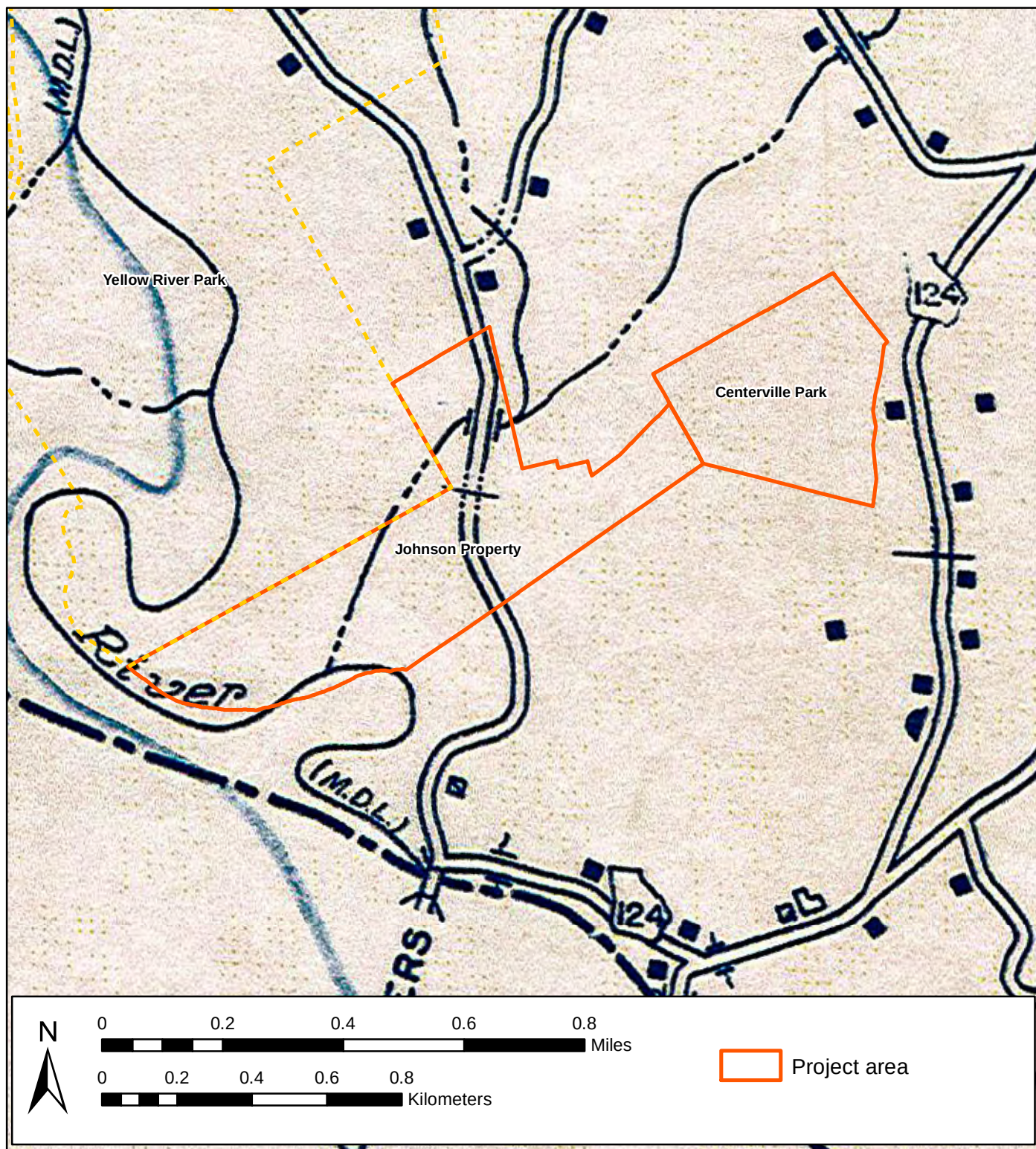


Figure 4. County highway map showing the project area and vicinity in 1938 (SHBG 1938).

An aerial photograph of the project area taken in 1939 (U.S. Department of Agriculture [USDA] 1939) seems to show two dwellings on SR 124 near the Centerville Park boundary (Figure 5). The northernmost dwelling was not shown on the 1938 highway map, so likely dates to 1938 or 1939. The Centerville Park tract was almost completely in crops or pasture at this time. Agricultural terracing is evident throughout the property and seems particularly pronounced in the southern portion of the tract.

In 1946, R. E. Mason sold 80 acres of the property in Land Lot 5, including the Centerville Park tract, to W. T. Davis (GCSC 1946: DB 77:303). This tract did not include the old E. J. Mason home place. Davis sold the property to Barney W. Shannon in 1955 (GCSC 1955: DB 117:333). The deed to Shannon notes that the property contained a six-room frame dwelling and a five-room concrete block dwelling. The two dwellings can be seen on the 1956 USGS topographic map in Figure 3. The six-room frame dwelling is likely the structure to the south, which is first shown on the 1938 highway map in Figure 4. The dwelling to the north is likely the concrete block house that is first shown on the 1939 aerial. Figure 6 is an aerial view of the property at the time it was acquired by Shannon in 1955 (USDA 1955). The two farm complexes shown on the 1956 map are evident on the edge of or just outside the Centerville Park tract. Farm roads can be seen along the southwest boundary of the current Centerville tract and through the center of the property. Most of the southern portion of the Centerville Park tract was cleared and appears to be terraced and in pasture, while the portion to the north of the central farm road appears to be abandoned pasture. There also appears to be a few buildings in the northeast part of the property that are not shown on the 1938 or 1956 maps.

Barney Shannon mortgaged the property at least twice before selling it to Mrs. Mary R. Newton in 1959 (GCSC 1959: DB 148:325). Six months later, Newton sold the land, including the balance of the two notes taken out by Shannon, to Family Enterprises, Inc. (GCSC 1959: DB 150:529). J. M. Henson, who was a stakeholder in Family Enterprises, had the property surveyed at that time, and it contained 77.8 acres. Unfortunately, no copy of this survey could be found in the records of the Gwinnett County Superior Court. The deed to Family Enterprises does not mention the dwellings, but Mr. Livsey recalls that J. M. Henson kept cattle on the property and lived in the concrete block house (personal communication 17 February, 2015).

