

HARBINS PARK COMMUNITY PARK ELEMENTS



**GWINNETT COUNTY DEPARTMENT
OF COMMUNITY SERVICES,
PARKS & RECREATION DIVISION**

NOVEMBER, 2009

Harbins Park - Community Park Elements Gwinnett County, Georgia

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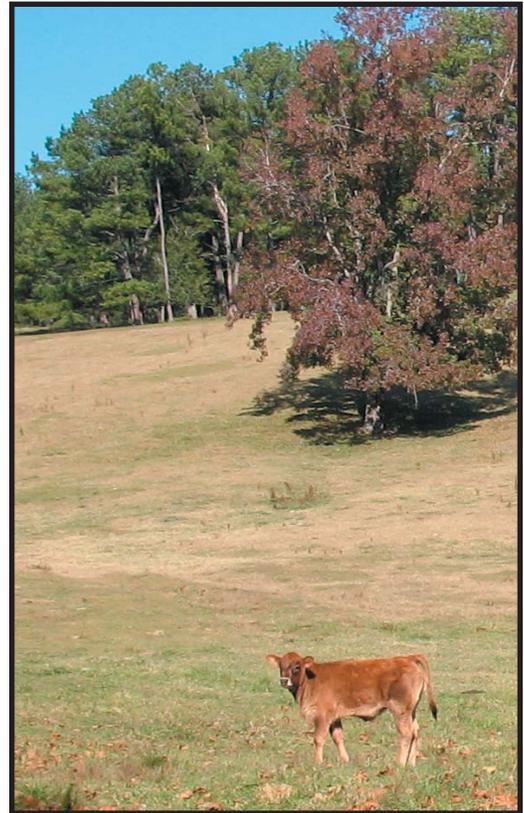
SECTION PROJECT GOALS AND OBJECTIVES

1.0 The 2004 Gwinnett County Comprehensive Parks and Recreation Master Plan included a prototype for Community Parks, which serve as the centerpiece of the park system. According to the plan, the County intends that Community Parks provide basic park facilities and services. Community Parks should balance active and passive uses, team and individual recreation serving all age groups. The prototype for a community park ranges from 100-300 acres and includes facilities and park elements to meet many diverse recreational needs for families and for individuals.

The typical Community Park includes various facilities and features, including one or more youth sports complexes, teen facilities, multi-purpose trails, natural surface trails, picnic and playground facilities. Additional Community Park facilities may also be included, such as a Community Center.

This report addresses the need for park services in the eastern most sector of Gwinnett County on 669+ acres acquired in 2005 and the more recently acquired 58.12 acre Wages Tract. The goals driving this master plan include the following:

- Realize goals of the 2004 comprehensive plan and the 2007 CIP Plan.
- Address the need for park services in the eastern most sector of the County to ensure that park services are provided to all areas of the County.
- Provide recreational facilities for the population that will be attending the Archer High School cluster.
- Integrate a variety of diverse recreation activities which will serve all age groups.
- Provide trail linkages between the Harbins Community Park and the adjacent Harbins Conservation Park as well as provide a greenway access point to the future Palm Creek Park.
- Maintain both passive and active areas of the park while providing safety to park users.

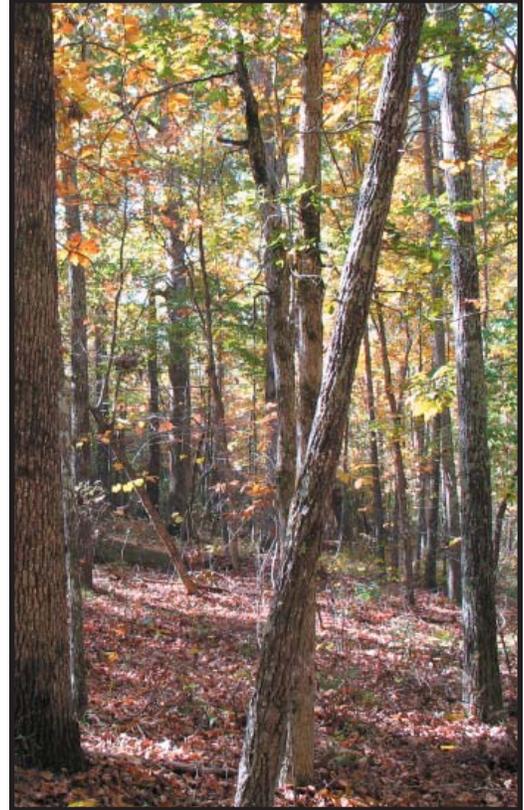


SECTION PROJECT UNDERSTANDING

2.0 The Harbins Community Park site is comprised of approximately 669 acres and located in the eastern corner of Gwinnett County along New Hope Road, Luke Edwards Road, Indian Shoals Road, and Masters Road. The area surrounding the site to the north, west and east consists primarily of residential properties and subdivisions. The southern boundary lies adjacent to the approximate 1290 acre Harbins Conservation site. The site is heavily wooded with young pines and scrub forest. There are several high plateaus on the site with highest elevations being in the northern portion, dropping

in a westerly and southeasterly direction towards Cedar Creek, and a tributary of Cedar Creek.

This park is to be utilized as a Community Park to house the active recreation amenities needed to serve the population in the easternmost sector of Gwinnett County. The 2007 Parks and Recreation Capital Improvement Plan recommends the development of youth sports complexes (soccer, baseball/softball, football), teen facilities (skate park, sand volleyball, basketball), multi-purpose trails, greenway linkages, natural surface trails, picnic & playground amenities and other community park facilities on this site. Additional programmatic elements can be sited as determined by the public and appointed Citizen Steering Committee.



SECTION PROJECT APPROACH

3.0 Using a standard Master Planning project approach toward the Harbins Community Park, the project passed through a series of design stages before a final Master Plan was approved. The following represent the milestones completed along the way.

- Notice to proceed issued to jB+a, inc.
- Flyers advertising public meetin distributed, public meeting sign erected.
- Public Input meeting, Community Interest Forms and Steering Committee Membership applications distributed.
- 4 Day Consultant / County Representative Site walk with John Gnoffo, Cerulea Inc.
- Steering Committee Scheduling Meeting
- Steering Committee Park Site Visit with Consultant and County Representatives
- Steering Committee Park System Tour with Consultant and County Representatives
- Presentation of Inventory / Analysis to Steering Committee and Park Programming Discussion
- Presentation of Concept Drawings to Steering Committee
- Presentaion of Preliminary Master Plan, Alteranative Master Plan and Cost Estimate to Steering Committee
- Master Plan Presentation w/ phasing prioritization
- Presentation to Gwinnett County Recreation Authority
- County Staff and Consultant Meeting with Adjacent Property Owner
- Presentation of Revised Master Plan to Adjacent Property Owner
- Presentation of Final Master Plan to Steering Committee
- Presentation of Final Master Plan to Gwinnett County Recreation Authority

harbins park - community park elements

The following provides a brief description and timeline of sequence of Meetings. Refer to Appendix I - Meeting Minutes (Page 143) for subsequent meetings.

Preparation of Base Information

jB+a, inc. prepared AutoCAD base information utilizing GIS files and aerial photography obtained from Gwinnett County.

Community Interest Meeting

The initial Public Meeting was held at the Grayson High School Theater on October 23, 2008 with a presentation of the park boundary survey, and aerial photography, a description of Gwinnett County Community Park type, a description and the receipt of Community Interest form surveys and Steering Committee Applications.

Preplanning Site Visits

Having analysed the entire 1700 acre tract during their master planning of the Harbins Conservation Park, Cerulea Inc. provided extensive knowledge of the site to jB+a, inc. and County Staff during a four day site walk. The team met at the park site for these informative site walks on October 29th and 30th, and November 3rd and 6th, 2008. The intent of the site walks was to review the various ecological systems of the site and to become familiar with its physical features.

Scheduling Meeting

The Steering Committee members met with the Consultant and Gwinnett County Staff on January 27, 2009 to schedule all meetings for the Harbins Community Park Site Master Planning Process.

Park Site Visit

Gwinnett County Staff, Consultants and Steering Committee Members met at the project site on February 21, 2009 for an informative site walk. The intent of the site walk was to become familiar with the opportunities and constraints of the park site. Steering committee members actively participated in the site tour by voicing concerns and requests for their Community Park.

Tour of County Parks

Gwinnett County Staff, Consultants and Steering Committee members met at the Tribble Mill Park Festival Field on February 28, 2009 to begin the Park system tour. The Park team visited 6 parks to discuss specific elements located at each park. These parks included the following:

Lenora Park (4515 Lenora Church Road, Snellville, GA 30058): Lenora Park is a 178 acre Community Park, which houses a variety of athletic fields and their associated parking. The Steering Committee visited the eastern sector of the park first to get an idea of what a full sized football field, walking track, associated parking, and site engineering would look like. The



Lenora Park - Multi-use Field

harbins park - community park elements

group then visited the western sector of the park, visiting the 2.6 acre dog park and experiencing the open layout of the designated disc golf course. The importance of having designated uses for specific park elements was discussed as a way to retain open space and or wooded areas.

Lucky Shoals Park (4651 Britt Road, Norcross, GA 30071): Lucky Shoals Park is a 68 acre park recently renovated to include a new Community Center / Gym. The new community center includes two classrooms, a dance studio with a wood floor, community room with a catering kitchen, lobby area and a game room. The gymnasium section includes two indoor basketball courts, volleyball and badminton court areas and a walking track around the upper level. This facility provided Steering Committee members an idea of what the footprint of a typical Gwinnett County Community Center included.



Lucky Shoals Park-Community Center

Pinckneyville Park (4707 South Old Peachtree Road, Norcross, GA 30071) – At Pinckneyville, the ball field complex and terraced soccer fields were visited. The Pinckneyville Park site has substantial elevation changes which facilitated the need for terracing of its' soccer and ball fields. Both cut and fill slopes and the differences between them were discussed. Additionally, the importance of providing hard surface gathering areas between fields to minimize maintenance and direct traffic flow was discussed. The ball field complex within Pinckneyville Park also includes 3 small playground areas, while technically three play areas may be a few too many, the intent is to provide an area for families with children participating in all types of recreation (free play or organized activities) to be able to play near each other.



Pinckneyville Park - Playground / Ballfield Complex

George Pierce Park (55 Buford Highway, Suwanee, GA 30024) – During the tour several inquiries were made regarding the potential for a senior center at the Harbins Community Park site. As a bonus, the Steering Committee members were taken to George Pierce Park to visit its Community Center. George Pierce Community Recreation Center and the new Prime Timers Pointe Senior Activity Center located at George Pierce Park in Suwanee recently opened in April of 2008. The 16,000-square-foot community center, the fourth community center operated by Gwinnett County Parks and Recreation, features a community room, catering kitchen, three classrooms, a dance/aerobic studio, game room, and outdoor basketball courts.



George Pierce Park - Senior Center

The attached 9,500-square-foot Prime Timers Point Senior Activity Center includes a large community room with a kitchen, an art studio, a classroom, a computer room for SeniorNet computer training classes, a covered outdoor terrace with shuffleboard courts and a lounge area. Prime Timers Pointe, “Where those in their prime, have the time of their lives,” has additional space for billiards and a reading room.

Rock Springs Park (550 Rock Springs Road, Lawrenceville, GA 30043)

– Rock Springs Park is a 114 acre Park located in Lawrenceville and serves as a sister park to Collins Hill Park. The recently opened section of the park which includes six (6) lighted tennis courts, a restroom building, shaded seating / picnic area, and associated parking was visited by the Steering Committee. Discussions included reasoning behind the basic layout of the tennis courts, fencing, lighting, and use.. Additionally, the use of “shade sails” around tennis courts and playgrounds was discussed. Shade sails are architectural, aesthetic, provide substantial shade –helping to reduce incidents of skin cancer, and are also significantly less expensive than built shelters.

Duncan Creek Park (3700 Braselton Hwy., Dacula, GA 30019)

– The park system tour concluded at Duncan Creek Park. Intent on providing recreation activities for all age groups and abilities, the Steering Committee visited Duncan Creek Park in Dacula. Duncan Creek Park serves as a sister park to Bogan Park, providing additional active recreation facilities. Geared predominantly toward teens, Duncan Creek Park has a 20,000 square-foot lighted skate complex, four lighted basketball courts (two full size and two half-court), and three lighted sand volleyball courts. Additionally, Duncan Creek also provides a playground with handicap accessible features, and 60-foot rental pavilion. The importance of providing playground equipment for a variety of ages and abilities was discussed. The importance of locating park elements with safety in mind, specifically the location of bathroom buildings in respect to playground areas, and the location of the basketball courts near the parking lot were also discussed.



Rock Springs Park - Sunshades Tennis Complex



Duncan Creek Park - Free Skate Park



Duncan Creek Park - HC Accessible Playground Equipment

Presentation of Inventory and Analysis

The Consultant presented the Park Site Inventory & Analysis diagrams to the Steering Committee on March 12, 2009. Diagrams included; Soils Analysis, Slope Analysis, Hydrology Analysis, Vegetation Analysis, Natural Features Analysis, Circulation Diagram, and Historic / Archaeological Analysis. Additionally, programming elements were discussed.

Presentation of Conceptual Master Plans

On April 14, 2009, jB+a presented three (3) Concept Plans to the Steering Committee. Each concept was depicted in a monochromatic form, utilizing bubble diagrams. Each followed the same

program requirements and differed only through spatial relationships and layout locations. The main focus of the discussion was the spatial relationships between the various park elements.



Harbins Community Park Site - Steering Committee Site Walk

Preliminary Master Plan

A Presentation of the Preliminary Master Plan graphic and cost estimate was given to the Steering Committee on May 19, 2009, by the Consultant. Additionally, a Preliminary Plan Alternative was presented. (RE: Preliminary Plan Alternative)

Preliminary Plan Alternative

The preliminary master plan was presented to County Staff prior to this Steering Committee Meeting on May 19, 2009. That presentation resulted in a request for modifications that were significant and had a "cascade" effect as regards to the distribution of facilities. Additionally, the Consultant and staff's recent assessment of existing BMX and woodland Disc Golf facilities in the metro area also brought forth a desire to make modifications to those amenities. A rough draft of the modified Preliminary Master Plan-that illustrated the consequences of the requested revisions was presented to the Steering Committee, concurrently with the Original Preliminary Master Plan. A number of comments from the Committee were generated and the Consultant was asked to incorporate the comments into the Final Master Plan

Master Plan Presentation

On July 14th, 2009 jB+a presented the Master Plan graphic, and cost estimates to Steering Committee. By majority acclamation the Steering Committee accepted the Master Plan as shown in the graphic presented (RE: Graphic M - Page 67). The Committee voted to accept the prioritized park elements for development when funding becomes available, by means of discussion and majority vote. By majority vote, the Committee agreed to submit the Graphic Plan and their development priorities to the Recreation Authority for their acceptance.

Presentation of Master Plan to Recreation Authority

The Steering Committee Master Plan recommendations were presented to the Gwinnett County

Recreation Authority on September 10, 2009. The plan was presented by the Consultant with several Steering Committee Members in attendance. During the discussion portion of the presentation an adjacent neighbor expressed concern about the proximity of some of the park elements to her property. The Recreation Authority requested an additional study by the Consultant to look into the concerns voiced by the neighbor and asked that modifications be made to the plan in an effort to appease the adjacent property owner. The approval of the Master Plan was tabled until the requested modifications could be studied and completed.

Meeting with Adjacent Property Owner

The Consultant and County Staff met with the adjacent property owner on September 22, 2009 to discuss a potential alternative to the park area near to her property. The neighbor agreed that the potential alternative was a plausible solution. The Consultant completed the modifications discussed with the property owner and County Staff presented the revisions dated October 8, 2009 to her on October 6, 2009. The adjacent neighbor approved the revisions to the Master Plan and forwarded a letter stating her approval to Gwinnett County.

Presentation of Final Master Plan to Steering Committee

In an effort to maintain the process of citizen committee review and comment prior to going back to the Recreation Authority for approval, a steering committee meeting was scheduled for October 8th, 2009 to review the Master Plan Revisions. Two separate meetings were scheduled to accommodate the Citizen Steering Committee, as this additional meeting went beyond their original commitment. The Revised Master Plan was presented to the steering committee members and the modifications to the master plan were unanimously approved.

Presentation of Final Master Plan to Recreation Authority

The Final Master Plan, approval letter and a Master Plan Revision Process Document were given to the Recreation Authority on November 12, 2009 for review. The Recreation Authority voted to accept the Harbins Park Final Master Plan as the guiding document for the development of the Harbins Community Park Elements

SECTION SITE INVENTORY AND ANALYSIS

- 4.0 Prior to concept development a series of analyses were conducted. The following is a summary of each of these analyses; a graphic diagram accompanies each summarization.

Soils (RE: Graphic A - Page 43)

Soil types provide guidance to help to determine the degree of construction that can occur on those soils. The capacity of the soil to hold water, support vegetation, or to compact will determine the feasibility of each area for various types of recreation facilities. The majority of existing soil types within the Harbins Community Park Site are generally favorable for development utilizing some planning and design techniques. Although, special attention will need to be made where geotechnical analysis limits development due to shallow soils. On this site, shallow soils are defined as exposed granite outcrops or bedrock very near the surface. To develop on or near these shallow soils would require blasting or trenching, two exceedingly expensive methods of rock removal. Additionally, soils located within the floodplain of Cedar Creek and its tributaries indicate poor percolation and unstable soil structure and are therefore not favorable for development. Large sections of the site indicate moderate to slight soil limitations for septic. Cross referencing with boring locations, slopes

and vegetation will be necessary to indicate actual preference for septic location. Several granite outcrops are featured throughout the site and should be retained for visual / ecological interest.

Slope (RE: Graphic B - Page 45)

The site exhibits variable topography with both ridges and valleys. The majority of the site falls between 0% slope and 10% slope. There are several high ridge points with the highest (elev 1010) located in the northwestern sector of the site off New Hope Road. The lowest point (elev. 822) of the site is the southern most point of the site where Cedar Creek exits the site. This is a 188 foot elevation difference between the highest and lowest points with many ridges and valleys between, which, in turn, creates positive drainage patterns. A small portion of the site is located in and along the flood zone of Cedar Creek. Like all floodplains, this zone is flat or nearly flat.

Hydrology (RE: Graphic C - Page 47)

The site possesses positive drainage patterns due to the ridges and valleys across the site which lead to several different tributaries of Cedar Creek. These tributaries then flow into Cedar Creek which is the main water feature on the site and has an extensive 100 year floodplain and floodway, in which development is severely prescribed; trails but no buildings. The aforementioned tributaries are "blue line" streams and will therefore be regulated under state waterway laws which requires a 75' setback on each side of the stream. Additionally there are several small cow ponds on the Wages Tract which will need to be mitigated due to the concentrated cattle waste accumulation.

There are several features such as stone ledges, waterfalls, and rock spills that are associated with Cedar Creek and its tributaries and should be preserved and considered as assets to the site.

Vegetation (RE: Graphic D - Page 49)

Vegetation across the site was analyzed and located on the Vegetation Analysis map. The site exhibits a mixture of vegetation types, including; young pine (10-20 years), medium pine (20-40 years), mature tall pine (40+ years), mixed hardwood and pine, good hardwood stands, specimen hardwoods, and open pasture. Areas in young, medium and mature pines are the most favorable for development due to the growth cycle of the pine forest which is relatively fast compared to hardwoods. These areas include the north east section along New Hope Road, the area adjacent to Luke Edwards Road on the western edge of the site, and the area flanking the eastern most area of the site along Indian Shoals Road. Additionally, the open pasture areas of the Wages Tract are also favorable for development.

Large specimen trees found along stream banks would be an asset to the site and should be maintained, as well as the areas of open hardwoods, specifically the central are of the site just north of the Conservation Park entrance at Indian Shoals Road. The stands of native azalea, and sweetbay magnolia along the stream banks and pockets along Masters Road and on the Wages Tract should also be protect.

Invasives found along the stream banks, specifically privet should be removed from the site.

Natural Features (RE: Graphic E - Page 51)

The Harbins Community Park Site has a very scenic quality to it with its many view sheds and physical features. These assets, specifically the stone ledges, waterfalls, and rock spills associated with Cedar Creek and its tributaries, the granite rock outcroppings and plant communities associates with them, and the good hardwood forest stands and specimen trees should be protected, retained, or enhanced in an effort to maintain the visual and ecological interest of the site.

Circulation Diagram (RE: Graphic F- Page 53)

The site is bounded or intersected by New Hope Road, Luke Edwards, Road, Indian Shoals Road and Masters Road. The intersection of Luke Edwards and New Hope Road is a blind intersection and is very dangerous. This intersection, signage and GDOT requirements pertaining to curb cuts should be reviewed prior to development.

Within the site exists several former dirt trails and/ or road beds, some that are deeply incised and eroded, others are historic. There is the potential for trail use on existing road beds.

Historical / Archaeological Resources (RE: Graphic G - Page 55)

There are little historical / archaeological resources that exist on site except for a few segments of historical roadbeds including the former alignment of New Hope Road. No Native American artifacts are known to exist on site.

SECTION PROGRAM OPTIONS

5.0 In order to understand the changing needs and new recreation trends in the community, the Gwinnett County Department of Community Services developed a Public Interest Form to distribute at the first Public Input meeting held on October 23, 2008. These forms are used to assess the needs and wants of the local community. The interest forms are then collated, and tabulated. The information in Appendix C - Community Input Tabulation and Comments (Page 109), contains the complete results.

Top ten community interests are as follows:

1. Playground (multiple age groups)
2. Paved multi-use trails (walking, jogging, rollerblading)
3. Baseball Fields
4. Picnic Areas
5. Football Fields
6. Disc Golf
7. Softball Fields
8. Natural Surface Trails
9. Skate Park
10. Teen Facilities

Following the presentation of the analysis graphics at the March 12, 2009 meeting, a programming discussion commenced. This information, supported by input from staff and Steering Committee members yielded the program of park elements that the Consultant was tasked with providing for the Harbins Community park acreage. The program elements included the following:

County Requests

- Baseball / Softball Fields
- Multipurpose Field (football, soccer, lacrosse, track)
- Soccer Complex
- Teen Facilities (skate park, sand volleyball, basketball)
- Picnic / Playground / Pavilion
- Multi-Purpose Trails
- Natural Surface Trails
- Greenway Linkages

Steering Committee Requests

- Community Center / Gym
- Trail Linkages and Network Connections (hiking, biking, walking, equestrian)
- Lake or Pond
- Senior Center or Wing (Included as part of the Community Center)
- Greenway Corridor Connectivity (Palm Creek, Tribble Mill Parks)
- Library (5 acre parcel)
- Concessions Area w/ Interactive Fountain
- Group Camping Site w/ Bath House
- Disc Golf Course
- BMX Course
- Cricket Pitch
- Gaelic Field Sports (rugby, hurling, Gaelic football)
- Tennis Courts



Harbins Community Park Site - Granite Rock Outcrop w/ quartz vein and moss

SECTION PROGRAM DEVELOPMENT

6.0 Working with the Citizen Steering Committee, and representatives from Gwinnett County, the consultant, jB+a, developed a program outline. What follows is the design stage progression from concept through the final master plan design. A description of each of the stages is included.

6.1 Concept Development

A total of three concept plans were prepared and presented to the Steering Committee on April 14, 2009. Each concept was depicted utilizing bubble diagrams and each followed the same program requirements. They differed only through spatial relationships and layout locations.

harbins park - community park elements

Concept 1 (RE: Graphic H - Page 57)

- Utilized the most developable areas of the park site
- Ball field Complex was sited in the north eastern section of the site off New Hope Road. Included in the complex are 7 ball fields arranged in a modified wagon wheel configuration around a central plaza. On access with the plaza is a 5000sf destination playground with open lawn area. Tucked into the site at the end of the expansive parking lot for 520 cars is the Teen Recreation Area, which will include the following; Skate park, sand volleyball, basketball, and access to the gully course.
- Just south of the ball field complex the community Center/ Gym with Senior wing is sited to take advantage of the existing peninsula. An additional 253 car parking lot is located adjacent to the Community Center.
- On the West side of New Hope Road a 5 acre area designated for the primitive camping is located. Parking for 80 cars and access to a bath house and the nature trail is available.
- Also located on the west side of New Hope Road is a trail head with pavilion, to provide access to the nature and multi-use trails.
- At the intersection of Luke Edwards Road and New Hope Road, a 5.35 acre parcel has been set aside to accommodate a future library. Also sharing the space is a garden area and interactive fountain.
- The south western section of the Community Park provides areas for a BMX biking facility with access off of New Hope Road and a 25 acre disc golf course. Parking for 200 cars is shared between these two park elements.
- Aligning an entrance with Harbins conservation park, parking is provided for 80 cars and serves as a trail head and rental pavilion area.
- A 6 court (3 pair) tennis complex is located in the eastern most section of the site just north of Indian Shoals Road. The complex includes a plaza area, tennis center and parking for 120 cars. This lot could also be used for trail access due to the amount of parking available.
- Aligning two separate entrances; one with Masters Road –which bisects the site and serves as an independent drive way that links all element without passing through parking areas and terminates at a round about, the other aligns with the tennis complex parking area and serves the multi-use field only. the Wages Tract hosts predominantly active recreation facilities including Multi-use field (football, soccer, lacrosse, and a .3 mile lighted track) in the north east corner of the tract, the Gaelic Sports Field (Rugby, Gaelic Football and hurling) south west of the multi-use field, five full sized soccer fields and a cricket pitch. It is anticipated that each sports field will be terraced into the site from front to back along with the parking areas that correspond to each field.
- On the western portion of the bisecting drive a playground area overlooking the Cedar Creek Floodway, enhanced lake and 1 mile paved trail loop are located.
- Additionally, a multi-use trail system, and Nature Trails links all elements throughout the entire Harbins Community Park site, connects to trails within the Harbins Conservation Park and provides opportunities to connect to the future Palm Creek Park.
- Areas for potential mountain bike and equestrian trails have also been designated.

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Concept 2 (RE: Graphic I - Page 59)

- Utilized the most developable areas of the park site.
- A Cricket Pitch was sited in the north eastern section of the site off New Hope Road with plaza area and restroom / concession facility. In addition to the cricket pitch, five full sized soccer fields have been sited on this same ridge. They are sited around a plaza area as well. On access with the plaza is a 5000sf destination playground with open lawn area and two acre dog park. Parking for 609 cars is provided in this area.
- Located on the west side of New Hope Road is a trail head with pavilion, to provide access to the nature and multi-use trails.
- At the intersection of Luke Edwards Road and New Hope Road, the community center, gym with senior wing has been sited. To accommodate the seniors a patio and court yard area is planned. Additionally, the teen recreation center has been located near the Community Center to encourage passive policing. The recreation center would include skate park, half court basketball, and sand volleyball courts
- The south western section of the Community Park provides areas for a BMX biking facility with access off of New Hope Road and a 25 acre disc golf course. Parking for 200 cars is shared between these two park elements.
- Aligning an entrance with Harbins Conservation Park, parking is provided for 80 cars and serves as a trail head and rental pavilion area.
- The 5 acre parcel designated for the future library is located in the eastern most section of the site just north of Indian Shoals Road. This area also includes a plaza area, interactive fountain and bath house directly behind the library. Just north of the Library in a more secluded area of the site, 5 acres has been designated for primitive camping. Campers would utilize the bathhouse at the interactive fountain. Parking for 200 cars is provided.
- The Wages Tract is host to active recreation. The single entrance into this portion of the site aligns with Masters Road. The seven field Ball Complex is sited in the north east corner arranged in a modified wagon wheel configuration around a central plaza. Three hundred and sixty (360) parking spaces are provided.
- A 6 court (3 pair) tennis complex is located just south of the ball complex. The complex includes a plaza area, tennis center and parking for 228 cars.
- Furthest into the site are the Gaelic Sports Field and the multi use field, with shared parking of 150 parking spaces.
- On the western portion of the entrance drive a 1 mile paved trail loop is located.
- Additionally, a multi-use trail system, and Nature Trails links all elements throughout the entire Harbins Community Park site, connects to trails within the Harbins Conservation Park and provides opportunities to connect to the future Palm Creek Park.
- Areas for potential mountain bike and equestrian trails have also been designated.

Concept 3 (RE: Graphic J - Page 61)

- “Sectors” Concept 3 divides the Community Park site into three sectors. The Active Sector, The Urban Sector, and the passive open field Sector.

Active Sector

- Ball field Complex was sited in the north eastern section of the site off New Hope Road. Included in the complex are 7 ball fields arranged in a modified wagon wheel configuration around a central plaza. On and east / west access with the plaza, is the

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Teen Recreation Area, which includes the following; Skate park, sand volleyball, basketball, and access to the gully course, and is located to be in a most visible area. In proximity to the Teen Rec. Area is the 6 court (3 pair) tennis complex. The complex includes a plaza area, and tennis center. On a north / south access with the ball field complex is a 5000sf destination playground with pavilion, open lawn area and overlook shelter.

- On the western side of New Hope Road the BMX biking facility has been located. Parking for 75 cars is provided.

Community Sector

- The intersection of Luke Edwards Road and New Hope Road has been developed in an urban core type layout. The intent is for this intersection to serve as a "welcome" to the park and open up the intersection for better visibility. The Community Center / Gym w/ Senior Wing is sited on the northern side of New Hope Road, with plaza areas to the front and back of the building. The library has been sited on the south side of New Hope Road with a welcoming plaza at the front to mirror the community center. Both buildings are intended to address the intersection and create more of an urban center feel. Behind the Library an interactive fountain / garden area is located with concessions and a .3 mile paved walking loop. This garden area is intended to link the urban core to the natural park atmosphere.

Passive Sector

- The passive / open field sector comprises the largest portion of the park.
- Located in a wooded area to the east of the urban core, the primitive camping area is located with parking for 70 cars and a bathhouse.
- Aligning an entrance with Harbins Conservation Park, parking is provided for 80 cars and serves as trail head and disc golf parking area.
- Masters Road has been eliminated to provide continuous use of the southern section of the park site without vehicular conflict. The existing road bed will be used as part of the multi use trail system.
- In the eastern most section of the site just north of Indian Shoals Road a large parking area for 325 cars is provided. This serves as a trail head to the trails section of the site. Parking would be terraced and sited among the trees to minimize impact.
- The Wages Tract is host to field type recreation. The single entrance into this portion of the site is located to the far east. The intent is to minimize the intrusiveness of the vehicle in the park area. Parking areas are also sited to the far east of the site in an effort to maintain as much of the passive feel of this sector as possible.
- Open field sports are located in this section, including; Multi use field, Gaelic sports field, four full sized soccer fields, and cricket pitch.



Harbins Community Park Site -Hardwood Tree Forest

- In the lower portion of this sector a 1.5 mile paved trail has been located.
- Additionally, a multi-use trail system, and Nature Trails links all elements throughout the entire Harbins Community Park site, connects to trails within the Harbins Conservation Park and provides opportunities to connect to the future Palm Creek Park.
- Areas for potential mountain bike and equestrian trails have also been designated.

Using the spatial diagrams of Concept 3 , real diagrammatic form was given to each of the park elements. Concept Plan 3 was adjusted based on comments from the Steering Committee and Staff, and further developed into the Preliminary Master Plan for the next meeting (May 19, 2009). The comments relating to the progression of Concept 3 toward teh Preliminary Master Plan are as follows:

- Football / Soccer layout should follow Concept 1
- Disc Golf would position itself on both sides of stream
- Include contiguous trails between Harbins Park and Community Park.

6.2 Preliminary Master Plan / Preliminary Master Plan Alternative

The preliminary master plan was presented to County Staff prior to the presentation to the Steering Committee. That presentation resulted in a request for modifications that were significant and had a “cascade” effect as regards to the distribution of facilities. Additionally, staff’s and consultants recent assessment of existing BMX and woodland Disc Golf facilities in the metro area also brought forth a desire to make modifications to those amenities. In addition to the preliminary Master Plan (RE: Graphic K - Page 63) being presented to the Steering Committee, on May 19th, 2009, a rough draft of the modified plan-that illustrated the consequences of the requested revisions, was presented. (RE: Graphic L - Page 65) The rough draft of the modified plan did not indicate the final design. Additional refinement and study of the exact location of the relocated elements would be required. The modifications requested by the Steering Committee and County Staff included the following:

Ballfield Complex

- Ballfield Complex area as requested by Steering Committee, with teen facilities moved closer to entrance and destination playground area included.

Staff Comments: Comments did not affect the Ballfield Complex area.

Wages Tract

- Entrance drive moved from eastern property line to align with Master Road per Steering Committee request.
- Recreation areas include four (4) soccer fields, multi-use field (football, soccer, and lacrosse), Gaelic sports field, and cricket pitch.
- Entrance drive was lengthened to extend down hill to the floodplain with a turn around at the end.

harbins park - community park elements

- Handicapped only parking spaces have been provided at the turn around point for access to the multi-use trail loop that is sited within the flood zone area.

(Note: With so much topo change on site there is very little to offer up as an accessible natural experience. This loop will provide and opportunity to include a very nice, handicapped accessible experience.)

Staff Comments: Originally the Preliminary Master Plan showed a shelter at the pond. Staff wants to replace the shelter with a rentable pavilion. This, in turn, required an expansion of the parking area and the addition of a playground.

Linkages to Harbins Conservation Park

- Always the intent to connect both the Conservation and the Community Parks via trail linkages
- Spur of multi-use trail will connect from the equestrian parking lot at the Conservation Park to the HC accessible loop on the Wages Track via a pedestrian bridge across Cedar Creek.
- Under pass Structure is proposed to provide linkage across Indian Shoals Road. (Note: With the removal of the almost 90 degree turn at the Conservation park entrance – per County DOT, traffic no longer slows to make the turn. As a result, traffic flows rapidly along both Luke Edwards and Indian Shoals Roads)
- Underpass structure would create a sort of chute that would have walls on both sides but would be open to the top. As the ground rises around the chute, passage would remain fairly level into the hillside for approximately 100', at which time a 90 degree turn would be made and users would pass under the road via a tunnel, exiting on the other side of the road via another chute structure. The tunnel portion would be lighted to allow for pedestrians, horses, cyclists to move between parks without vehicular conflict.
- A second underpass would be utilized on New Hope Road to provide linkage to the northwestern section of the park and potential greenway connection to Palm Creek Park.



Harbins Community Park Site - Pastoral View across Wages Tract

Masters Road Closure

Preliminary Master Plan proposes the closure of Masters Road within park boundaries. The Preliminary Master Plan anticipates the construction of a cul-de-sac at the southern

terminus of Masters Road where the road intersects with the northern park boundary. The closure is dependent upon the approval of property owners living off Masters Road, north of the Park. Preliminary Phone calls to: County DOT, County Planner, Bus Routing Officer for the Board of Education, and the Fire Marshall, indicated that none of the organizations listed above had any problem with the closure of the road.

Staff comments: Include a note on the Preliminary Master Plan which reads; "Master Road: Potential abandonment of road with existing road bed to be utilized by multi-use trail."

New Hope Road / Luke Edwards Road Intersection

Staff Comments: Requested the disassociation of the interactive fountain from the Library. Conversation with Department of Support Services alluded to an opportunity to conceive of the layout from a site planning perspective to how elements could be coordinated. Staff requested that a 5 acre parcel be shown on the Master Plan and labeled as Future Library.

- Potential Future Library Parcel shown as independent 5 acre parcel
- Community Center relocated to the area southeast of the NH Rd. / LE Rd. intersection. (Due to shallow depth to bedrock and the Center's larger footprint the Community Center could not be located on the corner intersection. Additionally, the newly occupied space required the relocation of the Primitive Camping Area.)
- Interactive Fountain is to be associated with the Community Center.

Primitive Camping Area

- Relocated to the North West Sector of the park near the BMX facility.
- Location shown on modified plan is representational and should not be viewed as final location. Additional refinements will be made that site the camping area more strategically and more towards the interior of that park zone.
- Relocation of the Primitive Camping Area is result of 1) relocation of community center, 2) response to visiting local BMX facility (Wild Horse Creek Park – Cobb County, GA)

(Note: When large meets are held, Cobb County Parks shuts down the rest of the community park to accommodate / dedicate parking to the National Meet (Dixieland BMX Nationals). As the primitive camping area will be utilized by small groups of users, parking associated with the camping area could also potentially be used by the BMX community.)

Woodland Disc Golf Course

- Staff and Consultant visited woodland golf courses at Fort Yargo State Park and East Roswell Park. The relocation of the woodland course is a result of these visits.

(Note: East Roswell Parks Disc Golf Course is very heavily used and heavily wooded. The effect of the discs hitting surrounding trees was underestimated. During the course visit, it was noted that several of the trees had gashes, and sloughed bark. Those trees that had been debarked appeared to either be in decline or dead. Trees that were more severely affected were hardwoods, such as oaks.)

- Originally the disc golf course was located within the best stands of woods (just north of the Harbins Conservation Park entrance) However, additional research has caused us to rethink the location as we do not want to sacrifice the best stands of trees to that kind of impact.

(Note: In thicker woodland, a wayward disc would get redirected back onto the course faster than in open woodland. Additionally, less foot traffic would be going off into the woods – foot traffic that could contribute to erosion. Younger thicker woodland appeared to be a better choice for the disc golf course.)

The woodland disc golf course has been relocated to the land surrounding Masters Road. The course will occupy land on both sides of the road.

- Additionally, the East Roswell course illustrated signs of severe erosion problems on fairways crossing significant slopes, where as fairways that stayed aligned with the contours had minimal erosion problems. Areas rich with pines proved enough pine straw dropping from trees to help minimize erosion effects as well as keep the course somewhat open.
- Parking for the disc golf course will be accommodated through the expansion of the parking area at the tennis complex. Additionally, spur trails will provide access to and from the course, and pedestrian footbridges will provide passage across streams.

Tennis Complex

- Layout modified to accommodate the expansion of parking area to park both the tennis complex and disc golf course.

Interpretive Trail

- New element added to the Harbins Community Park.
- Will utilize parking area and originally location of the disc golf course (across Indian Shoals Road from Harbins Conservation Park)
- Area will be converted to an extensive nature / interpretive trail system with information kiosks, in an effort to preserve the oldest, and nicest hardwoods on the site.
- Kiosks and trail would interpret the ecology of the Piedmont.

Based on comments from the Steering Committee and Staff, the Preliminary Master Plan was revised and further developed into the Master Plan for the next meeting (July 14, 2009). The comments relating to the progression of the Preliminary Master Plan toward the Master Plan are as follows:

- Provide a minimum buffer of 50' along the eastern property line
- Revise the camping area to a more interior location in the NW sector of the park
- Research round about traffic configuration for Indian Shoals Road.

Additional refinements included refinement to a sanitary sewer system.

6.3 Master Plan, July 14, 2009 (RE: Graphic M - Page 67)

jB+a developed a final color graphic, and cost estimate and presented them to the Steering Committee on July 14, 2009. The prioritization of park elements was the focus of the meeting. The result of the discussion was confirmation of the order of the development of the park elements as funding becomes available. Steering Committee members were asked to vote on the various elements of the park to help determine the order in which they would like to see the park elements constructed when funding becomes available. (Note: Certain infrastructure elements of the park will be required to be constructed during the first phase, such as parking, the site preparation and associated site utilities and septic) Priorities are as follows:

1. Multi-Use Complex (Football, Soccer, Lacrosse) and associated facilities. (Note: due to the proximity of the Gaelic Sports field to the multi-use complex, it is likely that it could be developed at the same time as the Multi-Use complex at minimal cost.)
2. Softball / Baseball Complex and associated facilities
3. Community Center
4. Soccer Complex
5. Tennis / Disc Golf. (Note: Disc golf is reliant upon the tennis center for parking and restroom facilities and should therefore be constructed simultaneously.)
6. BMX facility
7. ADA Multi-purpose trail loop (Lower section of Wages Track, includes bridge and connection to Harbins Conservation Park multi-use trail)
8. Cricket Pitch
9. Teen Facility
10. Nature / Interpretive Trail (Parking area could also be used as overflow parking for the Conservation Park)
11. Lake Amenities (Includes parking, playground, pavilion/ restroom, well fed interactive "stream" and the 3.0 acre lake)
12. Destination Playground
13. Primitive Camping Area
14. Interactive Fountain (Includes, parking, interactive fountain and adjacent plaza area, playground, restroom / concessions, pavilion, shelters, natural garden area and .45 mile paved walking loop)
15. Remaining Multi-use Trail System (Includes approximately 10 miles of trails, with connections / linkages to Conservation Park, and future greenway.)

Following the prioritization of park elements a vote to accept the priorities as listed above and to submit the progression to the Recreation Authority was taken. By majority vote the prioritization of park elements was approved for submission.

The Steering Committee Final Master Plan recommendations were presented to the Gwinnett County Recreation Authority on September 10, 2009. Several Steering Committee Members were in attendance. During the discussion portion of the presentation an adjacent neighbor expressed concern about the proximity of the Football-Lacrosse-Soccer Multi Purpose Field and parking to her property. The Recreation Authority requested an additional study by the Consultant to look into the

concerns voiced by the neighbor and asked that modifications be made to the plan in the area of the Football-Lacrosse-Soccer Multi Purpose Field in order to move the parking area away from the property line. The approval of the master Plan was tabled until the requested modifications could be studied and completed.

6.4 Final Master Plan, October 8, 2009 (RE: Graphic N page 69)

Following the Recreation Authority Meeting, the Consultant and County Staff met with the adjacent neighbor on September 22, 2009, to discuss a potential alternative to the park area adjacent to her property. The alternative included; removing the Gaelic Sports Field from the park, moving the parking areas of the Multi-use Field to the far side of the sports field away from the adjacent property and replacing the former parking area with a dog park. The property owner agreed that this was a plausible solution.

The Consultant completed the modifications discussed with the property owner and County Staff presented the revisions dated October 8, 2009 to her on October 6, 2009. The property owner approved the revisions to the Master Plan and forwarded a letter stating her approval to Gwinnet County the same day. (RE: Appendix H - Page 139)

In an effort to maintain the process of citizen committee review and comment prior to going back to the Recreation Authority for approval, a steering committee meeting was scheduled for October 8th, 2009 to review the Master Plan Revisions. Two separate meetings were scheduled to accommodate the Citizen Steering Committee, as this additional meeting went beyond their original commitment. The Revised Master Plan was presented to the steering committee members and the modifications to the master plan were unanimously approved.

The Final Master Plan, approval letter and a Master Plan Revision Process Document were given to the Recreation Authority on November 12, 2009 for review. The Recreation Authority voted to accept the Harbins Park Final Master Plan as the guiding document for the development of the Harbins Community Park Elements

6.5 Program Elements

The overall concept for park development is to provide a variety of desired active recreation facilities serving all age groups; preserving the majority of the less developable portions of the park as a passive use space, to enhance public awareness and access to the natural features of the park. Sports fields / active use type facilities and their supporting amenities will be strategically located to provide a variety of active use spaces. Active structured / team coached program facilities to be accommodated include:

- Multi-use field complex for Football, Soccer and Lacrosse
- Softball / Baseball
- Soccer
- Multi-use Trails
- Gymnasium - Indoor Basketball (Associated with Community Center)
- Bicycle Moto-cross (BMX)
- Cricket
- Tennis

Alignment of trails and passive use spaces will be strategic, coinciding with the topography in order to minimize erosion problems. Other recreation programming for the site includes:

- Community Center / Senior Wing
- Interactive fountain
- Large rental pavilions with restrooms
- Playground Areas
- 18-Hole Disc Golf Course
- 2.5 acre Dog Park
- Teen Recreation Complex
- Primitive Camping
- 3.0 acre Water Feature
- Nature Trail System
- Soft Surface Trail System
- Multi-use Trail System

Vehicular Circulation and Parking

Vehicular access to the park is comprised of a series of park entrances off of New Hope Road, Luke Edwards Road, and Indian Shoals Road as defined in each section of this report. Each entrance will have a deceleration lane and will be sited to take into consideration sight distances of each main road. Vehicular circulation is then addressed within the park by a single two-way drive. The drive will then either tie directly into a parking area or access pockets of parking dispersed along the length of the road serving the adjacent recreational facility as reflected in the Southern Sector of the Park.

The surface profile of the entrance drive and parking areas will be vehicular grade asphalt with curb and gutter to be provided along the length of each entry rive and each parking bay. Storm water inlets will be required at the low points of the parking areas. The layout will provide a total of 2626 parking spaces as detailed in the Master Plan Parking Summary.

Northwest Sector

Entrance to the Northwest Sector will be from New Hope Road. Entrance into this portion of the site should be aligned with the entrance to the Northeast Sector of the park.

BMX Facility

A BMX facility -Bicycle Moto-cross (X), is to be sited on the hilltop within the northwestern corner of the park, just west of New Hope Road. The facility is to be graded out so as to utilize the existing depression just north of the hilltop for storm water detention. The concept for the facility is contained within 2 acres and features a dirt track construction with a series of tight turns, jumps and berms. The intent is to create a fun and competitive track that will allow for very fast riding (hard-packed) and provide maximum traction. The quality of the riding surface is of the utmost importance for the reputation of the track and the success of competitions. Building a regulation size ABA/NBL BMX track, one that is challenging enough to provide safe competition will require attention to the following key areas: dirt, length of track, width of start gate, height of star hill, width of track, and width of straights. It is recommended that either the ABA (American Bicycle Association) or the NBL (National Bicycle League) guidelines be consulted during the construction of the BMX facility and track.

The BMX facility will be fenced and lighted. The facility will feature: an entrance plaza area, a starting gate system and covered platform, PA system, Gwinnett County Standard Concession / Restroom Building, announcing tower, bleachers, and moto-board.

Parking for the BMX facility is to be located just south of the property line and should be graded out so as to utilize the existing depression to the south of the lot for storm water detention. One hundred forty (140) parking spaces have been allotted for this facility with potential overflow parking within the primitive camping parking lot.

Primitive Camping

Located within good hardwood forest in the northwestern sector of the site, the primitive camping area will provide 30 tent sites for primitive camping type activities only. It is intended that this area will be utilized by organized, institutional, adult monitored, groups such as the Boy Scouts and church groups. The primitive camp ground is not intended to be utilized for individual family camping. The sites are to be tucked into the existing woodland and laid out along the existing contours to minimize disturbance of the forest. The tent pads are to be graded flat and bounded by wood rails. Common fire circles will be provided for every 3-4 tent sites.

A natural permeable surface walking path network intended for pedestrian use only will connect tent sites to each other as well as the parking area, bath house and amphitheatre. The typical trail profile is a graded aggregate sub-base with engineered mulch topcoat, 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 the drainage pattern parallel to the trail.

Parking for the primitive camping area will serve as the main parking area for primitive camping and as an overflow lot for the BMX facility. Seventy (70) parking spaces have been allotted for this facility.

Bathhouse

A bath house will be provided with separate restroom / shower, urinal / commode utilities per sex, required sinks and diaper changing stations. The structure will have security lighting incorporated into it and located within walking distance to the primitive camping sites and parking area.

Amphitheatre

This amenity is to be situated within the primitive camping area at the northeast corner of the open meadow area. The amphitheatre area will consist of terraced grass seating areas and utilized for group gatherings, outdoor classroom participation, and performance type activities. Low granite faced walls will retain the soil needed to accommodate the terracing. Stair assemblies will allow for easier access to the terraces. The amphitheatre can be accessed via the natural trails linking the various camp sites.

Multi-use Trail Loop

A .5-mile asphalt-paved, 12' wide multi-use trail loop is provided near the primitive camping area. This loop will provide a connection to the parking area, tie into the natural

surface trails and meadow areas. The .5 mile loop is to meander through the hardwood forest and meadow areas providing a variety of experiences to the user. A spur trail will provide a connection to the future paved greenway linkage to Palm Creek Park and to the southern sections of Harbins Park.

Meadow Areas

Three (3) open meadow areas will be provided within this sector. The meadow areas are a consequence of the need to clear areas for septic fields. (RE: Utilities – Septic). The fields should be seeded with native wildflowers or grassed. Maintenance requirements will be kept to a minimum, requiring mowing 1-2 times per year. Meadow areas may be used by campers for unstructured play, nature or ecology studies. Access to these meadow areas is via the .5-mile Multi-use trail loop.

Northeast Sector

Entrance to the Northeast Sector will be from New Hope Road. Entrance into this portion of the site should be aligned with the entrance to the Northwest Sector of the park.

Ball Field Complex

The ball field complex is sited within the park to take advantage of the natural wide ridge area located in the Northeast Sector of the park. Additionally the fields should be aligned as indicated on the Master Plan to advantage of axial connections with the Teen Recreation Area and Destination Playground. A seven (7) field ball complex is planned for the park. The complex layout is comprised of 2 field clusters. The northern most cluster consists of 5 ball fields; 3-200' fields, 1-180' field, and 1-150' field, arrayed in a wagon wheel configuration around a central restroom / concession / plaza area. . This plaza area will be comprised of concrete pavers laid on top of structural soil to aid in permeability. The southern ball field cluster consists of 1-300' field and 1-220' field and 7 batting cages. Each field is lighted and includes fencing and backstops, dugouts, bleachers, and score box. The two clusters are separated by a larger plaza / playground area (RE: Plaza / Playground this section).

The fields are connected to each other, the larger plaza / playground area, and multi-use trail via ADA compliant 10' wide concrete walkways.

Four hundred twenty (420) parking spaces have been allotted for the ball field complex.

Large Plaza / Playground Area

This plaza area will be comprised of concrete pavers laid on top of structural soil and patterned concrete paving (visually pleasing score and expansion joint pattern). The plaza / playground area should be configured per the Master Plan; around a Gwinnett County Standard Restroom / Concession Building. Planters will be used to break down the plaza into smaller gathering areas to allow for a variety of activities to take place. Shade trees placed in "at grade" planters or within a tree grate will help to provide shade for these spaces. Direct access to a sloping lawn area and spur trail connection to the multi-use trail, east of the plaza, will also be provided. Additionally, picnic tables, benches, trash

receptacles, bike racks, a freeze resistant drinking fountain and freeze proof bib will be sited as amenities in the plaza area.

Two (2) play areas configured per the Master Plan will be provided within the plaza area. The play areas are to be separated by a walk way area, one playground servicing 2-5 year old children and the other servicing 5-12 year old children. The walkway between the playgrounds will provide direct access to a sloping lawn area and spur trail connection to the multi-use trail, east of the plaza. The play areas will include picnic tables, and benches, and a wood chip mulch area with sub-drainage per departmental standards. Equipment would be prefabricated to include: swings, free standing play structures, and compound structures, all suitable for a variety of play – separated into zones to accommodate the various ages. ADA compliant transfer routes to access a representative portion of the compound structures should be provided, as well as 2" thick rubber particle mats under wear zones such as swings, slides and any other concentrated wear zone.

Teen Recreation Area

The Teen Recreation Area will be located in the Northeast Sector of the park. The complex is to be sited on axis with the large plaza area located between the 2 groups of ball fields within the ball field complex. These park elements are to be connected via a series of raised crosswalks. The layout of the Teen Recreation Area is to reflect the basic layout as illustrated in the Master Plan. The siting of the Teen Recreation Area is also intended to aid in passive patrolling of the area with it's location being near one of the entrances to the park, and it's proximity to the populated ball field complex and multi-use trail. All facilities within the Teen Recreation area will be lighted. The Teen Recreation area will include a free skate area, plaza area, 3 sand volleyball courts, 2 full sized basketball courts, 2 half court basketball courts, concession restroom building and open lawn area.

One hundred and fifty (150) parking spaces have been allotted for the Teen Recreation Area within the large shared parking lot.

Free Skate Area

The design of the free skate area will consist of a series of bowl shapes and should include a variety of concrete and metal fabrications suitable for skateboards and in-line skates. It is recommended that a contractor qualified in developing skate parks be consulted for design and development of the park. The skate area will be connected to the other elements of the teen recreation area via 8' wide concrete sidewalks and a plaza area for socializing. The County will develop posted rules for skate area usage, set fines for infractions, and will determine the extent of supervision and rule enforcement. The venue will be fenced for pedestrian and user safety, at the County's discretion.

Sand Volleyball Courts

Three (3) sand volleyball courts will be located in the teen recreation area in the Northeastern Sector of the park, and sited as shown in the Master Plan. Subsurface drainage will be provided to remove excess water. Playing surface is to be a deep sand base contained by a timber edge. Net and dimensions will be per County Standards, Equipment will be regulation and County Standard.

Basketball Courts

Two (2) full courts and two (2) half court basketball courts will be provided in the teen recreation area. Court dimensions, fencing, color, and equipment will be regulation and County Standard. The location of the courts was determined to allow for passive policing of the facility to minimize unfavorable activities.

Lawn Area

The lawn area is to be located in the southern portion of the Teen Recreation area. The approximate ¼ acre open lawn is intended to be used for unstructured play, Frisbee, sunbathing, or picnic type activities. The open lawn will be irrigated and maintained as an open lawn.

Plaza Area w/ Restroom / Concessions

The teen plaza area is to be sited on axis with the large plaza area within the ball field complex. The plaza area is will be comprised of concrete pavers laid on top of structural soil to aid in permeability. The plaza is intended to be utilized for socializing in a passive policing zone. Shade trees placed in “at grade” planters will provide shade for this space. Additionally, benches, trash receptacles, bike racks and a freeze resistant drinking fountain and freeze proof bib will be sited as amenities in the plaza area. A standard Gwinnett County restroom building will be centrally located in the plaza area (RE: ‘Restroom’ in this section).

Destination Playground

Located at the southern end of the Northeast sector is a 5000 square foot destination playground and supplemental amenities. The play area is sited on axis with the ball field complex. Because of the extensive grade change at this location a granite faced retaining wall is required. The long flat area created, with the help of the retaining wall, provides a space to accommodate the large playground, associated open lawn area for free play and 60’ rental pavilion with bathroom. Additionally the wall helps to create an overlook to the multi-use trail below and into the surrounding woodland. An ADA compliant ramp to the east of the play area allows access to the multi-use trail as well as to a shelter sited on the wooded peninsula.

The play area will include picnic tables, benches, and a wood chip mulch area with sub-drainage per departmental standards. Play equipment would be prefabricated to include: swings, free standing play structures, and compound structures, all suitable for a variety of play – separated into zones to accommodate the various ages. ADA compliant transfer routes to access a representative portion of the compound structures should be provided, as well as 2” thick rubber particle mats under wear zones such as swings, slides and any other concentrated wear zone.

A large, 60’ standard Gwinnett County pavilion will be accessible from the parking areas. The pavilion would be available for reservation through the County, or would be available on a first come first served basis. The structure will contain picnic tables, outdoor grills and security lighting.

One hundred fifty (150) parking spaces have been allotted for the Destination Playground. This parking count allows the destination playground with rest room to serve as a trailhead for access to the parks extensive multi-use trail system.

Central Sector

Entrance to the Central Sector of the park will be from New Hope Road just east of the New Hope Road, Luke Edwards Road Intersection. It is recommended that additional traffic studies be completed prior to the development of this sector. Many Steering Committee members expressed concern regarding the visibility of the park entrance to motorists due to the existing rise and curvature of the New Hope Road. It was announced by County DOT that the intersection would be reconstructed.

Community Center/ Gym / Senior Wing

The concept for this facility includes a Community Center, Gym, and Senior Wing housed under a single roof structure. One section of the building would house the community center facility with meeting room, catering kitchen, restrooms and storage areas. Another section would house a standard Gwinnett County Gym facility, similar to that found at Lucky Shoals Park. It is recommended that the building be aligned with the contours to provide a second floor entry for the senior wing, putting it on the same level as the perimeter corridor / track that typically encircles the gym facility at an elevated level. This would allow the senior wing to have direct access to this indoor walking loop in a conditioned space. Additionally, if positioned properly the senior wing would also have direct access to the garden area which includes a paved ADA (American Disabilities Act) compliant multi-use trail loop.

The Community Center / Gym / Senior Wing facility would include a series of hardscape spaces as gathering areas including drop off, entry plaza and shaded senior patio area.

Three hundred five (305) parking spaces have been allotted for this facility.

Interactive Fountain

A large interactive fountain with granite faced seating walls, plaza area and perimeter fencing will be sited at the corner of New Hope Road and Luke Edwards Road. The fountain is located to maximize its visibility; slightly higher than the existing perimeter roads, with perimeter fencing separating uses. Associated with the fountain is a large concrete paver area constructed on structural soils. The plaza includes sunshades, picnic tables, water fountain, trash receptacles, bike rack and benches.

Adjacent to the interactive fountain is an open lawn area for free play and a small playground area. Sunshades, benches, bike rack, and picnic tables will also be located within the playground area.

Seventy five (75) parking spaces have been allotted for this park facility.

Concessions /Restroom / Bathhouse

This structure will incorporate a concessions area, restroom, and bathhouse into a single building and be located near the parking area with access for servicing.

A bath house will be provided with separate restroom / shower, urinal / commode utilities per sex, required sinks and diaper changing stations. The structure will have security lighting incorporated into the structure and doors to the facilities should face the parking area for passive policing. The bath house is located so that interactive fountain users must walk by the facility on their way to the interactive fountain.

Pavilion

A large, 60' standard Gwinnett County pavilion will be located between the Community Center and the interactive fountain. It should be accessible from the parking area. The pavilion would be available for reservation through the County, or would be available on a first come first served basis. The structure will contain picnic tables, outdoor grills and security lighting.

Garden Area

The garden area is to be a more garden-esque area of the park. Included in the garden area will be the interactive fountain with plaza, a playground and open lawn area for informal play, a large rental pavilion, shelters and walking trail loop. Native plant species within the garden area are recommended to help areas blend with the passive woodland area.

Multi-use Trail Loop

A .45-mile asphalt-paved, 12' wide multi-use trail loop is provided within the Garden Area. This loop provides a connection to the parking area, Community Center / Gym / Senior Wing, interactive fountain, playground, and rental pavilion through a more garden-esque area of the park. The .45 mile loop is to meander through landscape, forested areas, and by an existing granite outcrop providing a variety of experiences to the user. The slope of this trail loop will never exceed 5% but will be kept as flat as possible. Due to its proximity to the Senior Wing, the trail loop is intended to provide an accessible trail option for our active seniors.

Shelters

Two (2) shelters, available on a first come first served are to be sited within the garden area to provide picnicking areas. These will also provide shelter for garden path users in the event of inclement weather. Space for up to two (2) picnic tables would be provided with a rectangular covered area of approximately 300 square feet. The structures would not have security lighting.

South Central Sector

Entrance to the South Central Sector of the park will be from Indian Shoals Road. Entrance should be aligned with the entrance to the Harbins Conservation Park Entrance.

Pedestrian Only Nature Trail

Located in the South Central Sector of the park across Indian Shoals Road from the Harbins Conservation Park is a "Pedestrian Only" Nature Trail. The 2.5 mile soft surface trail will explore the interesting natural and physical features of the site. The interior 1-mile section of the trail will be an interpretive section, with Piedmont ecology types depicted on interpretive kiosks. Sited at the trail head, the kiosks will call out, and illustrate the various natural features found along the trail. Additional numbered signage along the interpretive trail will correspond to the information described on the kiosks.

Eighty (80) parking spaces have been allotted for the Pedestrian Only Nature Trail. This parking area is also intended to be utilized as overflow parking for the Conservation Park when necessary.

Note: (RE: Trails Section - Soft Surface Trails) for typical trail treadway and trail layout.

Eastern Sector

Entrance into the Eastern Sector of the park will be via the round-about at the former Indian Shoal Road and Masters Road intersection. (RE: 'Masters Road Potential Closure' this section)

Tennis Complex

Six (6) lighted tennis courts will be provided on a series of three small terraces. The three (3) pairs of are to be arrayed around a paved plaza area as indicated in the Master Plan. Court fencing color, lighting, and equipment will be regulation and County Standard. The plaza area associated with the tennis complex is will be comprised of concrete pavers laid on top of structural soil to aid in permeability. Shade trees placed in "at grade" planters and sunshades will provide shade for this space. Additionally, benches, trash receptacles, bike racks and a freeze resistant drinking fountain and freeze proof bib will be sited as amenities in the plaza area. A standard Gwinnett County restroom building will be centrally located in the plaza area (RE: 'Restroom' in this section).

The parking area will be shared between the Tennis Complex and Disc Golf Course. Thirty (30) parking spaces have been allotted for the Tennis facility.

Disc Golf Course

It is recommended that a disc golf course designer be consulted during the construction document phase. The disc golf course sited within the confines of the Eastern Sector of the park, utilizing, if necessary, both sides of Masters Road. The course is intended to be a true 'woodland' golf course, with tight fairways set within a very natural setting. The alignment of the course will be strategic, coinciding with the topography in order to minimize erosion problems. The course should be laid out with the first tee and last basket sited within walking distance of the shared parking area. Additionally, multiple tees and multiple baskets at each hole, oriented to minimize trail user / disc golf participant conflicts, should be sited so that a variety of shots will be needed to score well. The course is intended to be both mentally and visually challenging.

A natural permeable surface walking path network intended for pedestrian use only will connect disc golf course users to the various holes. The typical trail profile is a graded aggregate sub-base with engineered mulch topcoat, 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 the drainage pattern parallel to the trail.

The center line of the trail will be field located and flagged to follow the site contours in an effort to minimize grading and disturbance to the site. The trail will be cleared of hazards such as dead or leaning trees, which will be cut down and left in full contact with the ground to hasten decay. Small hanging branches will 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. Footbridges are located within the trail system to traverse swales and tributary streams.

The parking area will be shared between the Disc Golf Course and Tennis Complex. One hundred (100) parking spaces have been allotted for the Disc Golf facility.