Family Enterprises apparently became Supply and Equipment Company, which was liquidated in 1971. The property was sold as part of the liquidation process to J. M. Henson, Jr., Mrs. Jean H. Smith, Mrs. Ann H. Matheson, and J. D. Matheson, Jr., who each received a designated undivided interest in the land. Henson sold his share to W. Sam Smith and J. Dan Matheson in 1979. Jean Smith sold her share to Sam Smith in 1989 (GCSC 1971: DB 438:78, 1979: DB 1887:106, 1989: DB 5822:141).

An aerial view of the Centerville Park tract in 1988 shows that the property was almost entirely in pasture (Figure 7). By 1993, the northeast corner of the property appears to have been sold and construction of Shiloh Christian Church was underway. In 2000, Highway 124 was realigned northward and westward, cutting off a portion of the old 80-acre Family Enterprises-Henson property. The two dwellings on the west side of the old road near the Centerville Park tract were razed during the construction of the road (USGS 1988–2002). In 2002, Gwinnett County purchased the remaining 60-acre tract from Doctors Diversified Investors, using Grant Funds received pursuant to an agreement with the Georgia Department of Natural Resources requiring that the

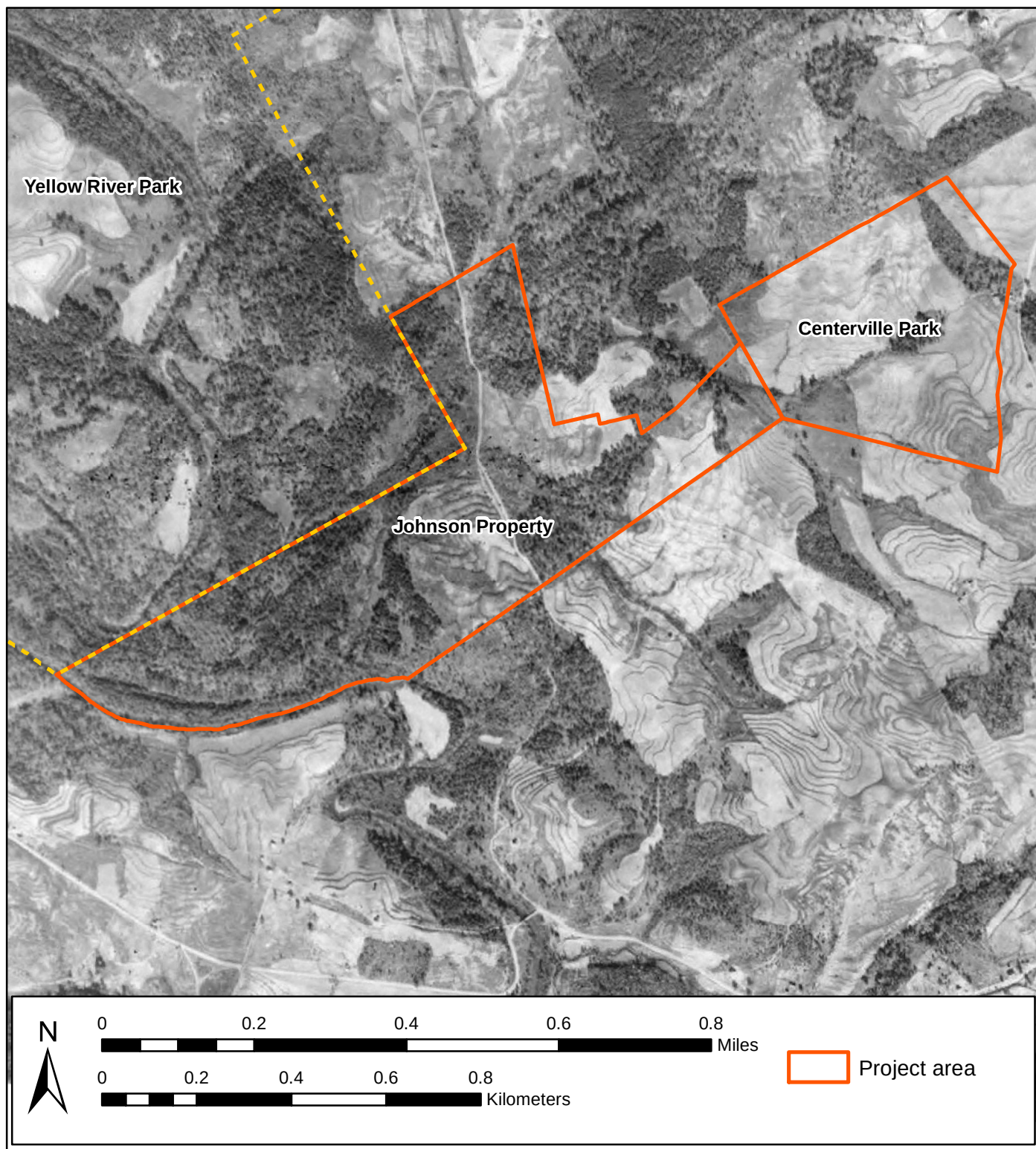


Figure 5. Aerial view of the project area in 1939 (USDA 1939).

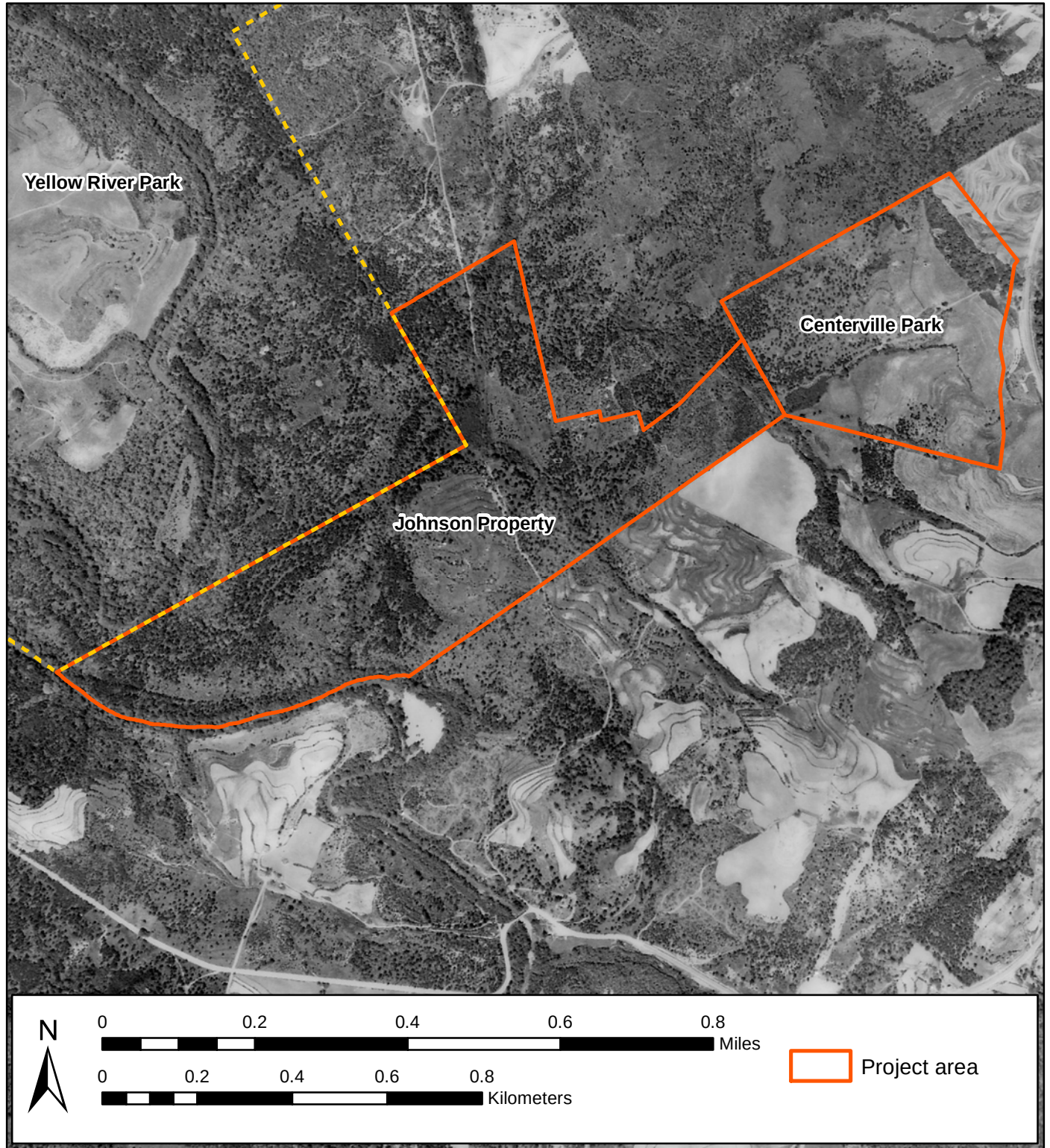


Figure 6. Aerial view of the project area in 1955 (USDA 1955).

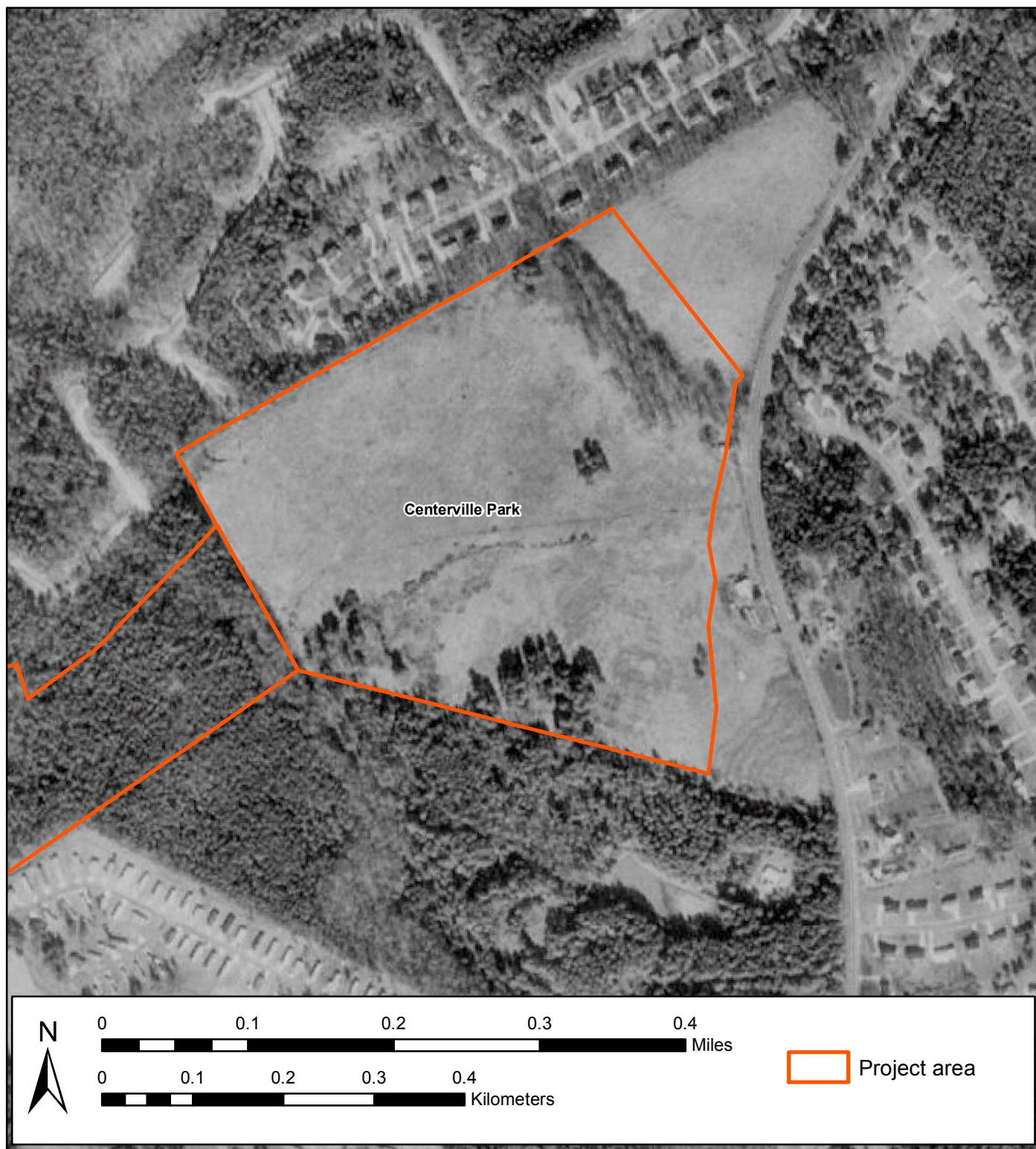


Figure 7. Aerial view of the project area in 1988 (courtesy of Google Earth).

property be used solely as a Greenspace Property (GCSC 2002: DB 28860:54). At the time the land was acquired, it was mostly cleared pasture, affording a view of Stone Mountain to the west (Rex Schuder, personal communication 10 February 2015).