Southern Sector

Entrance into the Southern Sector of the park will be via the round-about at the former Indian Shoal Road and Masters Road intersection. (RE: 'Masters Road Potential Closure') This entrance is a single entrance with a long two-way drive providing access to pockets of parking dispersed along the road and serving the adjacent recreational facilities as indicated on the Master Plan.

Multi Use Field

The proposed multi-use field, located in the Southern Sector of the Park just south of Indian Shoals Road, is intended to be set into cut slopes to minimize visibility of field lights from adjacent residents. The field is sited in a northeast / southwest orientation and will be lighted and irrigated. The field is intended to function as a football field, a soccer field, or as a lacrosse field. The field should include wide zones outside of the end zones to accommodate practice areas for other sports such as cheerleading. Bleachers, press box, PA system and concession/ restroom building will also be provided. The concessions/ restroom building is located on the southwest end of the field and includes a hardscape plaza. Additionally, the field will be surrounded by an ADA compliant .33 mile jogging loop and fence. The jogging trail will be considered part of the multi-use trail system with a spur trail connecting into it, however, the jogging loop will be independently lighted for evening use.

The parking area associated with the Multi-use Field is located to the west of the field. Access to this parking facility is via the main entry road for the southern sector of the park. A total of 365 parking spaces have been allotted for multi-use field users.

Dog Park

The 2.7 acre dog park is located between the eastern property line and the multi-use field. The majority of the dog park will be open grassland with a smaller section sited within the existing trees. The dog park is a fenced area that allows people and their dogs to play together without the restriction of leashes. This area also allows dogs to socialize with other dogs and owners with fellow owners. The dog park will feature a 6' black vinyl fence with double gates. It will be cordoned off into three sections; a dog run, an area for all dog play and an area for small dogs. A kiosk displaying dog park rules, benches, adult swings, trash receptacles, agility course equipment and water fountains for both owners and dogs will also be located.

The open grassy areas of the dog park will be graded out at a gentle 3% slope and will follow a structural soils profile, including: sand, 89 stone, and 57 stone, the intent is to provide a structural subsurface that will allow for deep sod root growth without compaction. Areas within the existing trees will not be graded in an effort to maintain the existing treeline, therefore the existing soil profile will be utilized. The dog park is to be irrigated, grassed, and maintained by the County.

Sixty Five (65) parking spaces have been allotted for dog park users in a lot at the northern end of the multi-use field. Pedestrian access to the dog park will be via a 6' concrete sidewalk.

Soccer Complex

The soccer complex will provide 4 regulation (360x240) fields in a terraced layout as indicated in the Master Plan. Each field will be fenced, lighted and graded out using the engineered soil profile concept using a sand profile with complete subsurface drainage. The fields will be arranged around a centrally located Gwinnett County Restroom / Concession building and plaza area. The fields will be connected to each other and to the plaza area via 6' wide concrete sidewalks with access to the 12' wide paved asphalt multi-use trail.

The plaza area associated with the soccer complex will be comprised of concrete pavers laid on top of structural soil to aid in permeability. Shade trees placed in "at grade" planters will provide shade for this space. Additionally, benches, trash receptacles, bike racks and a freeze resistant drinking fountain and freeze proof bib will be sited as amenities in the plaza area.

A large playground configured per the Master Plan will be provided within the plaza area. The play area will include picnic tables, benches, and a wood chip mulch area with sub-drainage per departmental standards. Equipment would be prefabricated to include: swings, free standing play structures, and compound structures, all suitable for a variety of play – separated into zones to accommodate the various ages. ADA compliant transfer routes to access a representative portion of the compound structures should be provided, as well as 2" thick rubber particle mats under wear zones such as swings, and any other concentrated wear zone.

Four hundred-twenty-eight (428) parking spaces have been allotted for the soccer complex. Two separate parking areas have been provided to accommodate the soccer complex.

Water Feature

An approximate 3 acre water feature/ pond is provided in the southern sector of the park with additional amenities such as; rental pavilion w/ restroom facilities, and a playground. To maintain a constant water level it will be necessary to drop a well to feed pond. The pond is to have "natural sloping" banks so that the waters edge can be accessed by park users. The water feature is to be utilized for water quality enhancement, use by wildlife, contemplation, and reflection. Swimming will be prohibited. It is recommended that the banks of the pond be allowed to re-vegetate in places in an effort to create a "living" pond. Overflow water from the pond will pass through a new channel / gutter before making its way back to Cedar Creek. The concrete gutter will parallel the walking trail down hill toward the cul-de-sac / parking area, east to the lower walking trail, at which point the gutter will turn south passing under the lower trail toward Cedar Creek. The estimated length of the gutter is 1356 linear feet, dropping approximately 24 vertical feet from the pond overflow to Cedar Creek. The overall slope of the gutter is estimated at 1.8%. As the gutter makes its way toward the creek it will include mini 2"-6" waterfalls and riffles to add a dynamic / interactive quality to the water feature. Access to the water feature and its amenities is provided via the Multi-use Trail as well as the adjacent parking area.

Eighty (80) parking spaces have been allotted to accommodate the Water Feature and its amenities. Additionally, it was requested by the Steering Committee that an overlook parking area be provided near the Water Feature so that the less physically active park users could still visibly enjoy the scenic qualities of the park from the windshield. A 10 space parking area/turn around has been provided as an overlook at the end of the parking bay.

Lake Amenity Playground

A large playground configured per the Master Plan will be provided at the Lake Amenity. The play area will include picnic tables, benches, and a wood chip mulch area with sub-drainage per departmental standards. Equipment would be prefabricated to include: swings, free standing play structures, and compound structures, all suitable for a variety of play – separated into zones to accommodate the various ages. ADA compliant transfer routes to access a representative portion of the compound structures should be provided, as well as 2" thick rubber particle mats under wear zones such as swings, and any other concentrated wear zone. Additionally, this play area will include an interactive stream (Rabbit Hill Park prototype). A small interactive stream will allow for children to experience some of the properties of water through interactive play. Water, pumped up from a well will make a single pass through a series of stone surface channels and runnels in a mock-stream type element, to allow children to utilize their senses and experience the water, making its way through the playground to a pipe before falling back into the pond. The interactive stream will also help to aerate the pond feature. The water from the well must be drinking water quality

Pavilion

A large, 60' standard Gwinnett County pavilion will be located overlooking the 3 acre lake / water feature. It should be accessible from the parking area. The pavilion would be available for reservation through the County, or would be available on a first come first served basis. The structure will contain restroom facilities and security lighting. Picnic tables, outdoor grills, trash receptacles and bike rack will also be provided.

Cricket

The proposed Cricket Pitch and Field are located at the southern most point within the Southern Sector of the Park. This amenity is sited in an east /west orientation and will be lighted and irrigated. The Cricket field consists of a large circular / oval-shaped grassy ground with a rectangular clay strip called the pitch. While there are no fixed dimensions for the field, the standard requirements as per the ICC (International Cricket Council) should be adhered to. The cricket field / pitch shown on the master plan is sized at the maximum dimensions recommended by the ICC (500 Feet). The pitch measures 66 feet from wicket to wicket. The cricket field is intended to be set into cut slopes to provide grassed stadium seating at the eastern end of the field. The field is graded out using the engineered soil profile concept using a sand profile with complete subsurface drainage. The fields will be arranged around a centrally located Gwinnett County Restroom / Concession building and plaza area.

The plaza area associated with the Cricket Pitch will be comprised of concrete pavers laid on top of structural soil to aid in permeability. Shade trees placed in “at grade” planters will provide shade for this space. Additionally, benches, trash receptacles, bike racks and a freeze resistant drinking fountain and freeze proof bib will be sited as amenities in the plaza area.

Ninety five (95) parking spaces have been allotted to accommodate the Cricket Pitch and its amenities.

ADA Loop Trail / Parking

The 2-mile, 12’ wide, handicapped accessible trail loop is located within and adjacent to the floodplain of Cedar Creek. The loop circulates through the clear turf meadow tying into the multi-use trail and connecting the southern sector of the park to the adjacent Harbins Conservation Park via a 230’ pedestrian bridge. The slope of this trail segment ranges from a minimum of 1% to a maximum of 5%. The portion of the trail loop that lies within the floodplain will be constructed of concrete, while the section outside the floodplain will be an asphalt paved 12’ wide trail section. An ADA compliant trail spur at the very southern tip of the park property, with a maximum slope of 5%, connects this trail loop to Handicapped parking at the top of the ridge. Parking for 10 cars at the overlook is provided.

Trails

Multi-use Trail

The master plan calls for a 12’ wide paved asphalt trail that connects all elements of the park. Approximately 10 miles of multi-use trail is provided. These 10 miles are broken down into smaller loops for additional trail use options. Spur trails connect these loops to the individual activity areas. The multi-use trail winds throughout the park allowing for a variety of park experiences and views. Pedestrian and vehicular traffic (excluding maintenance vehicles) are primarily separated. Where uses intersect, raised crosswalks are utilized. Trail routes should be staked in the field avoiding specimen hardwood trees, impact to steep slopes, and to optimize scenic quality.

There are three major trail loops provided within the multi-use trail system. The Northeastern Trail Section is an asphalt-paved, 12’ wide, 1.09 mile loop starting at the ball field complex and winding west across the parking area to the teen recreation facility. The trail then jogs south moving away from developed park area into the wooded forest. The trail then winds its way east and up toward the destination playground and providing spur trail connections that provide access to the overlook shelter and the destination playground itself. The loop then climbs north around the southern most ball fields and finally closing on itself.

The Central Trail Section is an asphalt-paved, 12’ wide, 2.6 mile loop starting at the trail head area for the Pedestrian Only Nature Trail.

The trail travels east utilizing an historic road bed before branching off to head down toward the Cedar Creek and its associated flood plain. After crossing Cedar Creek the trail then heads north, utilizing another historic road bed, past granite rock outcrops and the disc golf course. Near the intersection of the former Masters Road and the park property line, the trail curves southwest and meanders southwest toward Cedar Creek. Crossing Cedar Creek at more northern crossing the trail continues west / northwest through hardwood forest. At the Community Center facility the

trail again turns south to continue back to the parking area. Connecting via trail spurs, this sector of the trail system connects into Harbins Conservation Park through a trail underpass, and also the western sector of the park and ultimately the Future greenway to Palm Creek, again through use of a trail underpass. This trail loop sector links to the Southern Trail Sector by utilizing the spur trail constructed on the former road bed of Masters Road. Additionally, this trail spur provides access to the Tennis complex and disc golf course. An at grade trail crossing, located at the round-about, allows the trail to continue into the southern sector.

The Southern Trail Sector is an asphalt-paved, 12' wide, 1.6 mile loop starting at the round-about. The trail travels south to just outside the Cedar Creek floodplain, then turns south creating a very flat trail with minimal elevation change. The trail follows the contours of the site through the open pastoral landscape, past a grove of trees, skirting the 3.0 acre water feature. Near the southern most point of the park site the trail turns northeast, and gradually rises (5% or less) toward the Cricket pitch. Near the halfway point of this section, a spur trail ties in, creating an ADA compliant connection to the ADA parking area. From the Cricket Pitch the trail continues north, crossing a land bridge that separates storm ponds, across a parking area via raised crosswalks, and accessing the plaza area at the soccer complex. Passing between soccer fields the trail then turns southwest between the soccer complex and multi-use field. After crossing the entry drive the trail then parallels the entry drive and closes upon itself back at the round-about.

Smaller trail loops such as the 1-mile loop at the primitive camping area (RE: Primitive Camping), the .45-mile loop at within the garden area (RE: Garden Area – Multiuse Loop), and the 2-mile ADA trail loop (RE: ADA Loop Trail / Parking) also contribute to the Multi-use trail system within the park.

Connection to Harbins Conservation Park

Pedestrian Bridge -

One of the key requests expressed by the Citizens Steering Committee was the physical connection between the Conservation Park and the Community Park. Through a series of linkages this is made possible. A spur of multi-use trail will connect from the equestrian parking lot at the Conservation Park to the handicapped accessible loop in the Southern Sector Tract via a pedestrian bridge across Cedar Creek.

Road Underpass -

There are two road crossings proposed to provide linkage across Indian Shoal and New Hope Roads. The Steering Committee voiced several concerns regarding safely crossing these high speed, traffic corridors. The Consultant and County Staff looked at various methods that would safely connect the different sectors of the park; including the potential for an overpass or underpass at the proposed crossing locations. While there is great variation in topography throughout the park site, the topo will not allow for the development of an overpass at the road crossing, it will however, allow for the development of an underpass. The underpass structure located just east of the current entrance to the Conservation Park equestrian parking lot would create a chute with granite faced walls on both sides but would be open to the top. As the ground rises around the chute, passage would remain fairly level into the hillside for approximately 100', at which time a 90 degree

turn would be made and users would pass under the road via a tunnel, exiting on the other side of the road via another chute structure. The tunnel portion would be lighted to allow for pedestrians, horses, cyclists to move between parks without vehicular conflict. A second underpass would be utilized on New Hope Road, just south of Cedar Creek, to provide linkage to the northwestern section of the park and the potential greenway connection to Palm Creek Park.

Connection to Palm Creek

A future greenway and connection to Palm Creek Park is probable. Access to this greenway will be via a stream crossing of Cedar Creek in the Northwestern Sector of the Park. The crossing may include armoring the stream banks to minimize erosion potential. This connection point has been located via GPS, and has been identified on the Master Plan with an asterisk symbol

Soft Surface Trails

There are a variety of natural surface trail systems that have the potential to be included in Harbins Park. The typical trail treadway 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 the drainage pattern parallel to the trail.

Where the trail crosses the natural drainage channels, Cedar Creek or tributary of Cedar Creek, a pedestrian bridge with handrail is to be placed. The style of the bridge should exhibit rustic or natural theme to blend with the environment.

The trail will be cleared of hazards such as dead or leaning trees, which will be cut down and left in full contact with the ground to hasten decay. Small hanging branches will 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.

The center line of the trail will be field located and flagged to follow the site contours, in an effort to minimize grading and disturbance to the site, by an Owner-approved professional trail builder and constructed by same entity (or another of equally acceptable credentials) using specialized hand tool and powered trail building equipment. The professional trail designer and builder shall be a member in good standing with the Professional Trailbuilders Association.

Gully Trail

In the Northeastern Sector of the park and area has been designated for a Gully Trail. This area illustrates topography (deep crevices, steep terrain, etc) that would be appropriate for a more challenging type of trail. The trail is intended to be a soft surface trail (RE: Soft Surface Trails), and only accessible via a spur trail of the Multi-use trail. As with other soft surface trails, the center line of the trail will be field located and flagged to follow the site contours, in an effort to minimize grading and disturbance to the site, by an Owner-approved professional trail builder and constructed by same entity (or another of equally acceptable credentials) using specialized hand tool and powered trail building equipment. The professional trail designer and builder shall be a member in good standing with the Professional Trailbuilders Association.

Miscellaneous

Masters Road 'Potential Closing'

The Master Plan calls for the closure for Masters Road for that portion of Masters Road within the park. Preliminary Phone calls to County DOT, County Planner, Bus Routing Officer for the Board of Education, and the Fire Marshall indicated that none of the organizations listed above had any problem with the closure of the road. Should an agreement with the homewoners, living along Masters Road north of the Park, be met, a cul-de-sac would be created at the northern park property line. With the closure of Masters Road the existing road bed will be utilized by the multi-use trail.

Round-about

With the removal of the almost 90 degree turn at the Conservation park entrance – per County DOT, traffic no longer slows to make the turn. As a result, traffic flows rapidly along both Luke Edwards and Indian Shoals Roads. To help slow traffic, a modern round-about is to be developed at the intersection of the Southern Park Sector entrance and the entrance to the Eastern Sector (former Masters Road). The round-about is to follow AASHTO guidelines for the design speed of the road. The center island is to be raised and wither paved with concrete pavers or more preferably, landscaped so as to partially block the oncoming view, requiring drivers slow down and focus on the travel lane prior to entering the round-about. Pedestrian “safe-havens” are to be incorporated into the round-about design where the incoming roads intersect with the round-about itself, creating an area for pedestrians to stop safely after crossing one lane of traffic before traversing the second land of traffic. These pedestrian crossings will be at grade with the road.

Septic / Sewer

A combination of septic and sewer systems are to be utilized within the park. Septic fields have been identified on the Master Plan. Soil data used to locate suitable soils was taken from Gwinnett County GIS soil Database and cross referenced with USDA Natural Resources Conservation Service soil data., Using information from these sources, soils were designates to help dictate the suitability of each soil for water percolation and septic field usage. Primary and replacement absorption fields were located for the following park elements; BMX facility, Primitive Camping, Ball Field Complex, Teen Recreation Facility, Destination playground, Community Center / Gym / Senior Wing, and Interactive Fountain and are shown on the master plan as “Meadows”. The intent is for these septic fields to be mowed once or twice a year, and utilized for unstructured play. Due to minimal suitable soils located within the Northeastern Sector, Septic fields for the ball field complex and Teen Recreation Area are located across New Hope Road within the Western Sector.

The project elements including the soccer complex, 3.0 acre water feature, cricket field, multi-use field and the tennis complex will need to be serviced by sewer. The soils surrounding these elements are unsuitable for septic use. The design for the sewer system consists of 6” DIP sewer lines leaving the facilities and leading to a single lift station near the “ADA Trail parking” area. The sewage will be pumped from the proposed lift station at Harbins Park to an existing pump station (Bold Springs 'A' Pump Station) at the south western corner of the Equestria Subdivision, located to the east of Harbins Park. The Harbins lift station shall be built to Gwinnett County Standards and will use a 7 ½ HP pump and a 6” force main to carry the sewage to the Bold Springs 'A' Pump Station. Easement and property acquisition will be necessary to cross into neighboring property and tie into

the Bold Springs pump station. The Pump Station is not fully operational. The building, controls, electrical equipment and force main leaving the pump station are in place. The pumps have been removed and there is no meter located at the pump station. The sewer System design assumes that the Bold Springs 'A' Pump Station will be fully operational by the completion of the Harbins Park elements requiring sewer service.

Maintenance Facility

The park will utilize the existing Maintenance Facility located at the Conservation Park. Access to the Community Park will be via the parking areas or through removable bollards along the multi-use trail.

Deceleration Lanes

A deceleration lane will be located at each park entrance. The deceleration lane is to follow all guidelines and regulations set forth by the Georgia Department of Transportation and all County Regulations.

Site Lighting

The park drives, parking lots, sports fields, tennis complex, and teen recreation areas will be the only elements lighted in the park. The lights will be operated to turn off and on per a timer system. This system will allow visitors in the park from dawn until dusk. Only a portion of the multi-use trail system is to be lighted, the .33 mile track associated with the multi-use field.

Park Signage

Provide one standard Gwinnett County Park entrance Sign per entrance. The sign should be located at each entrance to the park. Signs should be visible to motorists but not encroach upon sight lines. Internal directional, vehicular and posted park rules, trail signs and markers will also be per County Standard.

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 in kiosk signs to explain the trail routes, lengths and ability levels.

Information Kiosks

Provide information kiosks at several locations throughout the park. The kiosks should include information and provide a site map indicating "You are here" graphics for user orientation. Kiosks should be roofed structures. Park maps should be UV protected.

Irrigation

The entrances, sports fields, open space areas, and common areas are to be irrigated. Use economical large diameter turn irrigation heads. All controller heads, piping, irrigation emitters and supporting elements will be per Gwinnett County Standards. Where possible the 3-acre water amenity will be utilized for irrigation

Landscape Management

Landscape management will consist of regular mowing of activity fields and open turf areas. Due to the natural woodland character of the site, native plant species are recommended for planting associated with park development. Native plantings will help new development areas blend with the undeveloped areas of the park.

Forest Management

Forest management will consist of pruning or removing trees that obstruct trail, roadways and parking lots; threaten buildings and other structures' or interfere with any type of circulation activity. Diseased trees should be monitored and removed if the spread of disease cannot be controlled. Efforts to preserve healthy trees will be a high priority in all areas, as well as the preservation and restoration of the understory woodland shrub layer. Where possible invasive species such as kudzu and privet should be managed with eradication and replaced with appropriate native species.

Areas designated for reforestation (slope 3:1 or greater) should be replanted with a combination of small pines and successional hardwoods such as; red maple, sweet gum, tulip poplar, and understory trees such as red bud. Stream bank revegetation areas should be planted with hardwood trees and riparian shrub and herbaceous plant species.

SECTION GRAPHICS

7.0

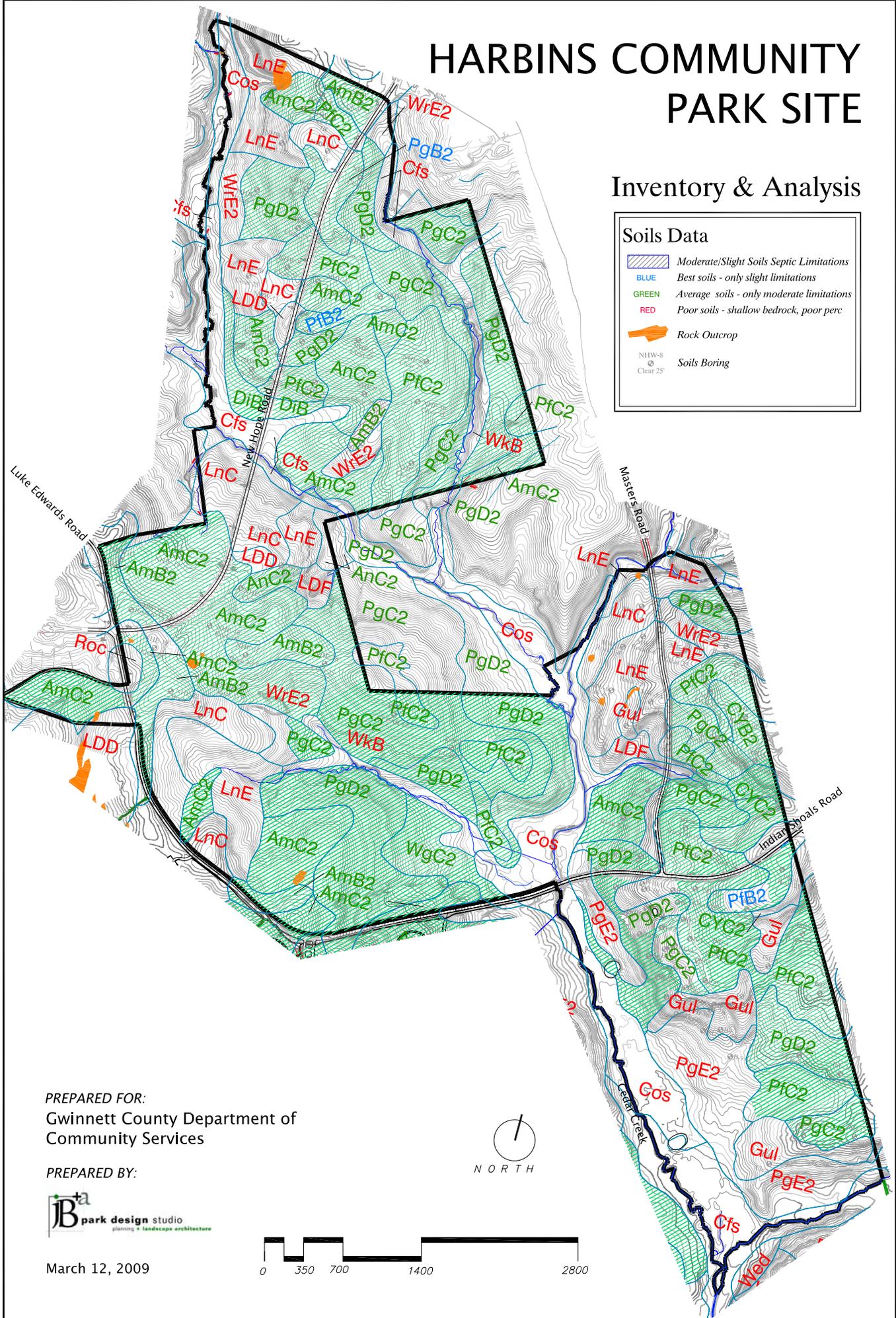
Graphic A: Inventory & Analysis - Soils Data	page	43
Graphic B: Inventory & Analysis - Slope Analysis	page	45
Graphic C: Inventory & Analysis - Hydrology Diagram	page	47
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HARBINS COMMUNITY PARK SITE

Inventory & Analysis

Soils Data

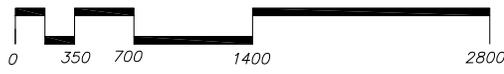
-  Moderate/Slight Soils Septic Limitations
-  Best soils - only slight limitations
-  Average soils - only moderate limitations
-  Poor soils - shallow bedrock, poor perc
-  Rock Outcrop
-  Soils Boring
-  NHWS - Clear 25'



PREPARED FOR:
Gwinnett County Department of
Community Services

PREPARED BY:
 **JB** park design studio
planning + landscape architecture

March 12, 2009

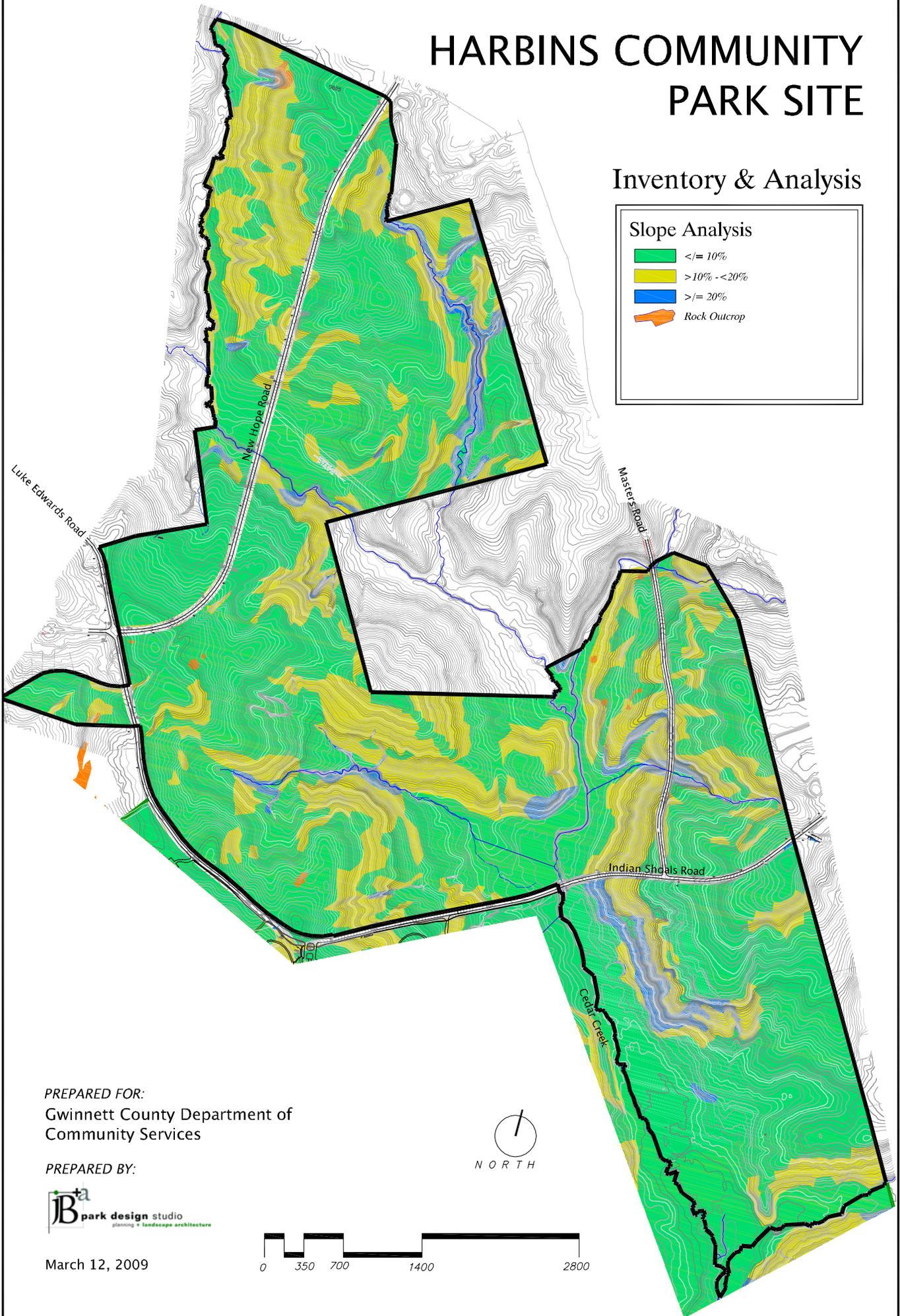


HARBINS COMMUNITY PARK SITE

Inventory & Analysis

Slope Analysis

-  $\leq 10\%$
-  $> 10\% - < 20\%$
-  $\geq 20\%$
-  Rock Outcrop

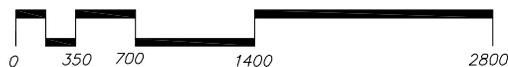


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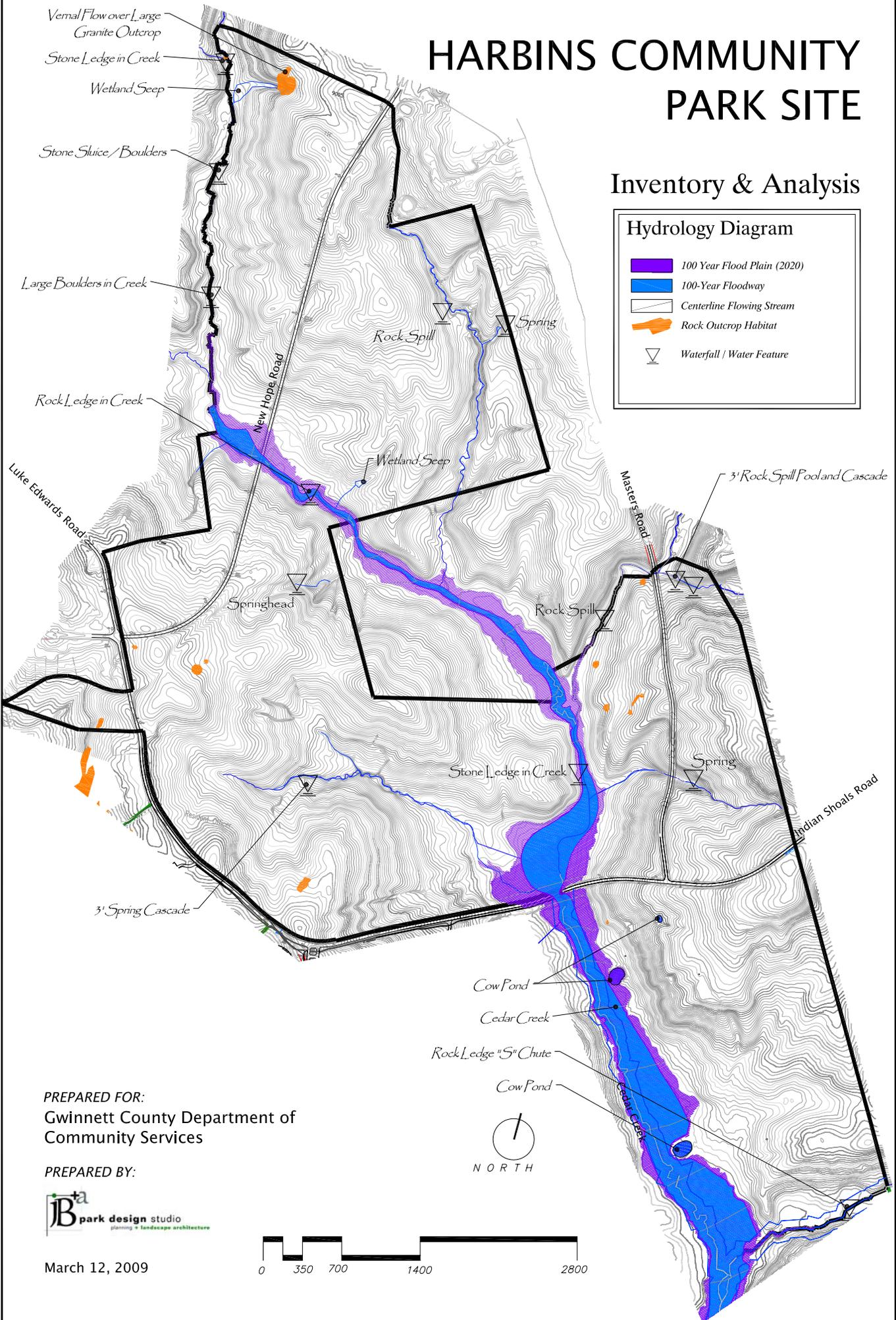


HARBINS COMMUNITY PARK SITE

Inventory & Analysis

Hydrology Diagram

-  100 Year Flood Plain (2020)
-  100-Year Floodway
-  Centerline Flowing Stream
-  Rock Outcrop Habitat
-  Waterfall / Water Feature



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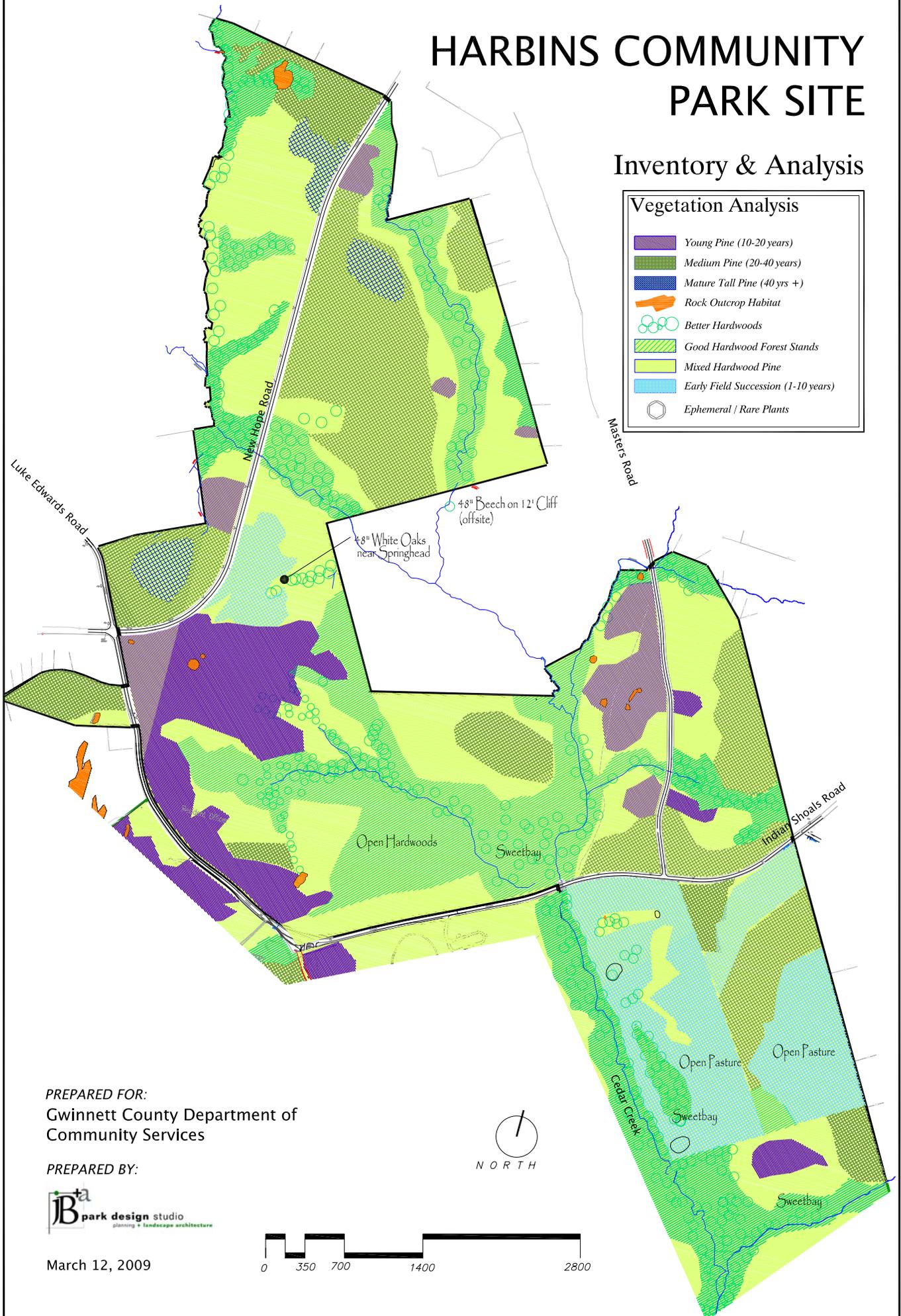
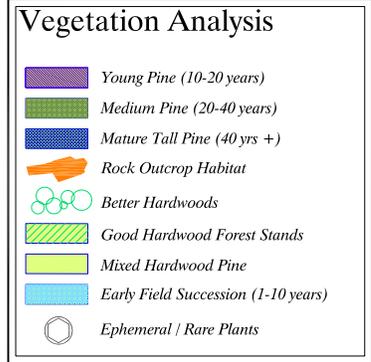


March 12, 2009



HARBINS COMMUNITY PARK SITE

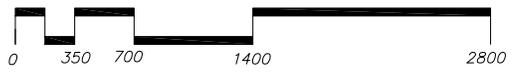
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March 12, 2009

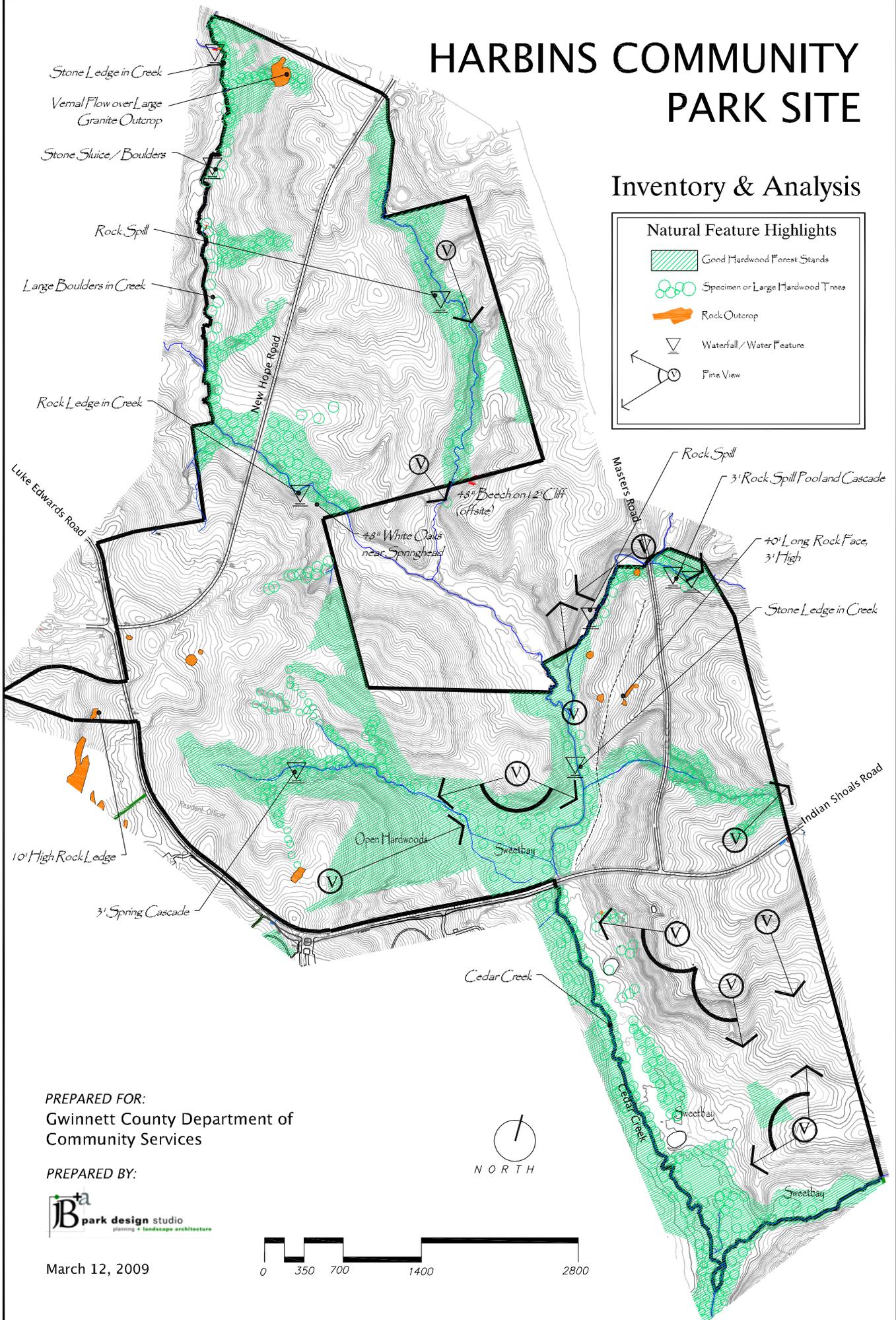


HARBINS COMMUNITY PARK SITE

Inventory & Analysis

Natural Feature Highlights

-  Good Hardwood Forest Stands
-  Specimen or Large Hardwood Trees
-  Rock Outcrop
-  Waterfall / Water Feature
-  Fine View

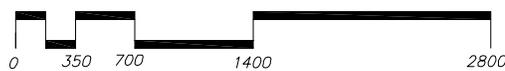


PREPARED FOR:
Gwinnett County Department of
Community Services

PREPARED BY:



March 12, 2009

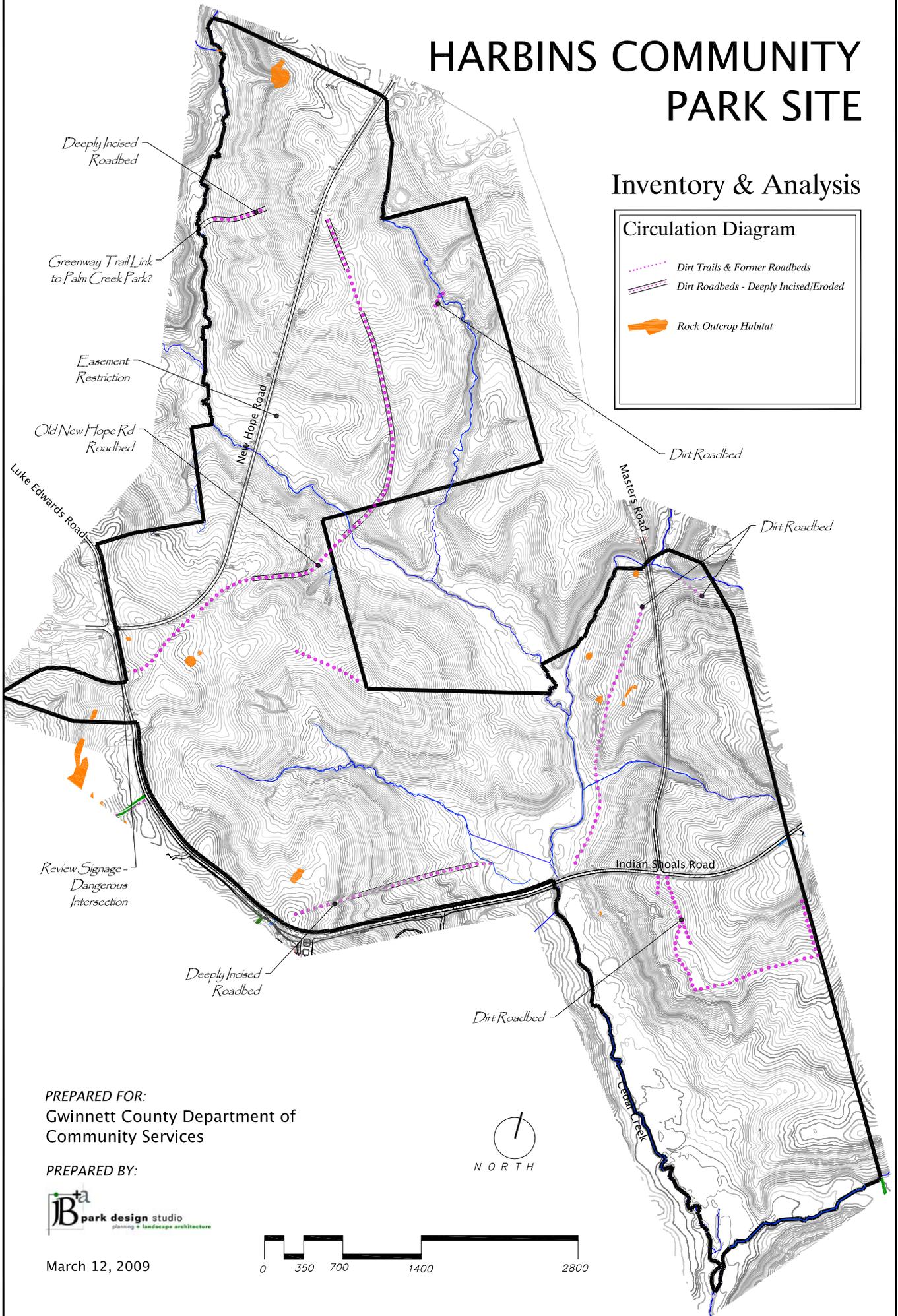


HARBINS COMMUNITY PARK SITE

Inventory & Analysis

Circulation Diagram

-  Dirt Trails & Former Roadbeds
-  Dirt Roadbeds - Deeply Incised/Eroded
-  Rock Outcrop Habitat



PREPARED FOR:
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Community Services

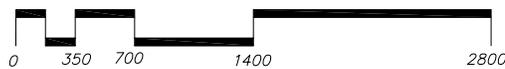
PREPARED BY:



March 12, 2009



NORTH

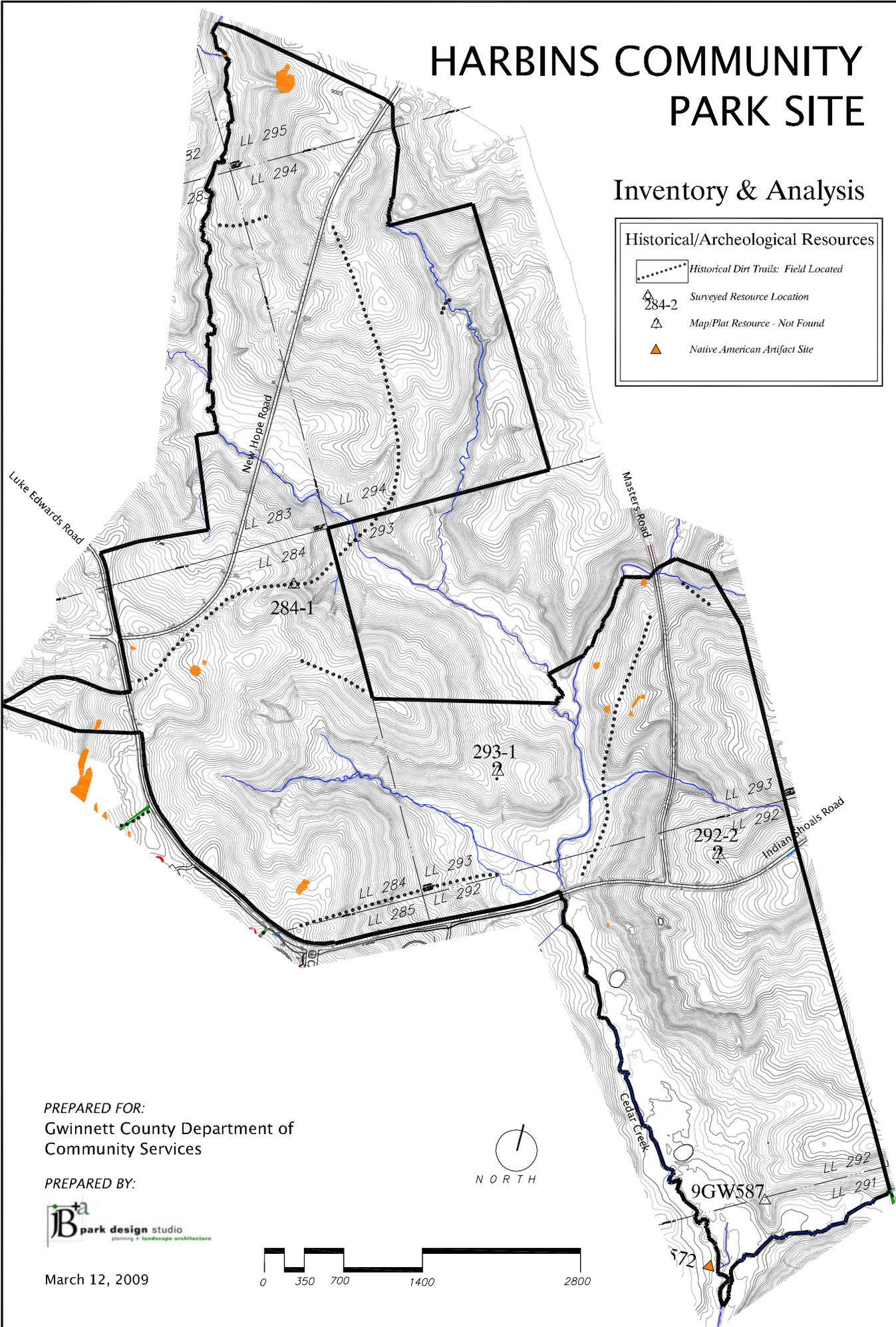


HARBINS COMMUNITY PARK SITE

Inventory & Analysis

Historical/Archeological Resources

-  Historical Dirt Trails: Field Located
-  284-2 Surveyed Resource Location
-  Map/Plat Resource - Not Found
-  Native American Artifact Site

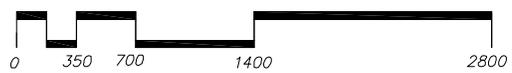


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March 12, 2009





Primitive Camping Sites
 5 acre designated for primitive camping only. Access to 80 car parking area and bathhouse via natural surface trail.

Future Connection to Palm Creek Park

Trail head w/ Pavilion
Destination Playground
 5000 sf Playground w/ play lawn area .

Interactive Fountain / Concessions Area
 Interactive fountain, concessions area with open lawn play area, and garden walk. Connection to Library Parcel

Library and Garden
 5.35 acre Library parcel. Garden / seating area at intersection. Hardscape plaza behind connecting to Harbins Community Park.

Ball Field Complex
 (1) 300-330' Ball Field
 (1) 220' Ball Field
 (3) 200' Ball Field
 (1) 180' Ball Field
 (1) 150' Ball Field

Ball Field Plaza Area
 Restroom / Concession
 Hardscape plaza

Extreme Mountain Biking
 Multiple -Gully Course

Teen Recreation Area
 Skate Park, Sand Volleyball, basketball, access to mountain bike gully course

Community Center / Gym w/ Senior wing
 Gym in proximity to teen rec. area. Senior wing overlooking natural area .

Tennis Complex
 (3) Pairs of Courts
 Plaza area and tennis center

Multi-Use Field
 Football, soccer, lacrosse and .3 Mile lighted track

BMX Facility
 BMX Course w/ associated buildings.

25 Acre Disc Golf
 Tees and baskets to be sited to minimize disc golf user / trail user conflicts.

Equestrian / Multi-use
 Trail Connection to Harbins Conservation Park

Existing Police officers residence
Trail head
 Parking for 80 cars w/ rental pavilion and access to trail system

Trail Connection to Harbins Conservation Park

Gaelic Sports Multi-use Field
 (For rugby, Gaelic football, and hurling, use)

Pervious Concrete Trail
 1 mile loop trail .

Playground Area
 5000sf playground overlooks Cedar Creek floodway. 60' associated rental pavilion

Soccer Complex
 (5) Five fields 230 x360
 Associated plaza area w/ Restroom Concessions

Enhanced Lake
 4.5 acre lake with 3 shelters .

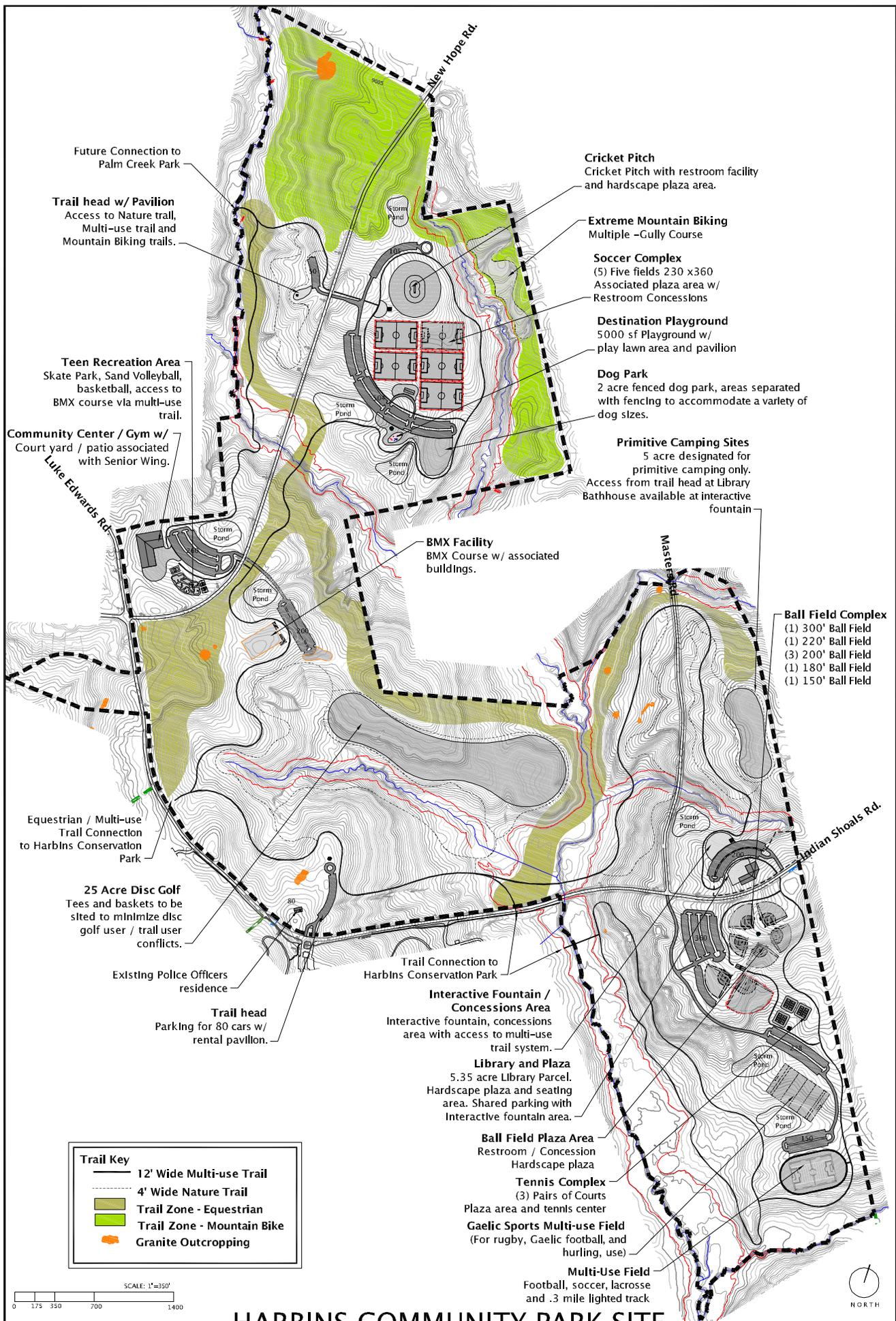
Cricket Pitch
 Includes shared parking for trail head .

Trail Key	
	12' Wide Multi-use Trail
	4' Wide Nature Trail
	Trail Zone - Equestrian
	Trail Zone - Mountain Bike
	Granite Outcropping



HARBINS COMMUNITY PARK SITE

Concept #1
 April 14, 2009



Future Connection to Palm Creek Park

Trail head w/ Pavilion
Access to Nature trail, Multi-use trail and Mountain Biking trails.

Teen Recreation Area
Skate Park, Sand Volleyball, basketball, access to BMX course via multi-use trail.

Community Center / Gym w/ Court yard / patio associated with Senior Wing.

Equestrian / Multi-use Trail Connection to Harbins Conservation Park

25 Acre Disc Golf
Tees and baskets to be sited to minimize disc golf user / trail user conflicts.

Existing Police Officers residence

Trail head
Parking for 80 cars w/ rental pavillon.

Trail Connection to Harbins Conservation Park

Interactive Fountain / Concessions Area
Interactive fountain, concessions area with access to multi-use trail system.

Library and Plaza
5.35 acre Library Parcel. Hardscape plaza and seating area. Shared parking with Interactive fountain area.

Ball Field Plaza Area
Restroom / Concession Hardscape plaza

Tennis Complex
(3) Pairs of Courts
Plaza area and tennis center

Gaelic Sports Multi-use Field
(For rugby, Gaelic football, and hurling, use)

Multi-Use Field
Football, soccer, lacrosse and .3 mile lighted track

Cricket Pitch
Cricket Pitch with restroom facility and hardscape plaza area.

Extreme Mountain Biking
Multiple -Gully Course

Soccer Complex
(5) Five fields 230 x360
Associated plaza area w/ Restroom Concessions

Destination Playground
5000 sf Playground w/ play lawn area and pavilion

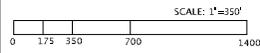
Dog Park
2 acre fenced dog park, areas separated with fencing to accommodate a variety of dog sizes.

Primitive Camping Sites
5 acre designated for primitive camping only.
Access from trail head at Library
Bathhouse available at interactive fountain

BMX Facility
BMX Course w/ associated buildings.

Ball Field Complex
(1) 300' Ball Field
(1) 220' Ball Field
(3) 200' Ball Field
(1) 180' Ball Field
(1) 150' Ball Field

Trail Key	
	12' Wide Multi-use Trail
	4' Wide Nature Trail
	Trail Zone - Equestrian
	Trail Zone - Mountain Bike
	Granite Outcropping

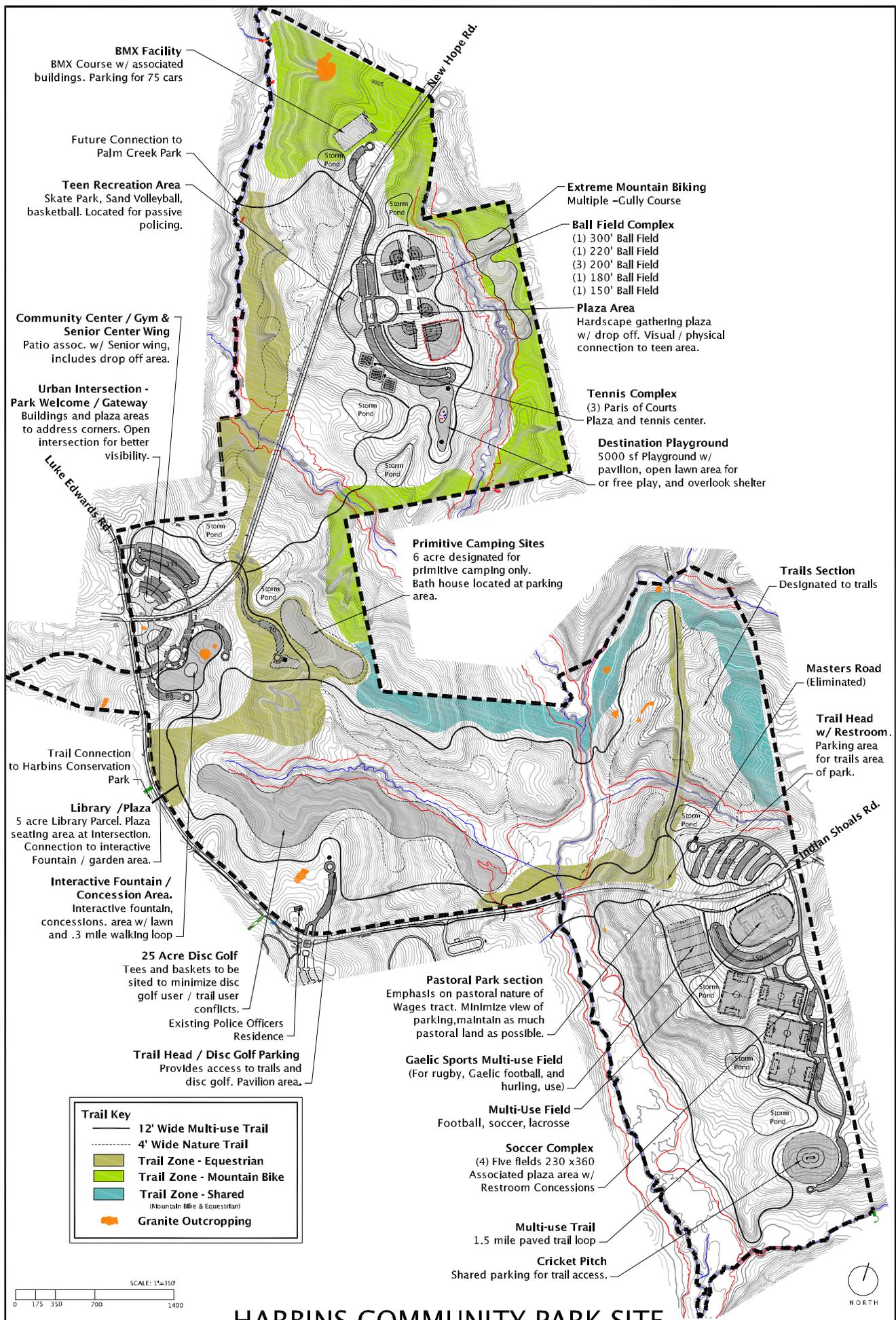


HARBINS COMMUNITY PARK SITE

Concept #2
April 14, 2009

PREPARED FOR:
Gwinnett County Department of
Community Services





BMX Facility
 BMX Course w/ associated buildings. Parking for 75 cars

Future Connection to Palm Creek Park

Teen Recreation Area
 Skate Park, Sand Volleyball, basketball. Located for passive policing.