Johnson Property

Table 3 presents a summary of the ownership history of the Centerville Park tract. The Johnson Property is an irregularly shaped parcel containing 140 acres between the Yellow River and the Centerville Park tract. This land may have been part of the David Anderson Plantation prior to or soon after the Civil War. It includes parts of two tracts owned and occupied by African Americans after the Civil War. The boundaries of the two tracts are shown in Figure 3. The 200-acre tract adjoining the east side of Yellow River was purchased in 1880 by Morris Anderson, an African American who may have been a slave or the child of a slave from the David Anderson plantation. Anderson bought the property from Jane E. Hannah for \$1,000, a significant sum for a former slave to have raised. He was already residing on the property at the time of the purchase (GCSC 1880: DB Q:98). Hannah appears to have inherited the property from H. E. Hannah. The second tract, consisting of 100 acres, was adjacent to the Centerville Park tract. It was reportedly owned by Julius C. Johnson as early as 1888, when he was referenced as the owner in a mortgage on the 200-acre tract taken out by Morris Anderson. However, tax and census records indicate that Frank Baxley, who was black, paid taxes on the property beginning in 1884 through at least 1910. He signed a quit claim deed to the property in 1927 at which time he no longer resided there (GCSC 1888: DB 1:91, 1927: DB 80:302; GCTA 1888, 1898, 1905, 1910). No deed was found originally conveying the property to either Baxley or Johnson.

Table 3. Ownership history of the Johnson property.

Grantor	Grantee	Year	Book & Page	Description
Jane E Hannah	Morris Anderson	1880	Q:98	200 acres in Land Lots 6, 7, 10, and 11.
	Frank Baxley	1884-1910	Tax digests	100 acres in Land Lots 6 and 11.
Morris Anderson	Julius C Johnson	1896	6:453	200-acre tract
Julius Johnson	R E Mason	1910	42:264	200-acre tract
R E Mason	D S Ethridge	1910	34:504	200-acre tract
Julius C Johnson	Martha Johnson	1918	Will	100-acre tract. Will referenced in 80:303 (1947).
Martha Johnson	Benjamin Alton (B A) Johnson	1923	Will	100-acre tract. Will referenced in 80:303 (1947).

	and George Johnson			
George Johnson estate	George Johnson heirs	1923	Heirs-at-law	100-acre tract. One-half undivided interest. Referenced in 80:303.
George Johnson heirs	B A Johnson	1947	80:303	100-acre tract. Same property conveyed by quit claim deed by Frank Baxley in 1927 (80:302).
BA Johnson	Martha Johnson and B A Johnson, Jr.	1957	3553:194	100-acre tract.
B A Johnson	Campbell Lumber Co	1965	231:279	200-acre tract. Timber rights.
B A Johnson	Martha Johnson and B A Johnson, Jr.	1965	3389:160	200-acre tract.
B A Johnson Jr heirs	Martha Johnson	2009	49594:852	140 acres in Land Lots 6, 7, 10, and 11.
Martha Johnson	The Conservation Fund	2012	Will	140-acre tract. Will referenced in 52853:55 (2014)
Conservation Fund	Gwinnett County	2014	52992:70	140-acre tract. Subject to conservation easement.

Anderson and Baxley were two of only nine African American landowners in Rockbridge District in 1888. A third black landowner, Frank Anderson, owned a 100-acre property on Yellow River adjacent on the north to Morris Anderson, in what is now part of Yellow River Park. The value of these three farms totaled \$1,900 (GCTA 1888).

Morris Anderson is listed in the 1880 census as a 45-year-old black farmer. He resided with his wife, Elizabeth, and eight children ranging in age from 20 to 1 years old. Anderson was born in Alabama, while his wife was born in North Carolina. By 1860 they were both in Georgia, where their son, Daniel, was born. Anderson and his wife were illiterate (he signed legal documents with a mark), while his children were attending school and could read but not write. Four of his children were employed as farm laborers, presumably on their home farm (U.S. Census Bureau 1880b).

Anderson appears in the 1880 agricultural census as the owner of a farm containing 50 plowed acres and 40 acres of woodlot valued at \$700. His livestock, including 2 mules, a milk cow, and two other cattle, was valued at \$150, and the total value of farm production for 1879 was \$945. He harvested 200 bushels of corn from 15 acres and 14 bales of cotton from 20 acres. He also planted 4 acres of wheat and an acre of sorghum. He hired black laborers to help on the farm, paying \$30

for 8 weeks of work. Anderson's cotton harvest was the 12th largest in the district, and his yield (0.7 bales per acre) was considerable higher than the average for the district (0.44 bales per acre). Although at least 50 farms were valued higher than his, it is clear that Morris Anderson was one of the more prosperous farmers in Rockbridge District. He mortgaged the property at least once in 1888, but the \$537 note was paid the following year. Anderson sold the land to Julius C. Johnson in 1896, but he appears to have paid taxes on the property until at least 1898 (GSCS 1896: DB 6:453; GCTA 1888, 1890, 1898; U.S. Census Bureau 1880a). Morris Anderson continued to reside in Rockbridge District, likely on the same land, after selling the Yellow River property. He is listed in the 1910 census at age 78, living with his wife and two grown daughters and three grandchildren. He was a general farmer who rented his farm (U.S. Census Bureau 1910).

Frank Baxley appears in the 1880 census as a 33 year-old farmer. His wife Nancy was 32. He had six children ranging in age from 11 to 2 years old. The agricultural schedule reports that he was a sharecropper with 30 tilled acres and 10 acres of woodlot. His farm was valued at \$400 and his livestock at \$70. He produced 3 bales of cotton on 9 acres and 120 bushels of corn on 15 acres in 1879. Baxley first appears in the Gwinnett County tax digest in 1884 as the owner of 100 acres valued at \$400, along with \$70 worth of livestock. In 1897 he married his second wife, Mattie Williams, in Gwinnett County. He appears with her in the 1900 census. He was 54 years old at that time and is reported as owning his farm. He had nine children and two grandchildren living with him. By 1920, he was 74 years old, living in a house with his wife (aged 63) and his grandsons Parry E. McCalls (aged 21) and John Hill (aged 18). He was a farmer and owned his home at that time (U.S. Census Bureau 1880a, 1880b, 1900, 1920).

Both properties were eventually acquired by Benjamin Alton (B. A.) Johnson, the son of Julius C. Johnson. Julius Johnson sold the 200-acre tract in 1910 to R. E. Mason, who sold it the same year to D. S. Ethridge. In 1926, Ethridge conveyed the property to B. A. Johnson (GCSC 1910: DB 42:264, 1910: DB 34:504, 1926: DB 41:533). Johnson acquired a half interest in the adjacent 100-acre parcel on which Frank Baxley was residing after the death of his father in 1918 and his mother in 1923. In 1927, Frank Baxley quit his claim to the property to B. A. Johnson for \$5. It is possible that Baxley had an agreement with Johnsons that he could live on the property and operate his farm as he saw fit as long as he paid the real estate taxes. Given the incomplete nature of the record and the efforts by whites of the time to stifle African American landownership, it is also possible that Baxley was swindled out of his land by a false claim or a "lost" deed. The quit claim deed was not filed until 1947 when B. A. Johnson acquired the half interest of his brother's heirs (GCSC 1927: DB 80:302, 1947: DB 80:303).

B. A. Johnson was a prominent businessman in Lithonia, where he operated a general store. He lived in a large home adjacent to the store (Brack 2014). Johnson owned land throughout the area and the two tracts in the Rockbridge District were likely leased to tenant farmers or remained largely vacant. The 1936 map in Figure 4 does not indicate any dwellings on the Johnson Property; however, the 1939 aerial photo in Figure 5 seems to show a structure in the cleared area on the east side of the north-south road shown on the 1936 map. This location corresponds to the house site (TPG-3) found during the field survey, and may be the dwelling used by Frank Baxley during his occupation of the land. Fields on both sides of this road appear to have been active in the aerial photograph.

The 200-acre tract that fronted the Yellow River apparently returned to timber during Johnson's ownership, because in 1965, he sold the timber rights to Campbell Lumber Company for \$25,000. The deed conveyed "all of the pine, oak, and poplar timber and standing trees for sawmill purposes." It also states that the right-of-way and easement privileges include the "right to construct, occupy and operate all necessary tram roads, roads, tenant houses, sawmill and other temporary structures during the period of 18 months" (GCSC 1965: DB 231:279).

The extent of timber cover in the Johnson Property can be seen in the 1955 aerial photograph in Figure 5. Most of the land appears to be forested or abandoned fields that are returning to forest, with the exception of the southeast corner of the original 200-acre tract, which is mostly cleared and agricultural terracing is evident. The north-south road through the property is evident in this view, and it is shown as an unimproved road or track on the 1956 topographic map (see Figure 3). It appears to be overgrown around the crossing of Centerville Creek and was apparently no longer in use as a public road by that time.

B.A. Johnson conveyed both tracts to his children, Martha Josephine Johnson and B. A. Johnson, Jr. The 100-acre tract was conveyed in 1957, and the 200-acre tract in 1965, a few months after selling the timber rights. Martha Johnson was a botanist and biologist who taught at Georgia State University beginning in 1947. She never married, and she resided in her father's Lithonia house until her death in 2012, at the age of 96. Her brother also resided in the house in 1986 when the deed for the 100-acre tract was recorded (Brack 2014; GCSC 1957: DB 3553:194, 1965: DB 3389:160).

Some time prior to 2009, the Johnsons sold a 41-acre parcel off of the 100-acre tract that is now a subdivision, and a 118-acre parcel off the 100-acre tract that became part of Yellow River Park. In 2009, the heirs of Benjamin A. Johnson, Jr. conveyed its interest in the remaining 140-acre Johnson Property to Martha Johnson. At her death in 2012, Johnson willed the property to The Conservation Fund for use as a park and recreation area to be named for the Johnson family (GCSC 2009: DB 49594:852, 2014: DB 52853:55). She also bequeathed other tracts of land for conservation and park purposes in DeKalb and Walton counties (Brack 2014). Gwinnett County purchased the Johnson Property from The Conservation Fund under the conditions set forth by Martha Johnson in her will to develop the land as a county park (GCSC 2014: DB 52992:70).

V. ARCHAEOLOGICAL RECONNAISSANCE

FIELD SURVEY METHODS

In March, 2015 TRC conducted an archaeological reconnaissance of the project area. All areas with a slope less than 10 percent were subjected to pedestrian coverage, including inspection of the soil conditions. In areas where applicable, careful surface inspection was undertaken. Hand-held Global Positioning System units were used throughout the project to obtain site locations and other provenience information. General field conditions were photographed and documented with digital media.

CURATION OF PROJECT MATERIALS

The materials generated as a result of this survey (i.e., field notes, maps, and photographs) will be temporarily stored at the TRC corporate office in Atlanta. They will be turned over to Gwinnett County Parks and Recreation upon completion of the project.

ARCHAEOLOGICAL SURVEY RESULTS

On March 6, and again on March 16, 2015 TRC conducted an archaeological reconnaissance survey of the proposed project area, using the methods described above. The project area contains numerous locations in which there would be a high probability for prehistoric sites, i.e., high ground near running water, and floodplain areas with well-drained soils. Detection of this type of site, however, is primarily accomplished through subsurface investigation, which was beyond the scope of the current project scope. During the investigation, TRC recorded the locations of four potential historic sites. The first, TPG-1, at the eastern boundary of the project area, is evinced by the presence of narcissus, privet, and a large, old, gnarled oak tree (see Figure 1; Figure 8). It is likely the rear, or western, portion of a house site depicted on the 1939 map (see Figure 5). TRC recommends that this site be avoided pending further archaeological study.

The second historic site encountered during the current survey, TPG-2, consists of a single, broken brick and concrete pier in the southeast portion of the project area, which, given the lack of any other visible cultural remains, may be of secondary deposition (see Figure 1; Figure 9). The soils at this site are also highly eroded, indicating a probable lack of significant subsurface deposits. No further work is recommended at this location with respect to cultural resources.