Community Center / Gym & Senior Center Wing
 Patio assoc. w/ Senior wing, includes drop off area.

Urban Intersection - Park Welcome / Gateway
 Buildings and plaza areas to address corners. Open intersection for better visibility.

Luke Edwards Rd

New Hope Rd

Extreme Mountain Biking
 Multiple -Gully Course

Ball Field Complex
 (1) 300' Ball Field
 (1) 220' Ball Field
 (3) 200' Ball Field
 (1) 180' Ball Field
 (1) 150' Ball Field

Plaza Area
 Hardscape gathering plaza w/ drop off. Visual / physical connection to teen area.

Tennis Complex
 (3) Paris of Courts
 Plaza and tennis center.

Destination Playground
 5000 sf Playground w/ pavillion, open lawn area for or free play, and overlook shelter

Primitive Camping Sites
 6 acre designated for primitive camping only. Bath house located at parking area.

Trails Section
 Designated to trails

Masters Road (Eliminated)

Trail Head w/ Restroom.
 Parking area for trails area of park.

Trail Connection to Harbins Conservation Park

Library /Plaza
 5 acre Library Parcel. Plaza seating area at Intersection. Connection to interactive Fountain / garden area.

Interactive Fountain / Concession Area.
 Interactive fountain, concessions. area w/ lawn and .3 mile walking loop

25 Acre Disc Golf
 Tees and baskets to be sited to minimize disc golf user / trail user conflicts.

Existing Police Officers Residence

Trail Head / Disc Golf Parking
 Provides access to trails and disc golf. Pavilion area.

Pastoral Park section
 Emphasis on pastoral nature of Wages tract. Minimize view of parking, maintain as much pastoral land as possible.

Gaelic Sports Multi-use Field
 (For rugby, Gaelic football, and hurling, use)

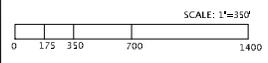
Multi-Use Field
 Football, soccer, lacrosse

Soccer Complex
 (4) Five fields 230 x360
 Associated plaza area w/ Restroom Concessions

Multi-use Trail
 1.5 mile paved trail loop

Cricket Pitch
 Shared parking for trail access.

Trail Key	
	12' Wide Multi-use Trail
	4' Wide Nature Trail
	Trail Zone - Equestrian
	Trail Zone - Mountain Bike
	Trail Zone - Shared (Mountain Bike & Equestrian)
	Granite Outcropping

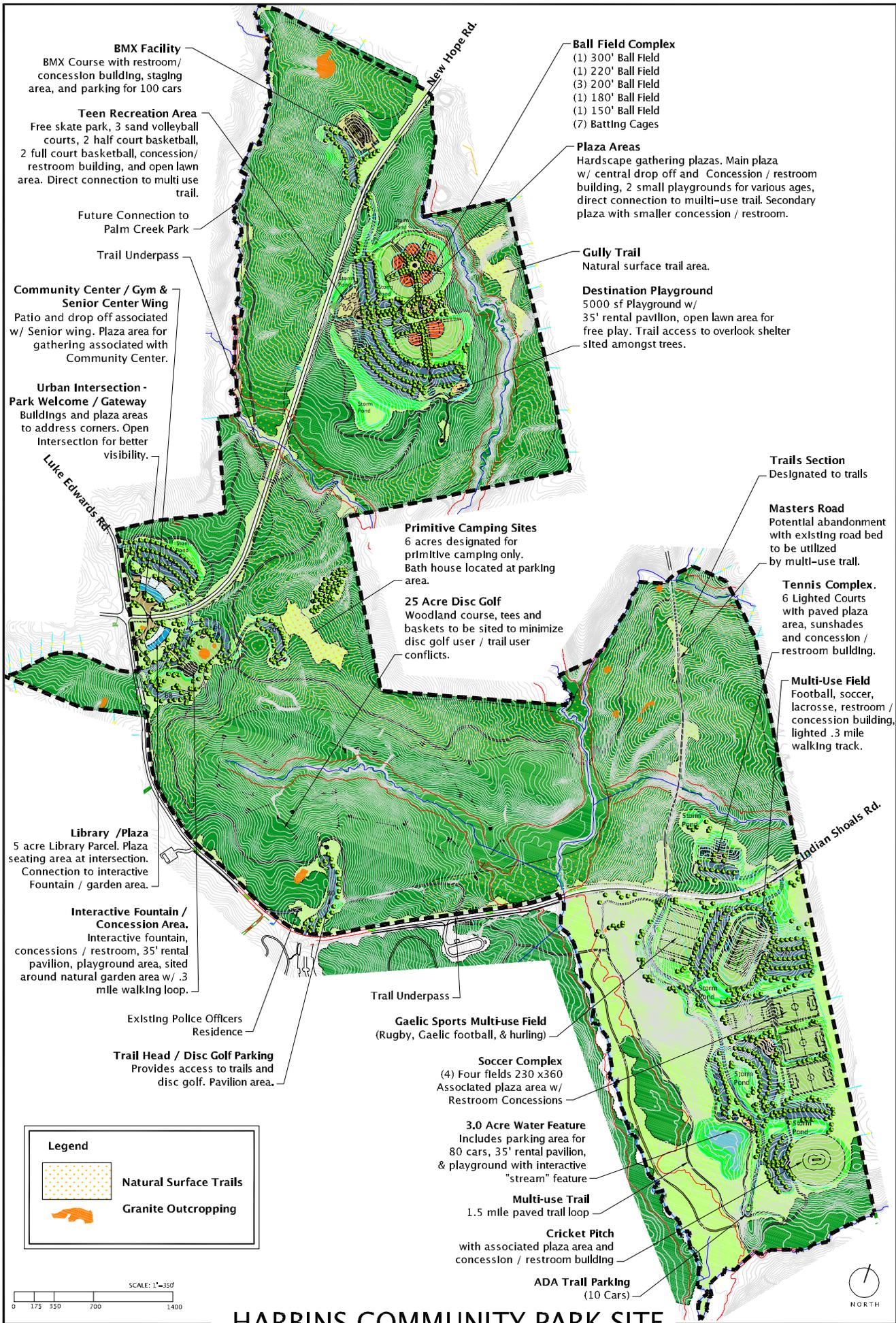


HARBINS COMMUNITY PARK SITE

Concept #3
 April 14, 2009

PREPARED FOR:
 Gwinnett County Department of Community Services





BMX Facility
 BMX Course with restroom/
 concession building, staging
 area, and parking for 100 cars

Teen Recreation Area
 Free skate park, 3 sand volleyball
 courts, 2 half court basketball,
 2 full court basketball, concession/
 restroom building, and open lawn
 area. Direct connection to multi use
 trail.

Future Connection to
 Palm Creek Park

Trail Underpass

**Community Center / Gym &
 Senior Center Wing**
 Patio and drop off associated
 w/ Senior wing. Plaza area for
 gathering associated with
 Community Center.

**Urban Intersection -
 Park Welcome / Gateway**
 Buildings and plaza areas
 to address corners. Open
 Intersection for better
 visibility.

Luke Edwards Rd

Primitive Camping Sites
 6 acres designated for
 primitive camping only.
 Bath house located at parking
 area.

25 Acre Disc Golf
 Woodland course, tees and
 baskets to be sited to minimize
 disc golf user / trail user
 conflicts.

Ball Field Complex
 (1) 300' Ball Field
 (1) 220' Ball Field
 (3) 200' Ball Field
 (1) 180' Ball Field
 (1) 150' Ball Field
 (7) Batting Cages

Plaza Areas
 Hardscape gathering plazas. Main plaza
 w/ central drop off and Concession / restroom
 building, 2 small playgrounds for various ages,
 direct connection to multi-use trail. Secondary
 plaza with smaller concession / restroom.

Gully Trail
 Natural surface trail area.

Destination Playground
 5000 sf Playground w/
 35' rental pavilion, open lawn area for
 free play. Trail access to overlook shelter
 sited amongst trees.

Trails Section
 Designated to trails

Masters Road
 Potential abandonment
 with existing road bed
 to be utilized
 by multi-use trail.

Tennis Complex.
 6 Lighted Courts
 with paved plaza
 area, sunshades
 and concession /
 restroom building.

Multi-Use Field
 Football, soccer,
 lacrosse, restroom /
 concession building,
 lighted .3 mile
 walking track.

Indian Shoals Rd

Library /Plaza
 5 acre Library Parcel. Plaza
 seating area at intersection.
 Connection to interactive
 Fountain / garden area.

**Interactive Fountain /
 Concession Area.**
 Interactive fountain,
 concessions / restroom, 35' rental
 pavilion, playground area, sited
 around natural garden area w/ .3
 mile walking loop.

Existing Police Officers
 Residence

Trail Head / Disc Golf Parking
 Provides access to trails and
 disc golf. Pavilion area.

Trail Underpass

Gaelic Sports Multi-use Field
 (Rugby, Gaelic football, & hurling)

Soccer Complex
 (4) Four fields 230 x360
 Associated plaza area w/
 Restroom Concessions

3.0 Acre Water Feature
 Includes parking area for
 80 cars, 35' rental pavilion,
 & playground with interactive
 "stream" feature

Multi-use Trail
 1.5 mile paved trail loop

Cricket Pitch
 with associated plaza area and
 concession / restroom building

ADA Trail Parking
 (10 Cars)

Legend

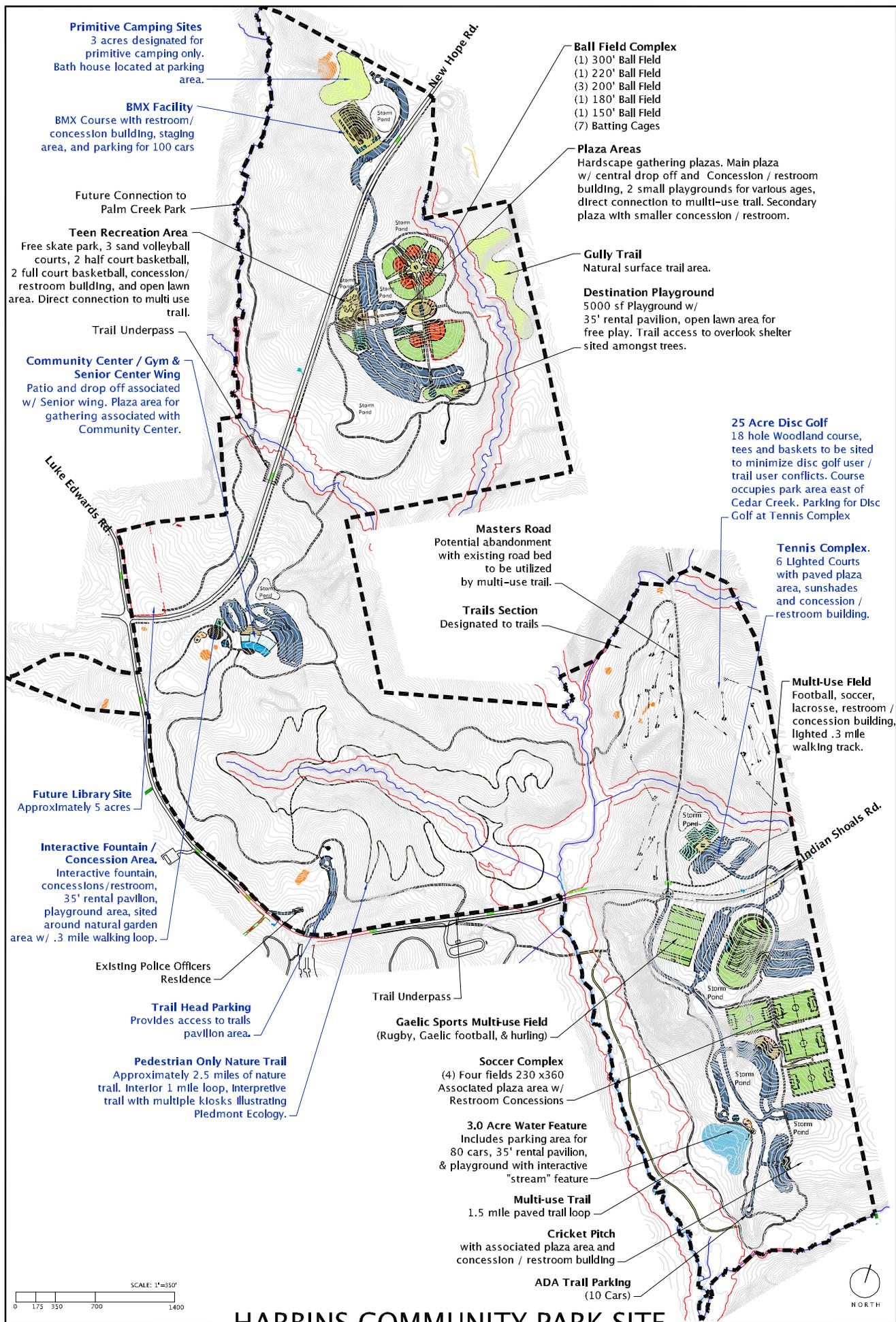
- Natural Surface Trails
- Granite Outcropping



HARBINS COMMUNITY PARK SITE
 Preliminary Master Plan
 May 19, 2009

PREPARED FOR:
 Gwinnett County Department of
 Community Services





Primitive Camping Sites
3 acres designated for primitive camping only. Bath house located at parking area.

BMX Facility
BMX Course with restroom/concession building, staging area, and parking for 100 cars

Future Connection to Palm Creek Park

Teen Recreation Area
Free skate park, 3 sand volleyball courts, 2 half court basketball, 2 full court basketball, concession/restroom building, and open lawn area. Direct connection to multi use trail.

Trail Underpass

Community Center / Gym & Senior Center Wing
Patio and drop off associated w/ Senior wing. Plaza area for gathering associated with Community Center.

Luke Edwards Rd

Masters Road
Potential abandonment with existing road bed to be utilized by multi-use trail.

Trails Section
Designated to trails

25 Acre Disc Golf
18 hole Woodland course, tees and baskets to be sited to minimize disc golf user / trail user conflicts. Course occupies park area east of Cedar Creek. Parking for Disc Golf at Tennis Complex

Tennis Complex.
6 Lighted Courts with paved plaza area, sunshades and concession / restroom building.

Multi-Use Field
Football, soccer, lacrosse, restroom / concession building, lighted .3 mile walking track.

Future Library Site
Approximately 5 acres

Interactive Fountain / Concession Area.
Interactive fountain, concessions/restroom, 35' rental pavilion, playground area, sited around natural garden area w/ .3 mile walking loop.

Existing Police Officers Residence

Trail Head Parking
Provides access to trails pavilion area.

Pedestrian Only Nature Trail
Approximately 2.5 miles of nature trail. Interior 1 mile loop, Interpretive trail with multiple kiosks illustrating Piedmont Ecology.

Trail Underpass

Gaelic Sports Multi-use Field
(Rugby, Gaelic football, & hurling)

Soccer Complex
(4) Four fields 230 x360 Associated plaza area w/ Restroom Concessions

3.0 Acre Water Feature
Includes parking area for 80 cars, 35' rental pavilion, & playground with interactive "stream" feature

Multi-use Trail
1.5 mile paved trail loop

Cricket Pitch
with associated plaza area and concession / restroom building

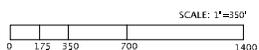
ADA Trail Parking
(10 Cars)

Ball Field Complex
(1) 300' Ball Field
(1) 220' Ball Field
(3) 200' Ball Field
(1) 180' Ball Field
(1) 150' Ball Field
(7) Batting Cages

Plaza Areas
Hardscape gathering plazas. Main plaza w/ central drop off and Concession / restroom building, 2 small playgrounds for various ages, direct connection to multi-use trail. Secondary plaza with smaller concession / restroom.

Gully Trail
Natural surface trail area.

Destination Playground
5000 sf Playground w/ 35' rental pavilion, open lawn area for free play. Trail access to overlook shelter sited amongst trees.



HARBINS COMMUNITY PARK SITE

Preliminary Master Plan – Alternative

May 19, 2009

PREPARED FOR:
Gwinnett County Department of
Community Services





Legend

- Natural Surface Trail Zone
- Granite Outcropping

TOTAL SITE - 669.5822 Acres

PARKING SUMMARY

NORTHWEST	EAST
140 Cars - BMX Facility	30 Cars - Tennis Complex
70 Cars - Primitive Camping	100 Cars - Woodland Disc Golf Course
NORTHEAST	SOUTH EAST
420 Cars - Ballfield Complex	140 Cars - Gaelic Sports Field
150 Cars - Teen Recreation	363 Cars - Multi-use Field
150 Cars - Destination Playground	428 Cars - Soccer Complex
SOUTHWEST	SOUTH CENTRAL
305 Cars - Community Center	95 Cars - Cricket Pitch
75 Cars - Interactive Fountain	80 Cars - Lakeside Playground
	2626 Cars - Total Parking Harbins Park

PREPARED FOR:
Gwinnett County Department of
Community Services

HARBINS PARK

Master Plan

July 14, 2009





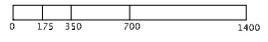
Legend

- Natural Surface Trail Zone
- Granite Outcropping

TOTAL SITE - 669.5822 Acres

PARKING SUMMARY

NORTHWEST 140 Cars - BMX Facility 70 Cars - Primitive Camping	EAST 30 Cars - Tennis Complex 100 Cars - Woodland Disc Course
NORTHEAST 420 Cars - Ballfield Complex 150 Cars - Teen Recreation 150 Cars - Destination Playground	SOUTH EAST 365 Cars - Multi-use Field 428 Cars - Soccer Complex 95 Cars - Cricket Pitch 80 Cars - Lakeside Playground 65 Cars - Dog Park
SOUTHWEST 305 Cars - Community Center 75 Cars - Interactive Fountain	
SOUTH CENTRAL 80 Cars - Nature Trail	2553 Cars - Total Parking Harbins Park



HARBINS PARK

Master Plan

October 8, 2009

PREPARED FOR:
Gwinnett County Department of
Community Services



SECTION **APPENDICES**

8.0

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Appendix G: Harbins Park Septic Study Report	page	131
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Appendix I: Meeting Minutes	page	143
Appendix J: Geotechnical Report (Digital file only)		

APPENDICES

Appendix A: Cost Estimate

Refer to the attached itemized Master Plan level Spreadsheet



**COST ESTIMATE FOR
HARBINS PARK
GWINNETT COUNTY DEPARTMENT
OF COMMUNITY SERVICES**

October 8, 2009

NORTHERN ENTRANCE ROAD /PARKING				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
DECELERATION LANES	1	LS	\$20,000.00	\$20,000.00
TREE PROTECTION	5,400	LF	\$4.00	\$21,600.00
EROSION CONTROL FENCING (double row)	10,800	LF	\$3.50	\$37,800.00
VEGETATIVE CLEAR & GRUB	12	AC	\$7,000.00	\$84,000.00
MASS GRADING	80,000	CY	\$10.00	\$800,000.00
CONCRETE CURB & GUTTER	12,900	LF	\$15.00	\$193,500.00
ROADWAY / PARKING ASPHALT-2"	305,000	SF	\$3.00	\$915,000.00
ROADWAY / PARKING GAB BASE- 6"	5,600	CY	\$15.00	\$84,000.00
ROADWAY / PARKING STRIPING	19,800	LF	\$0.25	\$4,950.00
ROADWAY/ PARKING LIGHTING	55	EA	\$2,500.00	\$137,500.00
RAISED CROSSWALK (STANDARD)	6	EA	\$2,000.00	\$12,000.00
RAISED CROSSWALK (EXPANDED)	2	EA	\$5,000.00	\$10,000.00
LANDSCAPE (Parking areas)	1	LS	\$150,000.00	\$150,000.00
WATER MANAGEMENT				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$12,000.00	\$12,000.00
SUBTOTAL				\$2,510,350.00
Mobilization, Fees, Bonds, etc (10% Total)				\$251,035.00
Contingency for Master Plan Level Cost Estimate (10%)				\$276,138.50
ENTRANCE ROAD SUBTOTAL				\$3,037,523.50
BALL FIELD COMPLEX				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	4,100	LF	\$4.00	\$16,400.00
EROSION CONTROL FENCING (double row)	8,200	LF	\$3.50	\$28,700.00
VEGETATIVE CLEAR & GRUB	16	AC	\$7,000.00	\$112,000.00
MASS GRADING	63,000	CY	\$10.00	\$630,000.00
MAIN CONCESSION / RESTROOM BUILDING	1	LS	\$350,000.00	\$350,000.00
CONCESSION / RESTROOM BUILDING	1	LS	\$200,000.00	\$200,000.00
PLAZA AREA - CONCRETE PAVERS	13,000	SF	\$6.00	\$78,000.00
STRUCTURAL SOILS	240	CY	\$25.00	\$6,000.00
PLAZA AREA - CONCRETE PAVING	28,000	SF	\$4.50	\$126,000.00
PLAZA AREA - CONCRETE WALKWAYS	52,000	SF	\$4.50	\$234,000.00
CONCRETE SIDEWALKS - 6' WIDE (at parking area & frontage road)	25,000	SF	\$4.50	\$112,500.00
12' PAVED ASPHALT TRAIL SPUR (2" ASPHALT)	11,500	SF	\$3.00	\$34,500.00
12' PAVED ASPHALT TRAIL SPUR 6" GAB)	200	CY	\$15.00	\$3,000.00

FIELD PREPARATION	7	LS	10,000	\$70,000.00
10' BLACK VINYL PERIMETER FENCING	500	LF	\$35.00	\$17,500.00
6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	4,000	LF	\$25.00	\$100,000.00
DUGOUTS	14	EA	\$2,000.00	\$28,000.00
BLEACHERS / SEATING (2 per field, 4 rows)	14	EA	\$4,500.00	\$63,000.00
BACKSTOP	7	LS	\$7,500.00	\$52,500.00
BATTING CAGES	7	EA	\$1,800.00	\$12,600.00
FIELD LIGHTING	7	LS	\$110,000.00	\$770,000.00
MAINTENANCE BINS	5	EA	\$700.00	\$3,500.00
SOD	218,000	SF	\$0.50	\$109,000.00
BASEBALL FIELD IRRIGATION	7	EA	\$10,000.00	\$70,000.00
<i>AMENITIES</i>				
PLAY STRUCTURES (various age groups)	2	EA	\$75,000.00	\$150,000.00
ENGINEERED WOOD CHIP MULCH -12" DEPTH	4,300	CF	\$7.50	\$32,250.00
TRASH RECEPTACLES	12	EA	\$450.00	\$5,400.00
PICNIC TABLES @ PLAZA AREA (Pedestal w/ Footing)	9	EA	\$1,650.00	\$14,850.00
BIKE RACKS	3	EA	\$600.00	\$1,800.00
WATER FOUNTAIN W/ DOGGIE DISH FILLER (FREEZE RESISTANT)	2	EA	\$3,000.00	\$6,000.00
BENCHES	12	EA	\$1,000.00	\$12,000.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
TREE GRATES	25	EA	\$500.00	\$12,500.00
LANDSCAPE	1	EA	\$100,000.00	\$100,000.00
<i>WATER MANAGEMENT</i>				
WATER METER	1	EA	\$1,200.00	\$1,200.00
IRRIGATION METER	1	EA	\$1,200.00	\$1,200.00
FINE GRADING	1	LS	\$10,000.00	\$10,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$10,000.00	\$10,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$10,000.00	\$10,000.00
12000 GALLON SEPTIC TANK	1	EA	\$19,500.00	\$19,500.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	1,615	LF	\$12.00	\$19,380.00
PRIMARY ABSORPTION FIELD	8,664	LF	\$10.00	\$86,640.00
REPLACEMENT ABSORPTION FIELD	9,490	LF	\$10.00	\$94,900.00
CLEARING AND GRUBBING	2	AC	\$4,500.00	\$7,200.00
FIRE HYDRANT	1	EA	\$5,200.00	\$5,200.00
8" FIRE SERVICE	500	LF	\$45.00	\$22,500.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00
			SUBTOTAL	\$3,939,920.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$393,992.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$433,391.20
			BALLFIELD COMPLEX SUBTOTAL	\$4,767,303.20
TEEN RECREATION AREA				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION FENCING	1,900	LF	\$4.00	\$7,600.00
EROSION CONTROL FENCING (double row)	3,800	LF	\$2.00	\$7,600.00
VEGETATIVE CLEAR & GRUB	4	AC	\$7,000.00	\$25,690.00
MASS GRADING	15,000	CY	\$10.00	\$150,000.00

RESTROOM BUILDING	1	LS	\$110,000.00	\$110,000.00
FREESTYLE SKATING AREA	1	LS	\$300,000.00	\$300,000.00
HALF COURT BASKETBALL (INCLUDES EQUIPMENT)	2	EA	\$30,000.00	\$60,000.00
FULL COURT BASKETBALL (INCLUDES EQUIPMENT)	2	EA	\$60,000.00	\$120,000.00
SAND VOLLEYBALL COURT	3	EA	\$10,000.00	\$30,000.00
8' WIDE - CONCRETE CONNECTOR TRAIL	5,000	SF	\$4.50	\$22,500.00
CONCRETE SIDEWALKS 6' WIDE	5,300	SF	\$4.50	\$23,850.00
PLAZA - CONCRETE PAVERS	4,600	SF	\$6.00	\$27,600.00
STRUCTURAL SOILS	85	CY	\$25.00	\$2,125.00
FREESTYLE SKATE LIGHTING	10	EA	\$2,500.00	\$25,000.00
SOD (Lawn Area)	12,000	SF	\$0.50	\$6,000.00
<i>AMENITIES</i>				
PICNIC TABLES	6	EA	\$1,500.00	\$9,000.00
BENCHES	9	EA	\$1,000.00	\$9,000.00
BIKE RACKS	3	EA	\$600.00	\$1,800.00
TRASH RECEPTACLES	10	EA	\$450.00	\$4,500.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
LANDSCAPE	1	EA	\$30,000.00	\$30,000.00
IRRIGATION	1	LS	\$4,000.00	\$4,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	600	LF	\$25.00	\$15,000.00
POTABLE WATER	600	LF	\$50.00	\$30,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$5,000.00	\$5,000.00
FOREBAY FILTRATION POND	1	LS	\$3,000.00	\$3,000.00
MICRO POOL	1	LS	\$3,000.00	\$3,000.00
PERMANENT GRASSING	1	LS	\$5,000.00	\$5,000.00
				SUBTOTAL
				\$1,074,265.00
Mobilization, Fees, Bonds, etc (10% Total)				\$107,426.50
Contingency for Master Plan Level Cost Estimate (10%)				\$118,169.15
TEEN RECREATION AREA SUBTOTAL				\$1,299,860.65
DESTINATION PLAYGROUND AREA / PICNIC AREA				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	1,300	LF	\$4.00	\$5,200.00
EROSION CONTROL FENCING (Double Row)	2,600	LF	\$3.50	\$9,100.00
VEGETATIVE CLEAR & GRUB	2	AC	\$4,600.00	\$6,900.00
MASS GRADING	10,000	CY	\$10.00	\$100,000.00
GRANITE FACED RETAINING WALL	640	LF	\$175.00	\$112,000.00
COVERED SHELTER - 20'	1	LS	\$25,000.00	\$25,000.00
60' PICNIC PAVILION	1	LS	\$75,000.00	\$75,000.00
8' PAVED ASPHALT TRAIL SPUR (2" ASPHALT)	3,000	SF	\$3.00	\$9,000.00
8' PAVED ASPHALT TRAIL SPUR 6" GAB)	55	CY	\$15.00	\$825.00
CONCRETE SIDEWALKS - 6' WIDE (at parking area)	1,200	SF	\$4.50	\$5,400.00
12' PAVED ASPHALT TRAIL SPUR (2" ASPHALT)	7,500	SF	\$3.00	\$22,500.00
12' PAVED ASPHALT TRAIL SPUR 6" GAB)	140	CY	\$15.00	\$2,100.00

<i>AMENITIES</i>				
PLAY STRUCTURES	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH -12" DEPTH	5,000	CF	\$7.50	\$37,500.00
TRASH RECEPTACLES	3	EA	\$450.00	\$1,350.00
PICNIC TABLES @ PAVILION	12	EA	\$1,500.00	\$18,000.00
BENCH SWINGS	3	EA	\$1,800.00	\$5,400.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
GRILLS (Community w/ Tree Grate)	4	EA	\$1,500.00	\$6,000.00
HOT COAL BIN (1 per 2 grills)	2	EA	\$300.00	\$600.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
LANDSCAPE	1	LS	\$10,000.00	\$10,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$5,000.00	\$5,000.00
1000 GALLON SEPTIC TANK	1	EA	\$1,200.00	\$1,200.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	313	LF	\$12.00	\$3,756.00
PRIMARY ABSORPTION FIELD	255	LF	\$10.00	\$2,550.00
REPLACEMENT ABSORPTION FIELD	255	LF	\$10.00	\$2,550.00
CLEARING AND GRUBBING	0.1	AC	\$4,500.00	\$450.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00
			SUBTOTAL	\$650,181.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$65,018.10
			Contingency for Master Plan Level Cost Estimate (10%)	\$71,519.91
			DESTINATION PLAYGROUND AREA / PICNIC AREA SUBTOTAL	\$786,719.01
<i>BMX FACILITY</i>				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	2,000	LF	\$4.00	\$8,000.00
EROSION CONTROL FENCING (Double Row)	4,000	LF	\$3.50	\$14,000.00
VEGETATIVE CLEAR & GRUB	9	AC	\$4,600.00	\$41,400.00
MASS GRADING	27,000	CY	\$10.00	\$270,000.00
DECELERATION LANE	1	LS	\$20,000.00	\$20,000.00
CONCRETE CURB & GUTTER	3,100	LF	\$15.00	\$46,500.00
PARKING LOTS - ASPHALT 2"	77,000	SF	\$3.50	\$269,500.00
PARKING LOTS - GAB 6"	1,400	CY	\$15.00	\$21,000.00
PARKING STRIPING	3,800	LF	\$0.25	\$950.00
PARKING LIGHTING	15	EA	\$2,000.00	\$30,000.00
CONCRETE SIDEWALKS 6' WIDE	6,000	SF	\$4.50	\$27,000.00
PLAZA AREA - CONCRETE PAVING	19,000	SF	\$4.50	\$85,500.00
BMX TRACK	1	LS	\$75,000.00	\$75,000.00
STARTING GATE SYSTEM	1	LS	\$5,000.00	\$5,000.00
PA SYSTEM	1	LS	\$900.00	\$900.00
CONCESSION RESTROOM (Gwinnett Standard)	1	LS	\$110,000.00	\$110,000.00
ANNOUNCING TOWER	1	LS	\$30,000.00	\$30,000.00
START LINE COVERED PLATFORM	1	LS	\$2,500.00	\$2,500.00
6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	1,100	LF	\$25.00	\$27,500.00
TRACK LIGHTING	6	EA	\$7,500.00	\$45,000.00
BLEACHERS	4	EA	\$5,000.00	\$20,000.00
MOTO BOARD	1	LS	\$200.00	\$200.00

<i>AMENITIES</i>				
TRASH RECEPTACLES	3	EA	\$450.00	\$1,350.00
BIKE RACKS	3	EA	\$600.00	\$1,800.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
WATER FOUNTAIN (FREEZE RESISTANT)	2	EA	\$3,000.00	\$6,000.00
LANDSCAPE	1	LS	\$20,000.00	\$20,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
2000 GALLON SEPTIC TANK	1	EA	\$3,000.00	\$3,000.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	418	LF	\$12.00	\$5,016.00
PRIMARY ABSORPTION FIELD	511	LF	\$10.00	\$5,110.00
REPLACEMENT ABSORPTION FIELD	511	LF	\$10.00	\$5,110.00
CLEARING AND GRUBBING	0.1	AC	\$4,500.00	\$450.00
PIPE	250	LF	\$25.00	\$6,250.00
POTABLE WATER	250	LF	\$50.00	\$12,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$1,294,736.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$129,473.60
			Contingency for Master Plan Level Cost Estimate (10%)	\$142,420.96
			BMX FACILITY SUBTOTAL	\$1,566,630.56
PRIMITIVE CAMPING AREA				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	5,000	LF	\$4.00	\$20,000.00
EROSION CONTROL FENCING (Double Row)	10,000	LF	\$3.50	\$35,000.00
VEGETATIVE CLEAR & GRUB	2	AC	\$4,600.00	\$10,580.00
MASS GRADING	4,100	CY	\$10.00	\$41,000.00
CONCRETE CURB & GUTTER	1,400	LF	\$15.00	\$21,000.00
ROADWAY / PARKING LOTS-ASPHALT 2"	25,000	SF	\$3.00	\$75,000.00
ROADWAY / PARKING LOTS -GAB 6"	460	CY	\$15.00	\$6,900.00
ROADWAY / PARKING STRIPING	1,400	LF	\$0.25	\$350.00
ROADWAY / PARKING LIGHTING	6	EA	\$2,000.00	\$12,000.00
BATHHOUSE	1	LS	\$350,000.00	\$350,000.00
CONCRETE SIDEWALKS 6' WIDE	2,100	SF	\$4.50	\$9,450.00
12' WIDE - ASPHALT MULTI-USE TRAIL LOOP - 2" ASPHALT	5,500	SF	\$3.00	\$16,500.00
12' WIDE - ASPHALT MULTI-USE TRAIL LOOP - 6" GAB	100	CY	\$15.00	\$1,500.00
6' WIDE MULCH TRAILS (4" Mulch)	2,000	SF	\$1.50	\$3,000.00
6' WIDE MULCH TRAILS (6" GAB)	37	CY	\$15.00	\$555.00
CAMPSITES (Includes fine grading and site definition)	30	EA	\$400.00	\$12,000.00
AMPHITHEATER - GRANITE FACED SEATING WALLS	300	LF	\$175.00	\$52,500.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	5	EA	\$450.00	\$2,250.00
PICNIC TABLES	10	EA	\$1,000.00	\$10,000.00
BIKE RACKS	2	EA	\$600.00	\$1,200.00

WATER FOUNTAIN W/ DOGGIE DISH FILLER (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
BENCHES	2	EA	\$500.00	\$1,000.00
FIRE CIRCLE	6	EA	\$300.00	\$1,800.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
LANDSCAPE	1	LS	\$20,000.00	\$20,000.00
MEADOW SEEDING	260,000	SF	\$0.04	\$10,400.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
8000 GALLON SEPTIC TANK	1	EA	\$14,400.00	\$14,400.00
6" PVC SEPTIC FEEDER LINE	258	LF	\$12.00	\$3,096.00
PRIMARY ABSORPTION FIELD	3,614	LF	\$10.00	\$36,140.00
REPLACEMENT ABSORPTION FIELD	3,614	LF	\$10.00	\$36,140.00
CLEARING AND GRUBBING	0.7	AC	\$4,500.00	\$2,970.00
PIPE	900	LF	\$25.00	\$22,500.00
POTABLE WATER	900	LF	\$50.00	\$45,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$8,000.00	\$8,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$8,000.00	\$8,000.00
			SUBTOTAL	\$932,231.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$93,223.10
			Contingency for Master Plan Level Cost Estimate (10%)	\$102,545.41
			PRIMITIVE CAMPING SUBTOTAL	\$1,127,999.51
COMMUNITY CENTER/ GYM / SENIOR WING				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
DECELERATION LANES	1	LS	\$20,000.00	\$20,000.00
TREE PROTECTION	4,700	LF	\$4.00	\$18,800.00
EROSION CONTROL FENCING	9,500	LF	\$3.50	\$33,250.00
VEGETATIVE CLEAR & GRUB	10	AC	\$7,000.00	\$67,900.00
MASS GRADING	20,000	CY	\$10.00	\$200,000.00
CONCRETE CURB & GUTTER	6,300	LF	\$15.00	\$94,500.00
PARKING LOTS - ASPHALT 2"	128,000	SF	\$3.00	\$384,000.00
PARKING LOTS - GAB -6"	2,400	CY	\$15.00	\$36,000.00
ROADWAY / PARKING STRIPING	6,800	LF	\$0.25	\$1,700.00
ROADWAY / PARKING LIGHTING	20	EA	\$2,000.00	\$40,000.00
RAISED CROSSWALK	1	EA	\$2,500.00	\$2,500.00
COMMUNITY CENTER / GYM / SENIOR WING	1	LS	\$3,000,000.00	\$3,000,000.00
PLAZA AREA - CONCRETE PAVING	4,000	SF	\$4.50	\$18,000.00
PLAZA AREA - CONCRETE PAVERS	8,500	SF	\$6.00	\$51,000.00
PLAZA AREA - STRUCTURAL SOIL	150	CY	\$25.00	\$3,750.00
CONCRETE SIDEWALKS 6' WIDE (@ parking area and frontage road)	7,700	SF	\$4.50	\$34,650.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	4,200	SF	\$3.00	\$12,600.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -6" GAB	75	CY	\$15.00	\$1,125.00
<i>AMENITIES</i>				
PICNIC TABLES	6	EA	\$1,000.00	\$6,000.00
BENCHES	12	EA	\$1,000.00	\$12,000.00
SIGNAGE	1	LS	\$10,000.00	\$10,000.00
BIKE RACKS	2	EA	\$600.00	\$1,200.00
TRASH RECEPTACLES	12	EA	\$450.00	\$5,400.00
LANDSCAPE	1	LS	\$30,000.00	\$30,000.00

<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
13000 GALLON SEPTIC TANK	1	EA	\$21,000.00	\$21,000.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	274	LF	\$12.00	\$3,288.00
PRIMARY ABSORPTION FIELD	4,453	LF	\$10.00	\$44,530.00
REPLACEMENT ABSORPTION FIELD	4,453	LF	\$10.00	\$44,530.00
CLEARING AND GRUBBING	0.8	AC	\$4,500.00	\$3,690.00
PIPE	200	LF	\$25.00	\$5,000.00
POTABLE WATER	200	LF	\$50.00	\$10,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$4,288,613.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$428,861.30
			Contingency for Master Plan Level Cost Estimate (10%)	\$471,747.43
			COMMUNITY CENTER / GYM/ SENIOR WING SUBTOTAL	\$5,189,221.73
<i>INTERACTIVE FOUNTAIN</i>	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	4,300	LF	\$4.00	\$17,200.00
EROSION CONTROL FENCING	8,600	LF	\$3.50	\$30,100.00
VEGETATIVE CLEAR & GRUB	5	AC	\$7,000.00	\$35,000.00
MASS GRADING	8,500	CY	\$10.00	\$85,000.00
CONCRETE CURB & GUTTER	1,500	LF	\$15.00	\$22,500.00
PARKING LOTS - ASPHALT 2"	35,000	SF	\$3.00	\$105,000.00
PARKING LOTS - GAB 6"	650	CY	\$15.00	\$9,750.00
ROADWAY / PARKING STRIPING	1,500	LF	\$0.25	\$375.00
ROADWAY / PARKING LIGHTING	6	EA	\$2,000.00	\$12,000.00
CONCRETE SIDEWALKS - 6' WIDE (at parking area & frontage road)	19,000	SF	\$4.50	\$85,500.00
PLAZA AREA - CONCRETE PAVERS	14,700	SF	\$6.00	\$88,200.00
PLAZA AREA - STRUCTURAL SOILS	270	CY	\$25.00	\$6,750.00
GRANITE FACED RETAINING WALL	200	LF	\$175.00	\$35,000.00
GRANITE FACED SEATING WALL (18" height)	150	LF	\$175.00	\$26,250.00
CONCESSIONS / BATHHOUSE	1	LS	\$250,000.00	\$250,000.00
INTERACTIVE FOUNTAIN	1	LS	\$350,000.00	\$350,000.00
60' RENTAL PAVILION	1	EA	\$75,000.00	\$75,000.00
20' SHELTER	2	EA	\$30,000.00	\$60,000.00
12' WIDE - ASPHALT MULTI USE TRAIL LOOP -2" ASPHALT	40,000	SF	\$3.00	\$120,000.00
12' WIDE - ASPHALT MULTI USE TRAIL LOOP -6" GAB	740	CY	\$15.00	\$11,100.00
<i>AMENITIES</i>				
PLAY STRUCTURES (various age groups)	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH -12" DEPTH	3,000	CF	\$7.50	\$22,500.00
TRASH RECEPTACLES	6	EA	\$450.00	\$2,700.00
PICNIC TABLES	6	EA	\$1,000.00	\$6,000.00
BIKE RACKS	2	EA	\$600.00	\$1,200.00
WATER FOUNTAIN W/ DOGGIE DISH FILLER (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
BENCHES	9	EA	\$1,000.00	\$9,000.00
6' BLACK VINYL FENCING (Between playareas and roadway)	800	LF	\$25.00	\$20,000.00
PLAZA - SUNSHADES	1	LS	\$40,000.00	\$40,000.00

PLAYGROUND - SUNSHADES	1	LS	\$20,000.00	\$20,000.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
MEADOW SEEDING	30,000	SF	\$0.04	\$1,200.00
LAWN AREA - SOD	100,000	SF	\$0.50	\$50,000.00
LANDSCAPE	1	LS	\$50,000.00	\$50,000.00
IRRIGATION	1	LS	\$10,000.00	\$10,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
1000 GALLON SEPTIC TANK	1	EA	\$1,200.00	\$1,200.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
PRIMARY ABSORPTION FIELD	274	LF	\$10.00	\$2,740.00
REPLACEMENT ABSORPTION FIELD	274	LF	\$10.00	\$2,740.00
CLEARING AND GRUBBING	0.1	AC	\$4,500.00	\$450.00
PIPE	450	LF	\$25.00	\$11,250.00
POTABLE WATER	450	LF	\$50.00	\$22,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$8,000.00	\$8,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$8,000.00	\$8,000.00
			SUBTOTAL	\$1,857,405.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$185,740.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$204,314.55
			INTERACTIVE FOUNTAIN SUBTOTAL	\$2,247,460.05
PEDESTRIAN ONLY NATURE TRAIL				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	3,000	LF	\$4.00	\$12,000.00
EROSION CONTROL FENCING (Double Row)	6,000	LF	\$3.50	\$21,000.00
VEGETATIVE CLEAR & GRUB	4	AC	\$4,600.00	\$18,400.00
MASS GRADING	2,500	CY	\$10.00	\$25,000.00
DECELERATION LANES	1	LS	\$20,000.00	\$20,000.00
CONCRETE CURB & GUTTER	2,300	LF	\$15.00	\$34,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	50,000	SF	\$3.00	\$150,000.00
ROADWAY / PARKING LOTS -GAB 6"	925	CY	\$15.00	\$13,875.00
ROADWAY / PARKING STRIPING	2,000	LF	\$0.25	\$500.00
ROADWAY / PARKING LIGHTING	5	EA	\$2,000.00	\$10,000.00
CONCRETE SIDEWALKS 6' WIDE	7,500	SF	\$4.50	\$33,750.00
20' SHELTER	1	EA	\$20,000.00	\$20,000.00
6" WIDE - MULCH NATURE TRAIL (4" MULCH)	276,000	SF	\$1.50	\$414,000.00
6' WIDE - MULCH NATURE TRAIL (6" GAB)	5,100	CY	\$15.00	\$76,500.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	2	EA	\$450.00	\$900.00
BENCHES	10	EA	\$1,000.00	\$10,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
TRAIL SIGNAGE	1	LS	\$5,000.00	\$5,000.00
INFORMATION KIOSKS	3	EA	\$1,500.00	\$4,500.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$10,000.00	\$10,000.00

<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$5,000.00	\$5,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$5,000.00	\$5,000.00
			SUBTOTAL	\$906,525.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$90,652.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$99,717.75
			PEDESTRIAN ONLY NATURE TRAIL SUBTOTAL	\$1,096,895.25
<i>DISC GOLF COURSE</i>	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	2,000	LF	\$4.00	\$8,000.00
EROSION CONTROL FENCING (Double Row)	4,000	LF	\$3.50	\$14,000.00
SELECTIVE CLEARING	1	LS	\$2,500.00	\$2,500.00
VEGETATIVE CLEAR & GRUB	2	AC	\$4,600.00	\$9,200.00
MASS GRADING	8,200	CY	\$10.00	\$82,000.00
CONCRETE CURB & GUTTER	1,700	LF	\$15.00	\$25,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	34,000	SF	\$3.00	\$102,000.00
ROADWAY / PARKING LOTS -GAB 6"	600	CY	\$15.00	\$9,000.00
ROADWAY / PARKING STRIPING	2,500	LF	\$0.25	\$625.00
ROADWAY / PARKING LIGHTING	7	EA	\$2,000.00	\$14,000.00
6" WIDE - MULCH NATURE TRAIL (4" MULCH)	13,300	SF	\$1.50	\$19,950.00
6' WIDE - MULCH NATURE TRAIL (6" GAB)	245	CY	\$15.00	\$3,675.00
12' WIDE- ASPHALT CONNECTOR TRAIL (2" ASPHALT)	10,000	SF	\$3.00	\$30,000.00
12' WIDE- ASPHALT CONNECTOR TRAIL (6" GAB)	185	CY	\$15.00	\$2,775.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	8	EA	\$450.00	\$3,600.00
BENCHES	6	EA	\$1,000.00	\$6,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
DISC GOLF EQUIPMENT (Tees and Baskets)	1	LS	\$30,000.00	\$30,000.00
PEDESTRIAN BRIDGE	2	LS	\$25,000.00	\$50,000.00
LANDSCAPE (Parking Area)	1	LS	\$10,000.00	\$10,000.00
			SUBTOTAL	\$428,425.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$42,842.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$47,126.75
			DISC GOLF SUBTOTAL	\$518,394.25
<i>TENNIS COMPLEX</i>	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	2,000	LF	\$4.00	\$8,000.00
EROSION CONTROL FENCING	4,000	LF	\$3.50	\$14,000.00
VEGETATIVE CLEAR & GRUB	4	AC	\$4,600.00	\$18,400.00
MASS GRADING	8,900	CY	\$10.00	\$89,000.00
CONCRETE CURB & GUTTER	1,000	LF	\$15.00	\$15,000.00
ROADWAY / PARKING LOTS-ASPHALT 2"	19,000	SF	\$3.00	\$57,000.00
ROADWAY / PARKING LOTS -GAB 6"	350	CY	\$15.00	\$5,250.00
PARKING STRIPING	600	LF	\$0.25	\$150.00
PARKING LIGHTING	4	EA	\$2,000.00	\$8,000.00

<i>TENNIS COURTS</i>				
TENNIS CONCESSIONS & RESTROOMS	1	LS	\$100,000.00	\$100,000.00
TENNIS COURTS (INCLUDES EQUIPMENT)	3	PAIR	\$55,000.00	\$165,000.00
SITE ELECTRICAL	1	LS	\$10,000.00	\$10,000.00
10' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	1,500	LF	\$35.00	\$52,500.00
COURT LIGHTING	3	PAIR	\$15,000.00	\$45,000.00
CONCRETE SIDEWALK - 6' WIDE (at parking & frontage)	8,500	SF	\$4.50	\$38,250.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
PLAZA AREA - CONCRETE PAVERS	14,000	SF	\$6.00	\$84,000.00
PLAZA AREA - STRUCTURAL SOIL	250	CY	\$25.00	\$6,250.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	4	EA	\$450.00	\$1,800.00
BIKE RACKS	1	EA	\$600.00	\$600.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,500.00	\$2,500.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
LANDSCAPE	1	LS	\$10,000.00	\$10,000.00
SUNSHADES	1	LS	\$40,000.00	\$40,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	350	LF	\$25.00	\$8,750.00
POTABLE WATER	350	LF	\$50.00	\$17,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$878,950.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$87,895.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$96,684.50
			TENNIS AREA SUBTOTAL	\$1,063,529.50
<i>INDIAN SHOALS ROUND-ABOUT</i>				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (double row)	1,000	LF	\$3.50	\$3,500.00
MASS GRADING	5,000	CY	\$10.00	\$50,000.00
CONCRETE CURB & GUTTER	1,500	LF	\$15.00	\$22,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	16,000	SF	\$3.00	\$48,000.00
ROADWAY / PARKING LOTS -GAB 6"	300	CY	\$15.00	\$4,500.00
ROADWAY STRIPING	500	LF	\$0.25	\$125.00
ROADWAY LIGHTING	4	LS	\$2,000.00	\$8,000.00
STAMPED ASPHALT CROSSWALK (Includes pattern and color)	8	EA	\$1,500.00	\$12,000.00
CENTER AREA - CONCRETE PAVERS	300	SF	\$6.00	\$1,800.00
CENTER AREA - STRUCTURAL SOIL	30	CY	\$25.00	\$750.00
			SUBTOTAL	\$151,175.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$15,117.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$16,629.25
			INDIAN SHOALS ROUND-ABOUT SUBTOTAL	\$182,921.75

<i>WAGES TRACT - ENTRANCE ROAD /PARKING</i>	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (double row)	7,000	LF	\$3.50	\$24,500.00
MASS GRADING	22,000	CY	\$10.00	\$220,000.00
CONCRETE CURB & GUTTER	6,200	LF	\$15.00	\$93,000.00
ROADWAY / PARKING LOTS-ASPHALT 2"	78,000	SF	\$3.00	\$234,000.00
ROADWAY / PARKING LOTS -GAB 6"	1,500	CY	\$15.00	\$22,500.00
ROADWAY STRIPING	3,000	LF	\$0.25	\$750.00
ROADWAY LIGHTING	30	LS	\$2,000.00	\$60,000.00
RAISED CROSSWALK	2	EA	\$2,500.00	\$5,000.00
FIRE HYDRANT	1	EA	\$5,200.00	\$5,200.00
8" FIRE SERVICE	1,500	LF	\$45.00	\$67,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$778,450.00
			Mobilization, Fees, Bonds, etc (10% Total)	
				\$77,845.00
			Contingency for Master Plan Level Cost Estimate (10%)	
				\$85,629.50
			WAGES TRACT ENTRANCE ROAD SUBTOTAL	
				\$941,924.50
<i>MULTI-USE FIELD (Football, Soccer, Lacrosse)</i>	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (double row)	4,500	LF	\$3.50	\$15,750.00
MASS GRADING	200,000	CY	\$10.00	\$2,000,000.00
CONCRETE CURB & GUTTER	5,500	LF	\$15.00	\$82,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	128,000	SF	\$3.00	\$384,000.00
ROADWAY / PARKING LOTS -GAB 6"	2,400	CY	\$15.00	\$36,000.00
PARKING STRIPING	9,800	LS	\$0.25	\$2,450.00
PARKING LIGHTING	35	EA	\$2,000.00	\$70,000.00
RESTROOM / CONCESSION BUILDING (FOOTBALL FIELD)	1	LS	\$270,000.00	\$270,000.00
PLAZA AREA - CONCRETE PAVERS	5,800	SF	\$6.00	\$34,800.00
PLAZA AREA - STRUCTURAL SOIL	100	CY	\$25.00	\$2,500.00
10' WIDE LIGHTED TRACK -2" ASPHALT	17,700	SF	\$3.00	\$53,100.00
10' WIDE LIGHTED TRACK -6" GAB	330	CY	\$15.00	\$4,950.00
CONCRETE SIDEWALKS - 6' WIDE (Parking & Frontage Road)	10,700	SF	\$4.50	\$48,150.00
CONCRETE WALKWAYS - 10' WIDE	16,000	SF	\$4.50	\$72,000.00
FIELD LIGHTING	1	LS	\$150,000.00	\$150,000.00
6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	738	LF	\$25.00	\$18,450.00
BLEACHERS / SEATING	2	EA	\$25,000.00	\$50,000.00
<i>AMENITIES</i>				
PICNIC TABLES	6	EA	\$1,500.00	\$9,000.00
TRASH RECEPTACLES	6	EA	\$450.00	\$2,700.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
SOD FOR FIELD	200,000	SF	\$0.50	\$100,000.00
FOOTBALL FIELD IRRIGATION	1	LS	\$15,000.00	\$15,000.00
PA SOUND SYSTEM	1	LS	\$8,000.00	\$8,000.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00

LANDSCAPE (Parking Area required trees & additional planting)	1	LS	\$100,000.00	\$100,000.00
PRESS BOX	1	LS	\$90,000.00	\$90,000.00
GOAL POSTS	2	EA	\$10,000.00	\$20,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
WATER METER	1	EA	\$1,200.00	\$1,200.00
IRRIGATION METER	1	EA	\$1,200.00	\$1,200.00
8" DIP	5,788	LF	\$40.00	\$231,520.00
JUNCTION BOX	14	EA	\$3,000.00	\$42,000.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
CLEARING AND GRUBBING	1.1	AC	\$4,500.00	\$4,950.00
SEWAGE PUMP STATION	1	LS	\$250,000.00	\$250,000.00
PIPE	450	LF	\$25.00	\$11,250.00
POTABLE WATER	450	LF	\$50.00	\$22,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$4,284,170.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$428,417.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$471,258.70
			FOOTBALL FIELD SUBTOTAL	\$5,183,845.70
OFF-LEASH DOG PARK				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
MASS GRADING	25,000	CY	\$10.00	\$250,000.00
EROSION CONTROL FENCING (double row)	3,600	LF	\$3.50	\$12,600.00
CONCRETE CURB & GUTTER	2,300	LF	\$15.00	\$34,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	28,500	SF	\$3.00	\$85,500.00
ROADWAY / PARKING LOTS -GAB 6"	530	CY	\$15.00	\$7,950.00
PARKING STRIPING	2,000	LS	\$0.25	\$500.00
PARKING LIGHTING	12	EA	\$2,000.00	\$24,000.00
SUBSURFACE DRAINAGE - SAND	1	LS	\$10,000.00	\$10,000.00
STRUCTURAL SOILS-	1,900	CY	\$25.00	\$47,500.00
SOD FOR TURF GRASS	100,000	SF	\$0.50	\$50,000.00
CONCRETE SIDEWALK - 6' WIDE	4,500	SF	\$4.50	\$20,250.00
STAIR ASSEMBLY	1	LS	\$2,000.00	\$2,000.00
<i>AMENITIES</i>				
6' BLACK VINYL PERIMTER FENCING (INCLUDING GATES)	2,000	LF	\$25.00	\$50,000.00
TRASH RECEPTACLES	5	EA	\$450.00	\$2,250.00
BENCHES	8	EA	\$1,000.00	\$8,000.00
SIGNAGE	1	LS	\$2,500.00	\$2,500.00
INFO KIOSK w/ BAG DISPENSER	1	EA	\$1,500.00	\$1,500.00
WATER FOUNTAIN w/ DOG DISH FILLER (Freeze resistant)	1	EA	\$3,000.00	\$3,000.00
DOG AGILITY EQUIPMENT	1	LS	\$20,000.00	\$20,000.00
LANDSCAPE (Parking area and play area)	1	LS	\$60,000.00	\$60,000.00
FIELD IRRIGATION	1	LS	\$15,000.00	\$15,000.00

<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$10,000.00	\$10,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$10,000.00	\$10,000.00
			SUBTOTAL	\$737,050.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$73,705.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$81,075.50
			OFF-LEASH DOG PARK SUBTOTAL	\$891,830.50
<i>SOCCER COMPLEX</i>				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING	5,000	LF	\$3.50	\$17,500.00
MASS GRADING	98,000	CY	\$10.00	\$980,000.00
PARKING LOTS - 2" ASPHALT	180,000	SF	\$3.00	\$540,000.00
PARKING LOTS - 6" GAB	3,333	CY	\$15.00	\$49,995.00
CONCRETE CURB & GUTTER	6,700	LF	\$15.00	\$100,500.00
RAISED CROSSWALK	2	EA	\$2,500.00	\$5,000.00
PARKING STRIPING	11,500	LF	\$0.25	\$2,875.00
PARKING LIGHTING	30	EA	\$2,000.00	\$60,000.00
CONCRETE SIDEWALKS - 6' WIDE	8,000	SF	\$4.50	\$36,000.00
GRANITE FACED RETAINING WALL(S)	500	LF	\$175.00	\$87,500.00
SUBSURFACE DRAINAGE - SAND	4	EA	\$6,000.00	\$24,000.00
SOD	380,000	SF	\$0.50	\$190,000.00
FIELD LIGHTING	4	EA	\$50,000.00	\$200,000.00
SOCCER FIELD IRRIGATION	4	EA	\$15,000.00	\$60,000.00
MAIN RESTROOM / CONCESSION BUILDING	1	LS	\$400,000.00	\$400,000.00
PLAZA AREA - CONCRETE PAVERS	21,000	SF	\$6.00	\$126,000.00
PLAZA AREA - STRUCTURAL SOIL	390	CY	\$25.00	\$9,750.00
GRANITE FACED SEATING / RETAINING WALL	360	LF	\$175.00	\$63,000.00
LIGHTING	6	EA	\$2,000.00	\$12,000.00
PLAZA LANDSCAPE	1	LS	\$8,000.00	\$8,000.00
<i>AMENITIES</i>				
PLAY STRUCTURES (various age groups)	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH - 12" DEPTH	5,000	CF	\$7.50	\$37,500.00
TRASH RECEPTACLES	8	EA	\$450.00	\$3,600.00
BENCHES	6	EA	\$1,000.00	\$6,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
PICNIC TABLES	6	EA	\$1,000.00	\$6,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	5,000	LF	\$25.00	\$125,000.00
MAINTENANCE BINS	2	EA	\$700.00	\$1,400.00
SOCCER GOALS	8	EA	\$2,000.00	\$16,000.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00

<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$3,419,220.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$341,922.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$376,114.20
			SOCCER COMPLEX SUBTOTAL	\$4,137,256.20
<i>CRICKET PITCH</i>				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING	5,000	LF	\$3.50	\$17,500.00
MASS GRADING	28,000	CY	\$10.00	\$280,000.00
PARKING LOTS - 2" ASPHALT	64,600	SF	\$3.00	\$193,800.00
PARKING LOTS - 6" GAB	1,200	CY	\$15.00	\$18,000.00
CONCRETE CURB & GUTTER	2,800	LF	\$15.00	\$42,000.00
PARKING STRIPING	5,000	LS	\$0.25	\$1,250.00
PARKING LIGHTING	13	EA	\$2,000.00	\$26,000.00
CONCRETE SIDEWALKS - 6' WIDE	2,300	SF	\$4.50	\$10,350.00
SUBSURFACE DRAINAGE - SAND	1	EA	\$12,000.00	\$12,000.00
SOD	180,000	SF	\$0.50	\$90,000.00
FIELD LIGHTING	1	EA	\$100,000.00	\$100,000.00
CRICKET FIELD IRRIGATION	1	EA	\$15,000.00	\$15,000.00
RESTROOM / CONCESSION BUILDING	1	LS	\$200,000.00	\$200,000.00
BLEACHERS	2	EA	\$25,000.00	\$50,000.00
PLAZA AREA - CONCRETE PAVERS	3,100	SF	\$6.00	\$18,600.00
PLAZA AREA - STRUCTURAL SOIL	57	CY	\$25.00	\$1,425.00
LIGHTING	5	EA	\$2,000.00	\$10,000.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	4	EA	\$450.00	\$1,800.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
PICNIC TABLES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$8,000.00	\$8,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$8,000.00	\$8,000.00
			SUBTOTAL	\$1,227,325.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$122,732.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$135,005.75
			CRICKET PITCH SUBTOTAL	\$1,485,063.25

LAKE AMENITY	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (Double row)	3,200	LF	\$3.50	\$11,200.00
MASS GRADING	53,000	CY	\$10.00	\$530,000.00
GROUNDWATER WELL	1	LS	\$75,000.00	\$75,000.00
PARKING LOTS - 2" ASPHALT	37,000	SF	\$3.00	\$111,000.00
PARKING LOTS - 6" GAB	700	CY	\$15.00	\$10,500.00
CONCRETE CURB & GUTTER	1,600	LF	\$15.00	\$24,000.00
PARKING STRIPING	2,100	LS	\$0.25	\$525.00
PARKING LIGHTING	5	EA	\$2,000.00	\$10,000.00
CONCRETE SIDEWALKS - 6' WIDE	3,600	SF	\$4.50	\$16,200.00
POND SPILLWAY (Concrete gutter)	1	LS	\$10,000.00	\$10,000.00
LANDSCAPE (Stream Garden, Bank Stabilization etc)	1	LS	\$100,000.00	\$100,000.00
AMENITIES				
PLAY STRUCTURES (various age groups)	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH - 12" DEPTH	5,000	CF	\$7.50	\$37,500.00
INTERACTIVE "STREAM" AMENITY	1	LS	\$20,000.00	\$20,000.00
TRASH RECEPTACLES	4	EA	\$450.00	\$1,800.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
BENCH SWING	6	EA	\$1,800.00	\$10,800.00
BIKE RACKS	1	EA	\$600.00	\$600.00
PICNIC TABLES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
COVERED SHELTER - 20'	1	LS	\$20,000.00	\$20,000.00
SITE UTILITIES				
SITE ELECTRICAL	1	LS	\$5,000.00	\$5,000.00
PIPE	100	LF	\$25.00	\$2,500.00
POTABLE WATER	100	LF	\$50.00	\$5,000.00
			SUBTOTAL	\$1,111,625.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$111,162.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$122,278.75
			LAKE AMENITY SUBTOTAL	\$1,345,066.25
COMMUNITY PARK TRAIL SYSTEM	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
FINE GRADING	1	LS	\$100,000.00	\$100,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	630,000	SF	\$3.00	\$1,890,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -6" GAB	11,700	CY	\$15.00	\$175,500.00
12' WIDE - CONCRETE TRAIL (WAGES FLOODWAY)	36,700	SF	\$4.50	\$165,150.00
TRAIL UNDERPASS	1	LS	\$350,000.00	\$350,000.00
AMENITIES				
TRAIL EDGE BENCHES (1 EVERY 3000')	15	EA	\$1,000.00	\$15,000.00
TRASH RECEPTACLES	15	EA	\$450.00	\$6,750.00
BENCH SWING	10	EA	\$1,800.00	\$18,000.00
SIGNAGE	1	LS	\$20,000.00	\$20,000.00
REMOVABLE BOLLARDS	1	LS	\$10,000.00	\$10,000.00
PEDESTRIAN BRIDGE	5	EA	\$25,000.00	\$125,000.00
			SUBTOTAL	\$2,875,400.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$287,540.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$316,294.00
			HARBINS TRAIL SYSTEM SUBTOTAL	\$3,479,234.00