The third site (TPG-3) recorded during the investigation is situated in the central portion of the project area. The site consists of an intact house site, as evidenced by the presence of two stone chimney falls, as well as two varieties of flora commonly used for domestic landscaping: yucca and narcissus (see Figure 1; Figures 10-13). A structure appears to be evident in this location on the 1939 aerial in Figure 5, but it is not shown on any other views of the project area. Although the scope of this investigation precluded systematic site delineation, and soils in the area generally exhibited subsoil at the surface, TRC feels that given the lack of apparent disturbance from activities such as logging, cultivation, or excavation, TGP-3 may contain intact subsurface deposits and/or features that may offer important insights into the activities and occupational history of the



Figure 8. General view of TPG-1, narcissus and oak tree, facing northwest.



Figure 9. General view of TPG-2, broken brick and concrete pier, facing northwest



Figure 10. General view of TPG-3, southeast chimney fall, facing northeast.



Figure 11. General view of TPG-3, northwest chimney fall, facing east



Figure 12. General view of TPG-3, narcissus, from northwest chimney fall, facing north-northwest.



Figure 13. General view of TPG-3, narcissus and yucca, from northwest chimney fall, facing south-southwest.

proposed development tract. Given this research potential, TRC recommends that this site be avoided pending further archaeological study.

The fourth and final site (TPG-4) encountered during the current survey was a feature in the form of a low rock wall aligned perpendicular and adjacent to the Yellow River in the southwest corner of the project area (see Figure 1; Figure 14). This feature may be associated with the water pumping system for the sawmill operated by the Mason family, or it may be a remnant of an agricultural feature such as a field wall or field clearing pile. No evidence was found of a mill dam or other industrial features. Soils in the site area are composed primarily of sandy clay, formed from colluvial deposits from adjacent slopes, and are very poorly drained. Given the location and soil composition, it is TRC's opinion that the potential for subsurface deposits is low. Preservation of the feature is recommended without further subsurface investigation.



Figure 14. General view of TPG-4, rock wall, facing south-southwest.

VI. SUMMARY AND RECOMMENDATIONS

TRC conducted historical and archaeological studies to document the historic occupation and land use and assess the potential for archaeological sites at two properties planned for development as parks by Gwinnett County Parks and Recreation. The results of the investigations are intended to inform and guide the planning process with respect to protecting and highlighting cultural resources at the Centerville Park tract and Johnson Property in south Gwinnett County.

No previously identified archaeological or historical resources are located within the project area. Four historic resources (standing structures) are located within a half-mile of the project boundaries. One of these, the E. J. Mason home place, was associated with the Centerville Park property between 1890 and 1946. The Promised Land plantation house, located 0.65 miles south of the project area, was associated with the Centerville Park tract during its ownership by the Maguire family before and after the Civil War.

The project area is located in the Rockbridge/Centerville community on the Hightower road, an important Native American trail and later wagon road accessing the upcountry of Georgia and the Cherokee Nation. Prior to the Civil War, two large plantations developed around the Rockbridge crossing of the Yellow River. After the war, the plantations were broken up and smaller family farms established. Centerville emerged as an important African American enclave during the late nineteenth and early twentieth centuries, and a number of black families owned farms in the area, cultivating cotton and corn and raising livestock, in some cases exceeding the output of their white counterparts. In the second half of the twentieth century, the black community established businesses in the area, and suburban development transformed the rural landscape. However, the land in the project area was gradually abandoned and returned forest.

The project area possesses clear potential for interpretation of prehistoric and historic occupation. No evidence of prehistoric activity was found in the project area, and subsequent land use during the historic period has impacted the potential for intact prehistoric archaeological sites. However, a number of high probability locations for prehistoric sites were noted, and the geographic setting attracted Native American activity. Historically, the properties that make up the project area were primarily owned by white families that were prominent in the area, but did not live within the boundaries of the project area. However, in the late nineteenth century, the Johnson Property was the home of two African American farmers who operated as landowners.

The remains of a dwelling house identified during the archaeological reconnaissance on the property (TPG-3) may be associated with the African American occupation of the land. Further archaeological investigations could provide more evidence regarding the dates of occupation and the type of structure at the site. Land in the project area has been used primarily for agriculture and forestry during the historic period, with evidence of agricultural terracing in a number of locations. Other remnants of human activity exist in the project area as well, including old road beds, domestic landscape plants, remnant architectural materials, and a rock wall. Protecting these features as part of the design and use plan of the park would serve to highlight the previous land use of the property and the ways in which those activities affected the land as it exists today.

REFERENCES CITED

Anderson, David G.

- 1990 The Paleoindian Colonization of Eastern North America: A View from the Southeastern United States. In *Early Paleoindians Economies of Eastern North America*, edited by Barry Issac and Kenneth Tankersley, pp. 163–216. *Journal of Economic Anthropology Supplement* No. 5.

Anderson, David G., and Joseph Schuldenrein (assemblers)

- 1985 *Prehistoric Human Ecology along the Upper Savannah River: Excavations at the Rucker's Bottom, Abbeville and Bullard Site Groups*. Russell Papers, Interagency Archeological Services, National Park Service, Atlanta.

Atlanta Constitution

- 1990 Promised Land “mayor” no politician. July 9: Section J, p. 7. Teletype on file, Georgia Department of Natural Resources, Historic Preservation Division, Atlanta, Georgia.
- 1992 Hope for the Promised Land: Georgia 124 reroute avoids historic haven. June 14: Section J, p. 1. Teletype on file, Georgia Department of Natural Resources, Historic Preservation Division, Atlanta, Georgia.

Blanton, Dennis B., and Ken E. Sassaman

- 1989 Pattern and Process in the Middle Archaic of South Carolina. In *Studies in South Carolina Archaeology in Honor of Robert L. Stephenson*, edited by Albert C. Goodyear. South Carolina Institute of Archaeology and Anthropology, Columbia.

Bode, Frederick A., and Donald E. Ginter

- 1986 *Farm Tenancy and the Census in Antebellum Georgia*. University of Georgia Press, Athens.

Bowen, William Rowe

- 1989 *An Examination of Subsistence, Settlement, and Chronology During the Early Woodland Kellogg Phase in the Piedmont Physiographic Province of the Southeastern United States*. Unpublished Ph.D. dissertation, University of Tennessee, Knoxville.

Brack, Elliott E.