CONSERVATION PARK TRAIL CONNECTION	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
FINE GRADING	1	LS	\$100,000.00	\$100,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	16,900	SF	\$3.00	\$50,700.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -6" GAB	312	CY	\$15.00	\$4,680.00
PEDESTRIAN BRIDGE (230')	1	LS	\$100,000.00	\$100,000.00
TRAIL UNDERPASS	1	LS	\$350,000.00	\$350,000.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	15	EA	\$450.00	\$6,750.00
SIGNAGE	1	LS	\$10,000.00	\$10,000.00
			SUBTOTAL	\$622,130.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$62,213.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$68,434.30
			CONSERVATION PARK TRAIL CONNECTION SUBTOTAL	\$752,777.30
MISCELLANEOUS	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
CONSTRUCTION SIGN (Contingent upon number of phases)	1	LS	\$400.00	\$400.00
NEW PARK ENTRANCE SIGN	7	LS	\$5,000.00	\$35,000.00
INFORMATION KIOSKS (7 Kiosks)	1	LS	\$15,000.00	\$15,000.00
SIGNAGE (PARK RULES, TRAFFIC-PARKING)	1	LS	\$30,000.00	\$30,000.00
NPDES (Contingent upon number of phases)	1	LS	\$5,000.00	\$5,000.00
			SUBTOTAL	\$85,400.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$8,540.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$9,394.00
			RENOVATIONS / IMPROVEMENTS SUBTOTAL	\$103,334.00
			DEVELOPMENT SUBTOTAL	\$41,204,790.66
			10% DESIGN, ENGINEERING AND PROGRAM MANAGEMENT FEES	\$4,120,479.07
			PROJECT TOTAL	\$45,325,269.73
Note: Totals reflecting quantities different from those listed above, have not been approved by jB+a, inc. (jB+a, inc Project Total : \$45,325,269.73 - 10.08.09)				
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: Prioritized Cost Estimate



**PRIORITIZED COST ESTIMATE FOR
HARBINS PARK
GWINNETT COUNTY DEPARTMENT
OF COMMUNITY SERVICES**

October 8, 2009

PRIORITY #1 - INDIAN SHOALS ROUND-ABOUT				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (double row)	1,000	LF	\$3.50	\$3,500.00
MASS GRADING	5,000	CY	\$10.00	\$50,000.00
CONCRETE CURB & GUTTER	1,500	LF	\$15.00	\$22,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	16,000	SF	\$3.00	\$48,000.00
ROADWAY / PARKING LOTS -GAB 6"	300	CY	\$15.00	\$4,500.00
ROADWAY STRIPING	500	LF	\$0.25	\$125.00
ROADWAY LIGHTING	4	LS	\$2,000.00	\$8,000.00
STAMPED ASPHALT CROSSWALK (Includes pattern and color)	8	EA	\$1,500.00	\$12,000.00
CENTER AREA - CONCRETE PAVERS	300	SF	\$6.00	\$1,800.00
CENTER AREA - STRUCTURAL SOIL	30	CY	\$25.00	\$750.00
			SUBTOTAL	\$151,175.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$15,117.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$16,629.25
			INDIAN SHOALS ROUND-ABOUT SUBTOTAL	\$182,921.75
PRIORITY #1 - WAGES TRACT - ENTRANCE ROAD /PARKING				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (double row)	7,000	LF	\$3.50	\$24,500.00
MASS GRADING	22,000	CY	\$10.00	\$220,000.00
CONCRETE CURB & GUTTER	6,200	LF	\$15.00	\$93,000.00
ROADWAY / PARKING LOTS-ASPHALT 2"	78,000	SF	\$3.00	\$234,000.00
ROADWAY / PARKING LOTS -GAB 6"	1,500	CY	\$15.00	\$22,500.00
ROADWAY STRIPING	3,000	LF	\$0.25	\$750.00
ROADWAY LIGHTING	30	LS	\$2,000.00	\$60,000.00
RAISED CROSSWALK	2	EA	\$2,500.00	\$5,000.00
FIRE HYDRANT	1	EA	\$5,200.00	\$5,200.00
8" FIRE SERVICE	1,500	LF	\$45.00	\$67,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$778,450.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$77,845.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$85,629.50
			WAGES TRACT ENTRANCE ROAD SUBTOTAL	\$941,924.50

PRIORITY #1 - MULTI-USE FIELD (Football, Soccer, Lacrosse)	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (double row)	4,500	LF	\$3.50	\$15,750.00
MASS GRADING	200,000	CY	\$10.00	\$2,000,000.00
CONCRETE CURB & GUTTER	5,500	LF	\$15.00	\$82,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	128,000	SF	\$3.00	\$384,000.00
ROADWAY / PARKING LOTS -GAB 6"	2,400	CY	\$15.00	\$36,000.00
PARKING STRIPING	9,800	LS	\$0.25	\$2,450.00
PARKING LIGHTING	35	EA	\$2,000.00	\$70,000.00
RESTROOM / CONCESSION BUILDING (FOOTBALL FIELD)	1	LS	\$270,000.00	\$270,000.00
PLAZA AREA - CONCRETE PAVERS	5,800	SF	\$6.00	\$34,800.00
PLAZA AREA - STRUCTURAL SOIL	100	CY	\$25.00	\$2,500.00
10' WIDE LIGHTED TRACK -2" ASPHALT	17,700	SF	\$3.00	\$53,100.00
10' WIDE LIGHTED TRACK -6" GAB	330	CY	\$15.00	\$4,950.00
CONCRETE SIDEWALKS - 6' WIDE (Parking & Frontage Road)	10,700	SF	\$4.50	\$48,150.00
CONCRETE WALKWAYS - 10' WIDE	16,000	SF	\$4.50	\$72,000.00
FIELD LIGHTING	1	LS	\$150,000.00	\$150,000.00
6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	738	LF	\$25.00	\$18,450.00
BLEACHERS / SEATING	2	EA	\$25,000.00	\$50,000.00
<i>AMENITIES</i>				
PICNIC TABLES	6	EA	\$1,500.00	\$9,000.00
TRASH RECEPTACLES	6	EA	\$450.00	\$2,700.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
SOD FOR FIELD	200,000	SF	\$0.50	\$100,000.00
FOOTBALL FIELD IRRIGATION	1	LS	\$15,000.00	\$15,000.00
PA SOUND SYSTEM	1	LS	\$8,000.00	\$8,000.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
LANDSCAPE (Parking Area required trees & additional planting)	1	LS	\$100,000.00	\$100,000.00
PRESS BOX	1	LS	\$90,000.00	\$90,000.00
GOAL POSTS	2	EA	\$10,000.00	\$20,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
WATER METER	1	EA	\$1,200.00	\$1,200.00
IRRIGATION METER	1	EA	\$1,200.00	\$1,200.00
8" DIP	5,788	LF	\$40.00	\$231,520.00
JUNCTION BOX	14	EA	\$3,000.00	\$42,000.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
CLEARING AND GRUBBING	1.1	AC	\$4,500.00	\$4,950.00
SEWAGE PUMP STATION	1	LS	\$250,000.00	\$250,000.00
PIPE	450	LF	\$25.00	\$11,250.00
POTABLE WATER	450	LF	\$50.00	\$22,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$4,284,170.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$428,417.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$471,258.70
			FOOTBALL FIELD SUBTOTAL	\$5,183,845.70

PRIORITY #1 - DOG PARK	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
MASS GRADING	25,000	CY	\$10.00	\$250,000.00
EROSION CONTROL FENCING (double row)	3,600	LF	\$3.50	\$12,600.00
CONCRETE CURB & GUTTER	2,300	LF	\$15.00	\$34,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	28,500	SF	\$3.00	\$85,500.00
ROADWAY / PARKING LOTS -GAB 6"	530	CY	\$15.00	\$7,950.00
PARKING STRIPING	2,000	LS	\$0.25	\$500.00
PARKING LIGHTING	12	EA	\$2,000.00	\$24,000.00
SUBSURFACE DRAINAGE - SAND	1	LS	\$10,000.00	\$10,000.00
STRUCTURAL SOILS-	1,900	CY	\$25.00	\$47,500.00
SOD FOR TURF GRASS	100,000	SF	\$0.50	\$50,000.00
CONCRETE SIDEWALK - 6' WIDE	4,500	SF	\$4.50	\$20,250.00
STAIR ASSEMBLY	1	LS	\$2,000.00	\$2,000.00
<i>AMENITIES</i>				
6' BLACK VINYL PERIMTER FENCIENG (INCLUDING GATES)	2,000	LF	\$25.00	\$50,000.00
TRASH RECEPTACLES	5	EA	\$450.00	\$2,250.00
BENCHES	8	EA	\$1,000.00	\$8,000.00
SIGNAGE	1	LS	\$2,500.00	\$2,500.00
INFO KIOSK w/ BAG DISPENSER	1	EA	\$1,500.00	\$1,500.00
WATER FOUNTAIN w/ DOG DISH FILLER (Freeze resistant)	1	EA	\$3,000.00	\$3,000.00
DOG AGILITY EQUIPMENT	1	LS	\$20,000.00	\$20,000.00
LANDSCAPE (Parking area and play area)	1	LS	\$60,000.00	\$60,000.00
FIELD IRRIGATION	1	LS	\$15,000.00	\$15,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$10,000.00	\$10,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$10,000.00	\$10,000.00
			SUBTOTAL	\$737,050.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$73,705.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$81,075.50
			OFF-LEASH DOG PARK SUBTOTAL	\$891,830.50
PRIORITY #2 -NORTHERN ENTRANCE ROAD /PARKING	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
DECELERATION LANES	1	LS	\$20,000.00	\$20,000.00
TREE PROTECTION	5,400	LF	\$4.00	\$21,600.00
EROSION CONTROL FENCING (double row)	10,800	LF	\$3.50	\$37,800.00
VEGETATIVE CLEAR & GRUB	12	AC	\$7,000.00	\$84,000.00
MASS GRADING	80,000	CY	\$10.00	\$800,000.00
CONCRETE CURB & GUTTER	12,900	LF	\$15.00	\$193,500.00
ROADWAY / PARKING ASPHALT-2"	305,000	SF	\$3.00	\$915,000.00
ROADWAY / PARKING GAB BASE- 6"	5,600	CY	\$15.00	\$84,000.00
ROADWAY / PARKING STRIPING	19,800	LF	\$0.25	\$4,950.00
ROADWAY/ PARKING LIGHTING	55	EA	\$2,500.00	\$137,500.00
RAISED CROSSWALK (STANDARD)	6	EA	\$2,000.00	\$12,000.00
RAISED CROSSWALK (EXPANDED)	2	EA	\$5,000.00	\$10,000.00
LANDSCAPE (Parking areas)	1	LS	\$150,000.00	\$150,000.00

<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$12,000.00	\$12,000.00
			SUBTOTAL	\$2,510,350.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$251,035.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$276,138.50
			ENTRANCE ROAD SUBTOTAL	\$3,037,523.50
PRIORITY #2 - BALL FIELD COMPLEX				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	4,100	LF	\$4.00	\$16,400.00
EROSION CONTROL FENCING (double row)	8,200	LF	\$3.50	\$28,700.00
VEGETATIVE CLEAR & GRUB	16	AC	\$7,000.00	\$112,000.00
MASS GRADING	63,000	CY	\$10.00	\$630,000.00
MAIN CONCESSION / RESTROOM BUILDING	1	LS	\$350,000.00	\$350,000.00
CONCESSION / RESTROOM BUILDING	1	LS	\$200,000.00	\$200,000.00
PLAZA AREA - CONCRETE PAVERS	13,000	SF	\$6.00	\$78,000.00
STRUCTURAL SOILS	240	CY	\$25.00	\$6,000.00
PLAZA AREA - CONCRETE PAVING	28,000	SF	\$4.50	\$126,000.00
PLAZA AREA - CONCRETE WALKWAYS	52,000	SF	\$4.50	\$234,000.00
CONCRETE SIDEWALKS - 6' WIDE (at parking area & frontage road)	25,000	SF	\$4.50	\$112,500.00
12' PAVED ASPHALT TRAIL SPUR (2" ASPHALT)	11,500	SF	\$3.00	\$34,500.00
12' PAVED ASPHALT TRAIL SPUR 6" GAB)	200	CY	\$15.00	\$3,000.00
FIELD PREPARATION	7	LS	10,000	\$70,000.00
10' BLACK VINYL PERIMETER FENCING	500	LF	\$35.00	\$17,500.00
6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	4,000	LF	\$25.00	\$100,000.00
DUGOUTS	14	EA	\$2,000.00	\$28,000.00
BLEACHERS / SEATING (2 per field, 4 rows)	14	EA	\$4,500.00	\$63,000.00
BACKSTOP	7	LS	\$7,500.00	\$52,500.00
BATTING CAGES	7	EA	\$1,800.00	\$12,600.00
FIELD LIGHTING	7	LS	\$110,000.00	\$770,000.00
MAINTENANCE BINS	5	EA	\$700.00	\$3,500.00
SOD	218,000	SF	\$0.50	\$109,000.00
BASEBALL FIELD IRRIGATION	7	EA	\$10,000.00	\$70,000.00
<i>AMENITIES</i>				
PLAY STRUCTURES (various age groups)	2	EA	\$75,000.00	\$150,000.00
ENGINEERED WOOD CHIP MULCH -12" DEPTH	4,300	CF	\$7.50	\$32,250.00
TRASH RECEPTACLES	12	EA	\$450.00	\$5,400.00
PICNIC TABLES @ PLAZA AREA (Pedestal w/ Footing)	9	EA	\$1,650.00	\$14,850.00
BIKE RACKS	3	EA	\$600.00	\$1,800.00
WATER FOUNTAIN W/ DOGGIE DISH FILLER (FREEZE RESISTANT)	2	EA	\$3,000.00	\$6,000.00
BENCHES	12	EA	\$1,000.00	\$12,000.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
TREE GRATES	25	EA	\$500.00	\$12,500.00
LANDSCAPE	1	EA	\$100,000.00	\$100,000.00
<i>WATER MANAGEMENT</i>				
WATER METER	1	EA	\$1,200.00	\$1,200.00
IRRIGATION METER	1	EA	\$1,200.00	\$1,200.00
FINE GRADING	1	LS	\$10,000.00	\$10,000.00

FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$10,000.00	\$10,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$10,000.00	\$10,000.00
12000 GALLON SEPTIC TANK	1	EA	\$19,500.00	\$19,500.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	1,615	LF	\$12.00	\$19,380.00
PRIMARY ABSORPTION FIELD	8,664	LF	\$10.00	\$86,640.00
REPLACEMENT ABSORPTION FIELD	9,490	LF	\$10.00	\$94,900.00
CLEARING AND GRUBBING	2	AC	\$4,500.00	\$7,200.00
FIRE HYDRANT	1	EA	\$5,200.00	\$5,200.00
8" FIRE SERVICE	500	LF	\$45.00	\$22,500.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00
			SUBTOTAL	\$3,939,920.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$393,992.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$433,391.20
			BALLFIELD COMPLEX SUBTOTAL	\$4,767,303.20
PRIORITY #3 - COMMUNITY CENTER/ GYM / SENIOR WING				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
DECELERATION LANES	1	LS	\$20,000.00	\$20,000.00
TREE PROTECTION	4,700	LF	\$4.00	\$18,800.00
EROSION CONTROL FENCING	9,500	LF	\$3.50	\$33,250.00
VEGETATIVE CLEAR & GRUB	10	AC	\$7,000.00	\$67,900.00
MASS GRADING	20,000	CY	\$10.00	\$200,000.00
CONCRETE CURB & GUTTER	6,300	LF	\$15.00	\$94,500.00
PARKING LOTS - ASPHALT 2"	128,000	SF	\$3.00	\$384,000.00
PARKING LOTS - GAB -6"	2,400	CY	\$15.00	\$36,000.00
ROADWAY / PARKING STRIPING	6,800	LF	\$0.25	\$1,700.00
ROADWAY / PARKING LIGHTING	20	EA	\$2,000.00	\$40,000.00
RAISED CROSSWALK	1	EA	\$2,500.00	\$2,500.00
COMMUNITY CENTER / GYM / SENIOR WING	1	LS	\$3,000,000.00	\$3,000,000.00
PLAZA AREA - CONCRETE PAVING	4,000	SF	\$4.50	\$18,000.00
PLAZA AREA - CONCRETE PAVERS	8,500	SF	\$6.00	\$51,000.00
PLAZA AREA - STRUCTURAL SOIL	150	CY	\$25.00	\$3,750.00
CONCRETE SIDEWALKS 6' WIDE (@ parking area and frontage road)	7,700	SF	\$4.50	\$34,650.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	4,200	SF	\$3.00	\$12,600.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -6" GAB	75	CY	\$15.00	\$1,125.00
<i>AMENITIES</i>				
PICNIC TABLES	6	EA	\$1,000.00	\$6,000.00
BENCHES	12	EA	\$1,000.00	\$12,000.00
SIGNAGE	1	LS	\$10,000.00	\$10,000.00
BIKE RACKS	2	EA	\$600.00	\$1,200.00
TRASH RECEPTACLES	12	EA	\$450.00	\$5,400.00
LANDSCAPE	1	LS	\$30,000.00	\$30,000.00

<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
13000 GALLON SEPTIC TANK	1	EA	\$21,000.00	\$21,000.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	274	LF	\$12.00	\$3,288.00
PRIMARY ABSORPTION FIELD	4,453	LF	\$10.00	\$44,530.00
REPLACEMENT ABSORPTION FIELD	4,453	LF	\$10.00	\$44,530.00
CLEARING AND GRUBBING	0.8	AC	\$4,500.00	\$3,690.00
PIPE	200	LF	\$25.00	\$5,000.00
POTABLE WATER	200	LF	\$50.00	\$10,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$4,288,613.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$428,861.30
			Contingency for Master Plan Level Cost Estimate (10%)	\$471,747.43
			COMMUNITY CENTER / GYM/ SENIOR WING SUBTOTAL	\$5,189,221.73
PRIORITY #4 - SOCCER COMPLEX				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING	5,000	LF	\$3.50	\$17,500.00
MASS GRADING	98,000	CY	\$10.00	\$980,000.00
PARKING LOTS - 2" ASPHALT	180,000	SF	\$3.00	\$540,000.00
PARKING LOTS - 6" GAB	3,333	CY	\$15.00	\$49,995.00
CONCRETE CURB & GUTTER	6,700	LF	\$15.00	\$100,500.00
RAISED CROSSWALK	2	EA	\$2,500.00	\$5,000.00
PARKING STRIPING	11,500	LF	\$0.25	\$2,875.00
PARKING LIGHTING	30	EA	\$2,000.00	\$60,000.00
CONCRETE SIDEWALKS - 6' WIDE	8,000	SF	\$4.50	\$36,000.00
GRANITE FACED RETAINING WALL(S)	500	LF	\$175.00	\$87,500.00
SUBSURFACE DRAINAGE - SAND	4	EA	\$6,000.00	\$24,000.00
SOD	380,000	SF	\$0.50	\$190,000.00
FIELD LIGHTING	4	EA	\$50,000.00	\$200,000.00
SOCCER FIELD IRRIGATION	4	EA	\$15,000.00	\$60,000.00
MAIN RESTROOM / CONCESSION BUILDING	1	LS	\$400,000.00	\$400,000.00
PLAZA AREA - CONCRETE PAVERS	21,000	SF	\$6.00	\$126,000.00
PLAZA AREA - STRUCTURAL SOIL	390	CY	\$25.00	\$9,750.00
GRANITE FACED SEATING / RETAINING WALL	360	LF	\$175.00	\$63,000.00
LIGHTING	6	EA	\$2,000.00	\$12,000.00
PLAZA LANDSCAPE	1	LS	\$8,000.00	\$8,000.00
<i>AMENITIES</i>				
PLAY STRUCTURES (various age groups)	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH -12" DEPTH	5,000	CF	\$7.50	\$37,500.00
TRASH RECEPTACLES	8	EA	\$450.00	\$3,600.00
BENCHES	6	EA	\$1,000.00	\$6,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
PICNIC TABLES	6	EA	\$1,000.00	\$6,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00

6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	5,000	LF	\$25.00	\$125,000.00
MAINTENANCE BINS	2	EA	\$700.00	\$1,400.00
SOCCER GOALS	8	EA	\$2,000.00	\$16,000.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$3,419,220.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$341,922.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$376,114.20
			SOCCER COMPLEX SUBTOTAL	\$4,137,256.20
PRIORITY #5 - DISC GOLF COURSE				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	2,000	LF	\$4.00	\$8,000.00
EROSION CONTROL FENCING (Double Row)	4,000	LF	\$3.50	\$14,000.00
SELECTIVE CLEARING	1	LS	\$2,500.00	\$2,500.00
VEGETATIVE CLEAR & GRUB	2	AC	\$4,600.00	\$9,200.00
MASS GRADING	8,200	CY	\$10.00	\$82,000.00
CONCRETE CURB & GUTTER	1,700	LF	\$15.00	\$25,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	34,000	SF	\$3.00	\$102,000.00
ROADWAY / PARKING LOTS -GAB 6"	600	CY	\$15.00	\$9,000.00
ROADWAY / PARKING STRIPING	2,500	LF	\$0.25	\$625.00
ROADWAY / PARKING LIGHTING	7	EA	\$2,000.00	\$14,000.00
6" WIDE - MULCH NATURE TRAIL (4" MULCH)	13,300	SF	\$1.50	\$19,950.00
6' WIDE - MULCH NATURE TRAIL (6" GAB)	245	CY	\$15.00	\$3,675.00
12' WIDE- ASPHALT CONNECTOR TRAIL (2" ASPHALT)	10,000	SF	\$3.00	\$30,000.00
12' WIDE- ASPHALT CONNECTOR TRAIL (6" GAB)	185	CY	\$15.00	\$2,775.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	8	EA	\$450.00	\$3,600.00
BENCHES	6	EA	\$1,000.00	\$6,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
DISC GOLF EQUIPMENT (Tees and Baskets)	1	LS	\$30,000.00	\$30,000.00
PEDESTRIAN BRIDGE	2	LS	\$25,000.00	\$50,000.00
LANDSCAPE (Parking Area)	1	LS	\$10,000.00	\$10,000.00
			SUBTOTAL	\$428,425.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$42,842.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$47,126.75
			DISC GOLF SUBTOTAL	\$518,394.25
PRIORITY #5 - TENNIS COMPLEX				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	2,000	LF	\$4.00	\$8,000.00
EROSION CONTROL FENCING	4,000	LF	\$3.50	\$14,000.00
VEGETATIVE CLEAR & GRUB	4	AC	\$4,600.00	\$18,400.00
MASS GRADING	8,900	CY	\$10.00	\$89,000.00

CONCRETE CURB & GUTTER	1,000	LF	\$15.00	\$15,000.00
ROADWAY / PARKING LOTS-ASPHALT 2"	19,000	SF	\$3.00	\$57,000.00
ROADWAY / PARKING LOTS -GAB 6"	350	CY	\$15.00	\$5,250.00
PARKING STRIPING	600	LF	\$0.25	\$150.00
PARKING LIGHTING	4	EA	\$2,000.00	\$8,000.00
<i>TENNIS COURTS</i>				
TENNIS CONCESSIONS & RESTROOMS	1	LS	\$100,000.00	\$100,000.00
TENNIS COURTS (INCLUDES EQUIPMENT)	3	PAIR	\$55,000.00	\$165,000.00
SITE ELECTRICAL	1	LS	\$10,000.00	\$10,000.00
10' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	1,500	LF	\$35.00	\$52,500.00
COURT LIGHTING	3	PAIR	\$15,000.00	\$45,000.00
CONCRETE SIDEWALK - 6' WIDE (at parking & frontage)	8,500	SF	\$4.50	\$38,250.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
PLAZA AREA - CONCRETE PAVERS	14,000	SF	\$6.00	\$84,000.00
PLAZA AREA - STRUCTURAL SOIL	250	CY	\$25.00	\$6,250.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	4	EA	\$450.00	\$1,800.00
BIKE RACKS	1	EA	\$600.00	\$600.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,500.00	\$2,500.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
LANDSCAPE	1	LS	\$10,000.00	\$10,000.00
SUNSHADES	1	LS	\$40,000.00	\$40,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	350	LF	\$25.00	\$8,750.00
POTABLE WATER	350	LF	\$50.00	\$17,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$878,950.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$87,895.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$96,684.50
			TENNIS AREA SUBTOTAL	\$1,063,529.50
PRIORITY #6 - BMX FACILITY				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	2,000	LF	\$4.00	\$8,000.00
EROSION CONTROL FENCING (Double Row)	4,000	LF	\$3.50	\$14,000.00
VEGETATIVE CLEAR & GRUB	9	AC	\$4,600.00	\$41,400.00
MASS GRADING	27,000	CY	\$10.00	\$270,000.00
DECELERATION LANE	1	LS	\$20,000.00	\$20,000.00
CONCRETE CURB & GUTTER	3,100	LF	\$15.00	\$46,500.00
PARKING LOTS - ASPHALT 2"	77,000	SF	\$3.50	\$269,500.00
PARKING LOTS - GAB 6"	1,400	CY	\$15.00	\$21,000.00
PARKING STRIPING	3,800	LF	\$0.25	\$950.00
PARKING LIGHTING	15	EA	\$2,000.00	\$30,000.00
CONCRETE SIDEWALKS 6' WIDE	6,000	SF	\$4.50	\$27,000.00
PLAZA AREA - CONCRETE PAVING	19,000	SF	\$4.50	\$85,500.00

BMX TRACK	1	LS	\$75,000.00	\$75,000.00
STARTING GATE SYSTEM	1	LS	\$5,000.00	\$5,000.00
PA SYSTEM	1	LS	\$900.00	\$900.00
CONCESSION RESTROOM (Gwinnett Standard)	1	LS	\$110,000.00	\$110,000.00
ANNOUNCING TOWER	1	LS	\$30,000.00	\$30,000.00
START LINE COVERED PLATFORM	1	LS	\$2,500.00	\$2,500.00
6' BLACK VINYL PERIMETER FENCING (INCLUDING GATES)	1,100	LF	\$25.00	\$27,500.00
TRACK LIGHTING	6	EA	\$7,500.00	\$45,000.00
BLEACHERS	4	EA	\$5,000.00	\$20,000.00
MOTO BOARD	1	LS	\$200.00	\$200.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	3	EA	\$450.00	\$1,350.00
BIKE RACKS	3	EA	\$600.00	\$1,800.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
WATER FOUNTAIN (FREEZE RESISTANT)	2	EA	\$3,000.00	\$6,000.00
LANDSCAPE	1	LS	\$20,000.00	\$20,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
2000 GALLON SEPTIC TANK	1	EA	\$3,000.00	\$3,000.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	418	LF	\$12.00	\$5,016.00
PRIMARY ABSORPTION FIELD	511	LF	\$10.00	\$5,110.00
REPLACEMENT ABSORPTION FIELD	511	LF	\$10.00	\$5,110.00
CLEARING AND GRUBBING	0.1	AC	\$4,500.00	\$450.00
PIPE	250	LF	\$25.00	\$6,250.00
POTABLE WATER	250	LF	\$50.00	\$12,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$15,000.00	\$15,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$15,000.00	\$15,000.00
			SUBTOTAL	\$1,294,736.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$129,473.60
			Contingency for Master Plan Level Cost Estimate (10%)	\$142,420.96
			BMX FACILITY SUBTOTAL	\$1,566,630.56
PRIORITY #7 - ADA TRAIL LOOP				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
FINE GRADING	1	LS	\$2,000.00	\$2,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	63,500	SF	\$3.00	\$190,500.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -6" GAB	1,500	CY	\$15.00	\$22,500.00
12' WIDE - CONCRETE TRAIL (WAGES FLOODWAY)	36,700	SF	\$4.50	\$165,150.00
PEDESTRIAN BRIDGE (230') -Connection to Conservation Park	1	LS	\$100,000.00	\$100,000.00
			SUBTOTAL	\$480,150.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$48,015.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$52,816.50
			ADA TRAIL LOOP SUBTOTAL	\$580,981.50

PRIORITY #8 - CRICKET PITCH	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING	5,000	LF	\$3.50	\$17,500.00
MASS GRADING	28,000	CY	\$10.00	\$280,000.00
PARKING LOTS - 2" ASPHALT	64,600	SF	\$3.00	\$193,800.00
PARKING LOTS - 6" GAB	1,200	CY	\$15.00	\$18,000.00
CONCRETE CURB & GUTTER	2,800	LF	\$15.00	\$42,000.00
PARKING STRIPING	5,000	LS	\$0.25	\$1,250.00
PARKING LIGHTING	13	EA	\$2,000.00	\$26,000.00
CONCRETE SIDEWALKS - 6' WIDE	2,300	SF	\$4.50	\$10,350.00
SUBSURFACE DRAINAGE - SAND	1	EA	\$12,000.00	\$12,000.00
SOD	180,000	SF	\$0.50	\$90,000.00
FIELD LIGHTING	1	EA	\$100,000.00	\$100,000.00
CRICKET FIELD IRRIGATION	1	EA	\$15,000.00	\$15,000.00
RESTROOM / CONCESSION BUILDING	1	LS	\$200,000.00	\$200,000.00
BLEACHERS	2	EA	\$25,000.00	\$50,000.00
PLAZA AREA - CONCRETE PAVERS	3,100	SF	\$6.00	\$18,600.00
PLAZA AREA - STRUCTURAL SOIL	57	CY	\$25.00	\$1,425.00
LIGHTING	5	EA	\$2,000.00	\$10,000.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	4	EA	\$450.00	\$1,800.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
PICNIC TABLES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$8,000.00	\$8,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$8,000.00	\$8,000.00
			SUBTOTAL	\$1,227,325.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$122,732.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$135,005.75
			CRICKET PITCH SUBTOTAL	\$1,485,063.25
PRIORITY #9 - TEEN RECREATION AREA	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION FENCING	1,900	LF	\$4.00	\$7,600.00
EROSION CONTROL FENCING (double row)	3,800	LF	\$2.00	\$7,600.00
VEGETATIVE CLEAR & GRUB	4	AC	\$7,000.00	\$25,690.00
MASS GRADING	15,000	CY	\$10.00	\$150,000.00
RESTROOM BUILDING	1	LS	\$110,000.00	\$110,000.00
FREESTYLE SKATING AREA	1	LS	\$300,000.00	\$300,000.00
HALF COURT BASKETBALL (INCLUDES EQUIPMENT)	2	EA	\$30,000.00	\$60,000.00
FULL COURT BASKETBALL (INCLUDES EQUIPMENT)	2	EA	\$60,000.00	\$120,000.00
SAND VOLLEYBALL COURT	3	EA	\$10,000.00	\$30,000.00
8' WIDE - CONCRETE CONNECTOR TRAIL	5,000	SF	\$4.50	\$22,500.00
CONCRETE SIDEWALKS 6' WIDE	5,300	SF	\$4.50	\$23,850.00

PLAZA - CONCRETE PAVERS	4,600	SF	\$6.00	\$27,600.00
STRUCTURAL SOILS	85	CY	\$25.00	\$2,125.00
FREESTYLE SKATE LIGHTING	10	EA	\$2,500.00	\$25,000.00
SOD (Lawn Area)	12,000	SF	\$0.50	\$6,000.00
<i>AMENITIES</i>				
PICNIC TABLES	6	EA	\$1,500.00	\$9,000.00
BENCHES	9	EA	\$1,000.00	\$9,000.00
BIKE RACKS	3	EA	\$600.00	\$1,800.00
TRASH RECEPTACLES	10	EA	\$450.00	\$4,500.00
WATER FOUNTAIN (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
SIGNAGE	1	LS	\$5,000.00	\$5,000.00
LANDSCAPE	1	EA	\$30,000.00	\$30,000.00
IRRIGATION	1	LS	\$4,000.00	\$4,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
PIPE	600	LF	\$25.00	\$15,000.00
POTABLE WATER	600	LF	\$50.00	\$30,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$5,000.00	\$5,000.00
FOREBAY FILTRATION POND	1	LS	\$3,000.00	\$3,000.00
MICRO POOL	1	LS	\$3,000.00	\$3,000.00
PERMANENT GRASSING	1	LS	\$5,000.00	\$5,000.00
			SUBTOTAL	\$1,074,265.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$107,426.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$118,169.15
			TEEN RECREATION AREA SUBTOTAL	\$1,299,860.65
PRIORITY #10 - PEDESTRIAN ONLY NATURE TRAIL				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	3,000	LF	\$4.00	\$12,000.00
EROSION CONTROL FENCING (Double Row)	6,000	LF	\$3.50	\$21,000.00
VEGETATIVE CLEAR & GRUB	4	AC	\$4,600.00	\$18,400.00
MASS GRADING	2,500	CY	\$10.00	\$25,000.00
DECELERATION LANES	1	LS	\$20,000.00	\$20,000.00
CONCRETE CURB & GUTTER	2,300	LF	\$15.00	\$34,500.00
ROADWAY / PARKING LOTS-ASPHALT 2"	50,000	SF	\$3.00	\$150,000.00
ROADWAY / PARKING LOTS -GAB 6"	925	CY	\$15.00	\$13,875.00
ROADWAY / PARKING STRIPING	2,000	LF	\$0.25	\$500.00
ROADWAY / PARKING LIGHTING	5	EA	\$2,000.00	\$10,000.00
CONCRETE SIDEWALKS 6' WIDE	7,500	SF	\$4.50	\$33,750.00
20' SHELTER	1	EA	\$20,000.00	\$20,000.00
6" WIDE - MULCH NATURE TRAIL (4" MULCH)	276,000	SF	\$1.50	\$414,000.00
6' WIDE - MULCH NATURE TRAIL (6" GAB)	5,100	CY	\$15.00	\$76,500.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	2	EA	\$450.00	\$900.00
BENCHES	10	EA	\$1,000.00	\$10,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
TRAIL SIGNAGE	1	LS	\$5,000.00	\$5,000.00
INFORMATION KIOSKS	3	EA	\$1,500.00	\$4,500.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$10,000.00	\$10,000.00

<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$5,000.00	\$5,000.00
FOREBAY FILTRATION POND	1	LS	\$8,000.00	\$8,000.00
MICRO POOL	1	LS	\$8,000.00	\$8,000.00
PERMANENT GRASSING	1	LS	\$5,000.00	\$5,000.00
			SUBTOTAL	\$906,525.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$90,652.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$99,717.75
			PEDESTRIAN ONLY NATURE TRAIL SUBTOTAL	\$1,096,895.25
PRIORITY #11 - LAKE AMENITY	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
EROSION CONTROL FENCING (Double row)	3,200	LF	\$3.50	\$11,200.00
MASS GRADING	53,000	CY	\$10.00	\$530,000.00
GROUNDWATER WELL	1	LS	\$75,000.00	\$75,000.00
PARKING LOTS - 2" ASPHALT	37,000	SF	\$3.00	\$111,000.00
PARKING LOTS - 6" GAB	700	CY	\$15.00	\$10,500.00
CONCRETE CURB & GUTTER	1,600	LF	\$15.00	\$24,000.00
PARKING STRIPING	2,100	LS	\$0.25	\$525.00
PARKING LIGHTING	5	EA	\$2,000.00	\$10,000.00
CONCRETE SIDEWALKS - 6' WIDE	3,600	SF	\$4.50	\$16,200.00
POND SPILLWAY (Concrete gutter)	1	LS	\$10,000.00	\$10,000.00
LANDSCAPE (Stream Garden, Bank Stabilization etc)	1	LS	\$100,000.00	\$100,000.00
<i>AMENITIES</i>				
PLAY STRUCTURES (various age groups)	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH - 12" DEPTH	5,000	CF	\$7.50	\$37,500.00
INTERACTIVE "STREAM" AMENITY	1	LS	\$20,000.00	\$20,000.00
TRASH RECEPTACLES	4	EA	\$450.00	\$1,800.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
BENCH SWING	6	EA	\$1,800.00	\$10,800.00
BIKE RACKS	1	EA	\$600.00	\$600.00
PICNIC TABLES	4	EA	\$1,000.00	\$4,000.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
COVERED SHELTER - 20'	1	LS	\$20,000.00	\$20,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$5,000.00	\$5,000.00
PIPE	100	LF	\$25.00	\$2,500.00
POTABLE WATER	100	LF	\$50.00	\$5,000.00
			SUBTOTAL	\$1,111,625.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$111,162.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$122,278.75
			LAKE AMENITY SUBTOTAL	\$1,345,066.25
PRIORITY #12 - DESTINATION PLAYGROUND AREA / PICNIC AREA	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	1,300	LF	\$4.00	\$5,200.00
EROSION CONTROL FENCING (Double Row)	2,600	LF	\$3.50	\$9,100.00
VEGETATIVE CLEAR & GRUB	2	AC	\$4,600.00	\$6,900.00
MASS GRADING	10,000	CY	\$10.00	\$100,000.00
GRANITE FACED RETAINING WALL	640	LF	\$175.00	\$112,000.00

COVERED SHELTER - 20'	1	LS	\$25,000.00	\$25,000.00
60' PICNIC PAVILION	1	LS	\$75,000.00	\$75,000.00
8' PAVED ASPHALT TRAIL SPUR (2" ASPHALT)	3,000	SF	\$3.00	\$9,000.00
8' PAVED ASPHALT TRAIL SPUR 6" GAB)	55	CY	\$15.00	\$825.00
CONCRETE SIDEWALKS - 6' WIDE (at parking area)	1,200	SF	\$4.50	\$5,400.00
12' PAVED ASPHALT TRAIL SPUR (2" ASPHALT)	7,500	SF	\$3.00	\$22,500.00
12' PAVED ASPHALT TRAIL SPUR 6" GAB)	140	CY	\$15.00	\$2,100.00
<i>AMENITIES</i>				
PLAY STRUCTURES	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH -12" DEPTH	5,000	CF	\$7.50	\$37,500.00
TRASH RECEPTACLES	3	EA	\$450.00	\$1,350.00
PICNIC TABLES @ PAVILION	12	EA	\$1,500.00	\$18,000.00
BENCH SWINGS	3	EA	\$1,800.00	\$5,400.00
SIGNAGE	1	LS	\$2,000.00	\$2,000.00
BIKE RACKS	1	EA	\$600.00	\$600.00
GRILLS (Community w/ Tree Grate)	4	EA	\$1,500.00	\$6,000.00
HOT COAL BIN (1 per 2 grills)	2	EA	\$300.00	\$600.00
BENCHES	4	EA	\$1,000.00	\$4,000.00
LANDSCAPE	1	LS	\$10,000.00	\$10,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$5,000.00	\$5,000.00
1000 GALLON SEPTIC TANK	1	EA	\$1,200.00	\$1,200.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	313	LF	\$12.00	\$3,756.00
PRIMARY ABSORPTION FIELD	255	LF	\$10.00	\$2,550.00
REPLACEMENT ABSORPTION FIELD	255	LF	\$10.00	\$2,550.00
CLEARING AND GRUBBING	0.1	AC	\$4,500.00	\$450.00
PIPE	1,000	LF	\$25.00	\$25,000.00
POTABLE WATER	1,000	LF	\$50.00	\$50,000.00
			SUBTOTAL	\$650,181.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$65,018.10
			Contingency for Master Plan Level Cost Estimate (10%)	\$71,519.91
			DESTINATION PLAYGROUND AREA / PICNIC AREA SUBTOTAL	\$786,719.01
PRIORITY #13-PRIMITIVE CAMPING AREA				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	5,000	LF	\$4.00	\$20,000.00
EROSION CONTROL FENCING (Double Row)	10,000	LF	\$3.50	\$35,000.00
VEGETATIVE CLEAR & GRUB	2	AC	\$4,600.00	\$10,580.00
MASS GRADING	4,100	CY	\$10.00	\$41,000.00
CONCRETE CURB & GUTTER	1,400	LF	\$15.00	\$21,000.00
ROADWAY / PARKING LOTS-ASPHALT 2"	25,000	SF	\$3.00	\$75,000.00
ROADWAY / PARKING LOTS -GAB 6"	460	CY	\$15.00	\$6,900.00
ROADWAY / PARKING STRIPING	1,400	LF	\$0.25	\$350.00
ROADWAY / PARKING LIGHTING	6	EA	\$2,000.00	\$12,000.00
BATHHOUSE	1	LS	\$350,000.00	\$350,000.00
CONCRETE SIDEWALKS 6' WIDE	2,100	SF	\$4.50	\$9,450.00
12' WIDE - ASPHALT MULTI-USE TRAIL LOOP - 2" ASPHALT	5,500	SF	\$3.00	\$16,500.00
12' WIDE - ASPHALT MULTI-USE TRAIL LOOP - 6" GAB	100	CY	\$15.00	\$1,500.00
6' WIDE MULCH TRAILS (4" Mulch)	2,000	SF	\$1.50	\$3,000.00
6' WIDE MULCH TRAILS (6" GAB)	37	CY	\$15.00	\$555.00

CAMPsites (Includes fine grading and site definition)	30	EA	\$400.00	\$12,000.00
AMPHITHEATER - GRANITE FACED SEATING WALLS	300	LF	\$175.00	\$52,500.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	5	EA	\$450.00	\$2,250.00
PICNIC TABLES	10	EA	\$1,000.00	\$10,000.00
BIKE RACKS	2	EA	\$600.00	\$1,200.00
WATER FOUNTAIN W/ DOGGIE DISH FILLER (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
BENCHES	2	EA	\$500.00	\$1,000.00
FIRE CIRCLE	6	EA	\$300.00	\$1,800.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
LANDSCAPE	1	LS	\$20,000.00	\$20,000.00
MEADOW SEEDING	260,000	SF	\$0.04	\$10,400.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
8000 GALLON SEPTIC TANK	1	EA	\$14,400.00	\$14,400.00
6" PVC SEPTIC FEEDER LINE	258	LF	\$12.00	\$3,096.00
PRIMARY ABSORPTION FIELD	3,614	LF	\$10.00	\$36,140.00
REPLACEMENT ABSORPTION FIELD	3,614	LF	\$10.00	\$36,140.00
CLEARING AND GRUBBING	0.7	AC	\$4,500.00	\$2,970.00
PIPE	900	LF	\$25.00	\$22,500.00
POTABLE WATER	900	LF	\$50.00	\$45,000.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$8,000.00	\$8,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$8,000.00	\$8,000.00
			SUBTOTAL	\$932,231.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$93,223.10
			Contingency for Master Plan Level Cost Estimate (10%)	\$102,545.41
			PRIMITIVE CAMPING SUBTOTAL	\$1,127,999.51
PRIORITY #14-INTERACTIVE FOUNTAIN	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
TREE PROTECTION	4,300	LF	\$4.00	\$17,200.00
EROSION CONTROL FENCING	8,600	LF	\$3.50	\$30,100.00
VEGETATIVE CLEAR & GRUB	5	AC	\$7,000.00	\$35,000.00
MASS GRADING	8,500	CY	\$10.00	\$85,000.00
CONCRETE CURB & GUTTER	1,500	LF	\$15.00	\$22,500.00
PARKING LOTS - ASPHALT 2"	35,000	SF	\$3.00	\$105,000.00
PARKING LOTS - GAB 6"	650	CY	\$15.00	\$9,750.00
ROADWAY / PARKING STRIPING	1,500	LF	\$0.25	\$375.00
ROADWAY / PARKING LIGHTING	6	EA	\$2,000.00	\$12,000.00
CONCRETE SIDEWALKS - 6' WIDE (at parking area & frontage road)	19,000	SF	\$4.50	\$85,500.00
PLAZA AREA - CONCRETE PAVERS	14,700	SF	\$6.00	\$88,200.00
PLAZA AREA - STRUCTURAL SOILS	270	CY	\$25.00	\$6,750.00
GRANITE FACED RETAINING WALL	200	LF	\$175.00	\$35,000.00
GRANITE FACED SEATING WALL (18" height)	150	LF	\$175.00	\$26,250.00
CONCESSIONS / BATHHOUSE	1	LS	\$250,000.00	\$250,000.00
INTERACTIVE FOUNTAIN	1	LS	\$350,000.00	\$350,000.00
60' RENTAL PAVILION	1	EA	\$75,000.00	\$75,000.00
20' SHELTER	2	EA	\$30,000.00	\$60,000.00
12' WIDE - ASPHALT MULTI USE TRAIL LOOP -2" ASPHALT	40,000	SF	\$3.00	\$120,000.00
12' WIDE - ASPHALT MULTI USE TRAIL LOOP -6" GAB	740	CY	\$15.00	\$11,100.00

<i>AMENITIES</i>				
PLAY STRUCTURES (various age groups)	1	EA	\$100,000.00	\$100,000.00
ENGINEERED WOOD CHIP MULCH -12" DEPTH	3,000	CF	\$7.50	\$22,500.00
TRASH RECEPTACLES	6	EA	\$450.00	\$2,700.00
PICNIC TABLES	6	EA	\$1,000.00	\$6,000.00
BIKE RACKS	2	EA	\$600.00	\$1,200.00
WATER FOUNTAIN W/ DOGGIE DISH FILLER (FREEZE RESISTANT)	1	EA	\$3,000.00	\$3,000.00
BENCHES	9	EA	\$1,000.00	\$9,000.00
6' BLACK VINYL FENCING (Between playareas and roadway)	800	LF	\$25.00	\$20,000.00
PLAZA - SUNSHADES	1	LS	\$40,000.00	\$40,000.00
PLAYGROUND - SUNSHADES	1	LS	\$20,000.00	\$20,000.00
EMERGENCY PHONE KIOSK	1	EA	\$4,000.00	\$4,000.00
MEADOW SEEDING	30,000	SF	\$0.04	\$1,200.00
LAWN AREA - SOD	100,000	SF	\$0.50	\$50,000.00
LANDSCAPE	1	LS	\$50,000.00	\$50,000.00
IRRIGATION	1	LS	\$10,000.00	\$10,000.00
<i>SITE UTILITIES</i>				
SITE ELECTRICAL	1	LS	\$25,000.00	\$25,000.00
1000 GALLON SEPTIC TANK	1	EA	\$1,200.00	\$1,200.00
GREASE TRAP	1	EA	\$1,200.00	\$1,200.00
PRIMARY ABSORPTION FIELD	274	LF	\$10.00	\$2,740.00
REPLACEMENT ABSORPTION FIELD	274	LF	\$10.00	\$2,740.00
CLEARING AND GRUBBING	0.1	AC	\$4,500.00	\$450.00
PIPE	450	LF	\$25.00	\$11,250.00
POTABLE WATER	450	LF	\$50.00	\$22,500.00
<i>WATER MANAGEMENT</i>				
FINE GRADING	1	LS	\$8,000.00	\$8,000.00
FOREBAY FILTRATION POND	1	LS	\$5,000.00	\$5,000.00
MICRO POOL	1	LS	\$5,000.00	\$5,000.00
PERMANENT GRASSING	1	LS	\$8,000.00	\$8,000.00
			SUBTOTAL	\$1,857,405.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$185,740.50
			Contingency for Master Plan Level Cost Estimate (10%)	\$204,314.55
			INTERACTIVE FOUNTAIN SUBTOTAL	\$2,247,460.05
PRIORITY #15 -COMMUNITY PARK TRAIL SYSTEM				
	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
FINE GRADING	1	LS	\$98,000.00	\$98,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	565,000	SF	\$3.00	\$1,695,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -6" GAB	10,500	CY	\$15.00	\$157,500.00
TRAIL UNDERPASS	1	LS	\$350,000.00	\$350,000.00
<i>AMENITIES</i>				
TRAIL EDGE BENCHES (1 EVERY 3000')	15	EA	\$1,000.00	\$15,000.00
TRASH RECEPTACLES	15	EA	\$450.00	\$6,750.00
BENCH SWING	10	EA	\$1,800.00	\$18,000.00
SIGNAGE	1	LS	\$20,000.00	\$20,000.00
REMOVABLE BOLLARDS	1	LS	\$10,000.00	\$10,000.00
PEDESTRIAN BRIDGE	5	EA	\$25,000.00	\$125,000.00
			SUBTOTAL	\$2,495,250.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$249,525.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$274,477.50
			HARBINS TRAIL SYSTEM SUBTOTAL	\$3,019,252.50

PRIORITY #15 - CONSERVATION PARK TRAIL CONNECTION	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
FINE GRADING	1	LS	\$100,000.00	\$100,000.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -2" ASPHALT	16,900	SF	\$3.00	\$50,700.00
12' WIDE - ASPHALT MULTI USE TRAIL SECTION -6" GAB	312	CY	\$15.00	\$4,680.00
TRAIL UNDERPASS	1	LS	\$350,000.00	\$350,000.00
<i>AMENITIES</i>				
TRASH RECEPTACLES	15	EA	\$450.00	\$6,750.00
SIGNAGE	1	LS	\$10,000.00	\$10,000.00
			SUBTOTAL	\$522,130.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$52,213.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$57,434.30
			CONSERVATION PARK TRAIL CONNECTION SUBTOTAL	\$631,777.30
MISCELLANEOUS	# OF UNITS	UNITS	COST/UNIT	ITEM TOTAL
CONSTRUCTION SIGN (Contingent upon number of phases)	1	LS	\$400.00	\$400.00
NEW PARK ENTRANCE SIGN	7	LS	\$5,000.00	\$35,000.00
INFORMATION KIOSKS (7 Kiosks)	1	LS	\$15,000.00	\$15,000.00
SIGNAGE (PARK RULES, TRAFFIC-PARKING)	1	LS	\$30,000.00	\$30,000.00
NPDES (Contingent upon number of phases)	1	LS	\$5,000.00	\$5,000.00
			SUBTOTAL	\$85,400.00
			Mobilization, Fees, Bonds, etc (10% Total)	\$8,540.00
			Contingency for Master Plan Level Cost Estimate (10%)	\$9,394.00
			RENOVATIONS / IMPROVEMENTS SUBTOTAL	\$103,334.00
			DEVELOPMENT SUBTOTAL	\$41,204,790.66
			10% DESIGN, ENGINEERING AND PROGRAM MANAGEMENT FEES	\$4,120,479.07
			PROJECT TOTAL	\$45,325,269.73
Note: Totals reflecting quantities different from those listed above, have not been approved by jB+a, inc. (jB+a, inc Project Total : \$45,325,269.73 - 10.08.09)				
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: Community Input Tabulations and Comments

Refer to the attached Spreadsheets for a summary of the tabulated Community interests and concerns information collected at the initial public meeting.

Harbins Community Park Site Master Plan

Community Interest Form Tabulations

Gwinnett Dept. of Community Services

October 24, 2008

jB+a park design studio

Program or Facility	Times Mentioned	Ranking					
		First	Second	Third	Fourth	Fifth	No Rank
Playground	27	5	4	6	4	5	3
Multi-Purpose Trails	26	5	5	4	4	4	4
Baseball Fields	20	3	9	2	2	1	3
Picnic Area	19	2	4	4	2	3	4
Football Fields	18	9	4	2	2		1
Disc Golf	16	10	1	0	0	1	4
Softball Fields	11	3	5	2	1	0	0
Natural Surface Trails	11	3	4	2	2	0	0
Skate Park	10	0	4	2	1	2	1
Teen Facilities	9	0	1	0	2	4	2
Mountain Bike Trails	8	1	1	3	2	0	1
Swimming	7	0	1	2	1	0	3
BMX Track	7	5	0	1	0	0	1
Soccer	7	0	2	2	1	0	2
Indoor Basketball	6	1	2	1	1	0	1
Outdoor Basketball	6	1	0	1	2	0	2
Greenway Linkages	6	0	0	2	2	0	2
Hiking/Walking Trails	5	0	3	1	1	0	0
Tennis	5	0	2	0	2	0	1
ATV/4-wheel Trails	4	1	0	2	0	0	1
Multi-purpose Fields	4	0	1	0	0	0	3
Youth Sports Complexes	4	1	0	0	1	2	0
Restrooms	4	1	0	0	1	0	2
Camping	3	0	0	1	0	1	1
Volleyball	3	0	0	2	0	0	1
Cricket Grounds	3	2	0	0	0	0	1
Lacrosse	3	2	0	0	0	1	0
Nature Center	2	1	1	0	0	0	0
Friday Movies	2	0	1	0	0	0	1
Pond	2	0	0	0	0	1	1
Picnic Pavillions	2	0	0	0	0	0	2
Mountain Boarding Area	2	0	0	1	1	0	0
Woodsman Activities	2	0	0	0	0	0	2
Bocce Ball	1	1	0	0	0	0	0
Amphitheater	1	0	0	0	0	1	0
Classrooms	1	1	0	0	0	0	0
Observatory	1	0	0	0	0	0	1
Police on Horseback	1	0	0	0	0	0	1
Daycare Center	1	0	1	0	0	0	0
Puppet Theater	1	0	0	0	0	1	0
Bleachers	1	0	0	0	0	1	0
Announcement Stand	1	0	0	0	0	1	0
Vending Machines	1	0	0	1	0	0	0
Water Slides	1	0	0	0	0	0	1
Fitness Area	1	0	0	0	0	0	1
Sports Store	1	0	0	0	0	0	1
Historical Museum	1	0	0	0	0	0	1
Bulletin Board	1	0	0	0	0	0	1
Interpretive Signage (Nature and Historic)	1	0	0	0	0	0	1
Field Hockey	1	0	1	0	0	0	0
Dog Park	1	0	0	0	1	0	0
Roller Hockey	1	0	0	0	0	1	0
Grills	1	0	0	0	1	0	0
Greenspace	1	0	1	0	0	0	0
Kayaking	1	0	0	1	0	0	0

Harbins Community Park Site Master Plan

Park Concerns Form Tabulations

Gwinnett Dept. of Community Services

October 24, 2008

jB+a park design studio

Community Concern	Times Mentioned	Ranking
Security	9	1
Increased Traffic	7	2
New Hope/Luke Edwards Roads Intersection	7	2
Length of tim until facilities available for youth sports	4	4
Light Pollution	3	5
Environmental Impacts	3	5
Noise	3	5
User conflicts of trails and disc golf	3	5
Wildlife Impacts	2	9
Location of facilities near existing homes	2	9
Keeping out ATV's and motorcycles	2	9
Adequate Parking	2	9
Buffers	1	13
Property reassments	1	13
Trespassing on adjacent property	1	13

Comments from the Harbins Community Park Site Master Plan Community Input Meeting 10.23.08

1. We would like to see a legal place for families to enjoy ATV and 4wheel drive activities re: dirt bike, 4 wheelers, and jeep type vehicles. Currently Gwinnett County is spending a large amount of resources policing illegal use of its parks and private property. We need to provide a legal and safe environment to allow this type of activity. The cost of cleaning up the environmental damage due to illegal "trail riding" would be offset by properly designing and maintaining an area for this type of activity. Also, the county would see the need of enforcement decrease if a proper area is provided. We could even retrofit the Harbins-Alcovy site
2. Would like to see Football, Basketball, Baseball/softball, Playground (Handicap), Trails
3. Disc Golf is a recreational activity that can be enjoyed by all ages and skill levels. It is easy on the environment and very inexpensive. A course in Harbins Community Park would be welcome to many of my friends and family. It can easily be intertwined with other park facilities or activities. Disc golfers are always respectful of other park activities and their surround environment
4. A disc golf course would be an excellent choice to utilize this park land. Disc Golf is a lifetime recreational sport that is growing very rapidly in Georgia and worldwide. Among the numerous benefits, disc golf is also very inexpensive to play as well to install (also very low impact on environment). Currently Lenora Park is the only disc golf course in Gwinnett and one is under construction. Baseball and soccer fields are everywhere... Disc golf could bring a unique aspect to the community. The best part is that disc golfers have a very strong community and are very passionate about the sport. If a course was allowed to be put in, many disc golfers would volunteer time and efforts to make sure it is successful
5. We would like to see multi-purpose trails, natural surface trails, picnic and playground areas, and greenway linkages. Also, we would like to see a bocce ball area. This would keep us from having to drive all the way to Ronald Reagan Park. I do not think a teen facility would be appropriate for this area.
6. I would like to see a balance of sports complexes and more natural sites, such as trails and greenways. Traffic on New Hope Road. I'd like to see more of the popular facilities i.e. sports facilities directed away from New Hope, as it has limited visibility and high speed limit. Security is also an issue with some of the news of gang activity at Dacula and other parks.
7. If you can check out the park (the big one) in Montgomery Co. Maryland- they have the most awesome playground we have ever seen. In this same county they have an excellent nature center with nature trails. I can't remember their exact names but I would love for Gwinnett or Harbins to have something on that level. We lived in Montgomery Co. for 2 years and spent many hours at the park and nature center. Montgomery Co., Maryland had the best park system I had ever seen, but Gwinnett is really doing a great job with their parks also.
8. Would like to see nature center, paved and unpaved trails, primitive group camping (no electric or water), really great playground, community "amphitheater" for meetings, movies, etc. I would really love this to be a place where folks could go to just find some peace and quiet in this fast paced community. I have some concerns with the "greenway" concept. I have trouble understanding how safety can be maximized with such an extensive system of trails through non-populated areas. I am also concerned about the impact on fragile streams of having people and construction suddenly where they've never been. I am also concerned about the impact of these ambitious parks upon the wildlife remaining in Gwinnett County. There is precious little undeveloped land in our county. While I realize this will largely be a conservation park, we will be bringing people and related problems to areas previously only visited by wildlife.

9. Would like to see classrooms for community use, playgrounds close to ball fields, greenway to Tribble Mill Park/Archer H.S., Teen facility/basketball, substrate surface trails around ball fields. Concerned about light pollution, traffic flow, security related to high school and middle school.
10. Concern over light bleed and whether the sporting and parking lights will be turned off overnight. Likes: indoor swimming facility, observatory, greenway linkages excellent idea, policed on horseback
11. We would like to see: BMX track (bicycle motor cross). Gwinnett County does not have a BMX Track. BMX has become an official Olympic sport. There are two sanctioning bodies in BMX racing (ABA and NBL), and either one is willing to provide support in building a national level racing track. If built, this track would pull in racers and spectators from 6 neighboring states, as races are typically held each weekend from March through December. More racers from other states and local races would increase the local economy with respect to hotels, restaurants, bicycle shop service, etc.
12. Would like to see Playground amenities, child day care center, football, soccer, baseball fields, skate park, a puppet theater, pool, swim team.
13. I would like to see the community park be able to support all athletics. It should also support not only youth but our older generation. It should be safe and well lit and maintained (like Bay Creek).
14. Would like to see water slides, picnic with open fields to play on, playground, older person playground (8-16), baseball, beach volleyball, volleyball, basketball, walking biking trail (2 miles), Frisbee golf, Frisbee field, goldfish pond, goldfish food, playground mister (water mister), bathrooms, chairs by the playground, fitness field (pushup, bar, etc.), vending machine, camping area, Friday movies- \$1.00 each, sport store (autographed baseball, etc), "Win some Candy" contest, historical museums, bulletin board.
15. Would like to see walking trails (paved), hiking path, playgrounds, bathrooms, nature/historical path with markers, picnic areas- near water source, covered picnic pavilions, movie night. Concerned about traffic flow, intersection of New Hope and Luke Edwards.
16. Would like to see possible managed archery deer hunt, as much natural area as possible, less sports/ more park, historical areas. Concerned about the intersection of New Hope and Luke Edwards road, increased traffic flow, noise- My subdivision (Harbins Estates) backs up to the active use area.
17. Would like to see playgrounds (swings, slides, monkey bars), walking path, Frisbee golf, open grass play area, picnic area by water, covered picnic area, bathrooms.
18. Would like to see swimming, football, basketball tennis. There is a need for a swimming pool. Would like to see football, basketball, pool, tennis, baseball, soccer.
19. Multi-purpose trails and natural trails, teen facilities, disc golf course. Leave drainage land for disc golf, combo of open and forested.
20. I would like to see an 18 hole disc golf course placed at Harbins. Disc golf provides an excellent low impact workout for both younger youth and older adults. Little landscaping is typically needed since the obstacles provided by nature add to the strategy of the game. Growth of the sport in recent years has led to many crowds. A new course would help invite even more people to this sport. I would also like to see multipurpose trails and greenway linkages throughout Gwinnett County. I like to ride bicycles but do not like riding in the roads. It's too dangerous. Walking and riding trails that are directly adjacent to disc golf holes is a concern. Golf discs are thrown at speeds that can injure someone.
21. We would like to see a park that includes football, baseball, and basketball. I would like to see a practice facility for all the sports mentioned above. Hopefully a water park will also be in the future plans. I see no problems with the proposed development.
22. Would like to see walking trails, tennis courts, swimming pools, sport grounds for healthy sports, cricket. We need a cricket ground in this facility. We have no facility for playing cricket. I can help in the designing and other requirements for this game. It needs a ground like baseball and many sports can be played in such a ground. I am concerned about the

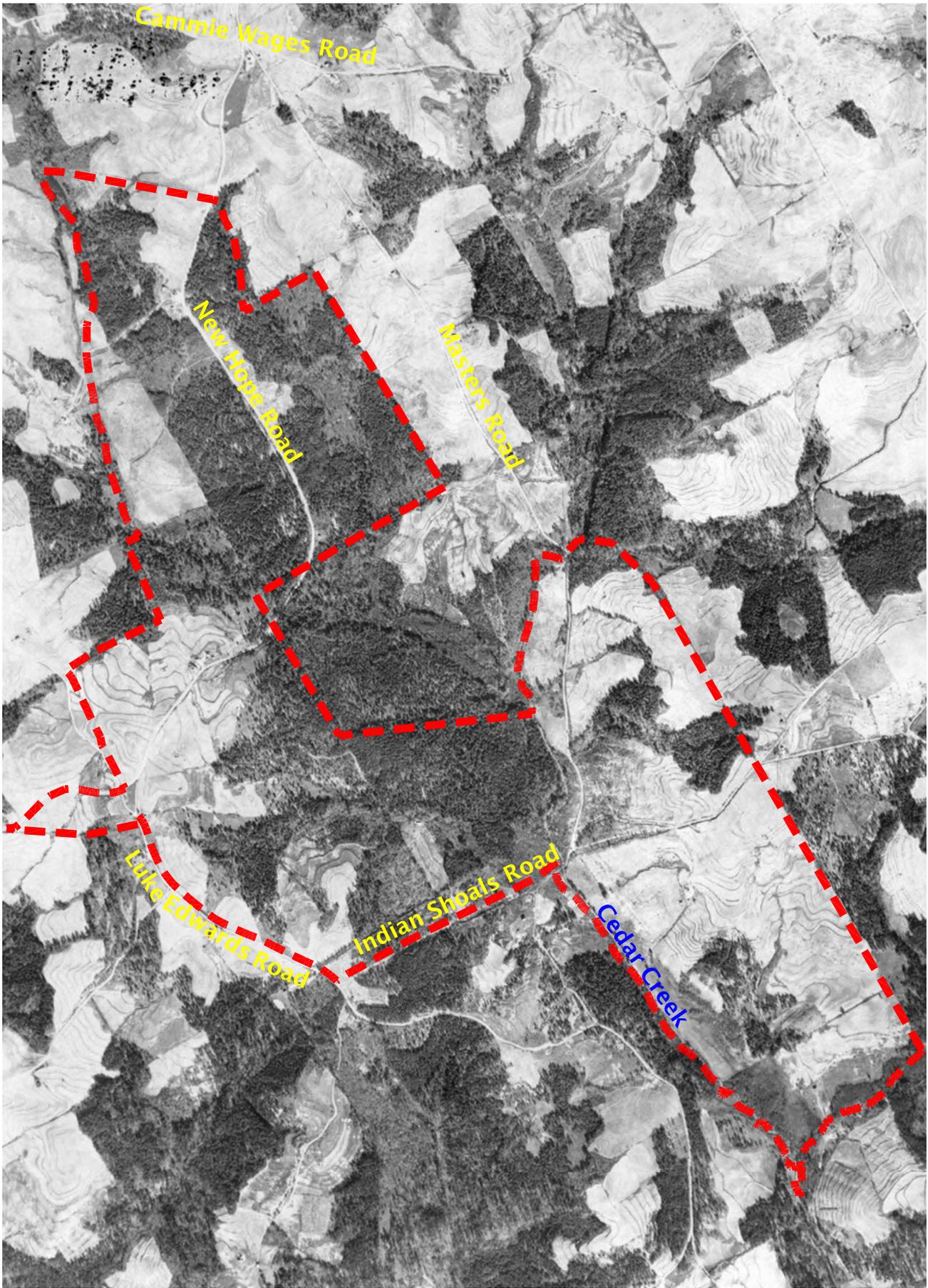
- part on the left side of New Hope Road and above Luke Edwards Road adjacent to my house. In the Harbins Park I would like to see many different sports and ATV trails. And woodman activities.
23. In the Harbins Community Park I would like to see mainly multiple sport facilities and opportunities. Not only team sports, but nature and woodsmen activities.
 24. We would love to see a disc golf course installed in wooded, open, and/or granite/scrub areas. Disc golf attracts people of all ages and is a wonderful form of social exercise. The Gwinnett Disc Golf Association (GDGO) will actively promote the use of this park. I am on the Board of Directors. Picnic and playground facilities would further enhance the park experience for people wishing to have a full day of disc golf, food, and fun. It would be helpful if no walking/riding trails crossed any disc golf fairways, thus avoiding any potential injury from flying discs.
 25. I would love to have an 18 hole Disc Golf Course as part of this park. As one of the fastest growing sports in the nation it provides an outlet for both young and old to enjoy a nice walk while getting plenty of exercise during play. Having Lenora Park already on board with a course and the addition of Alexander Park next spring. Plus bringing Harbins into the mix will put Gwinnett County as one of the Premiere counties for disc golf in Georgia.
 26. Our youth players are Archer cluster kids; they'll have no park for another 3 years at this point. I feel this will be a detriment to the high school sports. These kids are excited about the new park and are ready to open it and start building high school sports.
 27. Would like to see youth sports (football, baseball, and softball), picnic and playground, teen facilities: skate park, open space for practices (this is often an issue during the season, need a flat grade). I would not recommend additional trail beyond connectors to the conservation area (they have plenty of trails). Frisbee golf.
 28. Would like to see football, baseball, picnic and playground amenities, community park facilities, basketball gym.
 29. The facilities I would like to see developed are a BMX track and a bike friendly skatepark. The BMX track is definitely needed in Gwinnett County over the skatepark seeing as there are no BMX tracks within an hour and a half drive. If a skatepark is built, an alarm that would let the park riders/skaters know when the lights would turn out.
 30. As for me and my family we would like to see a nice playground area for my child. My wife likes a place for her dog to play. I would love to see some mountain bike trails. Maybe a BMX track. Possibly a concrete park for skateboarding. Thank you.
 31. Families and kids want a good park, but it is what is in the park that makes them so. A BMX track or mountain bike trails are fun for all. Have some things like playgrounds and are a good way for a family to get out and have fun.
 32. I would like to see a BMX track go in the park. BMX is not like any other sport. It does not matter how old or young you are or how experienced you are to have fun. BMX is a great family sport. Kids can ride with mom and dad. My background with BMX is: I've raced for the past 10 years. I also have been a track director for 10 years. I also have a BMX team that has been very successful.
 33. I am interested in a BMX racing facility. The ABA and NBL will both build a track for no cost. They will insure it 24/7 assuming a fence borders the track. The parent organization will run the track and maintain it. The only cost to the county will be space. I have been the track director for Sugar Hill and have a very large base of support for volunteers. I have a "core" group of 20 parents who are willing to help operate and maintain events and the track. My background- I own Board-n-Bike in Buford. Gwinnett County's first BMX racing store formed in 1998. I have also served as track director for Sugar Hill BMX track. Currently I serve on the CPSC for transportation funds on the 09 SPLOST fund. I am the environmentalist representative. The track would be most successful if the county could provide lighting for summertime night racing. I am concerned about the planning for traffic and event coordination at the facility.
 34. Would like to see bicycles BMX track, skate board park, mountain bike trails.

35. Would like to see cricket (very similar to baseball). There are so many people in Gwinnett County who love to play this sport but can't play because there are no grounds or park available. Cricket is a very entertaining sport and I think if we make a place for cricket in this park, people will love to watch it.
36. Would like to see indoor swimming pool, there is not one in this section of the county. Football, baseball/softball, soccer, playground. I don't live in the area now, but plan to move near the park in the near future and would love to see a disc golf course in this park. Disc golf is a sport that can be enjoyed by all ages and it is great exercise. It is also relatively inexpensive to install and maintain.
37. Would like to see baseball/softball/football/soccer, teen facilities, picnic and playground amenities, multipurpose trails. I would like to see the youth program started ASAP. The kids in the Archer district will not have a home until they reach high school age. This will be a negative for the community. We have enough interest within the community to get the association started and we can use the parks in the area for playing area.
38. The youth players will be Archer cluster kids with no park for another 3 years. They are excited about being in the new cluster, but the amount of time it is going to take is a concern.
39. Time concerns: Archer cluster is forming this coming year, not 3 years from now.
40. Concerned about: Buffers at least 400 feet from park trails, etc. Even if natural trails and not ball fields, etc. Sound barriers for residential close to activity areas. No property reassessments for 5 years after opening parks. Wetlands on both sides of Luke Edwards to be left natural. Park police to monitor activity day/evening. Park gates to be locked after hours. Red light to be placed at intersections of Luke Edwards and New Hope. Many accidents and several deaths, needed long time before this park project. Turning lanes off New Hope to park entrances. Wildlife considerations. No ATV/motorcycle on trails. If there is no fence how can you keep them out?
41. Would like to see disc golf, natural surface trails, mountain bike trails. Concerned that all development be done environmentally friendly, that park remains natural and versatile. Disc golf is an inexpensive, ecofriendly, family sport. Don't intersect walking paths with disc golf holes! (avoid potential injury)
42. Priority one: a red light needs to be at the intersection of Luke Edwards Road and New Hope Road. Wetlands on both sides of New Hope need to be left natural. Turning lanes need to be added to help the flow of traffic. The park should be closed at dark. Fencing near residential property. Have park police in park at all times. They should not allow ATV's and motorcycles.
43. Disc Golf, great family sport, walking biking, natural areas. Not everyone plays baseball and soccer and basketball! Sports that are outdoors like disc golf can be enjoyed by all, teams or alone. Little impact on environment. Too many baseball and soccer fields in Gwinnett. Not enough sports that girls can enjoy.
44. Cricket field, volleyball, tennis courts with lights. Cricket is quite popular among immigrant community in Gwinnett County. There are two cricket leagues in the Atlanta area. Most of the teams are based in Gwinnett. They all have to travel 60-70 miles every weekend to play. There is not even one local ground for more than 10 teams that are based here. A cricket ground is preferably circular (diagram attached)
45. As a Lawrenceville resident and president of the Gwinnett Disc Golf Organization, I would like to recommend a disc golf course for Harbins Park. Disc Golf represents a passive feature that is popular to all levels of play, from young children and families all the way to disc golf professionals. Installation is relatively inexpensive, requiring little expense in upkeep, save moving the grass...which needs doing anyway.
46. Would like to see soccer, baseball/softball, football, playgrounds, bike trails, running trails. Soccer fields are needed in this park of the county for rec. league soccer. The nearest fields are Blue Springs in Loganville or Brookwood Association off Bethesda Road. Multipurpose trails should be lighted and plenty of area be made available for younger kids to play (playground).

47. I want to make sure there is sufficient parking for all sporting related events. Also the Hills and valley of New Hope Road will need to be addressed. There could be some driver sight issues. Also, the area needs to be well lighted for safety and security issues.
48. Concerned about traffic, noise, bright lights, crime
49. Would like to see Multi-purpose trails, green space, fishing, kayaking, picnic areas, and playground. I live opposite the 400' road frontage of Palm Creek Park site on Luke Edwards. I am concerned that this small frontage will be used for park road entrance. Road entrance would be better suited to large frontage on Ewing Chapel Road. Trails connecting to Harbins Park would be on a dangerous curve for walker or horseback riders.

APPENDICES

Appendix D: 1940 Harbins Community Park Site Aerial Photograph
Refer to the attached aerial photo.



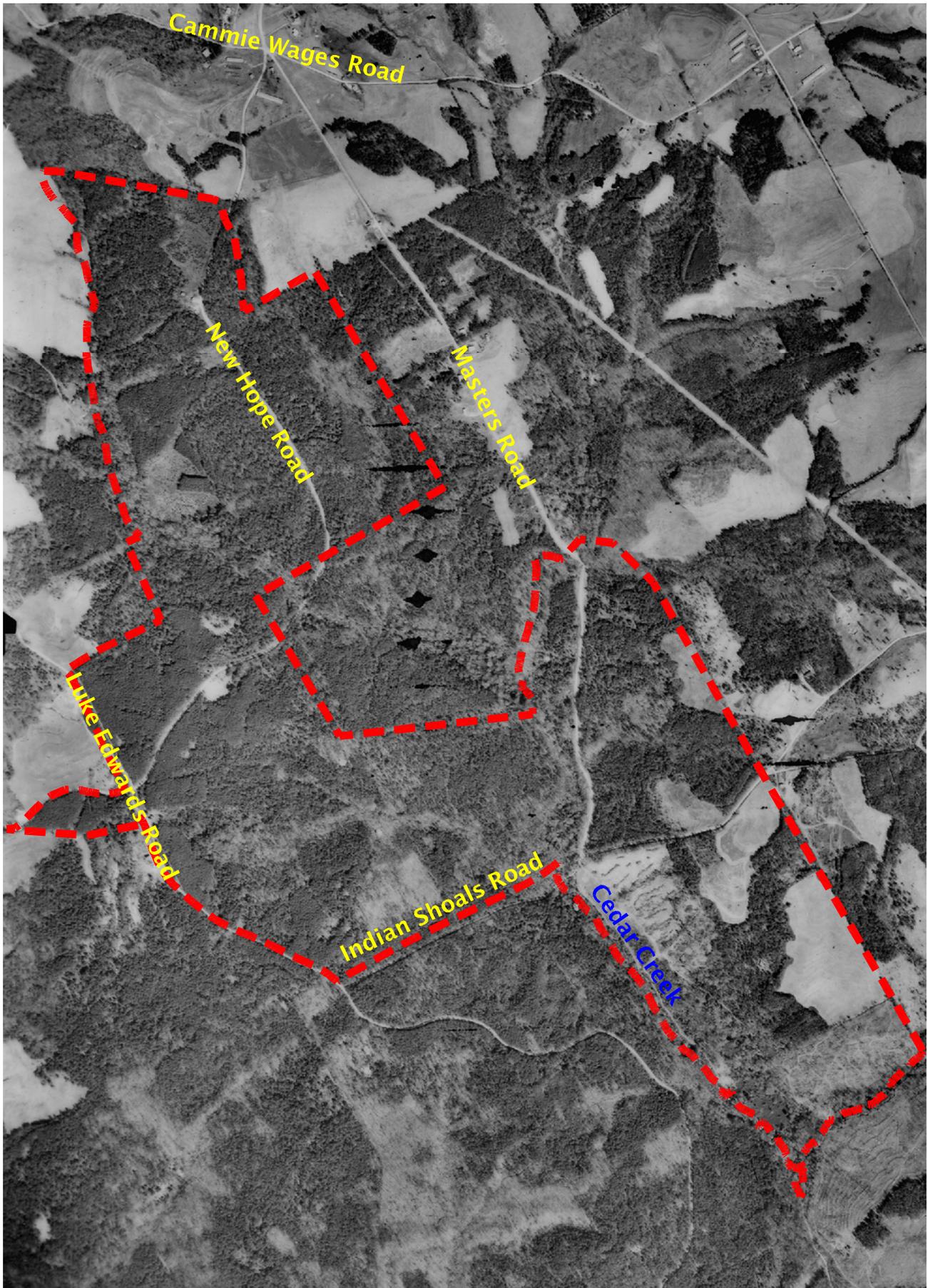
HARBINS COMMUNITY PARK SITE
Circa 1940
October 23, 2008

PREPARED FOR:
Gwinnett County Department of
Community Services



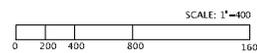
APPENDICES

Appendix E: 1972 Harbins Community Park Site Aerial Photograph
Refer to the attached aerial photo.



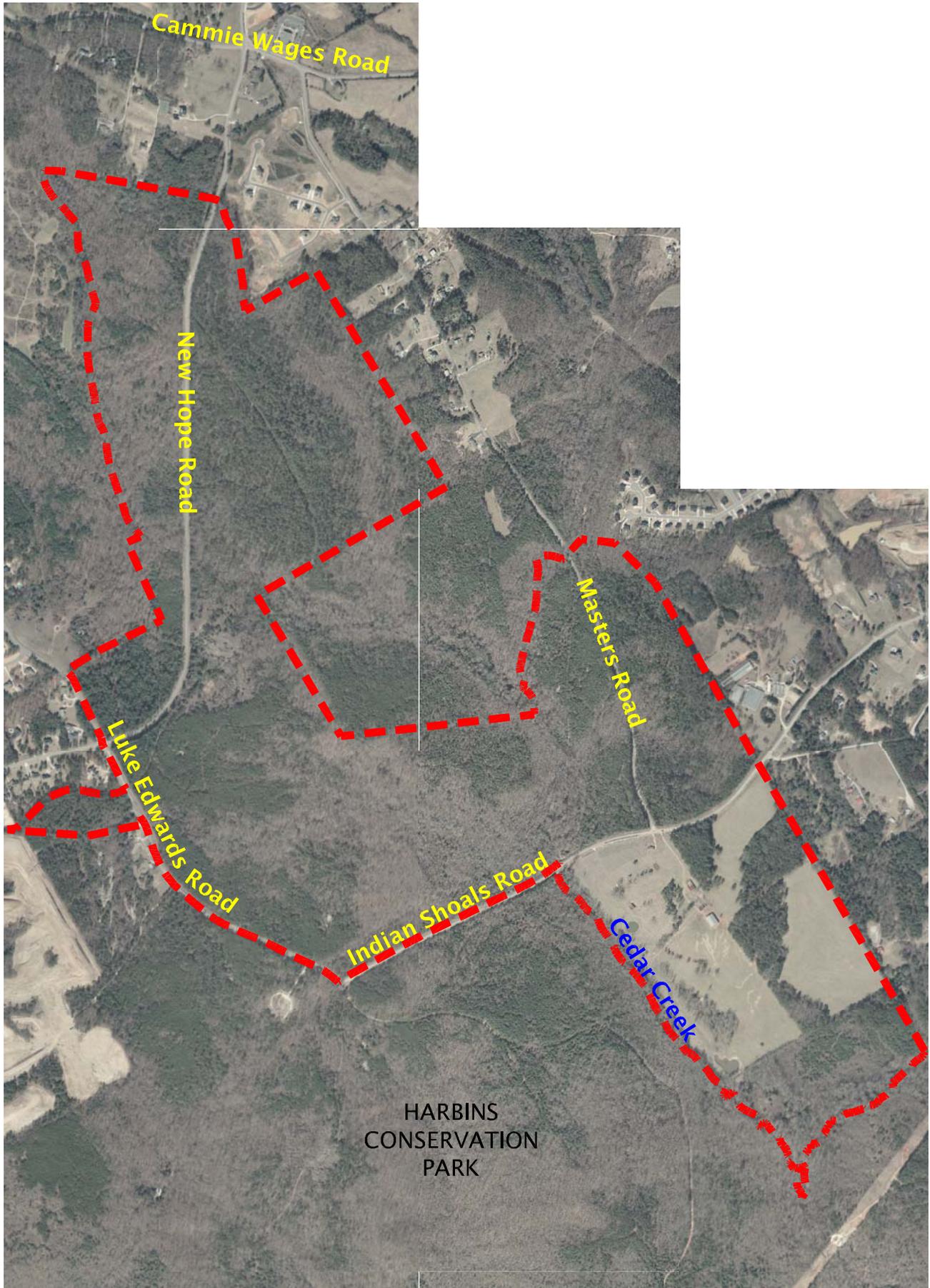
HARBINS COMMUNITY PARK SITE
Circa 1972
October 23, 2008

PREPARED FOR:
Gwinnett County Department of
Community Services



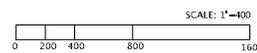
APPENDICES

Appendix F: 2007 Harbins Community Park Site Aerial Photograph
Refer to the attached aerial photo.



HARBINS COMMUNITY PARK SITE
Circa 2007
October 23, 2008

PREPARED FOR:
Gwinnett County Department of
Community Services



APPENDICES

Appendix G: Harbins Park Septic Study Report
Refer to the attached report

HARBINS PARK **SEPTIC STUDY REPORT**

BY HAYES JAMES & ASSOCIATES
June 26, 2009

Daily Flow Estimates

The gallon per day (GPD) flow was calculated by multiplying several factors. The factors used were: number of parking spaces, average number of people per car, estimated GPD per person and parking lot turnover. By multiplying these factors together, an estimated total GPD was calculated for each area of the proposed park.

Soil Data

The soil data used for this study was taken from the Gwinnett County GIS soil database and cross referenced with USDA Natural Resources Conservation Service soil data. Using information from these sources, soils were designated as: very limited, somewhat limited, not limited or not rated or not available. These designations help dictate the suitability of each soil for water percolation and septic field usage.

Absorption Field Sizing

The sizing for the septic absorption fields is based on a formula found in the Georgia Department of Human Resources: Department of Public Health – “Manual for On-site Sewage Management Systems”. This formula uses a coefficient (also found in the “Manual”) which is based on the permeability of the soil type in the desired location for absorption fields. This coefficient is multiplied by the total GPD and then divided by a factor of three (3). The result of this formula is the linear footage of the absorption field.

Absorption Field Locations

The initial absorption field locations were based solely on the data compiled from the soil data, designating each soil area as: very limited, somewhat limited, not limited or not rated or not available. Using the master plans sent by JB+A, absorption fields were located and sized according to park use and soil suitability. After speaking with JB+A and the Gwinnet County Department of Public Service, the proposed absorption field sites were re-evaluated incorporating soil suitability and desired usage at each area of the park.

Sewer System Design

The project elements including the soccer complex, 3.0 AC water feature, cricket field, multi-use field and the tennis complex will need to be serviced by sewer. The soils surrounding these elements are unsuitable for septic use. The design for the sewer

system consists of 6" DIP sewer lines leaving the facilities and leading to a single lift station near the "ADA trail parking" area. The sewage will be pumped from the proposed lift station at Harbins Park to an existing pump station (*Bold Springs 'A' Pump Station*) at the south western corner of the Equestria Subdivision, located to the east of Harbins Park. The Harbins lift station shall be built to Gwinnett County standards and will use a 7 ½ HP pump and a 6" force main to carry the sewage to the *Bold Springs 'A' Pump Station*. Easement and property acquisition will be necessary cross into neighboring property and tie into the Bold Springs pump station. It is now known that the *Bold Springs 'A' Pump Station* is not fully operational. The building, controls, electrical equipment and force main leaving the pump station are in place. The pumps have been removed and there is no meter located at the pump station. The sewer system design assumes that the *Bold Springs 'A' Pump Station* will be fully operational by the completion of the Harbins Park elements requiring sewer service.

**HARBINS COUMMUNITY PARK
JOHN BENSON AND ASSOCIATES
GWINNETT COUNTY, GEORGIA
SEWERAGE STUDY ESTIMATE**

6/23/2009

<u>ITEM</u>	<u>UNITS</u>	<u>QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL</u>
BMX PARK				
2,000 GAL SEPTIC TANK	EA	1	\$3,000.00	\$3,000.00
GREASE TRAP	EA	1	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	LF	418	\$12.00	\$5,016.00
PRIMARY ABSORPTION FIELD	LF	511	\$10.00	\$5,110.00
REPLACEMENT ABSORPTION FIELD	LF	511	\$10.00	\$5,110.00
CLEARING AND GRUBBING	AC	0.1	\$4,500.00	\$450.00
			TOTAL	\$19,886.00
CAMPING SITE				
8,000 GAL. SEPTIC TANK	EA	1	\$14,400.00	\$14,400.00
6" PVC SEPTIC FEEDER LINE	LF	258	\$12.00	\$3,096.00
PRIMARY ABSORPTION FIELD	LF	3,614	\$10.00	\$36,140.00
REPLACEMENT ABSORPTION FIELD	LF	3,614	\$10.00	\$36,140.00
CLEARING AND GRUBBING	AC	0.66	\$4,500.00	\$2,970.00
			TOTAL	\$92,746.00
BALL FIELD COMPLEX				
12,000 GAL. SEPTIC TANK	EA	1	\$19,500.00	\$19,500.00
GREASE TRAP	EA	1	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	LF	1,615	\$12.00	\$19,380.00
PRIMARY ABSORPTION FIELD	LF	8,664	\$10.00	\$86,640.00
REPLACEMENT ABSORPTION FIELD	LF	9,490	\$10.00	\$94,900.00
CLEARING AND GRUBBING	AC	1.6	\$4,500.00	\$7,200.00
			TOTAL	\$228,820.00
DESTINATION PAVILLION				
1,000 GAL. SEPTIC TANK	EA	1	\$1,200.00	\$1,200.00
GREASE TRAP	EA	1	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	LF	313	\$12.00	\$3,756.00
PRIMARY ABSORPTION FIELD	LF	255	\$10.00	\$2,550.00
REPLACEMENT ABSORPTION FIELD	LF	255	\$10.00	\$2,550.00
CLEARING AND GRUBBING	AC	0.1	\$4,500.00	\$450.00
			TOTAL	\$11,706.00

COMMUNITY CENTER				
13,000 GAL. SEPTIC TANK	EA	1	\$21,000.00	\$21,000.00
GREASE TRAP	EA	1	\$1,200.00	\$1,200.00
6" PVC SEPTIC FEEDER LINE	LF	274	\$12.00	\$3,288.00
PRIMARY ABSORPTION FIELD	LF	4,453	\$10.00	\$44,530.00
REPLACEMENT ABSORPTION FIELD	LF	4,453	\$10.00	\$44,530.00
CLEARING AND GRUBBING	AC	0.82	\$4,500.00	\$3,690.00
			TOTAL	\$118,238.00
INTERACTIVE FOUNTAIN AREA				
1,000 GAL. SEPTIC TANK	EA	1	\$1,200.00	\$1,200.00
GREASE TRAP	EA	1	\$1,200.00	\$1,200.00
PRIMARY ABSORPTION FIELD	LF	274	\$10.00	\$2,740.00
REPLACEMENT ABSORPTION FIELD	LF	274	\$10.00	\$2,740.00
CLEARING AND GRUBBING	AC	0.1	\$4,500.00	\$450.00
			TOTAL	\$8,330.00
TENNIS, SOCCER COMPLEX, MULTI USE FIELD, WATER FEATURE, CRICKET PITCH				
8" DIP	LF	5,788	\$40.00	\$231,520.00
JUNCTION BOX	EA	14	\$3,000.00	\$42,000.00
GREASE TRAP	EA	1	\$1,200.00	\$1,200.00
CLEARING AND GRUBBING	AC	1.1	\$4,500.00	\$4,950.00
SEWAGE PUMP STATION	LS	1	\$250,000.00	\$250,000.00
			TOTAL	\$529,670.00
			SUB TOTAL	\$1,009,396.00
			20% CONTINGENCY	\$201,879.20
			SITE TOTAL	\$1,211,275.20

HARBINS COUMMUNITY PARK		
JOHN BENSON AND ASSOCIATES		
GWINNETT COUNTY, GEORGIA		
SEWERAGE STUDY ESTIMATE		
6/23/2009		
ITEM	UNITS	QUANTITY
BMX PARK		
2,000 GAL SEPTIC TANK	EA	1
GREASE TRAP	EA	1
6" PVC SEPTIC FEEDER LINE	LF	418
PRIMARY ABSORPTION FIELD	LF	511
REPLACEMENT ABSORPTION FIELD	LF	511
CLEARING AND GRUBBING	AC	0.1
CAMPING SITE		
8,000 GAL. SEPTIC TANK	EA	1
PRIMARY ABSORPTION FIELD	LF	3,614
6" PVC SEPTIC FEEDER LINE	LF	258
REPLACEMENT ABSORPTION FIELD	LF	3,614
CLEARING AND GRUBBING	AC	0.66
BALL FIELD COMPLEX		
12,000 GAL. SEPTIC TANK	EA	1
GREASE TRAP	EA	1
6" PVC SEPTIC FEEDER LINE	LF	1,615
PRIMARY ABSORPTION FIELD	LF	8,664
REPLACEMENT ABSORPTION FIELD	LF	9,490
CLEARING AND GRUBBING	AC	1.6
DESINATION PLAYGROUND		
1,000 GAL. SEPTIC TANK	EA	1
GREASE TRAP	EA	1
6" PVC SEPTIC FEEDER LINE	LF	313
PRIMARY ABSORPTION FIELD	LF	255
REPLACEMENT ABSORPTION FIELD	LF	255
CLEARING AND GRUBBING	AC	0.1
COMMUNITY CENTER		
13,000 GAL. SEPTIC TANK	EA	1
GREASE TRAP	EA	1
6" PVC SEPTIC FEEDER LINE	LF	274
PRIMARY ABSORPTION FIELD	LF	4,453
REPLACEMENT ABSORPTIN FIELD	LF	4,453
CLEARING AND GRUBBING	AC	0.82

INTERACTIVE FOUNTAIN AREA		
1,000 GAL. SEPTIC TANK	EA	1
GREASE TRAP	EA	1
PRIMARY ABSORPTION FIELD	LF	274
REPLACEMENT ABSORPTION FIELD	LF	274
CLEARING AND GRUBBING	AC	0.1
TENNIS, SOCCER COMPLEX, MULTI USE FIELD, WATER FEATURE, CRICKET PITCH		
8" DIP	LF	5,788
JUNCTION BOX	EA	14
GREASE TRAP	EA	1
CLEARING AND GRUBBING	AC	1.1
SEWAGE PUMP STATION	LS	1

APPENDICES

Appendix H: Radford Letter

Refer to the attached letter for a summary of the discussion and presented materials to Katheryn Harrer Radford.

October 6, 2009

Rex Lee Schuder
Principal Community Planner
Gwinnett County Parks and Recreation
75 Langley Drive
Lawrenceville, GA 30045

Dear Mr. Schuder:

Thank you very much for taking into consideration my concerns regarding plans for the Harbins Park football and soccer development immediately adjacent to my home. The new plans, dated October 8, 2009, which moved the parking areas to the far side of the sports fields away from my property and replaced them with a dog park, are much better, and meet with my approval. Leaving as many trees as possible on the northeast side of the dog park as a buffer from the lights and noise of the football field will also improve the situation, as will the use of low-spill lighting at the football field.

I really appreciate the planning committee's willingness to revise their plans in order to reduce the effect of the sports complex on my property and home. Thank you again for working with me.



Kathryn Harrer Radford
3001 Luther Wages Rd
Dacula, GA 30019

APPENDICES

Appendix I: Meeting Minutes

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

HARBINS COMMUNITY PARK SITE MASTER PLAN – Community Interest Meeting

Minutes from: 10.23.08 Community Input Meeting

Attendees: Gwinnett County Department of Community Services- Phil Hoskins, Grant Guess and Rex Schuder

jB+a, inc. - Raigan Carr and Rachel Von Ins

Approximately 75 Community participants

Location: Grayson High School
Gwinnett County, Georgia

Time: 7:00pm – 8:30 pm

The meeting was conducted in an open house format. Boards located at the front of the room included: responsibilities of steering committee members, Harbins Conservation Park Phase I Master Plan, Harbins Community Park Site 1940 Aerial Photo, Harbins Community Park Site 1972 Aerial Photo, Harbins Community Park Site 2007 Aerial Photo, and Harbins Community Park Site Base Map.

Public Interest and Concerns forms, Park Location Map, and Archer High School Cluster Location Map were distributed as public participants entered. Interested participants were given Steering Committee Applications.

Grant Guess, Rex Schuder, Raigan Carr, and Rachel Von Ins were available to answer questions.

At approximately 7:30, Rex Schuder briefly explained the master planning process and the role of the Steering Committee.

If there are any additions or corrections to these meeting minutes, please contact Rachel Von Ins of jB+a immediately at 678.247.0735.

HARBINS COMMUNITY PARK SITE MASTER PLAN – Scheduling Meeting

Minutes from: 01.27.09 Scheduling Meeting

Attendees: Gwinnett County Department of Community Services – Grant Guess, Rex Schuder
jB+a - Raigan Carr

Steering Committee participants – Steve Adams, Ben Archer, Kevin Darby, Jim Nasoulis, Kerry Mitchell, David Jenkins, Chuck Smillie, Kathy Jackson, DeWayne Jackson, Ann Camp, Cassi Gaines, Gul Rahim, LaShawn Smith, Jeff Boss, Ed Jacob, Janice Rinaldo,

Location: GJAC – Conference Room B

Time: 7:00 pm

Rex Schuder welcomed everyone to the Scheduling Meeting for the Harbins Community Park.

Rex gave a brief explanation of the purpose of the meeting - to schedule the meetings for the Harbins Community Site Master Planning Process. Rex also explained the master planning process and what would occur at each meeting.

Introductions were made around the table and steering committee members introduced themselves and the organization they represented, if any.

Scheduling of meetings then commenced. The meetings are scheduled as follows:

- **February 21, 2009 – Site Walk**
(Saturday 8:15 to approximately 5pm)
Steering Committee Members are to meet at the Harbins Conservation Park Parking lot at 8:15 am (Directly across the street from the Harbins Community Park Site) The site walk will commence at 8:30 am. Select portions of the site will be hiked to give an overview or tasting of the various characteristics of the site. Lunch location TBA and everyone will be responsible for payment of their own lunch.
- **February 28, 2009– Gwinnett Park System Tour**
(Saturday 8:15 to approximately 5pm)
Steering Committee Members are to meet at the Tribble Mill Park Festival Field Parking Lot at 8:15am. The bus tour will leave the parking area at 8:30 am. Several park types will be visited and specific park elements will be highlighted. Lunch location TBA and everyone will be responsible for payment of their own lunch. Maps and directions will be mailed out.
- **March 12, 2009 – Inventory/Analysis Meeting**
(Thursday, 7:00 pm, GJAC Building, Conference Room B)
jB+a will present site analysis (vegetation, hydrology, soil analysis etc) drawings and a programming discussion will commence.

- **April 14, 2009 – Concept Development Meeting.**
(Tuesday, 7:00pm, GJAC Building, Conference Room A)
jB+a will present three concept plans to the Steering Committee for review and comment.
- **May 19th, 2009 – Preliminary Master Plan Meeting**
(Tuesday, 7:00pm GJAC Building, Conference Room B)
jB+a will present a graphic of the Preliminary Concept for the Harbins Community Park Site and a preliminary cost estimate to the Steering Committee for review and comment.
- **July 14th, 2009 - Final Master Plan Meeting**
(Tuesday, 7:00pm GJAC Building, Conference Room C)
jB+a will present the graphic for the Final Harbins Community Park Site Master Plan, and the final cost estimate. Based on the cost estimate, prioritization of park elements will be the main focus of this meeting.
- **TBD** - Recreation Authority Presentation.**
jB+a will present the Final Harbins Community Park Site Master Plan to the Recreation Authority. Steering Committee Members are encouraged to attend this meeting if possible.

**Dates for presentations to the Recreation Authority will be determined at a later date and the Steering Committee will be notified by Rex Schuder.

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

HARBINS COMMUNITY PARK SITE MASTER PLAN – Site Walk

Minutes from: 02.21.09 Site Walk

Attendees: Gwinnett County Department of Community Services – Grant Guess, Rex Schuder
(jB+a) - Raigan Carr

Steering Committee participants – Cassi Gaines, LaShawn Smith, Demtrios Nasoulis, Kevin Darby, Ben Archer, Chuck Smillie, Ann Camp, Janice Rinaldo, Evelyn Sims, Gul Rahim, Steve Adams, Ed Jacob, Kerry Mitchell, Dave Jenkins, Chris Jenkins

Location: Harbins Communtiy Park Site

Time: 8:15 am (Site walk commenced at 8:30am)

Weather: Sunny, Cold, 29 degrees, warming to 47 degrees

Consultants and Steering Committee Members met at the project site for an informative site walk. Due to the vast size of the park site the project site was not able to be walked in its entirety. Therefore select areas of the site were chosen so that the Steering Committee could experience the flavor the site and become familiar with its characteristics including topography, vegetation types, geology, drainage features, and opportunities and constraints of the park site.

Entering the site off New Hope Road, at a point in the north eastern corner, the team accessed existing paths created several years ago during Geotechnical investigations. The loop path moved through predominantly young pines and provided Steering Committee members with a land characteristic that could be considered for development.

Moving further north up New Hope Road, the site walk continued, east toward Cedar Creek, through the south western section of the tract along the old alignment of New Hope Road. After leaving the old road bed, the walk continued south along a tributary of Cedar Creek through a section of the site dominated by hardwoods. This characteristic forest type was identified as an asset to the site that should be considered for conservation rather than development. This leg of the site walk terminated at Indian Shoals Road.

Following a lunch break, the site walk continued along another old road bed (aligned roughly north south) in the eastern most section of the site just north of Indian Shoals road and west of Masters Road. This segment of the walk illustrated the shallow soils associated with the site. Several granite rock outcroppings were visible along the route, including one 40' long exposed chunk of granite. Crossing Masters Road, at the northern most point of the park site, the tour continued along another tributary of Cedar Creek to an area of the creek that had carved its way down to bedrock. Here a small water cascade is located.

The final leg of the site included the Wages Tract and the south eastern most tract of the site. These two parcels illustrated open field, flood plain, and flatter topography, ideal for field oriented recreation.

Steering committee members actively participated in the site tour by asking questions and voicing concerns and requests for this community park including:

- maintaining as much natural vegetation as possible
- maintaining vegetative buffers at perimeter of park
- locating the sports fields toward the interior of the park site to minimize light pollution
- allowing for special needs facilities
- establishing additional native wild flowers and plants
- maintaining as many of the hardwoods that currently exist on the site as possible
- providing multi-purpose fields where possible
- connecting to the Harbins Conservation Park via trails (hiking, biking, equestrian)

A tour of the Gwinnett County Park System will take place on February 28, 2009. The intent of this meeting will be to become familiar with and discuss the different park elements located throughout Gwinnett County. Based on the information gained during this tour, a park program for the Harbins Community Park Site, which the Steering Committee will help develop, will also be established at the end of the system tour.

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

HARBINS COMMUNITY PARK SITE MASTER PLAN – Park System Tour

Minutes from: 02.28.09 Park System Tour

Attendees: Gwinnett County Department of Community Services - Rex Schuder, Grant Guess

jB+a, inc. –Raigan Carr

Steering Committee participants – Kevin Darby, Chris Jenkins, Dave Jenkins, Cassi Gaines, Ben Archer, Steve Adams, Ed Jacobs, Ann Camp, Gul Rahim, Jim Nasoulis, Janice Rinaldo

Location: Tribble Mill Park Festival Field

Time: 8:30am

Consultants and Steering Committee Members met at the Tribble Mill Park Festival Field to begin a park tour that would include 6 existing park sites. The intent was to provide examples of different park elements, to the Steering Committee, that could potentially be sited on the Harbins Community Park site. These parks included the following:

Lenora Park (*4515 Lenora Church Road, Snellville, GA 30058*): Lenora Park is a 178 acre Community Park, which houses a variety of athletic fields and their associated parking. The Steering Committee visited the eastern sector of the park first to get an idea of what a full sized football field, walking track, associated parking, and site engineering would look like. The group then visited the western sector of the park, visiting the 2.6 acre dog park and experiencing the open layout of the designated disc golf course. The importance of having designated uses for specific park elements was discussed as a way to retain open space and or wooded areas.

Lucky Shoals Park (*4651 Britt Road, Norcross, GA 30071*): Lucky Shoals Park is a 68 acre park recently renovated to include a new Community Center / Gym. The new community center includes two classrooms, a dance studio with a wood floor, community room with a catering kitchen, lobby area and a game room. The gymnasium section includes two indoor basketball courts, volleyball and badminton court areas and a walking track around the upper level. This facility provided Steering Committee members an idea of what the footprint of a typical Gwinnett County Community Center included.

Pinckneyville Park (*4707 South Old Peachtree Road, Norcross, GA 30071*) – At Pinckneyville, the ball field complex and terraced soccer fields were visited. The Pinckneyville Park site has substantial elevation changes which facilitated the need for terracing of its' soccer and ball fields. Both cut and fill slopes and the differences between them were discussed. Additionally, the importance of providing hard surface gathering areas between fields to minimize maintenance and direct traffic flow was discussed. The ball field complex within Pinckneyville Park also includes 3 small playground areas, while technically three play areas may be a few too many, the intent is to provide an area for families with children participating in all types of recreation (free play or organized activities) to be able to play near each other.

George Pierce Park (*55 Buford Highway, Suwanee, GA 30024*) – During the tour several inquiries were made regarding the potential for a senior center at the Harbins Community Park site. As a bonus, the Steering Committee members were taken to George Pierce Park to visit its

Community Center. George Pierce Community Recreation Center and the new Prime Timers Pointe Senior Activity Center located at George Pierce Park in Suwanee recently opened in April of 2008. The 16,000-square-foot community center, the fourth community center operated by Gwinnett County Parks and Recreation, features a community room, catering kitchen, three classrooms, a dance/aerobic studio, game room, and outdoor basketball courts.

The attached 9,500-square-foot Prime Timers Point Senior Activity Center includes a large community room with a kitchen, an art studio, a classroom, a computer room for SeniorNet computer training classes, a covered outdoor terrace with shuffleboard courts and a lounge area. Prime Timers Pointe, "Where those in their prime, have the time of their lives," has additional space for billiards and a reading room.

Rock Springs Park (550 Rock Springs Road, Lawrenceville, GA 30043)– Rock Springs Park is a 114 acre Park located in Lawrenceville and serves as a sister park to Collins Hill Park. The recently opened section of the park which includes six (6) lighted tennis courts, a restroom building, shaded seating / picnic area, and associated parking was visited by the Steering Committee. Discussions included reasoning behind the basic layout of the tennis courts, fencing, lighting, and use.. Additionally, the use of "shade sails" around tennis courts and playgrounds was discussed. Shade sails are architectural, aesthetic, provide substantial shade –helping to reduce incidents of skin cancer, and are also significantly less expensive than built shelters.

Duncan Creek Park (3700 Braselton Hwy., Dacula, GA 30019)–The park system tour concluded at Duncan Creek Park. Intent on providing recreation activities for all age groups and abilities, the Steering Committee visited Duncan Creek Park in Dacula. Duncan Creek Park serves as a sister park to Bogan Park, providing additional active recreation facilities. Geared predominantly toward teens, Duncan Creek Park has a 20,000 square-foot lighted skate complex, four lighted basketball courts (two full size and two half-court), and three lighted sand volleyball courts. Additionally, Duncan Creek also provides a playground with handicap accessible features, and 60-foot rental pavilion. The importance of providing playground equipment for a variety of ages and abilities was discussed. The importance of locating park elements with safety in mind, specifically the location of bathroom buildings in respect to playground areas, and the location of the basketball courts near the parking lot were also discussed.

Next Meeting - Site Analysis Presentation - Harbins Community Park Site Analysis Drawings will be presented and a programming discussion will commence on March 12, 2009 at 7:00pm. (GJAC Conference Room B)

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

HARBINS COMMUNITY PARK SITE MASTER PLAN – Inventory & Analysis Meeting

Minutes from: 03.12.09 Inventory & Analysis Meeting

Attendees: Gwinnett County Department of Community Services – Phil Hoskins, Rex Schuder,
jB+a - Raigan Carr

Steering Committee participants – Ed Jacob, Steve Adams, Ben Archer, Kevin Darby, Cassi Gaines, Janice Rinaldo, Ann Camp, Dave Jenkins, Chris Jenkins, Rahim Gul, Karen Boss, Chuck Smillie, Kerry Mitchell, Lillian Pryor, Evelyn Sims, Kathy Jackson

Location: GJAC – Conference Room B

Time: 7:00pm

The Harbins Community Park Site Analysis boards were presented by Raigan Carr of jB+a. Analysis boards included soils, slopes, hydrology, vegetation, natural features, circulation, and Historical / Archaeological. The following points regarding the site were emphasized:

Soils Analysis

- Helps determine which soils on site are most stable and favorable for development.
- Generally, the majority of existing soil types on site are favorable for development utilizing some planning and design techniques. Although, special attention will need to be made where geotechnical analysis limits development due to shallow soils.
- Additionally, soils located within the floodplain of Cedar Creek and its tributaries indicate poor percolation and unstable soil structure and are therefore not favorable for development.
- Large sections of the site indicate moderate to slight soil limitations for septic. Cross referencing with boring locations, slopes and vegetation will be necessary to indicate actual preference for septic location.
- Several granite outcrops are featured throughout the site and should be retained as visual / ecological interest.
- Boring locations indicate that some areas encountered rock at shallow depths

Slope Analysis

- Site reflects variable topography with both hills and valleys.
- A very small portion of the site located in and along the floodplain of Cedar Creek, is flat or nearly flat.
- Majority of slopes on the site range lie in the 0% to 10% slope range.
- Site possesses positive drainage patterns due to ridges and stream valleys across site.

Hydrology Analysis

- Main water feature on the site is Cedar Creek.
- Cedar Creek has an extensive 100 year floodplain and floodway, in which no development may occur.

Floodplain – Flat or nearly flat land that is adjacent to stream, experiences occasional or periodic flooding and includes the floodway.

Floodway – Consists of the stream channel and adjacent areas that carry flood flows.

- Several tributaries of Cedar Creek are in existence on site. Regulations require a 75' setback each side of stream.
- Several features such as stone ledges, waterfalls, and rock spills are associated with Cedar Creek and its tributaries and should be considered assets to the site.
- Three small cow ponds exist on the Wages tract and which will need to be mitigated.

Vegetative Analysis

- Site illustrates a mixture of vegetation types.
- Areas in young, medium and mature pines are the most favorable for development due to the growth cycle of a pine forest which is relatively fast compared to hardwoods. These areas include the north east section, along New Hope Road, the area adjacent to Luck Edwards Road on the western edge of the site, and the area flanking the eastern most area of the site along Indian Shoals Road.
- Additionally, the open pasture (early Field succession) areas of the Wages Tract are also favorable for development.
- Large specimen quality trees found along stream banks would be an asset to the site if they were retained, as would be the areas of open hardwoods, specifically the central area of the site just north of Indian Shoals Road.
- Many invasives found along stream bank, specifically privet, should be removed from site.
- The stands of native azalea and sweetbay magnolia along the stream banks and pockets along Masters Road and on the Wages Tract should be protected.

Natural Features

- As mentioned, several features such as stone ledges, waterfalls, and rock spills are associated with Cedar Creek and its tributaries and should be considered assets to the site.
- Rock outcroppings should be maintained as visual / ecological interest. Plant communities associated with these granite outcrops should be protected.
- Good hardwood forest stands and specimen trees, specifically those along the stream corridors should be protected and maintained on site.
- This site has a scenic quality to it, as many of the view sheds as possible should be retained, enhanced, and maintained.

Circulation Diagram

- Site bounded or intersected by New Hope Road, Luke Edwards Road, Indian Shoals Road and Masters Road.
- Within the site exists several former dirt trails and / or roadbeds, some that are deeply incised and eroded, others are historic.
- Potential for trail use on existing road beds and or historic significance.
- Intersection of Luke Edwards and New Hope Road dangerous, important to review signage and GDOT requirements pertaining to curb cuts.

Historical / Archeological Resources

- Several segments of historical roadbeds exist on site, including the former alignment of New Hope Road.
- No Native American artifact Sites exist on site.

Utilizing the information inventoried and analyzed during this phase of the project, various park elements will be located within three conceptual diagrams. The inventory graphics are intended to be referred back to in an effort to locate these elements in the most favorable locations.

Following the presentation of the analysis graphics, a programming discussion commenced. The following elements are to be considered for the Harbins Community Park Site.

County Requests

1. Baseball / Softball Fields
2. Multipurpose Field (Football, Soccer, Lacrosse, Track)
3. Soccer Complex
4. Community Center / Gym
5. Teen Facilities (Skate Park, Sand Volleyball, Basketball)
6. Picnic / Playground /Pavilion
7. Disc Golf Course
8. BMX Course
9. Cricket Pitch
10. Gaelic Field Sports (Rugby, Hurling, Gaelic Football)
11. Tennis Courts

Steering Committee Requests

1. Trail Linkages and Network connections (Hiking, Biking, Walking, Equestrian)
2. Lake or pond
3. Senior Center or Wing (Include as part of Community Center?)
4. Greenway Corridor Connectivity (Palm Creek, Tribble Mill)
5. Library (5 acre Parcel)
6. Concessions Area w/ Interactive Fountain
7. Group Camping Site w/ Bath house

At the next meeting three concept drawings will be presented. Each concept will be depicted in a monochromatic form, utilizing bubble diagrams. Each will follow the same program requirements and differ only through spatial relationships and layout locations. The main focus of discussion for the next meeting will be the spatial relationships of the various park elements.

Next Meeting

- **April 14, 2009 – Concept Development Meeting.**
(Tuesday, 7:00pm, GJAC Building, Conference Room A)

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

HARBINS COMMUNITY PARK SITE MASTER PLAN –Concept Meeting

Minutes from: 04.14.09 Concept Meeting

Attendees: Gwinnett County Department of Community Services – Grant Guess, Rex Schuder
jB+a - Raigan Carr

Steering Committee participants – Cassie Gaines, Ann Camp, Kerry Mitchell, Ben Archer, Rahim Gul, Kevin Darby, Jim Nasoulis, Karen Boss, Janice Rinaldo, Steve Adams, Ed Jacob, Chris Albers, Lillian Pryor, Kathy Jackson, Shawn Smith, Evelyn Sims

Location: Gwinnett Justice and Administration Center (GJAC), Conference Room A

Time: 7:00pm

The Harbins Community Park Concept Plans were presented by Raigan Carr of jB+a. Each concept was depicted in a monochromatic form, utilizing bubble diagrams. Each followed the same program requirements and differed only through spatial relationships and layout locations. The main focus of the discussion was the spatial relationships between the various park elements.

Concept 1

- Utilized the most developable areas of the park site
- Ball field Complex was sited in the north eastern section of the site off New Hope Road. Included in the complex are 7 ball fields arranged in a modified wagon wheel configuration around a central plaza. On access with the plaza is a 5000sf destination playground with open lawn area. Tucked into the site at the end of the expansive parking lot for 520 cars is the Teen Recreation Area, which will include the following; Skate park, sand volleyball, basketball, and access to the gully course.
- Just south of the ball field complex the community Center/ Gym with Senior wing is sited to take advantage of the existing peninsula. An additional 253 car parking lot is located adjacent to the Community Center.
- On the West side of New Hope Road a 5 acre area designated for the primitive camping is located. Parking for 80 cars and access to a bath house and the nature trail is available.
- Also located on the west side of New Hope Road is a trail head with pavilion, to provide access to the nature and multi-use trails.
- At the intersection of Luke Edwards Road and New Hope Road, a 5.35 acre parcel has been set aside to accommodate a future library. Also sharing the space is a garden area and interactive fountain.
- The south western section of the Community Park provides areas for a BMX biking facility with access off of New Hope Road and a 25 acre disc golf course. Parking for 200 cars is shared between these two park elements.
- Aligning an entrance with Harbins conservation park, parking is provided for 80 cars and serves as a trail head and rental pavilion area.
- A 6 court (3 pair) tennis complex is located in the eastern most section of the site just north of Indian Shoals Road. The complex includes a plaza area, tennis center and parking for 120 cars. This lot could also be used for trail access due to the amount of parking available.
- Aligning two separate entrances; one with Masters Road –which bisects the site and serves as an independent drive way that links all element without passing through parking areas and terminates at a round about, the other aligns with the tennis complex parking area and

serves the multi-use field only. the Wages Tract hosts predominantly active recreation facilities including Multi-use field (football, soccer, lacrosse, and a .3 mile lighted track) in the north east corner of the tract, the Gaelic Sports Field (Rugby, Gaelic Football and hurling) south west of the multi-use field, five full sized soccer fields and a cricket pitch. It is anticipated that each sports field will be terraced into the site from front to back along with the parking areas that correspond to each field.

- On the western portion of the bisecting drive a playground area overlooking the Cedar Creek Floodway, enhanced lake and 1 mile paved trail loop are located.
- Additionally, a multi-use trail system, and Nature Trails links all elements throughout the entire Harbins Community Park site, connects to trails within the Harbins Conservation Park and provides opportunities to connect to the future Palm Creek Park.
- Areas for potential mountain bike and equestrian trails have also been designated.

Concept 2

- Utilized the most developable areas of the park site.
- A Cricket Pitch was sited in the north eastern section of the site off New Hope Road with plaza area and restroom / concession facility. In addition to the cricket pitch, five full sized soccer fields have been sited on this same ridge. They are sited around a plaza area as well. On access with the plaza is a 5000sf destination playground with open lawn area and two acre dog park. Parking for 609 cars is provided in this area.
- Located on the west side of New Hope Road is a trail head with pavilion, to provide access to the nature and multi-use trails.
- At the intersection of Luke Edwards Road and New Hope Road, the community center, gym with senior wing has been sited. To accommodate the seniors a patio and court yard area is planned. Additionally, the teen recreation center has been located near the Community Center to encourage passive policing. The recreation center would include skate park, half court basketball, and sand volleyball courts
- The south western section of the Community Park provides areas for a BMX biking facility with access off of New Hope Road and a 25 acre disc golf course. Parking for 200 cars is shared between these two park elements.
- Aligning an entrance with Harbins Conservation Park, parking is provided for 80 cars and serves as a trail head and rental pavilion area.
- The 5 acre parcel designated for the future library is located in the eastern most section of the site just north of Indian Shoals Road. This area also includes a plaza area, interactive fountain and bath house directly behind the library. Just north of the Library in a more secluded area of the site, 5 acres has been designated for primitive camping. Campers would utilize the bathhouse at the interactive fountain. Parking for 200 cars is provided.
- The Wages Tract is host to active recreation. The single entrance into this portion of the site aligns with Masters Road. The seven field Ball Complex is sited in the north east corner arranged in a modified wagon wheel configuration around a central plaza. Three hundred and sixty (360) parking spaces are provided.
- A 6 court (3 pair) tennis complex is located just south of the ball complex. The complex includes a plaza area, tennis center and parking for 228 cars.
- Furthest into the site are the Gaelic Sports Field and the multi use field, with shared parking of 150 parking spaces.
- On the western portion of the entrance drive a 1 mile paved trail loop is located.
- Additionally, a multi-use trail system, and Nature Trails links all elements throughout the entire Harbins Community Park site, connects to trails within the Harbins Conservation Park and provides opportunities to connect to the future Palm Creek Park.
- Areas for potential mountain bike and equestrian trails have also been designated.

Concept 3

- “Sectors” Concept 3 divides the Community Park site into three sectors. The Active Sector, The Urban Sector, and the passive open field Sector.

Active Sector

- Ball field Complex was sited in the north eastern section of the site off New Hope Road. Included in the complex are 7 ball fields arranged in a modified wagon wheel configuration around a central plaza. On and east / west access with the plaza, is the Teen Recreation Area, which includes the following; Skate park, sand volleyball, basketball, and access to the gully course, and is located to be in a most visible area. In proximity to the Teen Rec. Area is the 6 court (3 pair) tennis complex. The complex includes a plaza area, and tennis center. On a north / south access with the ball field complex is a 5000sf destination playground with pavilion, open lawn area and overlook shelter.
- On the western side of New Hope Road the BMX biking facility has been located. Parking for 75 cars is provided.

Urban Sector

- The intersection of Luke Edwards Road and New Hope Road has been developed in an urban core type layout. The intent is for this intersection to serve as a “welcome” to the park and open up the intersection for better visibility. The Community Center / Gym w/ Senior Wing is sited on the northern side of New Hope Road, with plaza areas to the front and back of the building. The library has been sited on the south side of New Hope Road with a welcoming plaza at the front to mirror the community center. Both buildings are intended to address the intersection and create more of an urban center feel. Behind the Library an interactive fountain / garden area is located with concessions and a .3 mile paved walking loop. This garden area is intended to link the urban core to the natural park atmosphere.

Passive Sector

- The passive / open field sector comprises the largest portion of the park.
- Located in a wooded area to the east of the urban core, the primitive camping area is located with parking for 70 cars and a bathhouse.
- Aligning an entrance with Harbins Conservation Park, parking is provided for 80 cars and serves as trail head and disc golf parking area.
- Masters Road has been eliminated to provide continuous use of the southern section of the park site without vehicular conflict. The existing road bed will be used as part of the multi use trail system.
- In the eastern most section of the site just north of Indian Shoals Road a large parking area for 325 cars is provided. This serves as a trail head to the trails section of the site. Parking would be terraced and sited amongst the trees to minimize impact.
- The Wages Tract is host to field type recreation. The single entrance into this portion of the site is located to the far east. The intent is to minimize the intrusiveness of the vehicle in the park area. Parking areas are also sited to the far east of the site in an effort to maintain as much of the passive feel of this sector as possible.
- Open field sports are located in this section, including; Multi use field, Gaelic sports field, four full sized soccer fields, and cricket pitch.
- In the lower portion of this sector a 1.5 mile paved trail has been located.
- Additionally, a multi-use trail system, and Nature Trails links all elements throughout the entire Harbins Community Park site, connects to trails within the Harbins Conservation Park and provides opportunities to connect to the future Palm Creek Park.
- Areas for potential mountain bike and equestrian trails have also been designated.

Following the presentation of the concepts, the meeting was open for questions and a series of votes were taken throughout the course of the discussion. Votes were decided by the raising of hands and majority rules. The following was decided:

- Football / Soccer layout would follow Concept 1
- Baseball / Softball complex would follow Concept 3
- Primitive Camping would follow Concept 3
- BMX location would follow Concept 3
- Urban Center would follow Concept 3
- Disc Golf would position itself on both sides of stream
- Include contiguous trails between Harbins Park and Community Park.

Meeting was adjourned.

Next Meeting

- **May 19th, 2009 – Preliminary Master Plan Meeting**
(Tuesday, 7:00pm GJAC Building, Conference Room B)
jB+a will present a graphic of the Preliminary Concept for the Harbins Community Park Site and a preliminary cost estimate to the Steering Committee for review and comment.

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

**HARBINS COMMUNITY PARK SITE MASTER PLAN –
Preliminary Master Plan Meeting**

Minutes from: 05.19.09 Preliminary Master Plan Meeting

Attendees: Gwinnett County Department of Community Services –Grant Guess, Rex Schuder

(jB+a) - Raigan Carr

Steering Committee Participants – Ann Camp, Steve Adams, Ed Jacob, Dave Jenkins, Chris Jenkins, Jim Nasoulis, Kevin Darby, Jeff Boss, Christopher Albers, Rahim Gul, Janice Rinaldo, Kathy Jackson, Ben Archer

Location: GJAC – Conference Room B

Time: 7:00pm

The preliminary master plan was presented to County Staff prior to this Steering Committee Meeting. That presentation resulted in a request for modifications that were significant and had a “cascade” effect as regards to the distribution of facilities. Additionally, staff’s recent assessment of existing BMX and woodland Disc Golf facilities in the metro area also brought forth a desire to make modifications to those amenities. In addition to the preliminary Master Plan being presented to the Steering Committee, a rough draft of the modified plan-that illustrated the consequences of the requested revisions, was presented. Rex Schuder presented both plans in a back and forth delivery.

(Note: The rough draft of the modified plan does not indicate final design. Additional refinement and study of the exact location of the relocated elements will be required.)

Ballfield Complex

- Ballfield Complex area as requested by Steering Committee, with teen facilities moved closer to entrance and destination playground area included.

Staff Comments: Comments did not affect the Ballfield Complex area.

Wages Tract

- Entrance drive moved from eastern property line to align with Master Road per Steering Committee request.
- Recreation areas include four (4) soccer fields, multi-use field (football, soccer, and lacrosse), Gaelic sports field, and cricket pitch.
- Entrance drive was lengthened to extend down hill to the floodplain with a turn around at the end.
- Handicapped only parking spaces have been provided at the turn around point for access to the multi-use trail loop that is sited within the flood zone area.

(Note: With so much topo change on site there is very little to offer up as an accessible natural experience. This loop will provide and opportunity to include a very nice, HC accessible experience.)

Staff Comments: Originally the Preliminary Master Plan showed a shelter at the pond. Staff wants to replace the shelter with a rentable pavilion. This, in turn, required an expansion of the parking area and the addition of a playground.

Linkage to Conservation Park

- Always the intent to connect both the Conservation and the Community Parks via trail linkages
- Spur of multi-use trail will connect from the equestrian parking lot at the Conservation Park to the HC accessible loop on the Wages Track via a pedestrian bridge across Cedar Creek.
- Under pass Structure is proposed to provide linkage across Indian Shoals Road. *(Note: With the removal of the almost 90 degree turn at the Conservation park entrance – per County DOT, traffic no longer slows to make the turn. As a result, traffic flows rapidly along both Luke Edwards and Indian Shoals Roads)*
- Underpass structure would create a sort of chute that would have walls on both sides but would be open to the top. As the ground rises around the chute, passage would remain fairly level into the hillside for approximately 100', at which time a 90 degree turn would be made and users would pass under the road via a tunnel, exiting on the other side of the road via another chute structure. The tunnel portion would be lighted to allow for pedestrians, horses, cyclists to move between parks without vehicular conflict.
- A second underpass would be utilized on New Hope Road to provide linkage to the northwestern section of the park and potential greenway connection to Palm Creek Park.

Masters Road Closer

- Preliminary Master Plan calls for the closer for Masters Road.
- Preliminary Phone calls to: County DOT, County Planner, Bus Routing Officer for the Board of Education, and the Fire Marshall. Indicated that none of the organizations listed above had any problem with the closer of the road.
- Included a note on the Preliminary Master Plan which reads; "Master Road: Potential abandonment of with existing road bed to be utilized by multi-use trail."

New Hope Road / Luke Edwards Road Intersection

- Most significant of changes requested by staff.