- 2012 *Gwinnett: A Little above Atlanta*. Gwinnett Forum, Norcross, Georgia.
- 2014 Facts on Martha Johnson, donor of 140 acres to Gwinnett. Electronic document, Gwinnett Forum, <http://www.gwinnettforum.com/2014issues/14.0620.htm#elliott>. Accessed February 25, 2015.

Bullen, Ripley P., and H. B. Greene

- 1970 Stratigraphic Tests at Stallings Island, Georgia. *Florida Anthropologist* 23: 8–28.

- Caldwell, Joseph
1950 A Preliminary Report on Excavations in the Allatoona Reservoir. *Early Georgia* 1(10):4–21.
- Cambron, James W., and David C. Hulse
1983 *Handbook of Alabama Archaeology: Part 1, Point Types*. Alabama Archaeological Society, Huntsville, Alabama.
- Cantley, Charles E., and J. W. Joseph
1991 *Prehistory of the Middle Chattahoochee River Valley: Findings of the 1989–1990 West Point Lake Archaeological Survey and Site Testing Project*. New South Associates, Atlanta. Submitted to the U.S. Army Corps of Engineers, Mobile District, Mobile Alabama.
- Chapman, Jefferson
1981 *The Bacon Bend and Iddins Sites: The Late Archaic Period in the Lower Tennessee River Valley*. Department of Anthropology, University of Tennessee, Report of Investigations No. 31. Knoxville.
- Coe, Joffre
1964 *The Formative Cultures of the Carolina Piedmont*. American Philosophical Society Transactions No. 54. Philadelphia, Pennsylvania.
- D'Angelo, James J.
2003 *Historical Research and Intensive Archaeological Survey Investigations of the Hightower Trail and Soapstone Site for the Graves Road Park Project, Gwinnett County, Georgia*. TRC Atlanta. Report submitted to Gwinnett County Parks and Recreation.

2004 *Historical and Archaeological Investigation of the Harbins-Alcovy Park Property, Gwinnett County, Georgia*. TRC, Atlanta. Submitted to Cerulea, Alpharetta, Georgia.
- Delcourt, Paul. A., and Hazel R. Delcourt
1985 Quaternary Palynology and Vegetational History of the Southeastern United States. In *Pollen Records of Late-Quaternary North American Sediments*, edited by V. M. Bryant, Jr., and R. G. Holloway, pp. 1–37. American Association of Stratigraphic Palynologists Foundation.
- Elliott, Daniel T., R. Jerald Ledbetter, and Elizabeth A. Gordon
1994 *Data Recovery at Lovers Lane, Phinizy Swamp and the Old Dike Sites Bobby Jones Expressway Extension Corridor Augusta, Georgia*. Occasional Papers in Cultural Resource Management No. 7. Georgia Department of Transportation Office of Environmental Analysis, Atlanta, Georgia.
- Flanigan, J. C.
1984 *History of Gwinnett County, Georgia, 1818–1943*. Vol. I. Reprinted. Gwinnett Historical Society, Lawrenceville, Georgia. Originally published by the author, 1943.

- 1995 *History of Gwinnett County, Georgia, 1818–1960*. Vol. II. Reprinted. Gwinnett Historical Society, Lawrenceville, Georgia. Originally published by the author, 1959.
- Galloway, Patricia K. (editor)
 1989 *The Southeastern Ceremonial Complex: Artifacts and Analysis*. University of Nebraska Press, Lincoln.
- Garrow, Patrick H.
 1975 The Woodland Period North of the Fall Line. *Early Georgia* 3(1):1–16.
- Gwinnett County Superior Court (GCSC)
 1871–2014 Real Estate Records. On file, Superior Court Clerk’s Office, Gwinnet Justice and Administration Center, Lawrenceville, Georgia.
- Gwinnett County Tax Assessor (GCTA)
 1860-1910 Tax Digests. On file, Gwinnett County Historical Society, Lawrenceville, Georgia.
- Hahn, Steven
 1983 *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850–1860*. Oxford University Press, New York.
- Hally, David J.
 1970 *Archaeological Investigations at the Potts Tract Site (9MU103), Carters Dam, Murray County, Georgia*. Laboratory of Archaeology Series No. 6. University of Georgia, Athens.
 1980 *Archaeological Investigations of the Little Egypt Site (9MU102), Murray County, Georgia, 1970–1972 Seasons*. Department of Anthropology, University of Georgia, Athens. Submitted to the Heritage Conservation and Recreation Service, United States Department of the Interior, Contract Nos. 14-10-9-900-390, 1910P21041, 9911T000411, C5546.
- Hally, David J., and James L. Rudolph
 1986 *Mississippi Period Archaeology of the Georgia Piedmont*. University of Georgia, Laboratory of Archaeology Series Report No. 24.
- Hally, David J., Wyman Trotti, and Patrick H. Garrow
 1975 Preliminary Analysis of the King Site Settlement Plan. *Southeastern Archaeological Conference Bulletin* 18:55–62 Memphis, Tennessee.
- Harrison, John M. (compiler)
 1949 The Promised Land, being a Glimpse of Ante-bellum Georgia taken from the “Farm Journal” of Thomas Maguire. Typescript on file, Gwinnett County Historical Society, Lawrenceville, Georgia.

- Harwood, C. R.
1973 Quartzite Points from the Appalachian Highlands. *Tennessee Archaeologist* 15:89–95.
- Justice, Noel D.
1987 *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States*. Indiana University Press, Bloomington.
- Keel, Bennie C.
1976 *Cherokee Archaeology: A Study of the Appalachian Summit*. University of Tennessee Press, Knoxville.
- Kelly, A. R.
1935 Exploring Prehistoric Georgia. *Scientific American* 152(3):117–120, (4):184–187, (5):244–246.
- Larson, Lewis H.
1971 Archaeological Implications of Social Stratification at the Etowah Site, Georgia. In *Approaches to the Social Dimensions of Mortuary Practices*, edited by James A. Brown, pp. 58–67. Society for American Archaeology Memoir No. 25. Washington, D.C.
- Messick, Denise P., Johannes Loubser, Theresa M. Hamby, J.W. Joseph, Mary Beth Reed, and Leslie Raymer
1998 *Prehistoric and Historic Excavations at Site 9Gw347, Annistown Road Improvement Project, Gwinnett County, Georgia*. New South Associates, Inc., Stone Mountain, Georgia. Submitted to Gwinnett County Department of Transportation, Lawrenceville, Georgia, and Moreland Altobelli Associates, Atlanta, Georgia.
- Messick, Denise P., J. W. Joseph, and Natalie Adams
2001 *Tilling the Earth: Georgia's Historic Agricultural Heritage – A Context*. New South Associates, Inc., Stone Mountain, Georgia. Submitted to Georgia Department of Natural Resources, Historic Preservation Division, Atlanta.
- Milanich, Jerald T., and Charles H. Fairbanks
1980 *Florida Archaeology*. Academic Press, New York.
- Rudolph, Teresa P.
1991 The Late Woodland “Problem” in North Georgia. In *Stability, Transformation, and Variation: The Late Woodland Southeast*, edited by M. S. Nassaney and C. R. Cobb, pp. 259–281. Plenum Press, New York.
- Rudolph, James L., and David J. Hally
1985 *Archaeological Investigations of the Beaverdam Creek Site (9EB85), Elbert County, Georgia*. Russell Papers, Archaeological Services Division, National Park Service, Atlanta.