Staff Comments: Requested the disassociation of the interactive fountain from the Library. Conversation with Department of Support Services alluded to an opportunity to conceive of the layout from a site planning perspective to how elements could be coordinated. Requested that a 5 acre parcel be shown on the Master Plan and labeled as Future Library.

- Library Parcel shown as independent 5 acre parcel
- Community Center relocated to the area southeast of the NH Rd. / LE Rd. intersection. (Due to shallow soils and the Center's larger footprint the Community Center could not be located on the corner intersection. Additionally, the newly occupied space required the relocation of the Primitive Camping Area.)
- Interactive Fountain is to be associated with the Community Center.

Primitive Camping Area

- Relocated to the North West Sector of the park near the BMX facility.
- Location shown on modified plan is representational and should not be viewed as final location. Additional refinements will be made that site the camping area more strategically and more towards the interior of that park zone.

- Relocation of the Primitive Camping Area is result of 1) relocation of community center, 2) response to visiting local BMX facility (Wild Horse Creek Park – Cobb County, GA)

When large meets are held, Cobb County Parks shuts down the rest of the community park to accommodate / dedicate parking to the National Meet (Dixieland BMX Nationals). As the primitive camping area will be utilized by small groups of users, parking associated with the camping area could also potentially be used by the BMX community.

Woodland Disc Golf Course

- Staff and Consultant visited woodland golf courses at Fort Yargo State Park and East Roswell Park. The relocation of the woodland course is a result of these visits.

East Roswell Parks Disc Golf Course is very heavily used and heavily wooded. Underestimated the effect the disc hits had on the surrounding trees. Noticed that several of the trees had gashes, and sloughed bark. Those trees that had been debarked appeared to either be in decline or dead. Trees that were more severely affected were hardwoods, such as oaks.

- Originally the disc golf course was located within the best stands of woods (just north of the Harbins Conservation Park entrance) However, additional research has caused us to rethink the location as we do not want to sacrifice the best stands of trees to that kind of impact.

In thicker woodland, a wayward disc would get redirected back onto the course faster than in open woodland. Additionally, less foot traffic would be going off into the woods – foot traffic that could contribute to erosion. Younger thicker woodland appeared to be a better choice for the disc golf course.

The woodland disc golf course has been relocated to the land surrounding Masters Road. The course will occupy land on both sides of the road.

- Additionally, the East Roswell course illustrated signs of severe erosion problems on fairways crossing significant slopes, where as fairways that stayed aligned with the contours had minimal erosion problems. Areas rich with pines proved enough pine straw dropping from trees to help minimize erosion effects as well as keep the course somewhat open.
- Parking for the disc golf course will be accommodated through the expansion of the parking area at the tennis complex. Additionally, spur trails will provide access to and from the course, and pedestrian footbridges will provide passage across streams.

Tennis Complex

- Layout modified to accommodate the expansion of parking area to park both the tennis complex and disc golf course.

Interpretive Trail

- New element added to the Harbins Community Park.
- Will utilize parking area and originally location of the disc golf course (across Indian Shoals Road from Harbins Conservation Park)
- Area will be converted to an extensive nature / interpretive trail system with information kiosks, in an effort to preserve the oldest, and nicest hardwoods on the site.
- Kiosks and trail would interpret the ecology of the Piedmont.

Questions / Comments

1. Was there ever a discussion about putting in a larger lake type amenity, outside the flood zone area, perhaps in the area where the interpretive trail will be? *No, did not want to get into damming up the creek, where we are trying to interpret and preserve nature. Damming the creek would destroy the area and the nature we are trying to preserve and also require extensive permitting. On the Wages Tract, it is easier to create the pond because it is already open, there would be little permitting required provided we stay out of the floodway and the water table is shallow enough that we could sink a well and keep the pond full.*
2. The "Interactive Stream", what is that? *Will need to sink a well to feed pond. Source to continually pump water to keep it at a constant level. Concept where water coming out of well is used in the children's playground. A stone runnel is constructed, water flows down the stones, as it makes its way through the playground to a pipe into the pond. Water quality must be drinking level quality.*

Examples of Interactive Stream: Webb Bridge Park (Alpharetta), Simms Lake Park (Suwannee), Gwinnett constructing one at Rabbit Hill Park.

3. Primitive Camping – What differentiates between property of park and residential? *Camping area shown is representational of where it could be located, In final Master Plan it will be moved more interior to site. However, the camping area itself when constructed will be fairly well defined, with trails. County does not fence its parks.*
4. Is there a noise issue with the BMX facility? *The BMX facility is actually fairly quiet. A PA system is used for races but we don't anticipate it being much of an issue.*
5. Where would the trails be behind the BMX facility? *All over, there are several very interesting features down along the creek that would be nice to highlight.*
6. My concern would be there would be BMX trails all through them. *BMX is contained within the 2 acres facility. Typically a fenced facility. There are not actual BMX trails.*
7. I have a concern with the location of some of the disc golf holes as well as the trail to the disc golf course being close to the property line, could they be moved a little further away? *Yes. When the course is laid out there will be a minimum of a 50' buffer between properties.*
8. My concern is with the safety through the underpass. I would be afraid to let my kids pass through a tunnel like that at night to get through the park. *Trails are typically open from dawn until dusk and the tunnel will be lighted. Trying to provide an option to get people from one portion of the site to another. The definite real danger is the speed at which the cars travel along New Hope and Indian Shoals Roads*
9. When might construction start? *Will be requesting bids from various firms once the master plan is complete. Usually takes about 3 months to get a firm on board to do the construction documents, then about 4-6 months to do all the design to the point where you are going through permitting, then it goes through permitting and them out to bid for construction. That whole process takes about 12months. Then construction of this park with two portions of the site under construction over vast distance potentially 18 months construction. Roughly 3 years before something opens. Complete build out will take decades.*

The Preliminary Cost Estimate was then passed out. In depth discussion regarding park cost will take place at the next meeting (July 14th).

It was then proposed that the master plan be approved with the following revisions:

- a.) Provide a minimum buffer of 50' along the eastern property line
- b.) Revise the camping area to a more interior location in the NW sector of the park
- c.) Research round about traffic configuration for Indian Shoals Road.
- d.) Research traffic calming devices, caution signage, strobes and audibles.

****NOTE:** A vote was taken to advance the preliminary master plan with the revisions to final master plan level. It was approved unanimously.

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

HARBINS COMMUNITY PARK MASTER PLAN – Final Master Plan Meeting

Minutes from: 07.14.09 Final Master Plan Meeting

Attendees: Gwinnett County Department of Community Services –Phil Hoskins, Rex Schuder
jB+a, inc. – Raigan Carr

Community participants –Cassie Gaines, Ann Camp, Steve Adams, Ed Jacob, Demetrios “Jim” Nasoulis, Ben Archer, Kevin Darby, Chuck Smillie, Dave Jenkins, Chris Jenkins, Evelyn Sims, Karen Boss, Janice Rinaldo, Lillian Pryor, LaShawn Smith

Location: GJAC Conference Room C

Time: 7:00pm

Raigan Carr of jB+a, inc. presented the Harbins Community Park Final Master Plan to the Steering Committee, pointing out the refinements made since the Preliminary Master Plan Presentation on 05.19.09. Refinements included:

- a.) Provide a minimum buffer of 50’ along the eastern property line
- b.) Revise the camping area to a more interior location in the NW sector of the park
- c.) Research round about traffic configuration for Indian Shoals Road.

Additional refinements included refinement to a sanitary sewer system.

The floor was then open for discussion:

1. What happened to the mountain biking trails? *We are just indicating zones (natural surface) in the master plan. They would be laid out on site and by the interest groups. The gully trail is still in the master plan as well as a future connection to the greenway that would eventually lead to Palm Creek Park (A shoal across Cedar Creek and an old road remnant provides the crossing.)*
2. At the last Recreation Authority Meeting the name for Harbins Community Park was discussed. The name will just be Harbins Park, and will include the Conservation Park and Community Park elements.
3. Can we add an exercise machine room to the Community Center? *Programming of individual rooms is more detailed than what we get into at the Master Planning level and is something that would occur during the construction document phase. It has been the general course of Gwinnett County not to include facilities that are common in the private market. (**Note: Several Committee members voiced a desire for an exercise room to be included in the Community Center.)*
4. Where is the library to be located? *The library could potentially be located just north of the Luke Edwards Road / New Hope Road intersection. The land allotted for the library is 2-3 times more than what it would typically need, however, a septic system may also be required and therefore land has been provided for that purpose.*
5. The parking area for the BMX facility is located next to a house, wouldn't that be a problem? *The property just north of the BMX facility is currently a large wooded tract. The residence is located north of the wooded area. At this time the BMX parking area would not be visible from the existing residence.*

Following the discussion a vote to accept the Master Plan as presented, to the Recreation Authority, as the guiding document for development of Harbins Park was taken. By unanimous vote the Master Plan was approved for submission.

Priorities for park construction were then discussed. Steering Committee members were asked to vote on the various elements of the park to help determine the order in which they would like to see the park elements constructed when funding becomes available. *(Note: Certain infrastructure elements of the park will be required to be constructed during the first phase, such as parking, the site preparation and associated site, utilities and septic)* Priorities are as follows:

1. Multi-Use Complex (Football, Soccer, Lacrosse) and associated facilities. (Note: due to the proximity of the Gaelic Sports field to the multi-use complex, it is likely that it could be developed at the same time as the Multi-Use complex at minimal cost.)
2. Softball / Baseball Complex and associated facilities
3. Community Center
4. Soccer Complex
5. Tennis / Disc Golf. (Note: Disc golf is reliant upon the tennis center for parking and restroom facilities and should therefore be constructed simultaneously.)
6. BMX facility
7. ADA Multi-purpose trail loop (Lower section of Wages Track, includes bridge and connection to Harbins Conservation Park multi-use trail)
8. Cricket Pitch
9. Teen Facility
10. Nature / Interpretive Trail (Parking area could also be used as overflow parking for the Conservation Park)
11. Lake Amenities (Includes parking, playground, pavilion/ restroom, well fed interactive "stream" and the 3.0 acre lake)
12. Destination Playground
13. Primitive Camping Area
14. Interactive Fountain (Includes, parking, interactive fountain and adjacent plaza area, playground, restroom / concessions, pavilion, shelters, natural garden area and .45 mile paved walking loop)
15. Remaining Multi-use Trail System (Includes approximately 10 miles of trails, with connections / linkages to Conservation Park, and future greenway.)

Following the prioritization of park elements a vote to accept the priorities as listed above and to submit the progression to the Recreation Authority was taken. By majority vote the prioritization of park elements was approved for submission.

jB+a will present the Harbins Park Master Plan to the Recreation Authority on September 10, 2009.. Steering Committee Members are invited to attend.

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

HARBINS COMMUNITY PARK MASTER PLAN-Recreation Authority Presentation

Minutes from: 09.10.09 Presentation to the Gwinnett County Recreation Authority

Attendees: Gwinnett County Recreation Authority
Gwinnett County Staff – Rex Schuder, Grant Guess, Phil Hoskins
Raigan Carr – jB+a, inc

Community participants –Ann Camp, Ben Archer, Janice Rinaldo, Dr. Rahim Gul

Location: Gwinnett County Justice and Administration Building

Time: 3:30pm

The Steering Committee Final Master Plan recommendations were presented to the Gwinnett County Recreation Authority by Raigan Carr of jB+a, inc. Several Steering Committee Members were in attendance.

During the discussion portion of the presentation an adjacent neighbor expressed concern about the proximity of the Football-Lacrosse-Soccer Multi Purpose Field and parking to her property. The Recreation Authority requested an additional study by the Consultant to look into the concerns voiced by the neighbor and asked that modifications be made to the plan in the area of the Football-Lacrosse-Soccer Multi Purpose Field in order to move the parking area away from the property line. The approval of the master Plan was tabled until the requested modifications could be studied and completed.

Upon completion of the modifications, the master plan will again be presented to the Recreation Authority for approval and adoption at their November meeting.

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

HARBINS COMMUNITY PARK MASTER PLAN-Revised Master Plan Meeting

Minutes from: 10.08.09 Revised Master Plan Meeting – Additional Meeting

Attendees: Gwinnett County Staff – Rex Schuder,
Raigan Carr – jB+a, inc

Community participants –
12:00pm Meeting – Janice Rinaldo, Ben Archer
7:00pm Meeting – Dave Jenkins, Chris Jenkins, Rahim Gul

Location: 12:00pm – GJAC-3rd Floor Parks & Rec Office Suite, Large Conf. Room
7:00pm - GJAC Conference Room C

Time: 12:00pm & 7:00pm

During the discussion portion of the Presentation to the Gwinnett County Recreation Authority on September 10, 2009, an adjacent neighbor expressed concern about the proximity of the Football-Lacrosse-Soccer Multi Purpose Field and parking to her property. The Recreation Authority requested an additional study by the Consultant to look into the concerns voiced by the neighbor and asked that modifications be made to the plan in the area of the Football-Lacrosse-Soccer Multi Purpose Field in order to move the parking area away from the property line. The approval of the Master Plan was tabled until the requested modifications could be studied and completed.

Following the Recreation Authority Meeting, the Consultant and County Staff met with the neighbor, Kathryn Radford, on September 22, 2009, to discuss a potential alternative to the park area adjacent to her property. The alternative included; removing the Gaelic Sports Field from the park, moving the parking areas of the Multi-use Field to the far side of the sports field away from the Radford property and replacing the former parking area with a dog park. Ms. Radford agreed that this was a plausible solution.

jB+a completed the modifications discussed with Ms. Radford and County Staff presented the revisions dated October 8, 2009 to her on October 6, 2009. Ms Radford approved the revisions to the Master Plan and forwarded a letter stating her approval to Rex Schuder (Gwinnett County) the same day. (RE: Attached)

In an effort to maintain the process of citizen committee review and comment prior to going back to the Recreation Authority for approval, a steering committee meeting was scheduled for October 8th, 2009 to review the Master Plan Revisions. Two separate meetings were scheduled to accommodate the Citizen Steering Committee, as this additional meeting went beyond their original commitment. The Revised Master Plan was presented to the steering committee members and the modifications to the master plan were unanimously approved.

The Revised Master Plan will be addressed with the Recreation Authority at their November Meeting.

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

October 6, 2009

Rex Lee Schuder
Principal Community Planner
Gwinnett County Parks and Recreation
75 Langley Drive
Lawrenceville, GA 30045

Dear Mr. Schuder:

Thank you very much for taking into consideration my concerns regarding plans for the Harbins Park football and soccer development immediately adjacent to my home. The new plans, dated October 8, 2009, which moved the parking areas to the far side of the sports fields away from my property and replaced them with a dog park, are much better, and meet with my approval. Leaving as many trees as possible on the northeast side of the dog park as a buffer from the lights and noise of the football field will also improve the situation, as will the use of low-spill lighting at the football field.

I really appreciate the planning committee's willingness to revise their plans in order to reduce the effect of the sports complex on my property and home. Thank you again for working with me.



Kathryn Harrer Radford
3001 Luther Wages Rd
Dacula, GA 30019

APPENDICES

Appendix J: Geotechnical Report (Digital Copy of Report Only)

Refer to the attached report for a summary of the subsurface soil conditions found within the Harbins Park site.

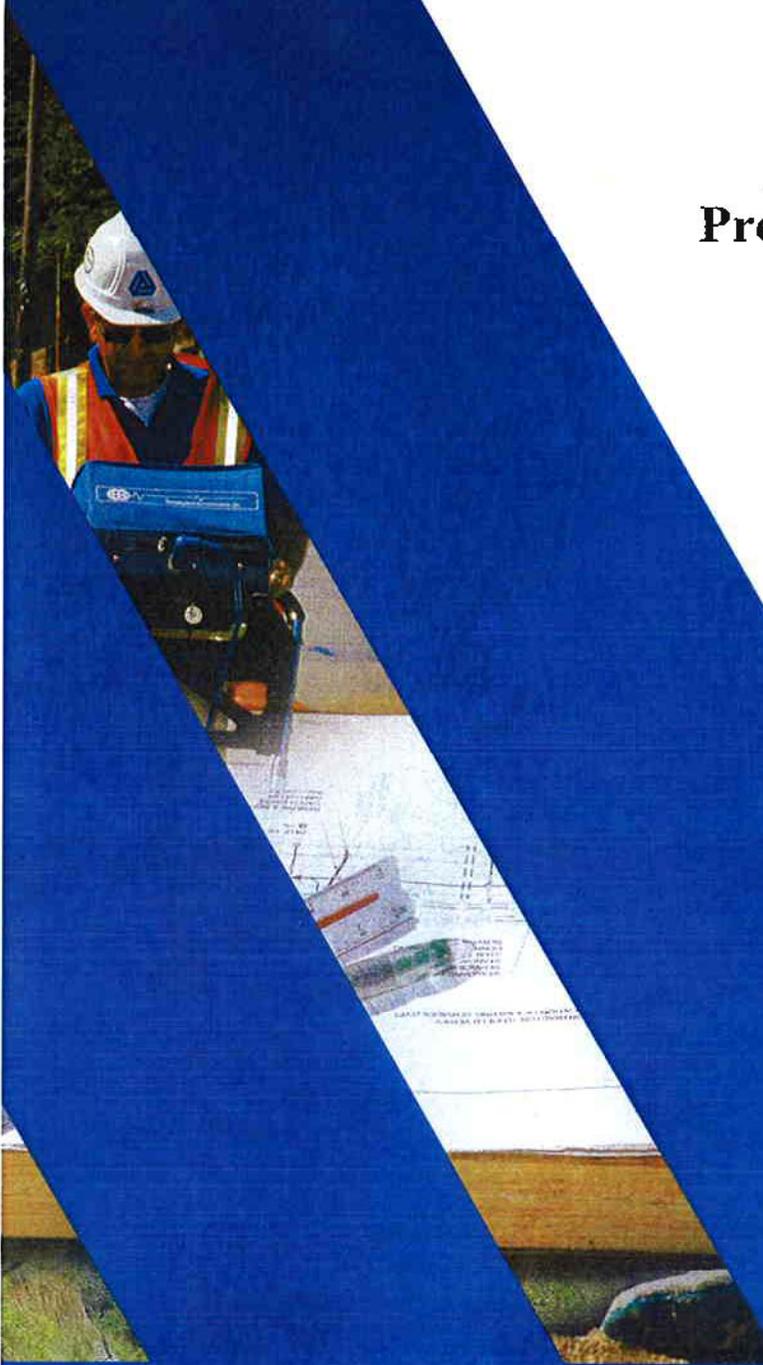
REPORT

Preliminary Geotechnical Exploration

Wages Tract
Indian Shoals Road at Masters Road
Gwinnett County, Georgia

Project Number
2008.1775.01

November 25, 2008



We're here for you

UNITED CONSULTING



We're here for you

UNITED CONSULTING

November 25, 2008

Mr. Rex Schuder, ASLA
Parks & Recreation Project Administration
Gwinnett County
75 Langley Drive
Lawrenceville, Georgia 30045

Via email: Rex.Schuder@gwinnettcountry.com

RE: Report of Preliminary Geotechnical Exploration
Wages Tract
Indian Shoals Road at Masters Road
Gwinnett County, Georgia
Project No. **2008.1775.01**

Dear Mr. Schuder:

United Consulting is pleased to submit this report of preliminary geotechnical exploration for the above-referenced project. We appreciate the opportunity to assist you with this project. Please contact us if you have any questions or if we can be of further assistance.

Sincerely,

UNITED CONSULTING


Aaron Epstein, P.E.
Senior Geotechnical Engineer





Chris L. Roberds, P.G.
Senior Executive Vice President

MH/ACE/CLR/jp

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FIGURE

Figure 1 - Boring Location Plan

APPENDIX A

General Notes/Narrative of Drilling Operations
Boring Logs (B-1 through B-24 and offsets)
Typical Benching Detail
Exploration Procedures
Laboratory Procedures
Standard Proctor Test Results: Compaction Test Reports (B-2, B-4, B-12, B-14)



EXECUTIVE SUMMARY

United Consulting has completed a Geotechnical Exploration on the **Wages Tract project site** located in Gwinnett County, Georgia. The results of this exploration are briefly summarized below. The text of the report should be reviewed for a discussion of these items.

1. The depth to rock varied widely across the site. Auger refusal depths varied from a minimum of 7 feet below the existing ground surface in boring B-13B drilled in the northern central area of the site to a maximum of 58 feet in boring B-17 drilled in the southern central area of the site. The most consistent area of shallow rock was encountered in the northern central and northwestern area of the site near the northern property boundary along Indian Shoals Road in borings B-10, B-10A, B-11, B-11A, B-18, and B-19 which encountered auger refusal at depths ranging from 8 feet to 15 feet below the existing ground surface. Discontinuous PWR was encountered at depths of 3.5 feet and 4.5 feet below the existing ground surface in borings B-22 and B-23 and in three other borings at depths ranging from 8.5 feet to 14.5 feet. Continuous PWR was encountered in 19 borings at depths ranging from 4 feet to 43 feet below the existing ground surface. Difficult excavation conditions (ripping and blasting) should be expected for excavations greater than about 4 feet in the central, north central and northwestern areas of the site and greater than about 15 feet in the northeastern and eastern areas of the site.
2. The soils encountered are generally suitable for reuse as engineered fill. We note that the upper 6 inches to 2 feet of soil across most of the site consisted of very loose to firm sand with varying amounts of silt, clay, root hairs, and occasional topsoil classified as cultivated soils. We envision that much of the loose near surface cultivated soils at the site will require treatment such as compaction in-place, stabilization, or excavation and replacement prior to fill placement and construction. Most of the cultivated soils should generally be suitable for re-use as engineered fill, provided the soils do not contain excessive roots or organics.
3. Groundwater was encountered in three borings at depths of 33 feet to 43 feet below the existing ground surface at the time of drilling. Shallow groundwater is not expected to be significantly problematic in most of the areas explored. However, due to the presence of shallow rock, areas of the site might be susceptible to the formation of a perched water table. Additionally shallow groundwater should be expected in and around the existing creeks ponds, and localized drainage valleys across the site. The contractor should be prepared to remove perched water or groundwater as needed.
4. Since building or park element FFE's, structural loads, and grading plans have not been finalized, our recommendations must be considered preliminary. Once the development plans are further along, United Consulting should be consulted to provide a final geotechnical exploration specific to the actual planned park development.



PROJECT INFORMATION

The project site was located directly south of the intersection of Indian Shoals Road and Masters Road in Gwinnett County, Georgia. The project site consisted of mostly clear grassed pasture/farm land with a house and barn, multiple ponds, and Cedar Creek traversing the western edge of the property with small tributaries branching out in the southern areas of the property. At the time of our site visit, the project site was bound to the north by Indian Shoals Road, to the south by woodlands, to the east by more pasture land and woodlands, and to the west by Cedar Creek and woodlands. The land was moderately to steeply sloping downhill from northeast to southwest. Based on the provided topographic site map and our site reconnaissance, the highest elevations existed in the northeastern areas of the property around 930 feet above mean sea level (ft. msl) and the lowest elevations existed in the southwestern areas of the property and along the western border adjacent to the channel banks of Cedar Creek around 830 feet msl. Thus, the total relief at the project site is on the order of 100± feet.

No information on structural loads, the grading plan, or proposed park elements or amenities was available at the time of this report.

PURPOSE

The purpose of this preliminary geotechnical exploration was to assess the general type and condition of the subsurface materials at the project site and to provide preliminary recommendations to guide planning of the park with respect to grading, earthwork, quality control and other geotechnical-engineering related issues.

SCOPE

The scope of our Geotechnical Exploration has included the following items:

1. A visual reconnaissance of the project site from a geotechnical standpoint;
2. Drilling twenty-four (24) Standard Penetration Test (SPT) borings and six (6) offsets to assess subsurface conditions;
3. Obtaining four bulk samples for further classification and assigning laboratory tests;
4. An examination of soil samples obtained during our field exploration program for further identification and classification;
5. Performing a laboratory testing program consisting of: four (4) standard proctor tests from the bulk samples obtained and thirty-nine (39) moisture content tests from selected split spoon samples;
6. Analyzing subsurface conditions with respect to the proposed construction; and



7. Preparing this report to document the results of our field-testing program, engineering analysis, earthwork, and quality assurance recommendations.

SUBSURFACE CONDITIONS

Site Geology

This project site was located in the Georgia Piedmont geologic region. The virgin, "residual" soils (or "residuum") native to this region have been formed by the in-place weathering of the parent crystalline rock. A typical residual soil profile consists of a clayey silt zone from the ground surface, underlain by sandy silts and silty sands. These silts and sands often exhibit the banded appearance of the parent rock. Seams of partially weathered rock (PWR) are often encountered with depth until the sound, relatively unaltered parent rock is encountered. PWR is a term for the residuum that can be penetrated by soil drilling techniques and has standard penetration resistance values (N-values) in excess of 100 blows per foot (bpf). Differing rates of weathering often produce a considerable variation in depth to bedrock over short horizontal distances. The depth to bedrock can usually be determined by extending the boring to the auger refusal depth: the depth at which the boring can no longer be advanced with conventional soil drilling equipment. Auger refusal can also be caused by a seam of rock, a boulder, or other hard obstruction.

Topography in the province is variable and ranges from gently rolling hills in the south to moderate to steep hills in the north. Based on the provided topographic site plan, elevations in the vicinity of the project site range from approximately 930 feet above mean sea level (ft msl) in the northeastern areas of the site along Indian Shoals Road to approximately 830 ft msl at the southwestern property corner and along the edge of the Cedar Creek channel which traverses along the western boundary of the site. The site had an approximate elevation change on the order of 100± ft.

Cultivated Soils

Cultivated soils were encountered below a thin veneer of topsoil in each of the borings and offsets to depths ranging from about 6 inches to 2 feet below the existing ground surface. Cultivated soils are those that have been disturbed due to agricultural practices. The cultivated soils generally consisted of very loose to firm sand with varying amounts of silt and clay, trace to some amounts of roots and root hairs, and occasional trace amounts of topsoil and mica. The standard penetration test resistances (N-values) recorded in the cultivated soils ranged from 4 to 11 blows per foot (bpf).

Residual Soils

Typical residual soils of the Piedmont Geologic Region were encountered below the cultivated soils in each of the borings and offsets. The residual soils encountered typically consisted of loose to very dense sand with varying amounts of silt and clay, varying amounts of mica,



occasional trace amounts of root hairs in the near surface soils, and occasional varying amounts of rock fragments. The N-values in residual soils encountered ranged from 7 to 77 bpf.

Partially Weathered Rock (PWR)

Discontinuous partially weathered rock (PWR) was encountered in borings B-3, B-20, B-22, B-23, and B-24 at depths ranging from 3.5 feet to 14.5 feet below the existing ground surface. Continuous PWR was encountered in borings B-2, B-3, B-5 through B-7A, B-10A through B-14, B-15A, B-16, B-18, and B-19 at depths ranging from 4 feet to 43 feet below the existing ground surface.

Auger Refusal

Auger refusal occurred in borings B-1 through B-8 at depths ranging from about 16 feet to 54 feet below the existing ground surface and in borings B-10 through B-19 at depths ranging from 7 to 58 feet below the existing ground surface.

Groundwater

Groundwater was encountered in borings B-2, B-12, and B-17 at depths ranging from about 33 to 43 feet below the existing ground surface at the time of drilling. Groundwater levels should be anticipated to fluctuate with the change of seasons, during periods of very low or high precipitation, or due to changes in the floodplain or watershed upstream from the area. For a more precise description of the subsurface conditions encountered within the soil test borings, we refer you to the Boring Logs included in The Appendix.

LABORATORY TESTING PROGRAM

Laboratory testing on selected split spoon samples and bulk samples included three (4) standard proctor tests and thirty-nine (39) moisture content tests. Results of the moisture content tests are included on the Boring Logs found in the Appendix of this report. Results of the Standard Proctor laboratory tests are tabulated below and included in the Appendix.

**TABLE 1:
STANDARD PROCTOR TESTS (ASTM D-698)**

Boring/Location	Depth Interval (ft)	Maximum Dry Density	% Optimum Moisture
B-2	11 - 16	119.1	11.7
B-4	5 - 9	108.1	16.8
B-12	6 - 12	112.8	13.5
B-14	3 - 5	116.1	14.1



DISCUSSION AND PRELIMINARY RECOMMENDATIONS

The following preliminary recommendations are based on our understanding of the proposed construction and development, the data obtained in our soil test borings, a site reconnaissance, and our experience with subsurface conditions similar to those encountered at the project site.

Since the grading plan, building types, locations, finished floor elevation (FFE) and structural loads have not been finalized the following discussions and recommendations should be considered preliminary. Once the design drawings are finalized, additional subsurface exploration and engineering analyses will be required to finalize our preliminary recommendations.

Site Preparation

Vegetation, topsoil, trees and their root mats, scattered debris and remnants of prior construction should be completely removed from the areas of the planned construction. Areas to receive fill, foundations and pavements, should then be proofrolled. Proofrolling should be performed under the observation of the Geotechnical Engineer or a qualified representative.

Areas, which exhibit "pumping" (wave type displacement) or rutting during proofrolling, should be treated by a method recommended by the Geotechnical Engineer. This method may consist of undercutting and backfilling with suitable compacted fill, replacing with surge stone and a layer of crusher run, or some other method that is deemed suitable.

We note that the upper 6 inches to 2 feet of soil across most of the site consisted of very loose to firm sand with varying amounts of silt, clay, root hairs, and occasional topsoil classified as cultivated soils. In areas where the cultivated soils will not be removed during mass excavation, we envision that much of the loose near surface cultivated soils at the site will require in-place compaction, stabilization, or excavation and replacement prior to fill placement and/or construction. As such greater than normal site preparation should be anticipated and budgeted for.

Difficult Excavation

Auger refusal occurred in most of the borings and the depth to rock varied widely across the site. Auger refusal depths varied from 7 feet below the existing ground surface in boring B-13B drilled in the northern central area of the site to as much as 53 feet in boring B-12 and 58 feet in boring B-17. The most consistent area of shallow rock was encountered in the northern central and northwestern area of the site near the northern property boundary along Indian Shoals Road with borings B-10, B-10A, B-11, B-11A, B-18, and B-19 encountering auger refusal at depths ranging from 8 feet to 15 feet below the existing ground surface. Shallow auger refusal also occurred in borings B-13, B-13A, B-13B, and B-14 at depths ranging from about 7 feet to 15 feet. Discontinuous PWR was encountered at depths of 3.5 feet and 4.5 feet below the existing ground surface in borings B-22 and B-23 and in three other borings at depths ranging from 8.5



feet to 14.5 feet. Continuous PWR was encountered in 19 borings at depths ranging from 4 feet to 43 feet below the existing ground surface.

The extent of difficult excavation conditions at this site will depend on the final grading plan, structure FFEs, and utility locations and depths. However, relatively shallow PWR and rock are present across much of the site, and difficult excavation conditions (ripping and blasting) should be expected for excavations greater than about 4 feet in the central, north central and northwestern areas of the site and greater than about 15 feet in the northeastern and eastern areas of the site.

Conventional scrapers and loaders can generally excavate soils. PWR typically requires loosening by ripping with large dozers pulling single tooth rippers in mass excavation and the use of jackhammers or light blasting in confined (trench) excavation. Relatively sound, massive, rock typically requires blasting for removal in mass or trench excavation.

We note that the depth to rock was erratic at this site and shallow pinnacles, lenses, or boulders of PWR or rock may be encountered in areas between or away from the areas explored. Excavation techniques may vary based on the weathering of materials, fracturing and jointing in the rock, and the overall stratigraphy of the site. Actual field conditions usually display a gradual weathering progression with poorly defined and uneven boundaries between layers of different materials. We recommend that the following definitions for rock in earthwork excavation be included in bid documents:

1. General Excavation: Any material occupying an original volume of more than 1 cubic yard which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rating of not less than 80,000 lbs. usable pull (Caterpillar D-8 or larger).
2. Trench Excavation: Any material occupying an original volume of more than 1/2 cubic yard which cannot be excavated with a backhoe having a bucket curling force rated at not less than 40,000 lbs., using a rock bucket and rock teeth (John Deere 790 or larger).

Removal of rock by blasting can be expensive. The costs of excavation vary with the type of material encountered and the quantities to be excavated. Hence, control of quantities is important. You should consider exposing the rock surface prior to blasting so that rock quantities can be more accurately estimated using surveying methods. Leaving soil overburden in place during blasting may result in difficulties in determination of blast rock quantities resulting in greater rock excavation costs. Loose fill or blasting mats can be placed over the blast area to control fly-rock.

Groundwater Considerations

Groundwater was encountered in borings B-2, B-12, and B-17 at depths ranging from 33 to 43 feet below the existing ground surface at the time of drilling. We do not generally envision that shallow groundwater will be problematic for construction in the areas explored. However, due to



the presence of shallow PWR or rock in some locations, the site might be susceptible to the formation of a perched water table and some localized dewatering might be required. Shallow groundwater should also be expected in and around the existing creeks ponds, and localized drainage valleys across the site. The contractor should be prepared to remove perched water or groundwater as needed.

Caving

Due to the presence of existing low-cohesive soil, some caving of excavations should be expected. Flattening of the excavation sidewalls and/or the use of bracing may be needed to maintain stability. All excavations must be performed in accordance with OSHA excavation safety standards.

Slopes

The site is moderately to steeply sloping, and as such, we expect that fill placement will occur on existing slopes. Where fill is to be placed on existing slopes or gullies greater than 4(H): 1(V), we recommend benching the slopes to prevent sliding of the fill mass along the existing surface. This can be achieved by notching the slope face by at least about two feet horizontally with the compactor blade as each lift is compacted. A typical benching detail is provided in the Appendix.

Permanent slopes should be constructed no steeper than 2(H): 1(V). Fill slopes greater than 20 feet in total height should be designed by a licensed professional structural Engineer.

All slopes should be protected from erosion during construction and provided with appropriate permanent vegetation or other cover after construction. Slopes should be protected from concentrated run-off flow by means of berms and drainage ditches to direct runoff around slopes or through concrete channels. Appropriate vegetative cover should consist of fast growing grasses that will rapidly create a dense root mat over the entire slope. Landscaping consisting of isolated shrubs and pine straw will not provide adequate slope protection.

Earthwork

The residual soils at the site should generally be suitable for reuse as engineered fill with appropriate moisture adjustment. Additionally, most of the cultivated soils should generally be suitable for re-use as engineered fill, provided the soils do not contain excessive roots or organics.

The Geotechnical Engineer or his representative should evaluate excavated soils to assess their suitability for reuse as engineered fill. Typical restrictions on suitable fill are no organics, plasticity index less than 20, and maximum particle size of four inches, with not more than 30 percent greater than $\frac{3}{4}$ -inch. These restrictions should also be applied to imported borrow soils if needed.



We recommend that the contractor be equipped for both drying and wetting soils. Positive drainage should be maintained at all times to prevent saturation of exposed soils in case of sudden rains. Rolling the surface of disturbed soils will also improve runoff and reduce the fill soil moisture and construction delays.

Ripped PWR and/or blasted rock fragments can be re-used and mixed into engineered fill provided that they are suitably pulverized and mixed with soil in order to fill voids between the rock pieces. A heavy compactor (Caterpillar 815 or larger) may be required to pulverize excavated blocks of dense soil or PWR.

If blast rock is to be used as engineered fill on the site, we suggest the spacing of the blasting holes be decreased in order to minimize the size of blast rock material. Particle size and placement will be a function of the character of the excavated material and its intended usage. We would be happy to consult regarding this when the intended usage has been decided upon.

Fill Placement

Moisture-density determinations should be performed for each soil type used, to provide data necessary for quality assurance testing. The natural moisture content at the time of compaction should be within moisture content limits, which will allow the required compaction to be obtained. The contractor should be prepared to increase or decrease soil water content.

The fill should be placed in thin lifts and compacted. We recommend that fill be compacted to at least 98% of Standard Proctor (ASTM D 698) maximum dry density within two feet below pavement subgrade or floor slabs and at least 95% of the Standard Proctor maximum dry density elsewhere.

A Geotechnical Engineer on a full-time basis should observe all grading operations. In-place density tests taken by that individual will assess the degree of compaction being obtained. The frequency of the testing should be determined by the Geotechnical Engineer.

Final Geotechnical Evaluation

The subsurface data gathered in this preliminary geotechnical exploration should be used to plan the site development, layout and earthwork so that difficult excavation and ground improvement requirements can be considered. Once the building FFEs, and foundation loads are finalized, additional borings should be performed to develop final geotechnical recommendations specific to the actual planned construction. The information provided in this preliminary geotechnical exploration report should be used to develop the scope for the final Geotechnical Exploration.



LIMITATIONS

This report is for the exclusive use of Gwinnett County Department of Parks and Recreation and the designers of the project, and may only be applied to this specific project. Our conclusions and recommendations have been prepared using generally accepted standards of Geotechnical Engineering practice in the State of Georgia. No other warranty is expressed or implied. Our firm is not responsible for conclusions, opinions or recommendations of others.

The right to rely upon this report and the data within may not be assigned without **UNITED CONSULTING'S** written permission.

The scope of this evaluation was limited to an evaluation of the load-carrying capabilities and stability of the subsoils. Oil, hazardous waste, radioactivity, irritants, pollutants, molds, or other dangerous substance and conditions were not the subject of this study. Their presence and/or absence is not implied or suggested by this report, and should not be inferred.

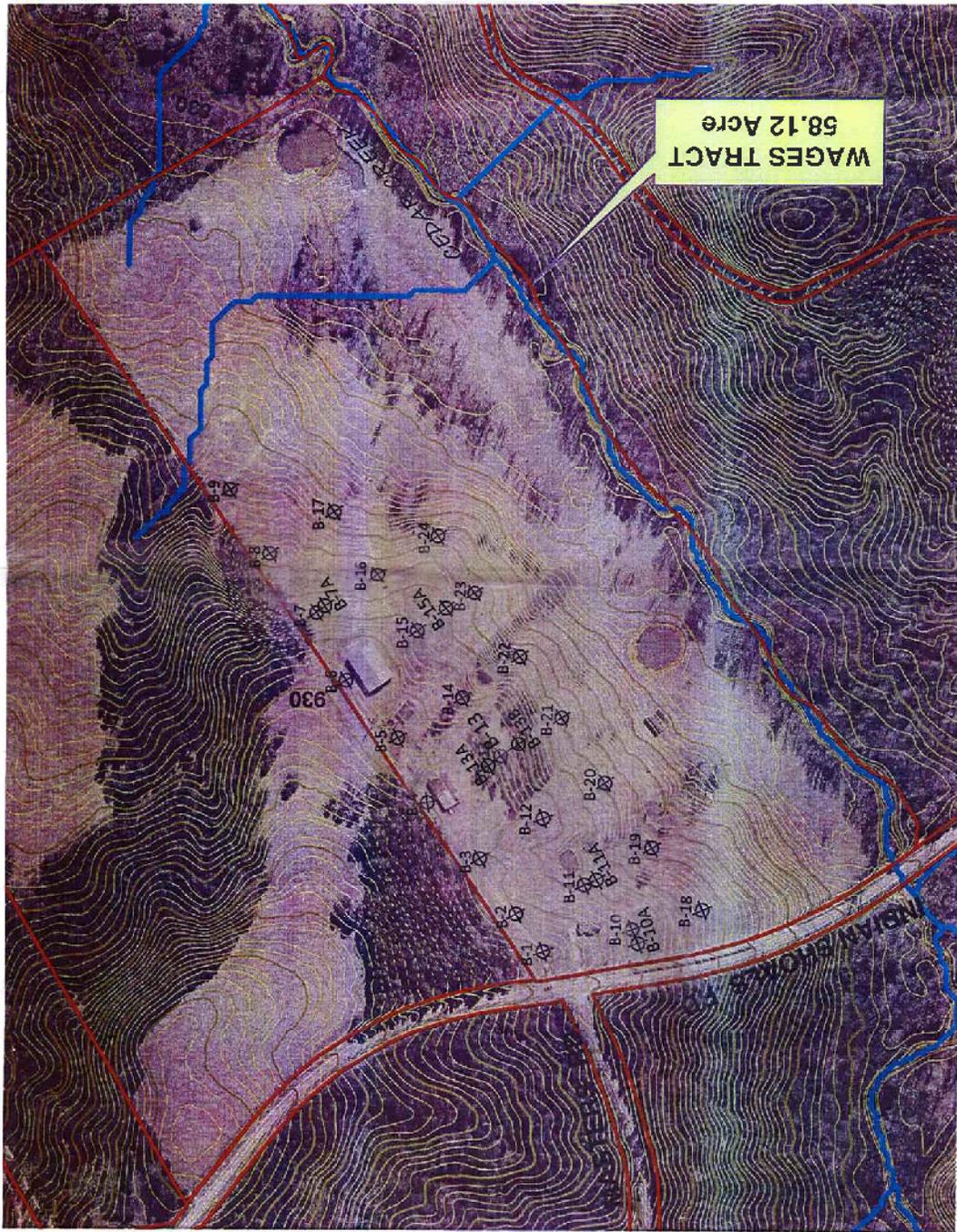
Our conclusions and recommendations are based upon design information furnished us, data obtained from the previously described exploration and testing program and our past experience. They do not reflect variations in subsurface conditions that may exist intermediate of our borings and in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon "on-site" observations of the conditions.

If the design or location of the project is changed, the recommendations contained herein must be considered invalid, unless our firm reviews the changes and our recommendations are either verified or modified in writing. When design is complete, we should be given the opportunity to review the foundation plan, grading plan, and applicable portions of the specifications to confirm that they are consistent with the intent of our recommendations.

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 UNITE CONSULTING 625 Holcomb Ridge Road, Marietta, GA 30071 TEL: 770-209-0029 FAX: 770-582-5900 www.uniteconsulting.com	CLIENT: GWINNETT COUNTY	
	PREPARED BY: MHI	CHECKED BY: ACE
TITLE: Boring Location Plan Wages Tract Gwinnett County, Georgia	DATE: 11/11/08	PROJECT NO: 2008.1775.01
FIG. 1	SCALE: 1"=300'	



LEGEND

 BORING LOCATION



GENERAL NOTES

The soil classifications noted on the Boring Logs are visual classifications unless otherwise noted. Minor constituents of a soil sample are termed as follows:

Trace	0 - 10%
Some	11 - 35%
Suffix "y" or "ey"	36 - 49%

LEGEND



Split Spoon Sample obtained during Standard Penetration Testing



Relatively Undisturbed Shelby Tube Sample



Groundwater Level at Time of Boring Completion



Groundwater Level at 24 hours (or as noted) after Termination of Boring

w

Natural Moisture Content

LL

Liquid Limit

PL

Plastic Limit

Atterberg Limits

PI

Plasticity Index

PF

Percent Fines (Percent Passing #200 Sieve)

γ_d

Dry Unit Weight (Pounds per Cubic Foot or PCF)

γ_m

Moist or In-Situ Unit Weight (PCF)

γ_{sat}

Saturated Unit Weight (PCF)

BORING LOG DATA AND NARRATIVE OF DRILLING OPERATIONS

The test borings were made by mechanically advancing helical hollow stem augers into the ground. Samples were covered at regular intervals in each of the borings following established procedures for performing the Standard Penetration Test in accordance with ASTM Specification D-1586. Soil samples were obtained with a standard 1.4" I.D. x 2.0" O.D. split barrel sampler. The sampler is first seated 6" to penetrate any loose cuttings and then driven an additional foot with the blows of a 140 pound hammer freely falling a distance of 30." The number of blows required to drive the sampler each six inches is recorded on the Boring Logs. The total number of blows required to drive the sampler the final foot is designated the "standard penetration resistance." This driving resistance, known as the "N" value, is a measure of the relative density of granular soils and is an indication of the consistency of cohesive deposits.

The following table describes soil consistencies and relative densities based on standard-penetration resistance values (N) determined by the Standard Penetration Test.

	"N"	Consistency
Clay and Silt	0-2	Very Soft
	3-4	Soft
	5-8	Firm
	9-15	Stiff
	16-30	Very Stiff
	Over 31	Hard
	"N"	Relative Density
Sand	0-4	Very Loose
	5-10	Loose
	10-19	Firm
	20-29	Medium Dense
	30-49	Dense
	50+	Very Dense



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-1

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/29/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE

RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES	
			NO.	TYPE	BLOWS/6"	RECOV.		W%
930	NO TOPSOIL	0					-Possible Cultivated soil from 0 to 1'	
	Sand-clayey, some silt, trace root hair and mica; firm; red, brown (Residual)		1		3-3-7	14		
	-some silt and clay, no root hair; mixed red, orange, white	5	2		4-7-8	11		9
925								
	-mixed orange, tan	10	3		4-8-11	14		13
920								
	-trace silt, some mica; mixed tan and gray	15	4		6-6-11	14		8
915								
	-trace rock fragments; medium dense	20	5		8-14-10	9		7
910								
	-dense	25	6		8-10-32	18		
905								
	AUGER REFUSAL AT 28'						No groundwater encountered at time of boring	
900		30						
895		35						
890		40						



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-2

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/29/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES	
			NO.	TYPE	BLOWS/6"	RECOV.		W%
925	NO TOPSOIL	0						
	Sand-clayey, some silt, trace root hair and mica; loose; red, brown (Residual)		1		3-3-4	18	-Possible Cultivated Soil from 0 to 1' -Bulk sample obtained from 11' to 17' with max. dry density = 119.1 pcf and % optimum moisture = 11.7	
920	-some silt, trace clay; dense; mixed red, orange	5	2		8-13-18	16		12
915	-trace silt, some mica; firm; gray	10	3		9-9-7	14		8
910		15	4		8-9-9	14		14
905	-medium dense	20	5		9-11-10	18		10
900	-dense	25	6		8-12-18	18	14	
895	-medium dense	30	7		10-13-15	18		
890	-dense	35	8		12-24-24	18		
885	-moist; mixed tan, gray	40	9		10-15-20	18		



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-2
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/29/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES					NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	W%	
								Groundwater encountered at 41' at time of boring
880	Partially Weathered Rock sampled as Sand-trac silt, some mica and quartz fragments; very dense; gray AUGER REFUSAL AT 44'	45	10		50/3	3		
875		50						
870		55						
865		60						
860		65						
855		70						
850		75						
845		80						



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-3

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/29/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE

RIG: CME-45

LOGGED BY: CHIP II.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
925	2" - TOPSOIL	0					
	Sand-trace silt, clay, root hair and mica; loose; orange, red (Cultivated)		1	▲	2-2-4	13	
	Sand-some silt, trace clay and mica; loose; red, orange (Residual)						
920		5	2	▲	3-3-5	11	15
915	Partially Weathered Rock sampled as Sand-trace silt and mica; very loose; tan	10	3	▲	50/4	4	4
	Sand-trace silt, some mica; medium dense; gray						
910		15	4	▲	14-13-12	13	8
905	Partially Weathered Rock sampled as Sand-trace silt and rock fragments, some mica; very dense; gray	20	5	▲	50/4	4	7
900	AUGER REFUSAL AT 24'	25	6	▲	50/3	3	7
895		30					
890		35					
885		40					

-Possible lens of Partially Weathered Rock or Boulder.

No groundwater encountered at time of boring



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-4

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/28/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES	
			NO.	TYPE	BLOWS/6"	RECOV.		W%
930	3" - TOPSOIL	0					-Possible Cultivated soils from 0 to 1'	
	Sand-clayey, some silt, trace root hair and mica; loose; rcd, brown (Residual)		1		3-3-4	13		
925	-silty, trace clay, no root hair; firm; red, orange	5	2		5-7-10	13		16
920	-some silt; mixed tan, white	10	3		7-8-11	13		12
915	-trace silt, some mica; very dense; gray	15	4		10-20-35	16		6
910	-firm; mixed tan and gray	20	5		4-6-5	18		12
905		25	6		7-7-8	18	13	
900	AUGER REFUSAL AT 28'	30					No groundwater encountered at time of boring	
895		35						
890		40						



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-5
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/29/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES	
			NO.	TYPE	BLOWS/6"	RECOV.		W%
925	NO TOPSOIL	0					-Possible Cultivated soil from 0 to 1'	
	Sand-clayey, some silt, trace root hair and mica; firm; red, brown (Residual)		1		2-5-5	11		
920	-silty, trace clay, no root hair; medium dense; red	5	2		5-8-12	18		20
915	-some silt and mica; firm; tan, gray mixed	10	3		4-6-8	16		16
910		15	4		4-7-9	18		18
905		20	5		5-7-9	18	11	
900		25	6		5-7-8	18	16	
895	-trace silt; dense; gray	30	7		5-18-14	18		
890	-firm	35	8		7-8-11	18		
885	Partially Weathered Rock sampled as Sand-trace silt, some mica, trace rock fragments; very dense; gray	40	9		50/2	2		



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-5
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/29/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES					NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	W%	
	AUGER REFUSAL AT 41'							No groundwater encountered at time of boring
880		45						
875		50						
870		55						
865		60						
860		65						
855		70						
850		75						
845		80						



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-6
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/30/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHP JL

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES	
			NO.	TYPE	BLOWS/6"	RECOV.		W%
	NO TOPSOIL	0						
925	Sand-some silt and clay, trace mica and root hair; firm; red, brown (Residual)		1		10-7-6	9	-Possible Cultivated soils from 0 to 6"	
	-trace silt, no clay, some mica; tan, gray mixed	5	2		7-9-10	9		8
920								
	-some silt; mixed orange, tan	10	3		5-8-9	13		15
915								
	-trace silt; medium dense; gray	15	4		7-9-14	18		9
910								
	Partially Weathered Rock sampled as Sand-trace silt and rock fragments, some mica; very dense; gray	20	5		47-50/1	7	9	
905								
		25	6		50/5	5		
900								
		30	7		50/2	2		
895								
	AUGER REFUSAL AT 31'						No groundwater encountered at time of boring	
		35						
890								
		40						
885								



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-7
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/30/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
910	1" - TOPSOIL	0					-Possible Cultivated soil from 0 to 6"
	Sand-silty, trace clay, mica and root hair; firm; mixed tan, orange (Residual)		1		5-5-6	14	
	-some silt; light tan						
905		5	2		4-5-5	16	
							-Amplification due to possible boulder or lens of Partially Weathered Rock
900	-trace silt, no clay, some mica and rock fragments; dense; gray	10	3		48-18-10	13	
895	Partially Weathered Rock sampled as Sand-trace silt, some mica to micaceous, trace rock fragments; very dense; mixed tan and gray	15	4		4-29-50/1	13	6
	AUGER REFUSAL AT 18'						No groundwater encountered at time of boring
890		20					
885		25					
880		30					
875		35					
870		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-7A
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/30/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
910	1/2" - TOPSOIL	0					-Boring B-7A offset 20'W of Boring B-7. -Possible Cultivated soil from 0 to 6"
	Sand-some silt and clay, trace root hair and mica; firm; brown (Residual)		1		5-5-5	18	
905	-silty, trace clay and rock fragments; loose; red, orange	5	2		3-3-4	16	
900	-some silt and mica; firm; tan	10	3		3-4-8	18	
895	Partially Weathered Rock sampled as Sand-trace silt, some mica and rock fragments; very dense; gray, white	15	4		10-16-50/1	13	No groundwater encountered at time of boring
	AUGER REFUSAL AT 16'						
890		20					
885		25					
880		30					
875		35					
870		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-8

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/30/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	3" - TOPSOIL	0					
885	Sand-some clay and silt, trace root hair; loose; brown (Cultivated)		1		3-2-3	18	
	Sand-some silt, trace clay, root hair and mica; firm; orange, tan (Residual)						
		5	2		5-6-8	18	
880							
	-some mica; mixed tan and gray						
		10	3		6-8-8	16	
875							
	-trace silt; medium dense; gray						
		15	4		7-10-15	16	
870							
		20	5		6-9-16	16	
865							
		25	6		7-9-16	16	
860							
	-firm						
		30	7		9-7-7	16	
855							
	-medium dense						
		35	8		9-11-11	16	
850							
		40	9		8-9-11	18	
845							

-Borehole caved-in at 32'



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-9

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/30/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
870	3" - TOPSOIL	0					-Possible Cultivated soil from 0 to 1'
	Sand-clayey, some silt, trace root hair and mica; loose; red, brown (Residual)		1		5-3-4	18	
865	-silty, trace to some clay, trace roots; medium dense	5	2		5-12-15	18	
860	-red	10	3		5-7-11	18	-Borhole caved-in at 11'
855	-some silt, trace clay; firm; orange, tan	15	4		6-7-9	18	
850	-trace silt, some mica; mixed tan, gray	20	5		7-7-9	16	No groundwater encountered at time of boring
	BORING TERMINATED AT 20'						
845		25					
840		30					
835		35					
830		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-10

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 11/03/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CJIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
915	1.5" - TOPSOIL	0					No groundwater encountered at time of boring
	Sand-clayey, some silt, trace mica and root hair; very loose; red, brown (Cultivated)		1		3-2-2	18	
	Sand-trace silt, some mica; dense; mixed tan, gray (Residual)						
910		5	2		17-15-26	13	
905	AUGER REFUSAL AT 8'	10					
900		15					
895		20					
890		25					
885		30					
880		35					
875		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-10A
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/03/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
915	2" - TOPSOIL	0					-Boring B-10A offset 20'N of Boring B-10.
	Sand-some clay and silt, trace root hair and mica; very loose; red, brown (Cultivated)		1		2-2-2	16	
	Sand-trace silt, some mica; firm; tan, gray mixed (Residual)						
910	Partially Weathered Rock sampled as Sand-trace silt, rock fragments, some mica; very dense; gray	5	2		10-50/4	10	No groundwater encountered at time of boring
905	AUGER REFUSAL AT 9'	10	3		50/4	4	
900		15					
895		20					
890		25					
885		30					
880		35					
875		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-11
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/03/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
910	2" - TOPSOIL	0					-Possible Cultivated soil from 0 to 1'
	Sand-some clay and silt, trace mica and root hair; loose; red, orange, brown (Residual)		1		3-4-4	16	
905	-trace silt, no clay, some mica; medium dense; mixed orange, gray, tan	5	2		7-10-11	16	
							No groundwater encountered at time of boring
900	-trace rock fragments; firm; gray	10	3		10-11-6	14	
895	Partially Weathered Rock sampled as Sand-trace silt, some mica and rock fragments; very dense; gray AUGER REFUSAL AT 15'	15	4		50/2	2	
890		20					
885		25					
880		30					
875		35					
870		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-11A
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/03/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	2" - TOPSOIL	0					-Boring B-11A offset 20'SW of Boring B-11. -Possible Cultivated soil from 0 to 1' No groundwater encountered at time of boring
	Sand-some clay and silt, trace root hair and mica; firm; red, brown (Residual)		1		4-4-6	14	
905	-some silt, trace clay; dense; red, orange and white	5	2		8-9-21	18	
900	Partially Weathered Rock sampled as Sand-trace silt, some mica; very dense; tan, orange, gray	10	3		50/3	3	
	AUGER REFUSAL AT 10'						
895		15					
890		20					
885		25					
880		30					
875		35					
870		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-12

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 11/03/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
915	1.5" - TOPSOIL	0					
	Sand-some silt, trace clay, mica and root hair; firm; brown (Cultivated)		1		3-4-8	14	
	Sand-some silt, trace clay and mica; firm; orange, tan (Residual)						
910		5	2		6-6-7	18	
905	-trace silt, some mica; tan, gray	10	3		5-8-10	14	12
900		15	4		4-4-6	18	13
895	-dense	20	5		14-18-21	18	
890	-firm	25	6		8-9-10	18	
885	-medium dense	30	7		7-12-14	18	
880	Partially Weathered Rock sampled as Sand-trace silt, some mica; very dense; tan, gray	35	8		20-50/3	18	
	Sand-trace silt, some mica; very dense, tan, gray						
875		40	9		25-37-40	13	-Borehole caved-in at 37' at time of boring



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-12
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/03/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP II.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
870	Partially Weathered Rock sampled as Sand-trace silt, some mica; very loose; tan, gray	45	10		50/5	5	-Apparent groundwater level at 44' at time of boring
865		50	11		50/3	3	
860	AUGER REFUSAL AT 53'	55					No groundwater encountered at time of boring
855		60					
850		65					
845		70					
840		75					
835		80					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-13A
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/04/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
920	2" - TOPSOIL	0					-Boring B-13A offset 20'E of Boring B-13.
	Sand-trace silt, clay, root hair and mica; loose; brown (Cultivated)		1		3-4-4	16	
	Sand-some mica, trace silt and rock fragments; dense; red, tan, gray (Residual)		2		9-18-30	13	
915			5				
	-loose; tan, gray		3		4-5-4	13	
910			10				
	Partially Weathered Rock sampled as Sand-some mica, trace silt and rock fragments; very dense; tan, gray		4		50/3	3	No groundwater encountered at time of boring
905	AUGER REFUSAL AT 15'	15					
900		20					
895		25					
890		30					
885		35					
880		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-13B
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/04/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
915	1.5" - TOPSOIL	0					-Boring B-3B offset 40'W of Boring B-13. No groundwater encountered at time of boring
	Sand-trace silt, clay mica and root hair; loose; brown (Cultivated)		1		4-4-5	9	
	Sand-trace silt, some mica, trace rock fragments; red, orange (Residual)						
910	Partially Weathered Rock sampled as Sand-trace silt and rock fragments, some mica; very dense; red, orange	5	2		10-10-50/3	14	
	AUGER REFUSAL AT 7'						
905		10					
900		15					
895		20					
890		25					
885		30					
880		35					
875		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-14

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 11/04/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE

RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	2" - TOPSOIL	0					
910	Sand-some silt and clay, trace mica and root hair; loose; brown (Cultivated)		1		3-3-4	13	
	Sand-some silt, trace clay, trace to some mica; medium dense; red, orange, brown (Residual)	5	2		5-10-15	14	14
905							
	-trace silt, no clay, some mica; gray, tan Partially Weathered Rock sampled as Sand-trace silt, some mica; very dense; tan, gray	10	3		32-50/3	9	8
900							
		15	4		50/1	0	-No Recovery
895	AUGER REFUSAL AT 15'						No groundwater encountered at time of boring
		20					
890							
		25					
885							
		30					
880							
		35					
875							
		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-15
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/31/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CMB-45 LOGGED BY: CIUP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES	
			NO.	TYPE	BLOWS/6"	RECOV.		W%
910	2" - TOPSOIL	0					No groundwater encountered at time of boring	
	Sand-some clay and silt, trace root hair and mica; loose; red, brown (Cultivated)		1		3-3-4	14		
	Sand-trace silt to some silt, trace mica and rock fragments; medium dense; gray, brown (Residual)							
905		5	2		7-11-12	9		14
	-trace silt, some mica; gray and tan							
900		10	3		9-14-15	18		
	-firm							
895		15	4		7-7-5	18		12
890		20	5		9-9-10	13		
	AUGER REFUSAL AT 23'							
885		25						
880		30						
875		35						
870		40						



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-15A
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/31/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
905	1" - TOPSOIL	0					-Boring B-15A offset 100'W of Boring B-15. -Possible Cultivated soil from 0 to 1'.
	Sand-some silt, trace clay, mica, rock fragments and root hair; firm; red, brown (Residual)		1		6-6-6	9	
900	-trace silt, some mica; medium dense; red, orange	5	2		9-11-12	18	
895	-firm; tan, gray	10	3		5-5-6	18	
890	-some rock fragments; medium dense	15	4		7-10-10	18	
885	Partially Weathered Rock sampled as Sand-trace silt and rock fragments, some mica; very dense; gray	20	5		9-50/5	11	
880		25	6		50/2	2	No groundwater encountered at time of boring
	AUGER REFUSAL AT 25'						
875		30					
870		35					
865		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-16

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/31/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
890	2" - TOPSOIL.	0					No groundwater encountered at time of boring
	Sand-trace silt, clay, root hair and mica; loose; brown (Cultivated)		1		3-3-3	18	
	Sand-some silt and clay, trace mica; dense; red (Residual)						
885		5	2		10-15-15	14	
	-silty, trace clay; firm; tan, orange						
880		10	3		5-8-8	11	
	-trace silt and rock fragments, no clay, some mica; very dense; gray						
875		15	4		7-25-29	18	
	Partially Weathered Rock sampled as Sand-trace silt, some mica; very dense; tan, gray						
870		20	5		50/5	5	
	-some rock fragments; gray						
865		25	6		50/4	4	
	AUGER REFUSAL AT 26'						
860		30					
855		35					
850		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-17

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 10/31/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE

RIG: CME-45

LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
865	2" - TOPSOIL	0					
	Sand-some silt and clay, trace root hair and topsoil; loose; brown (Cultivated)		1		2-2-3	18	
	Sand-clayey, some silt, trace mica and quartz fragments; firm; red (Residual)						
860		5	2		7-9-10	18	
855	-some silt and mica, trace clay; orange, tan	10	3		6-7-9	18	
850	-trace silt, no clay; tan, gray	15	4		7-7-11	18	
845	-medium dense	20	5		7-9-12	18	
840	-firm	25	6		5-8-10	18	
835	-some silt, micaceous; tan	30	7		7-7-8	18	
830	-trace silt; tan, gray	35	8		4-5-8	14	Groundwater encountered at 33' at time of boring
825		40	9		4-7-10	18	



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-17
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/31/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
820	-medium dense	45	10		7-10-12	18	-Borehole caved-in at 47'
815	-trace rock fragments	50	11		6-10-17	18	
810	-dense	55	12		7-17-24	18	
805	AUGER REFUSAL AT 58'	60					
800		65					
795		70					
790		75					
785		80					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-18
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/03/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	1" - TOPSOIL	0					
895	Sand-trace silt, clay and root hair, some rock fragments; loose; brown (Cultivated)		1		3-4-2	9	
	Sand-trace silt and rock fragments, some mica; very dense; gray, brown (Residual)	5	2		10-25-32	14	
890							
	Partially Weathered Rock - Not Sampled	10	3		50/1	0	
885	AUGER REFUSAL AT 9'						-No Recovery No groundwater encountered at time of boring
		15					
880							
		20					
875							
		25					
870							
		30					
865							
		35					
860							
		40					
855							



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-19
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/03/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP LL

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	1.5" - TOPSOIL	0					
	Sand-trace silt, clay, root hair and mica; loose; brown (Cultivated)		1		3-3-3	11	
885	Sand-some silt, trace clay and mica; medium dense; red (Residual)						
		5	2		7-9-17	9	
880	Partially Weathered Rock sampled as Sand and Rock Fragments-trace silt, some mica; very dense; gray	10	3		50/5	5	
	AUGER REFUSAL AT 10'						No groundwater encountered at time of boring
875							
		15					
870							
		20					
865							
		25					
860							
		30					
855							
		35					
850							
		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-20
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/03/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
890	1" - TOPSOIL	0					
	Sand-trace silt, clay and root hair; loose; brown (Cultivated)		1		2-3-3	14	
	Sand-some silt, trace clay and mica; firm; orange, tan (Residual)						
885		5	2		5-6-7	6	
880	-trace silt, some mica, no clay; tan, gray	10	3		6-8-7	11	
875	Partially Weathered Rock sampled as Sand-trace silt and rock fragments, some mica; very dense; gray	15	4		50/4	4	-Lens of Partially Weathered Rock or possible boulder
870	Sand-trace silt, some mica and rock fragments; medium dense; gray	20	5		17-16-12	18	
	BORING TERMINATED AT 20'						No groundwater encountered at time of boring
865		25					
860		30					
855		35					
850		40					



BORING LOG

CONTRACTED WITH: GWINNETT COUNTY

BORING NO.: B-21

PROJECT NAME: WAGES TRACT FUTURE PARK

DATE: 11/04/08

JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45

LOGGED BY: CIIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	1" - TOPSOIL	0					No groundwater encountered at time of boring
890	Sand-some silt, trace clay, root hair and mica; firm; brown (Cultivated)		1		4-5-7	18	
	Sand-some silt to silty, trace clay, some mica; firm; orange, brown (Residual)						
		5	2		5-7-7	18	
885							
	-some silt; orange, gray						
		10	3		4-7-8	18	
880							
	-trace silt and rock fragments, no clay; tan, gray						
		15	4		8-9-10	18	
875							
	Partially Weathered Rock sampled as Sand-trace silt, some rock fragments and mica; very dense; gray						
	BORING TERMINATED AT 20'	20	5		50/1	1	
870							
		25					
865							
		30					
860							
		35					
855							
		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-22
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 11/04/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
890	1" - TOPSOIL	0					
	Sand-trace silt, some mica and rock fragments; dense; orange, gray (Residual)		1		10-25-20	18	-Possible Cultivated soil from 0 to 6"
885	Partially Weathered Rock sampled as Sand-trace silt, some mica and rock fragments; very dense; gray	5	2		50/3	3	-Lens of Partially Weathered Rock or possible boulder
880	Sand-trace silt, some mica and rock fragments; medium dense; gray, tan	10	3		4-6-14	18	
875	Partially Weathered Rock sampled as Sand-trace silt, some mica and rock fragments; very dense; gray	15	4		45-50/2	8	-Lens of Partially Weathered Rock or possible boulder
870	Sand-trace silt, some mica and rock fragments; dense; tan, gray	20	5		14-19-26	18	
	BORING TERMINATED AT 20'						No groundwater encountered at time of boring
865		25					
860		30					
855		35					
850		40					



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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-23
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/30/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIP H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	2" - TOPSOIL	0					
885	Sand-trace silt, clay, mica, root hair and quartz fragments; firm; orange, brown (Residual)		1		4-11-8	18	-Possible Cultivated soil from 0 to 6"
		5	2		15-16-50/4	16	-Lens of Partially Weathered Rock or boulder
880	Partially Weathered Rock sampled as Sand-trace silt, some mica and rock fragments; very dense; gray						
		10	3		50/4	4	
875	Sand-some silt and mica; firm; tan, gray						
		15	4		7-8-9	14	
870	-trace silt and rock fragments; dense; gray						
		20	5		10-11-28	16	
865	BORING TERMINATED AT 20'						No groundwater encountered at time of boring
		25					
860							
		30					
855							
		35					
850							
		40					

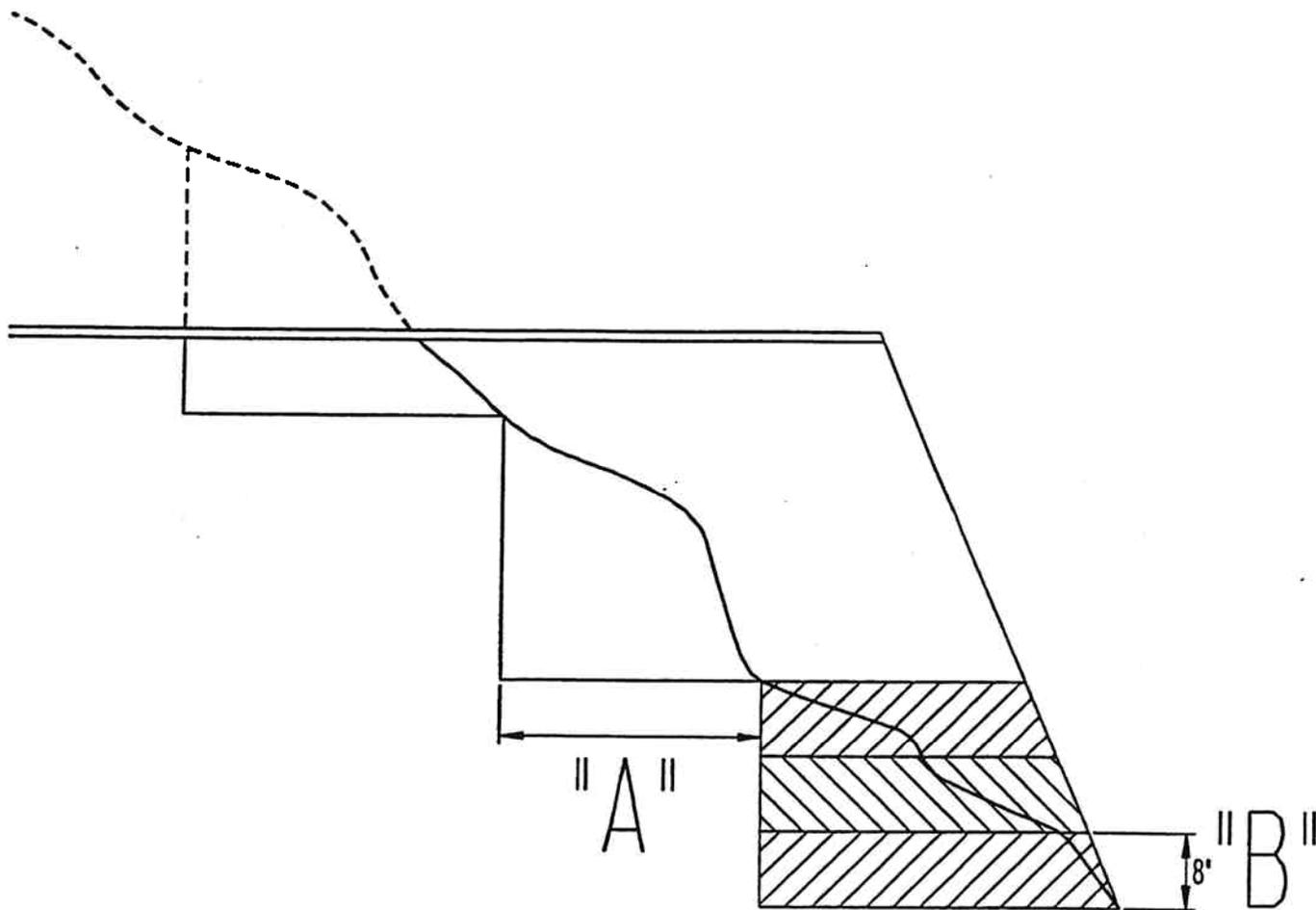


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BORING LOG

CONTRACTED WITH: GWINNETT COUNTY BORING NO.: B-24
 PROJECT NAME: WAGES TRACT FUTURE PARK DATE: 10/30/08
 JOB NO.: 2008.1775-01 DRILLER: GEORGE RIG: CME-45 LOGGED BY: CHIH H.

ELEV.	DESCRIPTION	DEPTH in FEET	SAMPLES				NOTES
			NO.	TYPE	BLOWS/6"	RECOV.	
	2" - TOPSOIL	0					
875	Sand-some silt and clay, trace root hair and mica; loose; brown (Cultivated)		1		3-3-4	18	
	Sand-some silt, trace clay, mica and quartz fragments; dense; red, tan (Residual)						
		5	2		10-14-17	16	
870							
	-trace silt, no clay, some mica; very dense; gray						
		10	3		14-32-20	18	
865							
	Partially Weathered Rock sampled as Sand-trace silt and rock fragments, some mica; very dense; gray						
		15	4		40-30-50/3	15	-Lens of Partially Weathered Rock or possible boulder
860	Sand-trace silt, some mica; medium dense; tan, gray						
		20	5		5-8-12	18	
855	BORING TERMINATED AT 20'						No groundwater encountered at time of boring
		25					
850							
		30					
845							
		35					
840							
		40					
835							



1. THE ABOVE DIAGRAM ILLUSTRATES A TYPICAL BENCHING FOR PLACEMENT OF FILL ON A SLOPING SURFACE.
2. THE DIAGRAM SHOWS THAT BEFORE FILL IS PLACED, THE FIRST STEP IS CUT INTO THE SLOPE A MAXIMUM DISTANCE OF ABOUT 8 FEET 'A' (ABOUT $\frac{3}{4}$ THE WIDTH OF USUAL D-8 BULLDOZER BLADE). SUCCESSIVE LAYERS OF FILL ARE THEN PLACED. BEFORE FINAL LAYER IS PLACED, THE SECOND STEP IS CUT 8 FEET INTO THE SLOPE AND SUCCESSIVE LAYERS ARE AGAIN PLACED.
3. SELECT FILL MATERIAL SHOULD BE PLACED IN 8 INCH LIFTS AND COMPACTED TO THE SPECIFIED DENSITY ('B').

TYPICAL BENCHING DETAIL



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EXPLORATION PROCEDURES

Test Borings

Twenty-four (24) Standard Penetration Test (SPT) borings and six (6) offset borings were drilled at the approximate locations indicated on the attached Boring Location Plan (Fig. 1). Soil samples obtained using the split spoon sampler were examined by the Geotechnical Engineer and classified according to the visual-manual procedure described in ASTM D 2488-00. Soil test borings were performed in general accordance with ASTM D 1586. A narrative of field operations is included in the Appendix.

Boring locations were determined in the field by our engineering representative who measured distances and estimated angles with the aid of a tape measure and hand held compass from existing site features. Therefore, the boring locations should be considered approximate. The elevations shown on the boring logs were obtained from the provided topographic site plan by interpolation and should be considered very approximate. The borings were backfilled with auger cuttings upon completion of drilling.

LABORATORY PROCEDURES

Moisture Content

The moisture content was determined for selected soil samples obtained in the split spoon sampler and bulk samples. A representative portion of each sample was weighed and then placed in an oven and dried at 110 degree Centigrade for at least 15 to 16 hours. After removal from the oven, the soil was again weighed. The weight of the moisture lost during drying thus was determined. From this data, the moisture content of the sample was then calculated as the weight of moisture divided by dry weight of the soil, expressed as a percentage. This test was conducted according to ASTM D 2216. Moisture content is a useful index of a soil's compressibility. If the soil is to be used as fill, the moisture content may be compared to the range of water content for which proper compaction may be achieved. The moisture content results are indicated on the boring logs attached.

Standard Proctor Test

This test determines the maximum dry density that could be achieved by using a uniform compactive effort at varying moisture contents. For Standard Proctor, 5.5-lb (2.49-kg) rammer is dropped 12 inches (305-mm) for compaction on the bulk sample in the cylindrical mold. Compaction is done in 3 equal layers. The method is explained in ASTM D 698.

COMPACTION TEST REPORT

Project No.: 2008177501

Date: 11/6/08

Project: WAGES TRACT FUTURE PARK

Client: GWINNETT CO. DEPARTMENT OF ADMINISTRATIVE

Sample Number: B-2 Depth: 11'-16'

Remarks:

MATERIAL DESCRIPTION

Description: SAND, TRACE TO SOME SILT, TRACE CLAY, SOME MICA, GRAY

Classifications -

USCS:

AASHTO:

Nat. Moist. =

Sp.G. =

Liquid Limit =

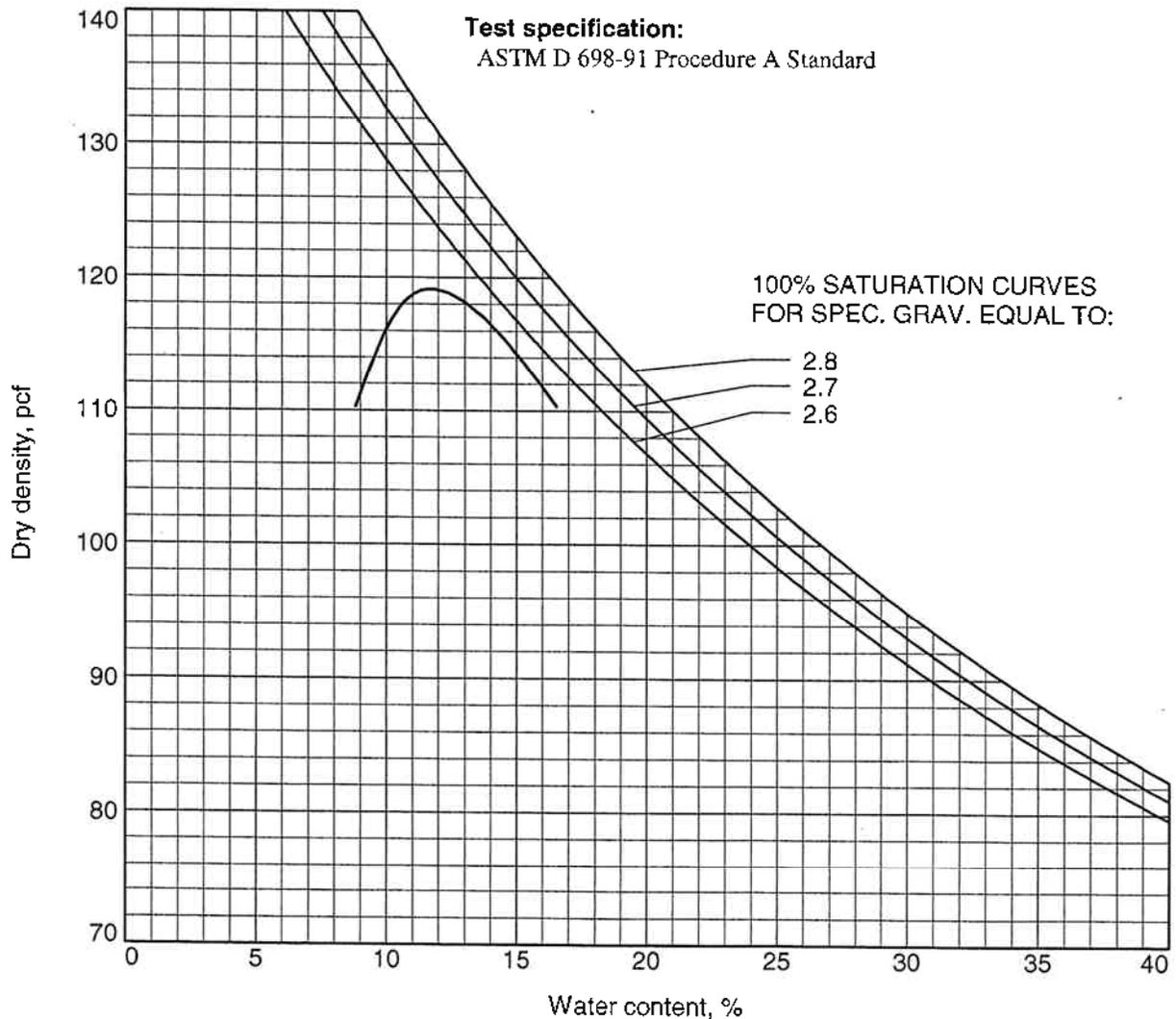
Plasticity Index =

% < No.200 =

TEST RESULTS

Maximum dry density = 119.1 pcf

Optimum moisture = 11.7 %



Figure

COMPACTION TEST REPORT

Project No.: 2008177501

Date: 11/05/2008

Project: WAGES TRACT FUTURE PARK

Client: GWINNETT CO. DEPARTMENT OF ADMINISTRATIVE

Sample Number: B-4 Depth: 5-9'

Remarks:

MATERIAL DESCRIPTION

Description: SAND, SOME SILT AND CLAY, TRACE MICA, RED, TAN

Classifications -

USCS:

AASHTO:

Nat. Moist. =

Sp.G. =

Liquid Limit =

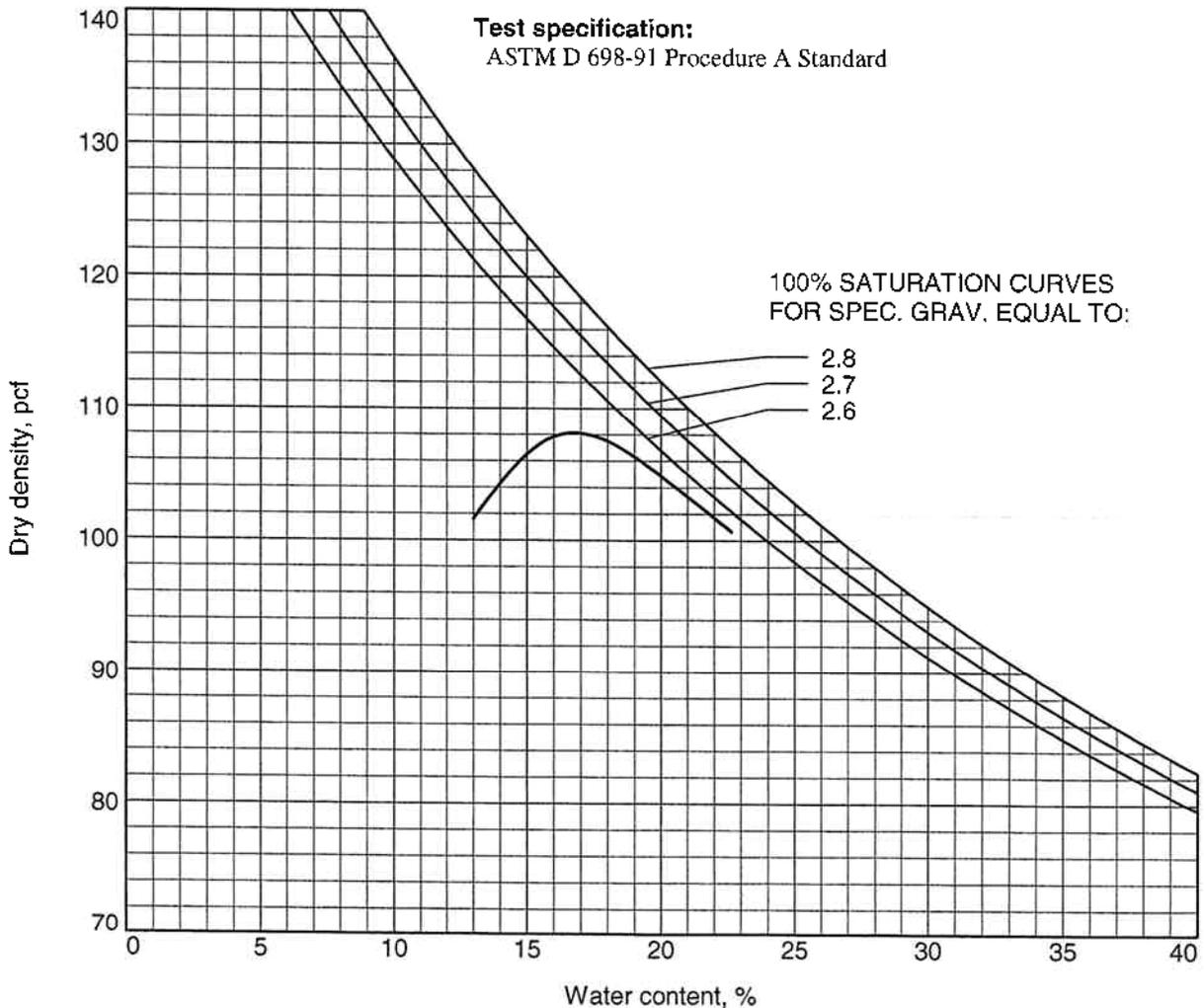
Plasticity Index =

% < No.200 =

TEST RESULTS

Maximum dry density = 108.1 pcf

Optimum moisture = 16.8 %



Figure

United Consulting

Tested By: Farzad

COMPACTION TEST REPORT

Project No.: 2008177501

Date: 11/6/2008

Project: WAGES TRACT FUTURE PARK

Client: GWINNETT CO. DEPARTMENT OF ADMINISTRATIVE

Sample Number: B-12 Depth: 6-12'

Remarks:

MATERIAL DESCRIPTION

Description: SAND, SOME SILT, TRACE CLAY, SOME MICA, TAN, GRAY

Classifications -

USCS:

AASHTO:

Nat. Moist. =

Sp.G. =

Liquid Limit =

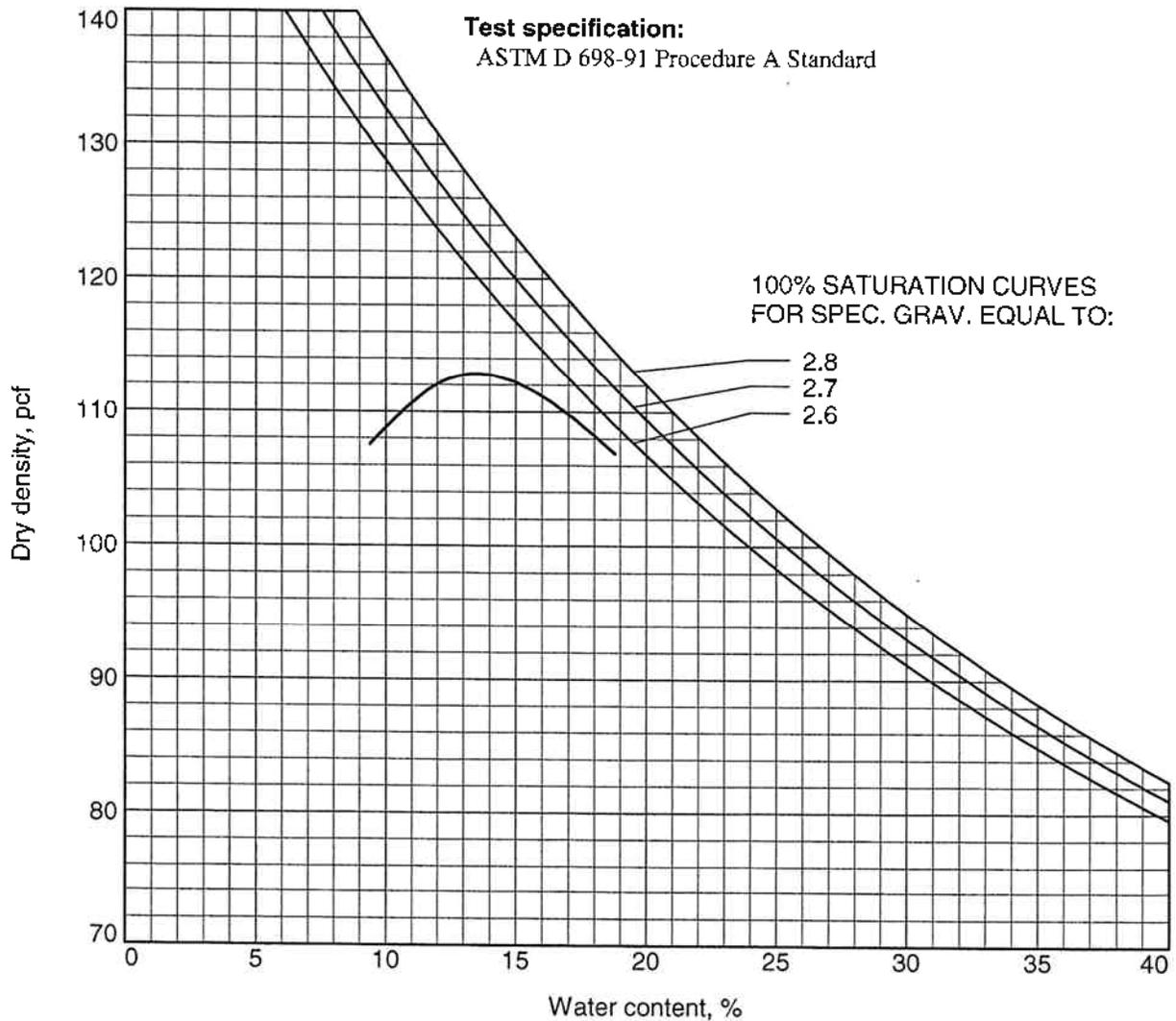
Plasticity Index =

% < No.200 =

TEST RESULTS

Maximum dry density = 112.8 pcf

Optimum moisture = 13.5 %



Figure

COMPACTION TEST REPORT

Project No.: 2008177501

Date: 11/06/08

Project: WAGES TRACT FUTURE PARK

Client: GWINNETT CO. DEPARTMENT OF ADMINISTRATIVE

Sample Number: B14 Depth: 3-5'

Remarks:

MATERIAL DESCRIPTION

Description: SAND, SOME SILT, TRACE CLAY, TRACE MICA, BROWN

Classifications -

USCS:

AASHTO:

Nat. Moist. =

Sp.G. =

Liquid Limit =

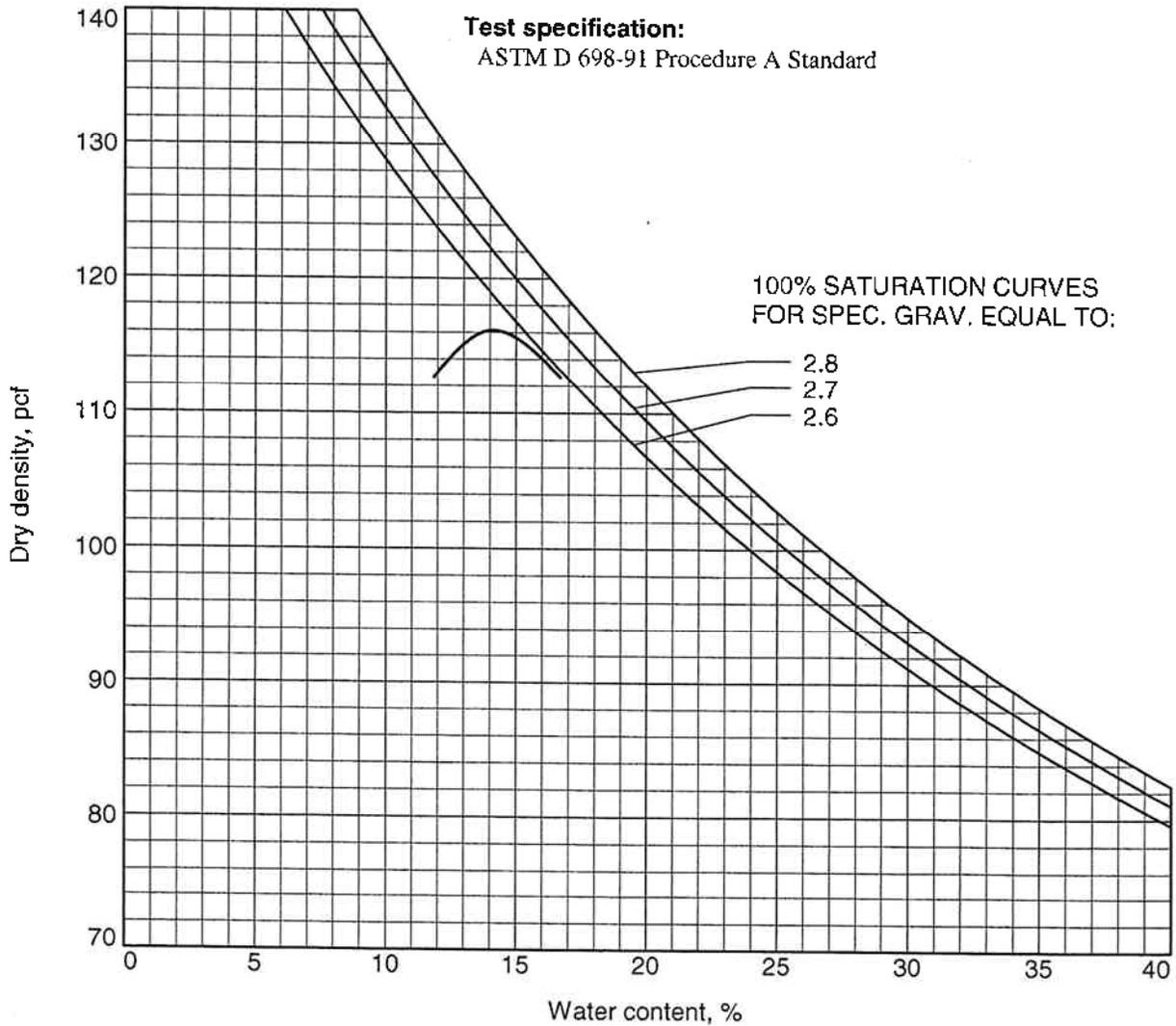
Plasticity Index =

% < No.200 =

TEST RESULTS

Maximum dry density = 116.1 pcf

Optimum moisture = 14.1 %



Figure

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.



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JIGER06045.0M

**PRELIMINARY GEOTECHNICAL EXPLORATION
FOR FEASIBILITY STUDY**

AT

**PROPOSED HARBINS ALCOVY RIVER PARK SITE
Gwinnett County, Georgia**

Submitted to

Gwinnett County Parks and Recreation
75 Langley Drive
Lawrenceville, Georgia 30045

PROJECT NUMBER: MEG 97140-35
October 2004



MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental, and Construction Materials Consultants

EXECUTIVE SUMMARY

A geotechnical exploration was completed for the proposed Harbins Alcovy River Park Site in Gwinnett County, Georgia. The objective of this exploration was to evaluate the subsurface soil conditions and provide general recommendations for site development. The following summarizes our findings and recommendations. For detailed information and discussions, refer to the appropriate section in the body of this report.

- ❑ A total of seventy four (74) test borings were performed at the locations shown in Figure 2 to 4 provided in the Appendix. The test borings were designated by the County and were located in the field by Matrix Engineering Staff, therefore, the locations shown in Figures 2 to 4. The site consists of approximately 1800 acres located along the eastern and western sides of New Hope Road, just north of the intersection of New Hope Road with Luke Edward Road, and along the northern and southern sides of Indian Shoals Road at its intersection with Masters Road.
- ❑ Based on the test borings records and our observations, a topsoil layer consisting of organics and a root system was encountered within the top 4 to 8 inches. Man made fill or disturbed soils were not distinctively noted at the test locations, however, we anticipate man-made fill to be limited to any previously improved areas (i.e. abandoned roads and new roads) and cultivated areas, which were not readily evident at the test borings. Thick topsoil layer (exceeding 12 inches) and deep root systems should be anticipated within the construction area. In general, loose to firm residual clayey sand and silt materials with mica and occasional rock fragments were encountered below the topsoil layer to depths ranging from 1 to 5 feet Below Ground Surface (BGS). The soil then changes to silty sands and sand-silt mixtures with mica and occasional rock fragments.
- ❑ Partially Weathered Rock (PWR) was encountered at several test borings especially at Areas 1, 2, and 5 at depths ranging from 1.5 to 23 feet BGS. Auger refusal was encountered at depths ranging from 3 feet to 22 feet BGS. Off-set test borings were performed to verify the depth to auger refusal. For detailed information on the depth to PWR, auger refusal, and Off-set borings, refer to Table 1 and Figures 2 to 4 provided in the Appendix.
- ❑ The proposed locations of the improvements and the design elevations had not been determined at the time of writing this report. Therefore, depths of cut and fill could not be determined. Since shallow rock was encountered at several locations within the site, rock removal will be required if proposed elevations are below the encountered auger refusal elevations. Additionally, we anticipate unsuitable soils to be encountered at proposed roadways across drainage features or creeks. **Therefore, we recommend that the owner negotiate competitive unit rates for potential unforeseen conditions and rock excavation prior to awarding the contract or include an estimated quantity of excavation and replacement of unsuitable soil and rock as part of the contract. Unit rates for subgrade stabilization utilizing crushed stone, surge stone, and geotechnical fabric should be negotiated prior to contract award.** Stabilization, when necessary, should be performed under the direction of a geotechnical engineer.
- ❑ The data indicate that the site is suitable for support of lightly loaded structures supported on shallow foundations. These foundations should be situated in the residual soils or on properly constructed structural fill in accordance with the criteria provided in Section 6.0 of this report. Based on the standard penetration test results, we recommend that an allowable design bearing capacity of 3,000 pounds per square foot be used for the design of foundations. The soils encountered appear to be suitable for use as a structural fill material when compacted in accordance with our recommendations provided in this report.

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1.0 INTRODUCTION

Matrix Engineering Group, Inc. has completed the authorized Subsurface Exploration for the Harbins Alcovy River Park Site in Gwinnett County, Georgia. This work was performed in accordance with our proposal number 120804-1 dated August 12, 2004 and was authorized on August 31, 2004. The objective of this work was to explore the subsurface conditions, determine depth of rock, if encountered, and provide recommendations for site development.

The proposed development will include an open space park. The proposed active facilities may include soccer fields, football fields, baseball fields, walking trails, possible equestrian facilities, and other ancillary buildings, parking areas, and driveways. The site grading and schematic plans have not been completed as of the time of writing this report, therefore, proposed finished floor elevations and depths of excavation and fill are not known.

The investigated areas are located along the eastern and western sides of New Hope Road, Just north of the intersection of New Hope Road with Luke Edward Road, and along the northern and southern sides of Indian Shoals Road at its intersection with Masters Road. For the purpose of this study the site was divided into the six areas as shown Figure 1 in the Appendix. These areas are described as follows:

Area 1: Occupies the northeastern quadrangle of the intersection of Indian Shoals Road and Masters Road.

Area 2: Occupies the northwestern quadrangle of the intersection of Indian Shoals Road and Masters Road.

Area 3: is bound by Masters Road from the north and Residential properties from the eastern and west near the intersection of Masters Road with Indian Shoals Road.

Area 4: is located north of Indian Shoals Road and West of Area 2.

Area 5: is bound by New Hope Road from the east, and occupies the southeastern corner of the intersection of New Hope Road and Luke Edward Road.

Area 6: is bound by New Hope Road from the east and south and Luke Edwards Road and undeveloped properties from the southwest.

A total of seventy-four (74) soil test borings were performed at the site. The approximate test locations and the approximate clearing paths to reach the test borings are shown on Figures 2, 3, and 4 provided in the Appendix. The test borings were designated by Cerulea, Inc. and located in the field by Matrix Engineering Group representatives using tape measurements, compass, and relying on existing features (i.e. existing structures and site topographic features). We recommend that the test locations be surveyed in order to determine the exact locations. Should the actual locations of the test borings be substantially different from those shown in Figures 2 to 4, we request that Matrix Engineering Group, Inc. be afforded the opportunity to review these locations and revise its recommendations, if necessary.

2.0 EXPLORATION AND TESTING PROGRAM

2.1 Subsurface Exploration

A total of seventy-four (74) soil borings were performed at the site. The borings were located as follows:

- Ten (10) soil borings within Area 1 and were designated as ME-1 to ME-10.
- Ten (10) borings within Area 2 and were designated as NW-1 to NW-10.
- Thirteen (13) soil borings within Area 3 and were designated as ISE-1 to ISE-13
- Three (3) soil borings within Area 4 and were designated as ISN-1 to ISN-3
- Twenty-two (22) soil borings within Area 5 and were designated as NHE-1 to NHE-22.
- Sixteen (16) soil borings within Area 6 and were designated as NHW-1 to NHW-16.

The subsurface exploration was performed in general accordance with ASTM D 1586-93 standards. The borings were performed using an ATV-drill rig and a truck-mounted drill rig. Borings were advanced by augering through soils with continuous flights of hollow-stem augers. The augers also act as a casing for the borehole to prevent collapse. At regular intervals, soil samples were obtained through the center of the auger with a standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. The sampler is first seated six inches to penetrate any loose cuttings, and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is recorded and is designated as the Standard Penetration Resistance. The penetration resistance, when properly evaluated, is an index of the soil strength, consistency and ability to support foundations.

The samples were classified in the field in general accordance with ASTM D 2488-93 (Visual-Manual Procedure for Description of Soils). Representative portions of the soil samples were placed in glass jars and transported to our laboratory where they were examined to verify the field classifications. During the field operations, Matrix staff maintained a continuous log of the subsurface conditions including changes in the stratigraphy and observed groundwater level. Soil descriptions and penetration resistance values are presented graphically on the Test Boring Records included in the Appendix of this report.

2.2 Laboratory Testing

All soil samples recovered from the field were transported to the laboratory for verification and storage. The soil classifications are described in the Test Boring Records. The soil samples are kept in sealed glass jars and will be stored for a period of 60 days and then disposed of, unless otherwise instructed by the owner or the engineer.

3.0 SITE DESCRIPTION AND GENERAL SITE GEOLOGY

3.1 Site Description

The site is located in Gwinnett County along New Hope Road, Luke Edwards Road, Indian Shoals Road and Masters Road. The area surrounding the site consists primarily of residential properties, undeveloped properties, and farmland. Alcovy River binds the site from the southwest and Walton County from the South. Access to the areas was made from Indian Shoals Road, Masters Road, and New Hope Road. Refer to Figure 1 for the site location.

The site is approximately 1,800 acres and is moderately to heavily wooded, primarily with evergreen trees. Based on the U.S.G.S Maps, there are several high plateaus at the site with topographical elevations on the order of 1000 feet MSL in the northern portions of Areas 4, 5 and 6. The topography drops to approximately 830 feet MSL at the southern portions of Area 3. Several drainage features and gullies are present within the site, particularly in the central portions of Areas 1, 2 and 4, as well as the eastern portions of Area 5. In general, the site slopes in a westerly and southeasterly direction with a topographical relief on the order of approximately 170 feet. A 125-foot Right of Way (Georgia Power Easement) is located along the southern portion of Area 3.

The site drains into intermittent drainage features and creeks leading primarily towards Cedar Creek and Alcovy River.

3.2 General Site Geology

The project site is located in the Piedmont Geologic Province, which contains the oldest rock formations in the Southeastern United States. The parent rocks in the region are primarily comprised of the unconsolidated mass of quartz, feldspar, mica, and a wide variety of dark minerals such as hornblende and amphibole. The local geology in Gwinnett County (according to the Geologic Map of Georgia) consists of the granite gneiss, which includes diorite and injected gneiss that underlies about 65 percent of the county. The rest of the county is underlain by Brevard Schist, which occupies a narrow area of 2 to 3 miles wide in

most places, but near Suwannee it widens to about 5 miles. The biotite gneiss and schist form a triangular pattern from Lawrenceville southwestward.

The proportion of felsic and mafic minerals in these parent rocks, as well as of quartz that is very resistant to weathering, limits the amount of clay in the soils. Therefore these soils are sandy and have faint horizons, and in small, scattered areas hard rock is exposed.

Chemical decomposition initially occurs along the boundaries of individual mineral crystals. As a result, partially weathered rock has the appearance of dense sand (SM, SP). With further weathering, the individual crystals other than quartz are attacked and the mass becomes a micaceous silty sand (SM) or micaceous sandy silt (ML). In this stage, the original banding of the parent rock is apparent, but the original crystalline structure is not observed. Reflecting the composition of the original rock, mica flakes, rather than the quartz grains, often comprise the majority of the sand-size particles. Finally, in the more advanced stages of chemical weathering, the material is changed into a red or reddish-brown silty clay (CL or CH) or clayey silt (ML or MH). Depending on the quartz content, a sandy fraction will be present. In this weathered stage, the banding and crystalline structure of the parent rocks is lost.

4.0 GENERAL SUBSURFACE CONDITIONS

The subsurface conditions were characterized by visual examination of the soil obtained from the split-spoon sampler and observation of the auger cutting during the drilling operation in general accordance with ASTM D2488-93 and ASTM D2487-93. The test borings were planned to extend to 25 feet Below Ground Surface (BGS).

Based on our observations and test boring records, the conditions at the subject site can be characterized as follows:

4.1 Surface Cover Man-Made Fill

The surface at the project site primarily is covered with organic material and a thick vegetative cover. The topsoil layer at the test locations measured approximately 4 to 8 inches.

Man made fill or disturbed soils were not distinctively noted. However, based on the topography, we believe that limited cut/fill operations took place during the initial construction of New Hope Road and Masters Road. According to the USGS maps, portions of New Hope Road and Masters Road were rerouted. Therefore, man-made fill could be present around these improved areas and other areas that were not explored in the course of this study.

Beneath the topsoil layer, the soil consisted of red and brown clayey coarse to fine sand (SC). The materials encountered within the top 1 to 3.5 feet BGS was possibly fill at some locations as noted in the individual test boring records. This material appeared to be compact. Minor to moderate amounts of roots were noted within this layer at several test borings. The presence of roots within the residual soil could be related to the root system of the large trees.

4.2 Residual Material

Residual soils are those which have weathered in place from the parent rock. The top few feet of the residual soils consisted primarily of loose to medium dense inorganic clayey sand (SC) up to 9 feet at some locations. Beneath the initial layer of residual soils, loose to medium dense and occasionally very dense coarse to fine sand (SM) with occasional rock fragments and varying degrees of mica were encountered up to the termination depths. The standard penetration resistance, N, ranged from 2 blows per foot (bpf) to 78 bpf with most ranging around 20 bpf. Saprolite was encountered within a few feet below the surface at several locations. Saprolite is completely weathered rock but the material maintains the parent rock morphology.

4.3 Partially Weathered Rock

Partially weathered rock (PWR) was encountered as a transition zone between the overlying residual soils (saprolite) and the relatively sound, continuous rock. PWR is a regionally used term for residual material with a Standard Penetration Resistance of 100 bpf or more, but which can be penetrated by the soil drilling equipment. Partially weathered rock was encountered at several tests boring. Penetration below the PWR depths was not possible at many of the test borings due to mechanical auger refusal. Refer to Table 1 for the summary of the test boring records and subsurface information. Mechanical auger refusal is normally associated with presence of boulders, dense partially weathered rock, and/or bedrock. The PWR, when sampled, consisted of very dense tannish gray and white silty coarse to fine sand with rock fragments, and mica.

The upper and lower boundaries of the partially weathered rock zone may be poorly defined. In many cases the zone may be overlain by very dense residual soils similar in many respects to partially weathered rock. Lenses of moderately hard to hard rock often exist within the partially weathered rock zone. These lenses may cause refusal to soil drilling methods prior to encountering relatively sound, continuous rock. Table 1 provides a summary of the test boring records and depths to partially weathered rock.

4.4 Bedrock

Bedrock typically underlies the partially weathered rock. The depth of the bedrock, Rock Quality Designation (RQD), classification, and its continuity is obtained through rock coring procedures. Rock coring was not in the scope of this study.

Rock Outcrops were noted at Area 2 along Masters Road. Bedrock should be anticipated at relatively shallow depths in this area.

The geologic profile described in this report generally represents the conditions encountered in the soil borings. Some variations in the description should be expected. A Matrix geotechnical engineer grouped the various soil types in the major zones noted on the boring

logs. The stratification lines designating the interfaces between earth materials shown on the boring logs are approximate; in-situ transition may be gradual.

4.5 Groundwater

Groundwater was encountered at several of the test boring locations. Refer to Table 1 for the summary of the test borings and subsurface information. Groundwater within the top 10 feet was encountered at test borings ME-6 at 3.5 feet BGS, and MW-7 at 6 feet BGS.

Groundwater typically fluctuates with seasonal changes and may vary on the order of 4 to 8 feet.

Table 1: Summary of Test Boring Records

Boring No.	Planned Depth (ft)	Drilled Depth (ft)	Groundwater Depth (ft)	PWR Depths (ft)	Auger Refusal Depth (ft)
AREA 1					
ME-1	25	13	N/A	N/A	13
ME-1a	25	16	N/A	N/A	16
ME-2	25	11	N/A	N/A	11
ME-2a	25	10	N/A	9	10
ME-2b	25	11	N/A	N/A	11
ME-3	25	3	N/A	N/A	3
ME-3a	25	25	N/A	24	N/A
ME-4	25	25	23	23.5	N/A
ME-5	25	25	N/A	19	N/A
ME-6	25	10	3.5	4.5	10
ME-6a	25	5	N/A	N/A	5
ME-6b	25	5	N/A	N/A	5
ME-7	25	3	N/A	N/A	3
ME-7a	25	7	N/A	4.5	7
ME-7b	25	10	N/A	9.5	10
ME-8	25	22	N/A	18.5	22
ME-9	25	10	N/A	9	10
ME-9a	25	15	N/A	14	15
ME-10	25	21	N/A	19.5	21

Boring No.	Planned Depth (ft)	Drilled Depth (ft)	Groundwater Depth (ft)	PWR Depths (ft)	Auger Refusal Depth (ft)
AREA 2					
MW-1	25	3	N/A	1.5	3
MW-1a	25	4	N/A	N/A	4
MW-1b	25	5	N/A	4.5	5
MW-2	25	5	N/A	4	5
MW-2a	25	6	N/A	N/A	6
MW-2b	25	5	N/A	N/A	5
MW-3	25	3.5	N/A	N/A	3.5
MW-3a	25	4	N/A	N/A	4
MW-3b	25	4	N/A	N/A	4
MW-4	25	3.5	N/A	N/A	3.5
MW-4a	25	3.5	N/A	N/A	3.5
MW-5	25	4	N/A	4	4
MW-5a	25	25	N/A	N/A	N/A
MW-6	25	3.5	N/A	N/A	3.5
MW-6a	25	5	N/A	4.5	5
MW-6b	25	3.5	N/A	N/A	3.5
MW-7	25	15	6	14	15
MW-8	25	10	N/A	4.5	10
MW-8a	25	3	N/A	N/A	3
MW-8b	25	5	N/A	N/A	5
MW-9	25	3.5	N/A	3.5	3.5
MW-9a	25	5	N/A	N/A	5
MW-9b	25	11	N/A	9.5	11
MW-10	25	3.5	N/A	N/A	3.5
MW-10a	25	4	N/A	N/A	4
MW-10b	25	5	N/A	4.5	5
AREA 3					
ISE-1	25	21	N/A	21	21
ISE-2	25	25	N/A	N/A	N/A
ISE-3	25	25	N/A	N/A	N/A
ISE-4	25	20	N/A	18.5	20
ISE-5	25	25	N/A	N/A	N/A
ISE-6	25	25	N/A	N/A	N/A

Boring No.	Planned Depth (ft)	Drilled Depth (ft)	Groundwater Depth (ft)	PWR Depths (ft)	Auger Refusal Depth (ft)
ISE-7	25	25	N/A	23	N/A
ISE-8	25	25	N/A	N/A	N/A
ISE-9	25	25	N/A	N/A	N/A
ISE-10	25	25	N/A	N/A	N/A
ISE-11	25	25	N/A	N/A	N/A
ISE-12	25	25	N/A	N/A	N/A
ISE-13	25	25	N/A	N/A	N/A
AREA 4					
ISN-1	25	17	N/A	17	17
ISN-2	25	25	N/A	N/A	N/A
ISN-3	25	25	N/A	N/A	N/A
AREA 5					
NHE-1	25	21	N/A	20	21
NHE-2	25	25	N/A	N/A	N/A
NHE-3	25	25	N/A	N/A	N/A
NHE-4	25	25	N/A	N/A	N/A
NHE-5	25	25	N/A	N/A	N/A
NHE-6	25	25	N/A	N/A	N/A
NHE-7	25	25	N/A	N/A	N/A
NHE-8	25	25	20	N/A	N/A
NHE-9	25	25	17.5	N/A	N/A
NHE-10	25	25	N/A	N/A	N/A
NHE-11	25	25	N/A	N/A	N/A
NHE-12	25	25	N/A	N/A	N/A
NHE-13	25	5	N/A	4	5
NHE-13a	25	8	N/A	N/A	8
NHE-13b	25	5	N/A	N/A	5
NHE-14	25	10	N/A	9	10
NHE-14a	25	4	N/A	N/A	4
NHE-14B	25	3	N/A	N/A	3
NHE-15	25	25	15	N/A	N/A
NHE-16	25	18	N/A	N/A	18
NHHE-17	25	5	N/A	5	5
NHE-17a	25	3	N/A	3	3

Boring No.	Planned Depth (ft)	Drilled Depth (ft)	Groundwater Depth (ft)	PWR Depths (ft)	Auger Refusal Depth (ft)
NHE-17b	25	13	N/A	12	13
NHE-18	25	25	N/A	23	N/A
NHE-19	25	25	N/A	N/A	N/A
NHE-20	25	3	N/A	3	3
NHE-20a	25	7	N/A	N/A	N/A
NHE-21	25	25	N/A	N/A	N/A
NHE-22	25	10	N/A	9.5	10
NHE-22a	25	3	N/A	N/A	3
NHE-22b	25	3	N/A	N/A	3
AREA 6					
NHW-1	25	25	N/A	N/A	N/A
NHW-2	25	13	12	9.5	13
NHW-3	25	13	N/A	N/A	13
NHW-4	25	25	N/A	N/A	N/A
NHW-5	25	7	N/A	4.5	7
NHW-5a	25	3	N/A	N/A	3
NHW-5b	25	10	N/A	9	10
NHW-6	25	25	N/A	19.5	N/A
NHW-7	25	25	16	N/A	N/A
NHW-8	25	25	N/A	N/A	N/A
NHW-9	25	25	21.5	N/A	N/A
NHW-10	25	25	12	N/A	N/A
NHW-11	25	25	N/A	19.5	N/A
NHW-12	25	11	N/A	N/A	11
NHW-12a	25	4	N/A	N/A	4
NHW-12b	25	8	N/A	N/A	8
NHW-13	25	25	N/A	14	N/A
NHW-14	25	22	20	N/A	22
NHW-15	25	25	N/A	N/A	N/A
NHW-16	25	6	N/A	N/A	6
NHW-16a	25	7	N/A	N/A	7
NHW-16b	25	13	N/A	N/A	13

PWR: Partially Weathered Rock depth at upper zone or first encountered.

N/A: Not Encountered.

5.0 FINDINGS AND RECOMMENDATIONS

The following recommendations are based on the information furnished to us, the data obtained from the above-mentioned subsurface exploration, and our past experience with similar projects. They were prepared in general accordance with established and accepted professional geotechnical engineering practice in this region. Our recommendations do not reflect any variations that would likely exist between the pre-designated borings or unexplored areas. If generalized soil profiles are a part of this report, they are merely intended to illustrate an anticipated profile and not an actual one. No other warranty is expressed or implied. Matrix Engineering Group, Inc. is not responsible for conclusions, opinions, or recommendations made by others based on this report.

5.1 Excavation Considerations

The proposed locations of the improvements and the design elevations have not been determined at the time of writing this report. Therefore, depths of cut and fill could not be determined. Since shallow rock was encountered at several locations within the site, excavation depths at those areas should be carefully examined to minimize the amount of rock removal.

The excavation within the site may include the topsoil, residual materials, partially weathered rock, boulders, and possibly bedrock. Consequently, several different excavation methods may be required. Our experience indicates that the fill and residual soils can generally be removed with conventional earth moving equipment provided that proper groundwater control is maintained.

PWR was encountered above the planned drilling depths at several test borings. Refer to Table 1 for the summary of the test borings and subsurface information. Minor amounts of partially weathered rock can generally be removed by large front-end loaders, large hydraulic trackhoes, or heavy tractor drawn rippers (such as D-8 Caterpillar). However,

more extensive depths of partially weathered rock normally require blasting or rock drilling for removal. **Therefore, we recommend that the owner negotiate competitive unit rates for potential unforeseen conditions and rock excavation prior to awarding the contract or include an estimated quantity of rock excavation as part of the contract.**

We recommend that the following general recommendations for rock excavation, or a variation thereof, be incorporated into the project specifications.

General Recommendations for Rock Excavation:

Rock excavation shall consist of all material which can not be excavated except by drilling, blasting or wedging. It shall consist of un-decomposed stone hard enough to ring under a hammer, and the amount of solid stone shall be not less than one (1) cubic yard in volume. Rock is further defined as follows:

(1) General Excavation: Any material occupying an original volume of more than one cubic yard which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 80,000 pounds (caterpillar D-8 or larger).

(2) Trench Excavation: Any material occupying an original volume of more than one cubic yard which cannot be excavated with a backhoe having a bucket curling force rated at not less than 40,000 pounds, using a rock bucket and rock teeth (a John Deere 790 or larger).

5.2 Subgrade Preparation

Subgrade preparation should be performed by stripping of the topsoil layer, removal of existing structures and/or construction debris, unsuitable existing fills, and soft soils, if encountered. Underground utility lines, or other items, such as septic tanks, or trash pits that may be encountered during the grading operation should be treated on an individual basis.

After the unsuitable materials, if encountered, are removed, the suitability of the exposed subgrades in all areas should be confirmed by proofrolling. Based on our visual observation of the proposed fill area, we anticipate that localized stabilization might be required around the drainage features. The proofrolling should be performed by a loaded tandem-wheeled dump truck with minimum weight of 20 tons. Any material that deflects excessively or ruts under the loaded truck should be densified or removed and replaced with well-compacted materials. The proofrolling should be observed by a geotechnical engineer or other qualified inspector. Structural Fill procedures are provided in Section 6.1 of this report.

Based on the test borings, site reconnaissance and our field observations, we anticipate that unsuitable materials and/or unstable areas to be encountered at localized areas, particularly at proposed roads across drainage features or creeks. The depth of this material may range from 1 to 1.5 feet of the existing fill and up to 3 feet in the drainage areas. Therefore, we recommend that the owner negotiate competitive unit rates for potential excavation and replacement of unsuitable soils and stabilization of soft areas utilizing crushed stone and geotextile fabric.

5.3 Slopes and Vertical Cuts

A common practice in this region has been to limit temporary slopes to 2.0(H) to 1.0(V) or flatter. The soil conditions at this site may tolerate a maximum temporary slope of 1.5(H) to 1.0(V). The soils in this area may contain fissures, foliation planes and other discontinuities that could cause sloughing or possibly a slope failure, even on relatively flat slopes. Therefore the excavation for the slopes should be monitored by a geotechnical engineer to ensure that soil conditions are similar to those we have encountered. Potential planes of weakness will be more visible at depth as the excavation proceeds. If weak conditions are evident, our geotechnical engineer can then recommend the necessary remedial actions.

Vertical cuts that exceed 5 feet should be braced or shored as required by OSHA regulations for safety. If any excavation, including a utility trench, is extended to a depth

of more than 20 feet, it will be necessary to have the slopes designed by a professional engineer. We recommend that design values of 28 degrees for internal friction angle and 0 psf for cohesion be used for design of slopes.

5.4 Lateral Earth Pressures

The design of any retaining wall is based on the determination of the lateral earth pressures that will act on the wall. These pressures are a function of the retained soils properties, and the structural design of the wall. Three common conditions are considered to exist behind a retaining wall depending on the wall's structural design; namely Active, At-Rest, and Passive earth pressure conditions. Active earth pressures are mobilized when a relatively flexible retaining structure such as a free standing wall is designed allowing for slight movement or deflection. At-rest conditions apply to restrained retaining wall design such as basement or tunnel walls. The passive state represents the maximum possible pressure when a structure is pushed against the soil, and is used in wall design to help resist at-rest or active pressures. Since significant movement has to occur before the passive earth pressure is mobilized, the total calculated passive pressure should be reduced by one-half to two-thirds for design purposes.

Based on our experience, wall movement (known as tilt) that is necessary for earth pressures to mobilize range from 0.01H to 0.02H for the Active state and 0.02H to 0.04H for the Passive state. It is assumed that the ground surfaces behind retaining walls will be constructed relatively level and that residual soils like those encountered in our borings will be used for wall backfill. Based on our experience with similar soils, we recommend that an angle of internal friction (ϕ) = 28 degrees and a cohesion $c = 0$ psf be used as design strength parameters for the sand-silt mixture encountered at the site. These strength parameters result in the following earth pressures coefficients and equivalent fluid pressure per foot of depth for compacted fill (based on a total (wet) unit weight of 120 pounds per cubic foot). A coefficient of friction of 0.40 could be used between the wall foundations and

the underlying soil, when calculating the resistance to sliding (this includes a factor of safety of 1.5).

Table2

<i>Earth Pressure Condition</i>	<i>Coefficient</i>	<i>Recommended Equivalent Earth Pressure (pcf)</i>
Active	0.35	42
At-Rest	0.50	60
Passive	2.8	-

Backfill against the walls should be done carefully to minimize the horizontal load on the wall. Heavy equipment should not be used to compact the soil within 10 feet of the walls. The use of hand-tampers should be sufficient to obtain the required density when working the 10-foot zone adjacent to the wall. Recommended structural fill specifications and procedures are provided in Section 6.1 of this report.

6.0 CONSTRUCTION RECOMMENDATIONS

6.1 Structural Fill

The residual soils present at the subject site appear to be suitable for use as a structural fill. Structural fill should be compacted in accordance with the following criteria:

1. Adequate laboratory proctor density tests should be performed on representative samples of the proposed fill materials to provide data necessary for the quality control. The moisture content at the time of compaction should be within 3 percentage points of the optimum moisture content. In addition, we recommend that the fill soils be free of organics and relatively non-plastic with plasticity indices less than 20.

2. Suitable fill material should be placed in thin lifts (lift thickness depends on the type of equipment used, but generally lifts of 8 inches loose measurement is recommended).
The soils should be compacted by mechanical means such as sheepfoot rollers.
3. We recommend that the fill be compacted to a minimum of 95% of the Standard Proctor Maximum Dry Density (ASTM Specifications D 698). The top 2 feet under pavements should be compacted to a minimum of 98% of the Standard Proctor maximum dry density.
4. An experienced soil engineering inspector should take adequate density tests throughout the fill placement operation to ensure that the specified compaction is being achieved.

6.2 Construction Inspection and Testing

During construction, it is advisable that Matrix Engineering Group, Inc. inspect the site preparation and foundation construction work in order to ensure that our recommended procedures are followed. The placement of any compacted fill should be inspected and tested. The utilization of acceptable on-site borrow materials as well as adequate off-site selected fill must be verified.