Sassaman, Kenneth E.

1985 *A Preliminary Typological Assessment of MALA Hafted Bifaces from the Pen Point Site, Barnwell County, South Carolina*. South Carolina Antiquities 17:1–17.

1991 *Economic and Social Contexts of Early Ceramic Vessel Technology in the American Southeast*. Ph.D. dissertation, Department of Anthropology, University of Massachusetts. University Microfilms, Ann Arbor.

1993a *Early Pottery in the Southeast: Tradition and Innovation in Cooking Technology*. University of Alabama Press, Tuscaloosa.

1993b *Early Woodland Settlement in the Aiken Plateau: Archaeological Investigations at 38AK157, Savannah River Site, Aiken County, South Carolina*. Savannah River Archaeological Research Papers No. 3. Occasional Papers of the Savannah River Archaeological Research Program, South Carolina Institute of Archaeology and Anthropology, University of South Carolina, Columbia.

Shapiro, Gary

1983 *Site Variability in the Oconee Province: A Late Mississippian Society of the Georgia Piedmont*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Florida, Gainesville.

Sholes, A. E.

1879 *Sholes Georgia State Gazetteer and Business Directory for 1879 and 1880*. A. E. Sholes, Atlanta.

Smith, Marvin T.

1981 *Archaeological Investigations at the Dyar Site, 9GE5*. Wallace Reservoir Project Contribution No. 11. Department of Anthropology, University of Georgia, Athens.

Snow, Frankie

1975 *Swift Creek Designs and Distributions: A South Georgia Study*. *Early Georgia* 3(2):38–59.

Standard Directory Company

1881 *Georgia State Gazetteer*. Standard Directory Company, Nashville.

1886 *Georgia State Gazetteer*. Standard Directory Company, Nashville.

Stanyard, William F., and Thomas R. Baker

1992 *Two Hundred Years of Woodstock Occupation in Northwest Georgia: The View from Whitehead Farm 1*. *Early Georgia* 20(2):33–71.

State Highway Board of Georgia (SHBG)

1938 *Gwinnett County, Georgia*. State Highway Board of Georgia, Division of Highway Planning, in cooperation with the Federal Works Agency, Public Roads Administration.

Street, Michael

- 1993 The Maguire Plantation: Nomination for the National Register. On file, Georgia Department of Natural Resources, Historic Preservation Division, Atlanta.

Tate, Ray J.

- 1967 *Soil Survey of Gwinnett County, Georgia*. U.S. Department of Agriculture, Soil Conservation Service. United States Government Printing Office, Washington, D.C.

U.S. Census Bureau

- 1850 Manuscript Returns of the Seventh Federal Census, Schedule 1: Population. Electronic documents, ancestry.com. Accessed March 9, 2015.
- 1880a Manuscript Returns of the Tenth Federal Census, Schedule 1: Population. Electronic documents, ancestry.com. Accessed March 6, 2015.
- 1880b Manuscript Returns of the Tenth Federal Census, Schedule 2: Productions of Agriculture. Electronic documents, ancestry.com. Accessed March 6, 2015.
- 1902 *Twelfth Census of the United States, Taken in the Year 1900: Agriculture, Part I. Farms, Live Stock, and Animal Products*. U.S. Census Office, Washington, D.C.
- 1910 Manuscript Returns of the Twelfth Federal Census, Schedule 1: Population. Electronic documents, ancestry.com. Accessed March 10, 2015.
- 1920 Manuscript Returns of the Thirteenth Federal Census, Schedule 1: Population. Electronic documents, ancestry.com. Accessed March 12, 2015.
- 1930 Manuscript Returns of the Fourteenth Federal Census, Schedule 1: Population. Electronic documents, ancestry.com. Accessed March 15, 2015.

U.S. Department of Agriculture (USDA)

- 1939 Gwinnett County Aerial Photographs. USDA, Agricultural Stabilization and Conservation Service, Washington, D.C.
- 1955 Gwinnett County Aerial Photographs. USDA, Agricultural Stabilization and Conservation Service, Washington, D.C.

U.S. Geological Survey (USGS)

- 1888 Atlanta, Georgia quadrangle map, 30-minute series. USGS, Washington, D.C.
- 1956 Snellville, Georgia quadrangle map, 7.5-minute series. USGS, Washington, D.C.
- 1988–2002 Aerial photography. Published by Google Earth (Version 7.1.2.2041)[Software]. Google, Inc., Mountain View, California. Available at <http://www.google.com/earth/download/ge/agree.html>.

University of Virginia Library

2007 Historical Census Browser. Electronic document, University of Virginia, Geospatial and Statistical Data Center, <http://mapserver.lib.virginia.edu/>. Accessed March 9, 2015.

Wauchope, Robert

1966 *Archaeological Survey of Northern Georgia: With a Test of Some Cultural Hypotheses*. Memoir of the Society for American Archaeology No. 21. Society for American Archaeology, Salt Lake City.

White, George

1854 *Historical Collections of Georgia*. Rudney and Russell, New York.

Williams, Mark, and Gary Shapiro

1990 *Lamar Archaeology: Mississippian Chiefdoms in the Deep South*. University of Alabama Press, Tuscaloosa.

Wood, W. D., and R. Jerald Ledbetter

1990 Rush: An Early Woodland Period Site in Northwest Georgia. Occasional Papers in Cultural Resource Management No. 4. Georgia Department of Transportation Office of Environmental Analysis, Atlanta, Georgia.