APPENDIX

Figure 1: Test Boring Locations Plan

Figure 2: Test Boring Locations Plan (Areas 1&2)

Figure 3: Test Boring Locations Plan (Area 3)

Figure 4: Test Boring Locations Plan (Areas 4, 5, &6)

Correlation of Standard Penetration Resistance with Relative Compactness and Consistency

Area 1: Test Boring Records ME-1 T0 ME-10

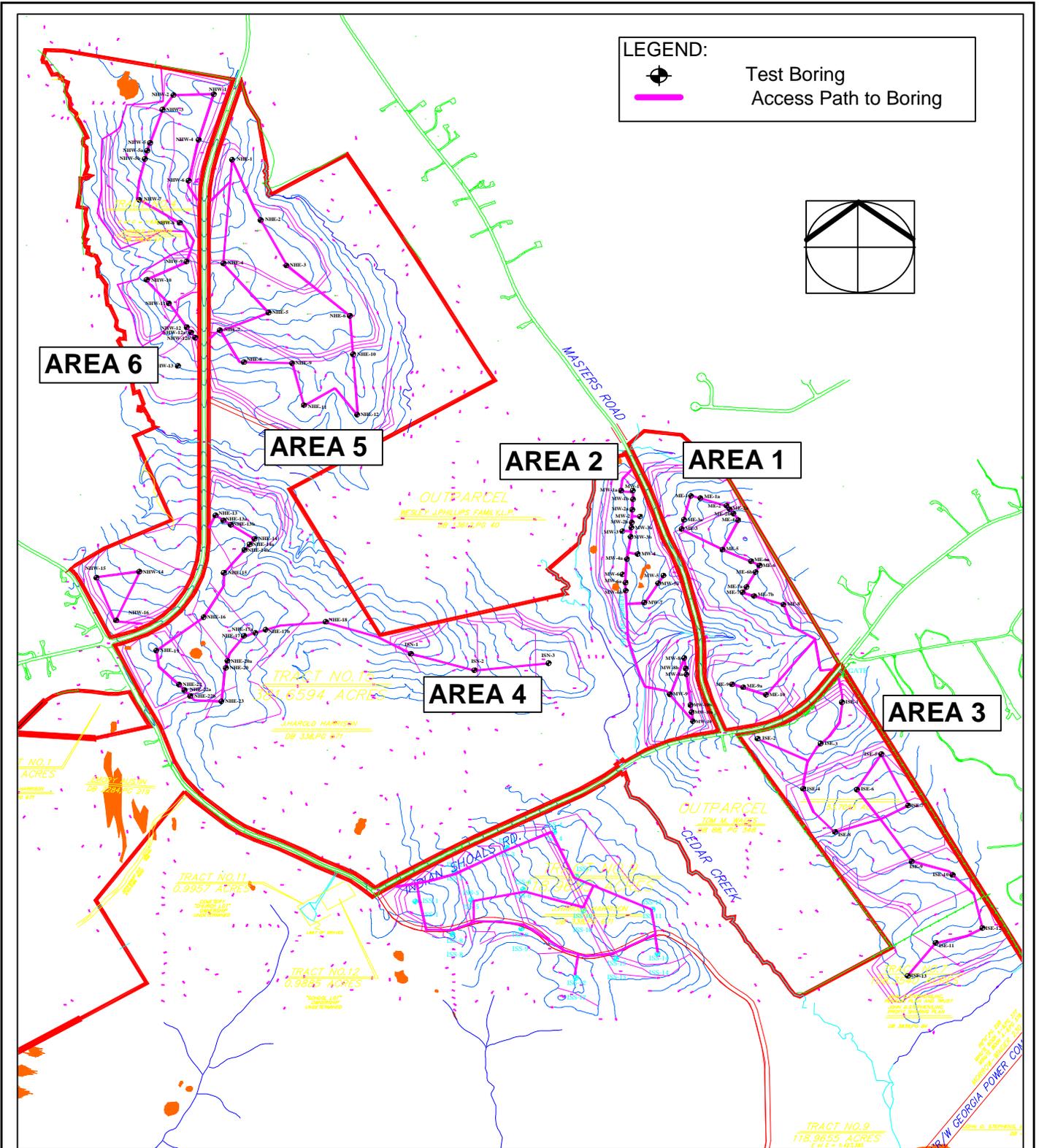
Area 2: Test Boring Records MW-1 T0 MW-10

Area 3: Test Boring Records ISE-1 T0 ISE-13

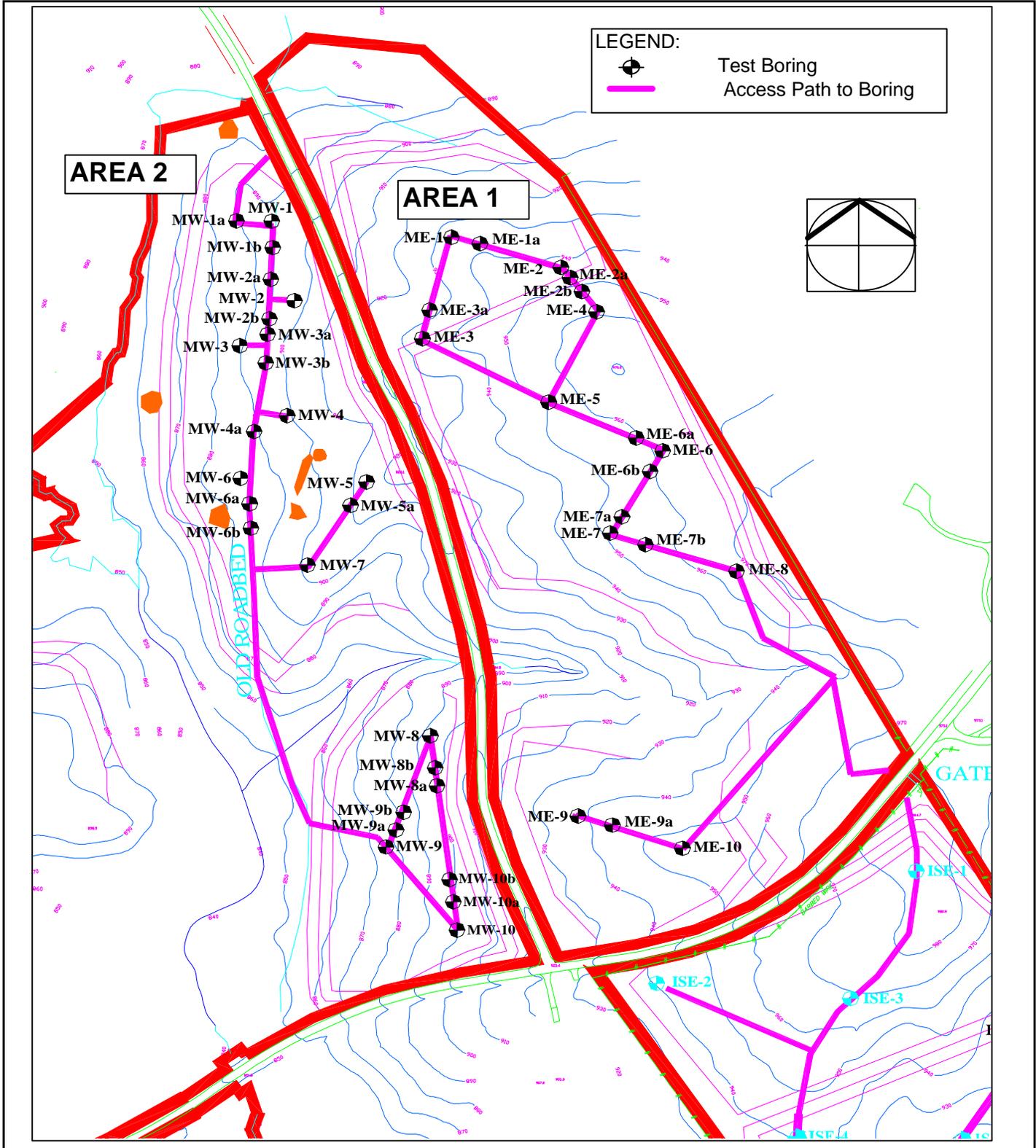
Area 4: Test Boring Records ISN-1 T0 ISN-3

Area 5: Test Boring Records NHE-1 T0 NHE-20

Area 6: Test Boring Records NHW-1 T0 NHW-16

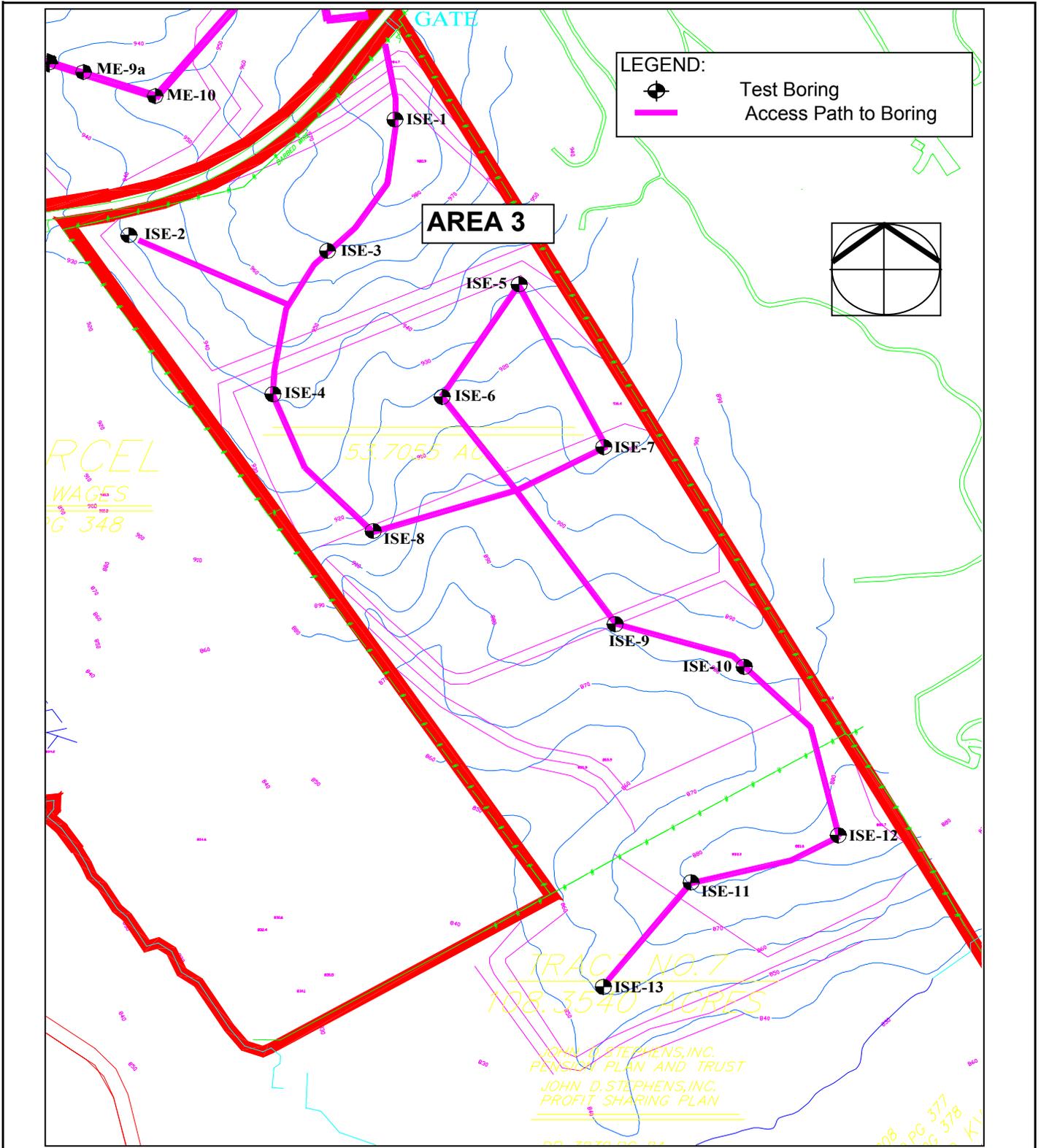


 MATRIX ENGINEERING GROUP NORCROSS, GEORGIA	TITLE			Test Boring Locations Plan Harbins Alcovy River Park Site Gwinnett County, Georgia		
	CLIENT/PROJECT			SCALE		
Gwinnett County Parks and Recreation.			PROJECT NUMBER			
DRAWN	REVIEWED	DATE	PROJECT NUMBER		FIGURE	
EB	SA		MEG 97140.35		1	

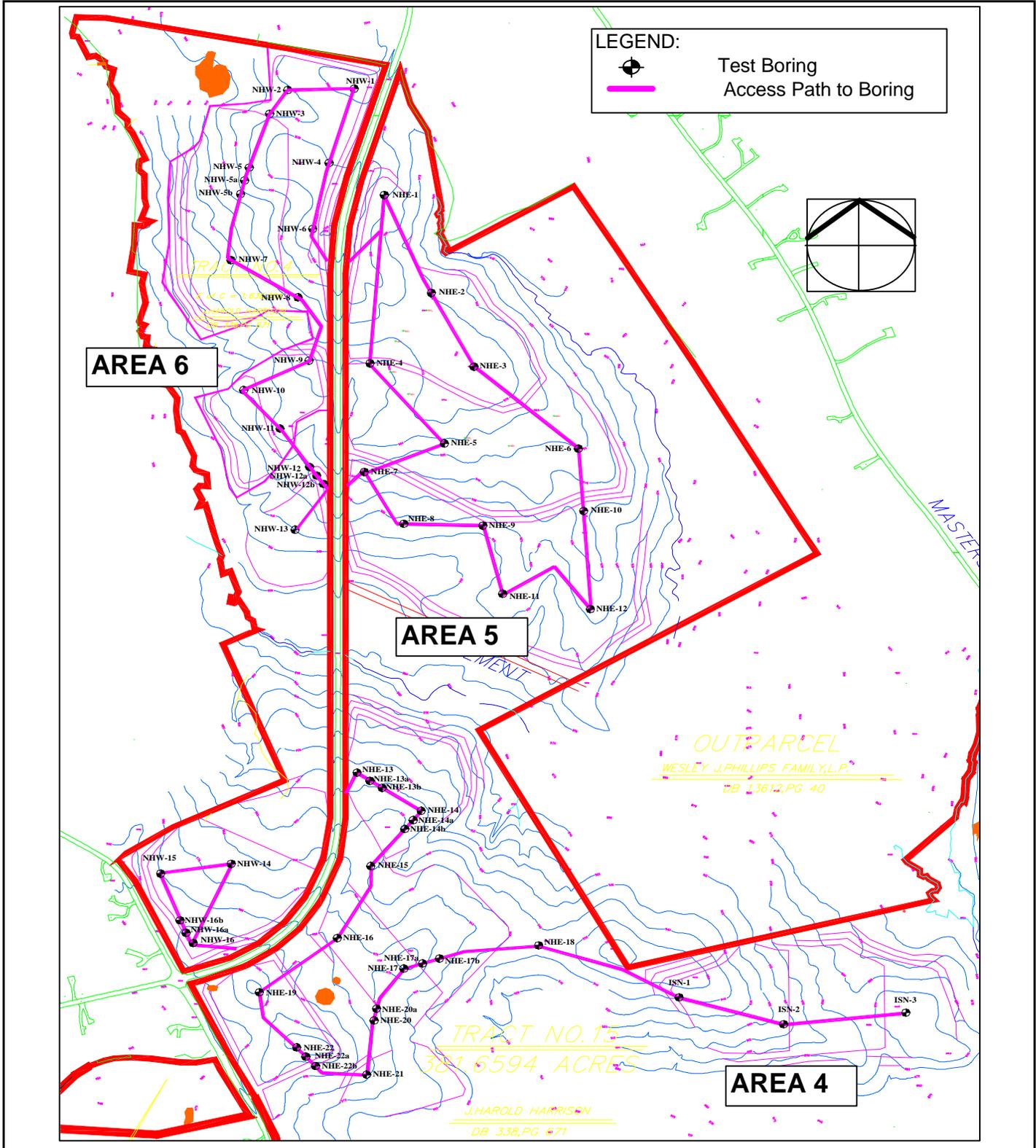


	MATRIX ENGINEERING GROUP NORCROSS, GEORGIA		
	CLIENT/PROJECT Gwinnett County Parks and Recreation.		
DRAWN EB	REVIEWED SA	DATE	SCALE -

TITLE Test Boring Locations Plan (Areas 1 & 2) Harbins Alcovy River Park Site Gwinnett County, Georgia		
PROJECT NUMBER MEG 97140.35	FIGURE 2	



 MATRIX ENGINEERING GROUP NORCROSS, GEORGIA	TITLE			Test Boring Locations Plan (Area 3) Harbins Alcovy River Park Site Gwinnett County, Georgia		
	CLIENT/PROJECT			SCALE		
Gwinnett County Parks and Recreation.			PROJECT NUMBER			
DRAWN	REVIEWED	DATE	PROJECT NUMBER		FIGURE	
EB	SA		MEG 97140.35		3	



 MATRIX ENGINEERING GROUP NORCROSS, GEORGIA	TITLE Test Boring Locations Plan (Areas 4, 5, & 6) Harbins Alcovy River Park Site Gwinnett County, Georgia	
	CLIENT/PROJECT Gwinnett County Parks and Recreation	
DRAWN EB	REVIEWED SA	DATE
SCALE -	PROJECT NUMBER MEG 97140.35	FIGURE 4

**CORRELATION OF STANDARD PENETRATION RESISTANCE
WITH RELATIVE COMPACTNESS AND CONSISTENCY**

SAND & GRAVEL

<u>NO. OF BLOWS, N</u>	<u>RELATIVE COMPACTNESS</u>
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
Over 50	Very Dense

SILT & CLAY

<u>NO. OF BLOWS, N</u>	<u>RELATIVE COMPACTNESS</u>
0 - 1	Very Soft
2 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very Stiff
31 - 50	Hard
Over 50	Very Hard

DRILLING SYMBOLS



Water Table Level after 24 Hours



Water Table Level at the Time of Drilling



Standard Penetration Test



Dynamic Cone Penetrometer Test (ASTM STP399)

50/2" Number of Blows (50) to Drive the Spoon a Number of Inches (2")

DRILLING PROCEDURES

SOIL SAMPLING AND STANDARD PENETRATION TESTING ARE PERFORMED IN ACCORDANCE WITH ASTM D1586-84 (RE-APPROVED IN 1992). THE STANDARD PENETRATION RESISTANCE (N) REPRESENTS THE NUMBER OF BLOWS OF A 140-LB HAMMER FALLING 30 INCHES ON A 2.0 INCH O.D. 1.4 INCH I.D. SPLIT SPOON SAMPLER TO DRIVE IT ONE FOOT. THE SAMPLES OBTAINED FROM THE SPLIT SPOON SAMPLER ARE CLASSIFIED IN THE FIELD IN ACCORDANCE WITH ASTM D2488-93 (VISUAL MANUAL PROCEDURE FOR DESCRIPTION OF SOILS).

AREA 1

TEST BORING RECORDS ME-1 TO ME-10



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-1	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>☒</u> AFTER 24 Hours: <u>☒</u> CAVING> <u>☒</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil.										3
	2.5	Residual, Very Loose, Tan, Clayey Coarse to Fine SAND.	SC									
	5	Loose, Tan, Micaceous, Silty Coarse to Fine SAND.	SM									10
	7.5											
	10											6
	12.5	Rock.	ROCK									
	15	Auger Refusal @ 13 feet B.G.S.										
	17.5											
	20											
	22.5											
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-1a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger									
	2.5										
	5										
	7.5										
	10										
	12.5										
	15	Medium Dense, Tan, Micaceous, Coarse to Fine SAND.	SW	[Pattern]	▲						13
	17.5	Auger Refusal @ 16 feet B.G.S.									
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward ME2



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-2	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
0		<u>Topsoil.</u>									
	2.5	Residual, Very Loose, Brown, Clayey Coarse to Fine SAND.	SC			20					2
	5	Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM			25					15
	7.5	Medium Dense, Gray, Micaceous, Coarse to Fine SAND.	SW			30					26
	10										
	12.5	Auger Refusal @ 11 feet B.G.S.									
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-2a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u> </u> AFTER 24 Hours: <u> </u> CAVING> <u> </u>

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS					N-Value
					Natural Moisture Content (%) - ▲ Penetration - ●					
					10	20	30	40	50	
	0	Straight Auger								
	2.5									
	5									
	7.5									
	10		Partially Weathered Rock, Sampled as Tan, Micaceous, Coarse to Fine SAND. Auger Refusal @ 10 feet B.G.S.	PWR						
	12.5									
	15									
	17.5									
	20									
	22.5									
	25									
	27.5									
	30									
	32.5									

*Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward ME-4*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-2b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u> </u> AFTER 24 Hours: <u> </u> CAVING> <u> </u>

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
	2.5	Straight Auger									
	5										
	7.5										
	10	Medium Dense, Tan, Micaceous, Coarse to Fine SAND / Weathered Rock.	SW	[Pattern]	▲						15
	12.5	Auger Refusal @ 11 feet B.G.S.									
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward ME-5.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-3	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <input type="checkbox"/> AFTER 24 Hours: <input type="checkbox"/> CAVING> <input type="checkbox"/>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	<div style="border-top: 1px dashed black; padding-top: 2px;"> Topsoil. Residual, Loose, Red changing to White, Micaceous, Coarse to Fine SAND. </div>	SW		▲	●					10
	5	Auger Refusal @ 3 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/21/2004
 LOCATION: Refer to Figure 2 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. ME-3a

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS					N-Value
					Natural Moisture Content (%) - ▲ Penetration - ●					
0		Straight Auger								
2.5										
5		Residual, Dense, White and Tan, Micaceous, Silty Coarse to Fine SAND. Rock Lens	SM							50
7.5		Dense changing to Medium Dense, Red and Tan, Micaceous, Silty Coarse to Fine SAND.	SM							12
10										
12.5		Partially Weathered Rock, Sampled as Tan, Micaceous, Coarse to Fine SAND.	PWR							50/3"
15										
17.5										
20		Medium Dense, Reddish and Tan, Micaceous, Coarse to Fine SAND.	SW							17
22.5										
25		Partially Weathered Rock, Sampled as Tan, Micaceous, Coarse to Fine SAND. Boring Terminated @ 25 feet B.G.S.	PWR							50/3"
27.5										
30										
32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward ME-1



DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site **PROJECT NO.:** MEG 97140.35
CLIENT: Gwinnett County Parks and Recreation **DATE:** 9/20/2004
LOCATION: Refer to Figure 2 **ELEVATION:**
DRILLER: KILMAN BROS. **LOGGED BY:** Akram Hudaib
DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
DEPTH TO - WATER> INITIAL: 23 **AFTER 24 Hours:** 20 **CAVING>** C

BORING NO. ME-4

File: Harbins Alcovy River Park Site Date Printed: 11/12/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS		N-Value
						Natural Moisture Content (%) - ▲	Penetration - ●	
0	0	Topsoll.						
	2.5	Residual, Loose, Brown, Clayey Coarse to Fine SAND.	SC	[Diagonal Hatching]	▲	●		5
	5	Very Dense, Red and Brown, Micaceous, Coarse to Fine SAND.	SW	[Dotted]	▲	●		53
	10	Loose to Medium Dense, White and Tan, Micaceous, Silty Coarse to Fine SAND.	SM	[Vertical Lines]	▲	●		9
	15				▲	●		19
	20	Medium Dense, Gray, Micaceous, Coarse to Fine SAND.	SW	[Dotted]	▲	●		11
	25	Partially Weathered Rock.		[Cross-hatching]	▲	●		50/3"
	27.5	Boring Terminated @ 25 feet B.G.S.						
	30							
	32.5							
	35							

Groundwater was encountered at 23' B.G.S. at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/21/2004
 LOCATION: Refer to Figure 2 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. ME-5

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil.										
	2.5	Residual, Medium Dense, Red, Clayey Coarse to Fine SAND.	SC									11
		Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM									
	5											12
	7.5											
	10											10
	12.5											
	15	Medium Dense, Reddish and Tan, Micaceous, Coarse to Fine SAND.	SW									15
	17.5											
	20	Partially Weathered Rock, Sampled as Tan and White, Micaceous, Coarse to Fine SAND.	PWR									50/4"
	22.5											
	25	Partially Weathered Rock, Sampled as Gray Micaceous, Coarse to Fine SAND. Boring Terminated @ 25 feet B.G.S.	PWR									50/5"
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-6	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u>3.5</u> AFTER 24 Hours: <u>2.5</u> CAVING> <u>£</u>

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
0		Topsoil. Residual, Very Loose, Tan, Clayey Coarse to Fine SAND.	SC		Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	2
2.5		Partially Weathered Rock, Sampled as Silty Coarse to Fine SAND.	PWR			50/1"
5						
7.5						
10		Auger Refusal @ 10 feet B.G.S.				50/1"
12.5						
15						
17.5						
20						
22.5						
25						
27.5						
30						
32.5						

Groundwater was encountered at 3.5 ft B.G.S. at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-6a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger									
	5										
	7.5	Auger Refusal @ 5 feet B.G.S.									
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50' toward ME-5.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-6b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
	0				Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
	2.5	Straight Auger				
	5					
	7.5	Auger Refusal @ 5 feet B.G.S.				
	10					
	12.5					
	15					
	17.5					
	20					
	22.5					
	25					
	27.5					
	30					
	32.5					

*Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward ME-7.*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-7	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u>3.5</u> AFTER 24 Hours: _____ CAVING> <u>£</u>

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Topsoil.									
	2.5	Residual, Very Loose, Brown, Clayey Coarse to Fine SAND.	SC	■	●						2
	5	Auger Refusal @ 3 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-7a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>		

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS					N-Value
					SAMPLERS					
					Natural Moisture Content (%) - ▲					
					Penetration - ●					
					10	20	30	40	50	
	0									
	2.5	Straight Auger								
	5	Partially Weathered Rock, Sampled as Gray, Micaceous, Coarse to Fine SAND.	PWR							50/4"
	7.5	Auger Refusal @ 7 feet B.G.S.								
	10									
	12.5									
	15									
	17.5									
	20									
	22.5									
	25									
	27.5									
	30									
	32.5									

Groundwater was not encountered at the time of drilling.
 Offset 30' toward ME-6.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-7b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004	DEPTH TO - WATER> INITIAL: <u>☒</u> _____	AFTER 24 Hours: <u>☒</u> _____
		CAVING> <u>☒</u> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger									
	2.5										
	5	Dense, White, Micaceous, Coarse to Fine SAND.	SW		▲						41
	7.5										
	10	Partially Weathered Rock, Sampled as White, Micaceous, Coarse to Fine SAND. Auger Refusal @ 10 feet B.G.S.	PWR		▲						50/2"
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward ME-8.



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DRILL HOLE LOG

BORING NO. ME-8

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/20/2004
 LOCATION: Refer to Figure 2 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Residual, Very Loose, Brown, Silty Coarse to Fine SAND.	SM	[Symbol]	▲						4
2.5		Very Loose, Red, Clayey Coarse to Fine SAND with little mica.	SC	[Symbol]	▲						
5		Loose, Red, Micaceous, Silty Coarse to Fine SAND.	SM	[Symbol]	▲						10
7.5											
10											7
12.5											
15		Medium Dense, Gray, Micaceous, Coarse to Fine SAND.	SW	[Symbol]	▲						22
17.5											
20		Partially Weathered Rock, Sampled as Gray, Micaceous, Coarse to Fine SAND.	PWR	[Symbol]	▲						50/6"
22.5		Auger Refusal @ 22 feet B.G.S.									
25											
27.5											
30											
32.5											

Groundwater was not encountered at the time of drilling.



DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site **PROJECT NO.:** MEG 97140.35
CLIENT: Gwinnett County Parks and Recreation **DATE:** 9/20/2004
LOCATION: Refer to Figure 2 **ELEVATION:**
DRILLER: KILMAN BROS. **LOGGED BY:** Akram Hudaib
DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
DEPTH TO - WATER> INITIAL: **AFTER 24 Hours:** **CAVING>**

BORING NO. ME-9

File: Harbins Alcovy River Park Site Date Printed: 11/12/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS		N-Value
						Natural Moisture Content (%) - ▲	Penetration - ●	
	0	Topsoll.	PWR					
	2.5	Partially Weathered Rock, Sampled as, Red, Micaceous, Clayey Coarse to Fine SAND.	PWR					50/6"
	5	Partially Weathered Rock, Sampled as Red, Micaceous, Coarse to Fine SAND, with trace of Clay.	PWR					50/6"
	7.5							
	10	Partially Weathered Rock, Sampled as Tan, Micaceous, Coarse to Fine SAND.	PWR					50/1"
	10	Auger Refusal @ 10 feet B.G.S.						
	12.5							
	15							
	17.5							
	20							
	22.5							
	25							
	27.5							
	30							
	32.5							
	35							

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ME-9a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
0		Straight Auger			Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
2.5						
5						
7.5						
10		Loose, Brown, Micaceous, Silty Coarse to Fine SAND.	SM			8
12.5		Rock Lens. (10' - 11.5')				
15		Partially Weathered Rock.	PWR			50/6"
17.5		Auger Refusal @ 15 feet B.G.S.				
20						
22.5						
25						
27.5						
30						
32.5						

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward ME-10



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/20/2004</u>
BORING NO. ME-10	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil.										
	2.5	Residual, Loose, Red, Micaceous, Silty Coarse to Fine SAND.	SM SC									6
	5	Loose, Red, Micaceous, Clayey Coarse to Fine SAND. Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									16
	7.5											
	10	Soil changes to Tan in color.										12
	12.5											
	15	Medium Dense, Tan, Micaceous, Coarse to Fine SAND.	SW									21
	17.5											
	20	Partially Weathered Rock, Sampled as Tan, Micaceous, Coarse to Fine SAND.	PWR									50/3"
	22.5	Auger Refusal @ 21 feet B.G.S.										
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.

KEY TO SYMBOLS

Symbol Description

Strata symbols



Topsoil



Clayey sand



Silty sand



Partially Weathered Rock



Blank



Well graded sand

Misc. Symbols



Water table during
drilling



Water table at
boring completion

Soil Samplers



Standard penetration test

Notes:

1. Exploratory borings were drilled on 9/20/2004 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

AREA 2

TEST BORING RECORDS MW-1 TO MW-10



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-1	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Topsoil.									
	2.5	Partially Weathered Rock, Sampled as Brown, Coarse to Fine SAND.	PWR								50/1"
	5	Auger Refusal @ 3 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/21/2004
 LOCATION: Refer to Figure 2 ELEVATION: _____
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: ∅ AFTER 24 Hours: ∅ CAVING> £

BORING NO. MW-1a

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger									
	5	Auger Refusal @ 4 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet back from MW-1



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-1b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u>▼</u> _____ AFTER 24 Hours: <u>▼</u> _____ CAVING> <u>£</u> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS					N-Value
					SAMPLERS					
					Natural Moisture Content (%) - ▲					
					Penetration - ●					
					10	20	30	40	50	
	0									
	2.5	Straight Auger								
	5	Partially Weathered Rock.	PWR							50/5"
		Auger Refusal @ 5 feet B.G.S.								
	7.5									
	10									
	12.5									
	15									
	17.5									
	20									
	22.5									
	25									
	27.5									
	30									
	32.5									

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-2



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-2	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS					N-Value
					Natural Moisture Content (%) - ▲ Penetration - ●					
0		Topsoil.								
	2.5	Residual, Loose, Brown, Coarse to Fine SAND.	SW		●					7
	5	Partially Weathered Rock.	PWR							50/5"
	7.5	Auger Refusal @ 5 feet B.G.S.								
	10									
	12.5									
	15									
	17.5									
	20									
	22.5									
	25									
	27.5									
	30									
	32.5									

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-2a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger									
	2.5										
	5	Medium Dense, Tan, Micaceous, Coarse to Fine SAND.	SW								15
	7.5	Auger Refusal @ 6 feet B.G.S.									
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-3



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-2b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
	2.5	Straight Auger									
	5	Loose, Brown, Coarse to Fine SAND, with trace of Mica, (Wet). Auger Refusal @ 5 feet B.G.S.	SW								6
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-1.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-3	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Topsoil.									
	2.5	Residual, Loose, Brown, Coarse to Fine SAND.	SW			●					10
	5	Auger Refusal @ 3.5 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-3a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger									
	5	Auger Refusal @ 4 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-2*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-3b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger									
	5	Auger Refusal @ 4 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-4*



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DRILL HOLE LOG

BORING NO. MW-4

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/21/2004
 LOCATION: Refer to Figure 2 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Residual, Loose, Brown, Coarse to Fine SAND.	SW								8
	2.5	Loose, Brown, Clayey Coarse to Fine SAND.	SC								
		Rock									
	5	Auger Refusal @ 3.5 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-4a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
DEPTH TO - WATER> INITIAL: <u>☒</u> _____ AFTER 24 Hours: <u>☒</u> _____		CAVING> <u>☒</u> _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger									
	5	Auger Refusal @ 3.5 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-6*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-5	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
DEPTH TO - WATER> INITIAL: <u>☐</u> AFTER 24 Hours: <u>☐</u> CAVING> <u>☐</u>		

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
	2.5	Residual, Very Loose, Brown, Clayey Coarse to Fine SAND. Very Loose, Tannish Brown, Silty Coarse to Fine SAND.	SC SM								2
	5	Partially Weathered Rock. Auger Refusal @ 4.5 feet B.G.S.	PWR								50/2"
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-5a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger									
	2.5										
	5	Loose changing to Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM	[Symbol]	[Symbol]						10
	7.5										
	10										13
	12.5	Changing to Tan in Color.									
	15										15
	17.5										
	20	Medium Dense changing to Dense, White and Tan, Micaceous, Silty Coarse to Fine SAND.	SW	[Symbol]	[Symbol]						25
	22.5										
	25	Boring Terminated @ 25 feet B.G.S.									45
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-7



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-6	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
DEPTH TO - WATER> INITIAL: <u>☐</u> AFTER 24 Hours: <u>☐</u> CAVING> <u>☐</u>		

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Topsoil.									
	2.5	Residual, Loose, Brown, Coarse to Fine SAND.	SW								8
		Loose, Brown, Clayey Coarse to Fine SAND.	SC								
		Rock.	ROCK								
	5	Auger Refusal @ 3.5 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-6a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
DEPTH TO - WATER> INITIAL: <u>☐</u> AFTER 24 Hours: <u>☐</u> CAVING> <u>☐</u>		

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
	2.5	Straight Auger									
	5	Partially Weathered Rock, Sampled as Tan, Micaceous, Coarse to Fine SAND. Auger Refusal @ 5 feet B.G.S.	PWR								50/5"
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-7



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-6b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/21/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
	0				Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
	2.5	Straight Auger				
	5	Auger Refusal @ 3.5 feet B.G.S.				
	7.5					
	10					
	12.5					
	15					
	17.5					
	20					
	22.5					
	25					
	27.5					
	30					
	32.5					

*Groundwater was not encountered at the time of drilling.
 Offset 60 feet toward MW-7*



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/22/2004
 LOCATION: Refer to Figure 2 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: 14 AFTER 24 Hours: 6 CAVING> £

BORING NO. MW-7

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
0	0	Topsoil.	SC	[Symbol]							5
	2.5	Residual, Very Loose, Reddish Brown, Clayey Coarse to Fine SAND.									
	5	Very Loose changing to Loose, Tannish Brown, Micaceous, Silty Coarse to Fine SAND. (Wet)	SM	[Symbol]							3
	7.5										
	10										8
	12.5										
	15	Partially Weathered Rock, Sampled as Tan and White, Micaceous, Coarse to Fine SAND. Auger Refusal @ 15 feet B.G.S.	PWR	[Symbol]							50/1"
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was encountered at 14 feet at the time of drilling, and 6 feet after two hours.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/22/2004
 LOCATION: Refer to Figure 2 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. MW-8

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil.										
	2.5	Residual, Loose, Tannish Brown, Clayey Coarse to Fine SAND.	SC									5
		Loose, Red, Micaceous, Silty Coarse to Fine SAND.	SM									
	5	Partially Weathered Rock.	PWR									50/5"
	7.5											
	10											50/3"
	12.5	Auger Refusal @ 10 feet B.G.S.										
	15											
	17.5											
	20											
	22.5											
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

BORING NO. MW-8a

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/22/2004
 LOCATION: Refer to Figure 2 ELEVATION: _____
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: ∅ AFTER 24 Hours: ∅ CAVING> £

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger.									
	5	Auger Refusal @ 3 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-10



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-8b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger									
	5										
	7.5	Auger Refusal @ 5 feet B.G.S.									
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-8



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
BORING NO. MW-9	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil.										
	2.5	Residual, Very Loose, Brown, Clayey Coarse to Fine SAND.	SC									4
	5	Partially Weathered Rock. Auger Refusal @ 4 feet B.G.S.	PWR									50/4"
	7.5											
	10											
	12.5											
	15											
	17.5											
	20											
	22.5											
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-9a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger.									
	2.5										
	5	Residual, Medium Dense, Red and Brown, Micaceous, Silty Coarse to Fine SAND. Auger Refusal @ 5 feet B.G.S.	SM			●					12
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 60 feet toward MW-8



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
BORING NO. MW-9b	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>☒</u> AFTER 24 Hours: <u>☒</u> CAVING> <u>☒</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Straight Auger									
2.5											
5		Medium Dense, Red and Brown, Micaceous, Coarse to Fine SAND, with Rock fragments.	SW								28
7.5											
10		Partially Weathered Rock.	PWR								50/2"
12.5		Auger Refusal @ 11 feet B.G.S.									
15											
17.5											
20											
22.5											
25											
27.5											
30											
32.5											

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-8



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
BORING NO. MW-10	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	<u>Topsoil.</u>	SC								4
	2.5	<u>Residual, Very Loose, Brown, Clayey Coarse to Fine SAND.</u>									
	5	<u>Auger Refusal @ 3.5 feet B.G.S.</u>									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-10a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger.									
	5	Auger Refusal @ 4 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-8*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. MW-10b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 2</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
	2.5	Straight Auger									
	5	Partially Weathered Rock, Sampled as Brown, Coarse to Fine SAND. Auger Refusal @ 5 feet B.G.S.	PWR								50/4"
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.
 Offset 50 feet toward MW-8

KEY TO SYMBOLS

Symbol Description

Strata symbols



Topsoil



Partially Weathered Rock



Blank



Well graded sand



Clayey sand



Silty sand

Misc. Symbols



Water table during
drilling



Water table at
boring completion

Soil Samplers



Standard penetration test

Notes:

1. Exploratory borings were drilled on 9/22/2004 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

AREA 3

TEST BORING RECORDS ISE-1 TO ISE-13



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/8/2004</u>
BORING NO. ISE-1	LOCATION: <u>Refer to Figure 3</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		<u>Topsoil with roots.</u>									
2.5		Residual, Loose changing to Medium Dense, Red, Micaceous, Clayey Coarse to Fine SAND.	SC								6
5											14
7.5											
10		Medium Dense changing to Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM								21
12.5											
15											23
17.5											
20											39
22.5		Auger Refusal at 21 feet B.G.S.									
25											
27.5											
30											
32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/8/2004
 LOCATION: Refer to Figure 3 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. ISE-2

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									
	2.5	Residual, Loose changing to Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM								5
	5	Soil changes to Tan in color with MnO stains.									7
	7.5										
	10	Soil changes to Reddish Tan in color.									9
	12.5										
	15										10
	17.5										
	20										16
	22.5										
	25	Partially Weathered Rock.	PWR								50/1"
	27.5	Boring terminated at 25 feet B.G.S.									
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ISE-3	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/8/2004</u>
	LOCATION: <u>Refer to Figure 3</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Red, Clayey Coarse to Fine SAND.	SC									6
	5	Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM									15
	7.5											
	10											19
	12.5											
	15	Soil changes to Reddish Tan in color.										17
	17.5											
	20	Soil changes to Tan in color with quartzite particles.										14
	22.5											
	25	Boring terminated at 25 feet B.G.S.										21
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/8/2004
 LOCATION: Refer to Figure 3 ELEVATION: _____
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: ∇ _____ AFTER 24 Hours: ∇ _____ CAVING> £ _____

BORING NO. ISE-4

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Very Loose, Red, Clayey Coarse to Fine SAND.	SC									3
	5	Medium Dense, Red, Silty Coarse to Fine SAND with little Clay.	SM									12
	7.5											
	10											29
	12.5											
	15											28
	17.5											
	20	Partially Weathered Rock.	PWR									50/3"
	22.5	Auger Refusal at 20 feet B.G.S.										
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/8/2004
 LOCATION: Refer to Figure 3 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. ISE-5

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Medium Dense, Red, Micaceous, Clayey Coarse to Fine SAND.	SC									15
	5	Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND with little Clay.	SM									13
	7.5											
	10	Medium Dense, Red and White, Silty Coarse to Fine SAND.	SM									13
	12.5											
	15											11
	17.5											
	20											17
	22.5											
	25	Soil changes to Reddish Brown in color.										12
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/8/2004</u>
BORING NO. ISE-6	LOCATION: <u>Refer to Figure 3</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		<u>Topsoil with roots.</u>										
	2.5	Residual, Loose changing to Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND with little Clay.	SM									7
	5											16
	7.5											
	10	Loose changing to Medium Dense, Brown and White, Micaceous, Silty Coarse to Fine SAND.	SM									9
	12.5											
	15											12
	17.5											
	20	Soil changes to Tannish White in color.										14
	22.5											
	25											14
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/8/2004</u>
BORING NO. ISE-7	LOCATION: <u>Refer to Figure 3</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		<u>Topsoil with roots.</u>										
	2.5	<u>Residual, Loose, Tannish Orange, Clayey Coarse to Fine SAND.</u>	SC									10
	5											7
	7.5											
	10	<u>Loose changing to Medium Dense, Orange, Silty Coarse to Fine SAND.</u>	SM									8
	12.5											
	15	<u>Soil changes to Yellowish Orange in color.</u>										11
	17.5											
	20											13
	22.5											
	25	<u>Soil changes to Olive Gray in color.</u>										14
	27.5	<u>Boring terminated at 25 feet B.G.S.</u>										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/8/2004
 LOCATION: Refer to Figure 3 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. ISE-8

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										8
	2.5	Residual, Loose, Red, Clayey Coarse to Fine SAND.	SC									10
	5											
	7.5											
	10	Loose changing to Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM									8
	12.5											
	15	Soil changes to Tan in color.										11
	17.5											
	20											12
	22.5											
	25											12
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



MATRIX ENGINEERING GROUP, INC.
 Geotechnical, Environmental, and Construction Materials Consultants

DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/8/2004
 LOCATION: Refer to Figure 3 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. ISE-10

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									
	2.5	Residual, Loose, Red, Clayey Coarse to Fine SAND.	SC								5
	5										6
	7.5										
	10	Loose changing to Medium Dense, Yellowish Orange, Micaceous, Silty Coarse to Fine SAND.	SM								7
	12.5										
	15										6
	17.5										
	20	Soil changes to Tannish Brown in color.									13
	22.5										
	25	Soil changes to Olive Gray in color.									11
	27.5	Boring terminated at 25 feet B.G.S.									
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/8/2004
 LOCATION: Refer to Figure 3 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. ISE-11

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Brown, Clayey Coarse to Fine SAND.	SC									5
	5	Medium Dense changing to Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									12
	7.5											
	10											14
	12.5											
	15											32
	17.5											
	20	Medium Dense changing to Dense, Brown, Micaceous, Silty Coarse to Fine SAND.	SM									30
	22.5											
	25											39
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/8/2004</u>
BORING NO. ISE-12	LOCATION: <u>Refer to Figure 3</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									4
	2.5	Residual, Very Loose changing to Medium Dense, Reddish Brown, Silty Coarse to Fine SAND.	SM								9
	5										8
	7.5										9
	10	Soil changes to Brown in color.									14
	12.5										28
	15										
	17.5										
	20										
	22.5										
	25	Boring terminated at 25 feet B.G.S.									
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ISE-13	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/8/2004</u>
	LOCATION: <u>Refer to Figure 3</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									
	2.5	Residual, Loose, Red, Clayey Coarse to Fine SAND.	SC								8
	5	Medium Dense changing to Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM								17
	7.5										
	10	Soil changes to Tan in color.									20
	12.5										
	15										29
	17.5										
	20										22
	22.5										
	25										33
	27.5	Boring terminated at 25 feet B.G.S.									
	30										
	32.5										

Groundwater was not encountered at the time of drilling.

KEY TO SYMBOLS

Symbol Description

Strata symbols



Topsoil



Clayey sand



Silty sand



Partially Weathered Rock

Misc. Symbols



Water table during
drilling

Soil Samplers



Standard penetration test

Notes:

1. Exploratory borings were drilled on 10/8/2004 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

AREA 4

TEST BORING RECORDS ISN-1 TO ISN-3



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/5/2004</u>
BORING NO. ISN-1	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>
	File: Harbins Alcovy River Park Site Date Printed: 10/22/2004	

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		<u>Topsoil with roots.</u>									
	2.5	<u>Residual, Loose, Tannish Brown, Coarse to Fine SAND with little Silt.</u>	SM								8
	5										9
	7.5										
	10										12
	12.5										
	15	<u>Dense, Tan and White, Micaceous, Silty Coarse to Fine SAND.</u>	SM								37
	17.5	<u>Auger Refusal at 17 feet B.G.S.</u>									
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



MATRIX ENGINEERING GROUP, INC.

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DRILL HOLE LOG

BORING NO. ISN-2

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/5/2004
 LOCATION: Refer to Figure 4 ELEVATION: _____
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: ∇ _____ AFTER 24 Hours: ∇ _____ CAVING> £ _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Very Loose, Red, Clayey Coarse to Fine SAND.	SC									4
	5	Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM									16
	7.5											
	10	Soil changes to Tan in color.										24
	12.5											
	15											20
	17.5											
	20											23
	22.5											
	25											19
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. ISN-3	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/5/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
0					Natural Moisture Content (%) - ▲ Penetration - ●	
	2.5	Topsoil with roots. Residual, Very Loose, Brown, Clayey Coarse to Fine SAND.	SC		10 20 30 40 50	4
	5	Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM			20
	7.5					
	10	Quartzite particles encountered.				17
	12.5					
	15					25
	17.5					
	20					17
	22.5					
	25					12
	27.5	Boring terminated at 25 feet B.G.S.				
	30					
	32.5					

Groundwater was not encountered at the time of drilling.

KEY TO SYMBOLS

Symbol Description

Strata symbols



Topsoil



Silty sand



Clayey sand

Soil Samplers



Standard penetration test

Notes:

1. Exploratory borings were drilled on 10/5/2004 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

AREA 5

TEST BORING RECORDS NHE-1 TO NHE-22



MATRIX ENGINEERING GROUP, INC.
 Geotechnical, Environmental, and Construction Materials Consultants

DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/5/2004
 LOCATION: Refer to Figure 4 ELEVATION: _____
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: ∅ AFTER 24 Hours: ∅ CAVING> £

BORING NO. NHE-1

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Very Loose, Brown, Silty Coarse to Fine SAND.	SM	[Symbol]	[Symbol]							4
	5	Medium Dense, Red, Clayey Coarse to Fine SAND.	SC	[Symbol]	[Symbol]							12
	7.5											
	10	Medium Dense, Tan and White, Micaceous, Silty Coarse to Fine SAND with quartzite particles.	SM	[Symbol]	[Symbol]							24
	12.5											
	15											
	17.5											
	20	Soil changes to Tannish Brown in color with MnO stains.										
	22.5	Auger Refusal at 21 feet B.G.S.										
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
BORING NO. NHE-2	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									
	2.5	Residual, Loose, Brown, Clayey Coarse to Fine SAND.	SC								7
	5	Loose changing to Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM								10
	7.5										
	10										9
	12.5										
	15	Soil changes to Tannish Brown in color.									16
	17.5										
	20	Loose changing to Dense, Tannish Gray, Micaceous, Coarse to Fine SAND with little Silt and quartzite particles.	SM								10
	22.5										
	25	Boring terminated at 25 feet B.G.S.									35
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-3	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Brown, Clayey Coarse to Fine SAND.	SC									8
	5	Loose changing to Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									9
	7.5											
	10											6
	12.5											
	15	Soil changes to Tannish Brown in color.										6
	17.5											
	20	Soil changes to Reddish Brown in color.	SM									9
	22.5											
	25	Soil changes to Tan in color.										12
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/5/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHE-4

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose changing to Medium Dense, Reddish Brown, Clayey Coarse to Fine SAND.	SC									5
	5											14
	7.5											
	10	Dense changing to Medium Dense, Orange and Tan, Micaceous, Silty Coarse to Fine SAND.	SM									47
	12.5											
	15	Soil changes to Reddish Brown in color.										29
	17.5											
	20	Dense changing to Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									35
	22.5											
	25	Soil changes to Tannish Brown in color.										26
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/6/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHE-5

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Reddish Brown, Micaceous, Clayey Coarse to Fine SAND.	SC									10
	5											8
	7.5											
	10	Medium Dense, Tannish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									12
	12.5											
	15	Soil changes to Reddish Brown in color.										17
	17.5											
	20	Soil changes to Tan in color with quartzite particles.										20
	22.5											
	25	Soil changes to Olive Gray in color.										16
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-6	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Brown, Clayey Coarse to Fine SAND.	SC									8
	5	Medium Dense changing to Loose, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									16
	7.5											
	10											9
	12.5											
	15	Medium Dense, Tannish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									11
	17.5											
	20											13
	22.5											
	25											18
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
BORING NO. NHE-7	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>
	File: Harbins Alcovy River Park Site Date Printed: 10/22/2004	

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										2
	2.5	Residual, Very Loose, Tan, Clayey Coarse to Fine SAND.	SC									
	5	Dense changing to Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM									46
	7.5											
	10	Soil changes to Tannish Brown in color.										13
	12.5											
	15											18
	17.5											
	20	Soil changes to Tannish Gray in color.										22
	22.5											
	25											23
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/6/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHE-10

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Very Loose changing to Medium Dense, Reddish Brown, Clayey Coarse to Fine SAND.	SC									4
	5											18
	7.5											
	10	Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									11
	12.5											
	15											13
	17.5											
	20	Soil changes to Tannish Brown in color.										13
	22.5											
	25											13
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/6/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHE-11

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Very Loose, Tan, Silty Coarse to Fine SAND.	SM									4
	5	Medium Dense, Red, Clayey Coarse to Fine SAND.	SC									14
	7.5											
	10	Loose, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									8
	12.5											
	15											10
	17.5											
	20	Medium Dense changing to Loose, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									12
	22.5											
	25											8
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
BORING NO. NHE-12	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
	2.5	Topsoil with roots. Residual, Medium Dense, Red, Micaceous, Clayey Coarse to Fine SAND.	SC	[Symbol]	▲						19
	5	Medium Dense changing to Loose, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM	[Symbol]	▲						18
	7.5										
	10	Soil changes to Tan in color.									9
	12.5										
	15										8
	17.5										
	20										10
	22.5										
	25	Medium Dense, Reddish Tan, Micaceous, Silty Coarse to Fine SAND. Boring terminated at 25 feet B.G.S.	SM	[Symbol]	▲						12
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/23/2004
 LOCATION: Refer to Figure 4 ELEVATION: _____
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: ∅ AFTER 24 Hours: ∅ CAVING> £

BORING NO. NHE-13

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
0												
	2.5	Compost Material. Topsoil. Residual, Loose, Brown, Coarse to Fine SAND.	SW									6
	5	Partially Weathered Rock, Sampled as White, Micaceous, Coarse to Fine SAND. Auger Refusal @ 5 feet B.G.S.	PWR									50/4"
	7.5											
	10											
	12.5											
	15											
	17.5											
	20											
	22.5											
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
BORING NO. NHE-13a	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> _____ AFTER 24 Hours: <u>∅</u> _____ CAVING> <u>£</u> _____	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger.									
	2.5										
	5	Residual, Medium Dense, Tannish Red, Micaceous, Silty Coarse to Fine SAND.	SM					●			15
	7.5										
	10	Auger Refusal @ 8 feet B.G.S.									
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Offset 50 feet toward NHE-14
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-13b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
	0				Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
	2.5	Straight Auger				
	5					
	7.5	Auger Refusal @ 5 feet B.G.S.				
	10					
	12.5					
	15					
	17.5					
	20					
	22.5					
	25					
	27.5					
	30					
	32.5					

*Offset 50 feet toward NHE-14
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-14	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>☒</u> AFTER 24 Hours: <u>☒</u> CAVING> <u>☒</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Topsoil.									
	2.5	Residual, Loose, Brown, Coarse to Fine SAND. Loose, Red, Clayey Coarse to Fine SAND with little mica.	SW SC								7
	5	Loose, Brown, Micaceous, Silty Coarse to Fine SAND.	SM								8
	7.5										
	10	Partially Weathered Rock, Sampled as White, Micaceous, Coarse to Fine SAND. Auger Refusal @ 10 feet B.G.S.	PWR								50/1"
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-14a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
	0				Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
	2.5	Straight Auger.				
	5	Auger Refusal @ 4 feet B.G.S.				
	7.5					
	10					
	12.5					
	15					
	17.5					
	20					
	22.5					
	25					
	27.5					
	30					
	32.5					

*Offset 50 feet toward NHE-15
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-14b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
	0				Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
	2.5	Straight Auger				
	5	Auger Refusal @ 3 feet B.G.S.				
	7.5					
	10					
	12.5					
	15					
	17.5					
	20					
	22.5					
	25					
	27.5					
	30					
	32.5					

*Offset 50 feet toward NHE-15
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/23/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: 17 AFTER 24 Hours: 15 CAVING> £

BORING NO. NHE-15

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil.										9
	2.5	Residual, Loose, Tan, Coarse to Fine SAND. Loose changing to Medium Dense, Red, Clayey Coarse to Fine SAND.	SW SC									13
	5											
	7.5											
	10	Loose, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									9
	12.5											
	15	Soil changes to Tan in color.										9
	17.5											
	20	Soil changes to Tannish Brown in color.										8
	22.5											
	25	Boring Terminated @ 25 feet B.G.S.										
	27.5											
	30											
	32.5											

Groundwater was encountered at 17 feet at the time of drilling, and 15 feet after two hours.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
BORING NO. NHE-16	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil.										5
2.5		Residual, Loose, Tan, Coarse to Fine SAND. Loose, Tan, Clayey Coarse to Fine SAND.	SC									
5		Medium Dense changing to Loose, Tan, Micaceous, Silty Coarse to Fine SAND.	SM									28
7.5												
10												8
12.5												
15												8
17.5												
20		Auger Refusal @ 18 feet B.G.S.										
22.5												
25												
27.5												
30												
32.5												

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-17	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
0											
	2.5	Topsoil with roots. Residual, Medium Dense, Tan, Coarse to Fine SAND with little Silt.	SM								24
	5	Partially Weathered Rock.	PWR								50/4"
	7.5	Auger Refusal at 5 feet B.G.S.									
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-17a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value							
	0	Straight Auger.			TEST RESULTS								
	2.5				Natural Moisture Content (%) - ▲ Penetration - ●								
	5	Auger Refusal at 3 feet B.G.S.			10	20	30	40	50				
	7.5">												
	10">												
	12.5">												
	15">												
	17.5">												
	20">												
	22.5">												
	25">												
	27.5">												
	30">												
	32.5">												

Boring was offset 50 feet toward Boring NHE-18.
 Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/6/2004</u>
BORING NO. NHE-17b	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger.									
	2.5										
	5										
	7.5										
	10	Residual, Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM		▲						15
	12.5										
	15	Auger Refusal at 13 feet B.G.S.									
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Boring was offset 50 feet toward Boring NHE-18.
 Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 10/5/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHE-18

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Medium Dense, Tan, Coarse to Fine SAND with little Silt.	SM									14
	5	Medium Dense, Reddish Tan, Micaceous, Clayey Coarse to Fine SAND.	SC									17
	7.5											
	10	Medium Dense changing to Loose, Reddish Tan, Micaceous, Silty Coarse to Fine SAND.	SM									18
	12.5											
	15	Soil changes to Tan in color.										10
	17.5											
	20	Dense, Tan and White, Micaceous, Silty Coarse to Fine SAND with quartzite particles.	SM									48
	22.5											
	25	Partially Weathered Rock.	PWR									50/4"
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
BORING NO. NHE-19	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Residual, Loose, Brown, Coarse to Fine SAND.	SW								6
2.5		Loose, Brown, Clayey Coarse to Fine SAND.	SC								
5		Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND, Weathered Rock.	SM								13
7.5											
10											14
12.5											
15		Soil changes to Reddish Brown in color.									17
17.5											
20		Soil changes to Red and White in color.									24
22.5											
25		Soil changes to Tan and White in color.									27
27.5		Boring Terminated @ 25 feet B.G.S.									
30											
32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-20	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/5/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
	2.5	<div style="border: 1px dashed black; padding: 2px;">Topsoil with roots.</div> Residual, Medium Dense, Brown, Silty Coarse to Fine sAND.	SM				●				16
	5	Auger Refusal at 3 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-20a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/5/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger.									
	2.5										
	5	Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM			●					14
	7.5	Auger Refusal at 7 feet B.G.S.									
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Boring was offset 50 toward Boring NHE-17.
 Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>10/5/2004</u>
BORING NO. NHE-21	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Medium Dense, Reddish Tan, Micaceous, Clayey Coarse to Fine SAND.	SC									11
	5	Medium Dense, Tan, Micaceous, Silty Coarse to Fine SAND.	SM									13
	7.5											
	10											13
	12.5											
	15											15
	17.5											
	20											14
	22.5											
	25											15
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
BORING NO. NHE-22	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>☐</u> AFTER 24 Hours: <u>☐</u> CAVING> <u>☐</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0										
		Residual, Loose, Brown, Coarse to Fine SAND.	SW	[Symbol]							8
	2.5	Weathered Rock. Loose, Brown, Coarse to Fine SAND.	ROCK SW	[Symbol]							
	5	Medium Dense, Brown, Micaceous, Silty Coarse to Fine SAND.	SM	[Symbol]							16
	7.5										
	10	Partially Weathered Rock, Sampled as Tan, Micaceous, Coarse to Fine SAND. Auger Refusal @ 10 feet B.G.S.	PWR	[Symbol]							50/3"
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-22a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger.									
	5	Auger Refusal @ 3 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Offset 50 feet toward NHE-21
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHE-22b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
	0					10	20	30	40	50	
	2.5	Straight Auger									
	5	Auger Refusal @ 3 feet B.G.S.									
	7.5										
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Offset 50 feet toward NHE-21
 Groundwater was not encountered at the time of drilling.*

KEY TO SYMBOLS

Symbol Description

Strata symbols

 Description not given for:
"TJ"

 Topsoil

 Well graded sand

 Partially Weathered Rock

 Blank

 Silty sand

 Clayey sand

Misc. Symbols

 Water table during
drilling

 Water table at
boring completion

Soil Samplers

 Standard penetration test

Notes:

1. Exploratory borings were drilled on 10/5/2004 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

AREA 6

TEST BORING RECORDS NHW-1 TO NHW-16



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/23/2004</u>
BORING NO. NHW-1	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>
	File: Harbins Alcovy River Park Site Date Printed: 10/22/2004	

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Light Brown, Silty Coarse to Fine SAND.	SM									10
	5	Medium Dense, Tannish Gray, Silty Coarse to Fine SAND.	SM									21
	7.5											
	10											13
	12.5											
	15	Soil changes to Reddish Orange in color.										22
	17.5											
	20											16
	22.5											
	25											15
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/24/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHW-3

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Brown, Clayey Coarse to Fine SAND.	SC	[Symbol]								5
	5	Partially Weathered Rock.	PWR	[Symbol]								50/6"
	7.5											
	10	Medium Dense, Reddish Brown, Silty Coarse to Fine SAND.	SM	[Symbol]								27
	12.5											
	15	Auger Refusal at 13 feet B.G.S.										
	17.5											
	20											
	22.5											
	25											
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/23/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHW-4

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									
	2.5	Residual, Loose, Reddish Orange, Clayey Coarse to Fine SAND.	SC								10
	5	Medium Dense, Reddish Brown, Silty Coarse to Fine SAND.	SM								12
	7.5										
	10	Soil changes to Tan in color.									11
	12.5										
	15										18
	17.5										
	20	Dense, Gray and White, Micaceous, Coarse to Fine SAND with little Silt.	SM								32
	22.5										
	25	Medium Dense, Tan and White, Micaceous, Coarse to Fine SAND with little Silt.	SM								22
	27.5	Boring terminated at 25 feet B.G.S.									
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/24/2004
 LOCATION: Refer to Figure 4 ELEVATION: _____
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: ∅ AFTER 24 Hours: ∅ CAVING> £

BORING NO. NHW-5

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									
	2.5	Residual, Loose, Brown, Coarse to Fine SAND with little Clay.	SC								6
	5	Partially Weathered Rock.	PWR								50/3"
	7.5	Auger Refusal at 7 feet B.G.S.									
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHW-5a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/24/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____		CAVING> <input type="checkbox"/> _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value							
	0	Straight Auger.			Natural Moisture Content (%) - ▲								
	2.5				Penetration - ●								
	5	Auger Refusal at 3 feet B.G.S.			10	20	30	40	50				
	7.5">												
	10">												
	12.5">												
	15">												
	17.5">												
	20">												
	22.5">												
	25">												
	27.5">												
	30">												
	32.5">												

*Offset 50 feet toward NHE-7
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/24/2004</u>
BORING NO. NHW-5b	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>☒</u> AFTER 24 Hours: <u>☒</u> CAVING> <u>☒</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger.									
	2.5										
	5	Residual, Loose, Tan, Silty Coarse to Fine SAND.	SM								8
	7.5										
	10	Partially Weathered Rock.	PWR								50/1"
	12.5	Auger Refusal at 10 feet B.G.S.									
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

Offset 50 feet toward NHE-7
 Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/23/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHW-6

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
0												
	2.5	Topsoil with roots. Residual, Medium Dense, Reddish Orange, Clayey Coarse to Fine SAND.	SC	[Symbol]								15
	5	Loose changing to Medium Dense, Grayish Tan, Silty Coarse to Fine SAND.	SM	[Symbol]								10
	7.5											
	10											13
	12.5											
	15											23
	17.5											
	20	Partially Weathered Rock.	PWR	[Symbol]								50/4"
	22.5											
	25	Boring terminated at 25 feet B.G.S.										50/6"
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/24/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHW-8

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Loose, Brown, Clayey Coarse to Fine SAND.	SC									5
	5											7
	7.5											
	10	Medium Dense, Tannish Gray, Micaceous, Silty Coarse to Fine SAND.	SM									11
	12.5											
	15											16
	17.5											
	20											13
	22.5											
	25											12
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: Harbins Alcovy River Park Site	PROJECT NO.: MEG 97140.35
	CLIENT: Gwinnett County Parks and Recreation	DATE: 9/24/2004
BORING NO. NHW-10	LOCATION: Refer to Figure 4	ELEVATION:
	DRILLER: KILMAN BROS.	LOGGED BY: Akram Hudaib
	DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.	
	DEPTH TO - WATER> INITIAL: 12 feet AFTER 24 Hours: CAVING> £	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									
	2.5	Residual, Very Loose, Brown, Clayey Coarse to Fine SAND.	SC								4
	5										2
	7.5										
	10	Wet, Loose, Tan, Micaceous, Silty Coarse to Fine SAND.	SM								8
	12.5										
	15										8
	17.5										
	20										5
	22.5										
	25	Soil changes to Tannish White in color.									5
	27.5	Boring terminated at 25 feet B.G.S.									
	30										
	32.5										



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/24/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHW-11

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		Topsoil with roots.										
	2.5	Residual, Soft, Brown, Sandy CLAY.	CL									3
	5	Medium Dense, Reddish Brown, Clayey Coarse to Fine SAND.	SC									14
	7.5											
	10	Loose, Red, Micaceous, Silty Coarse to Fine SAND.	SM									8
	12.5											
	15	Soil changes to Tannish Gray in color.										8
	17.5											
	20	Partially Weathered Rock.	PWR									50/5"
	22.5											
	25	Very Dense, Gray and White, Coarse to Fine SAND with little Silt and rock fragments. Boring terminated at 25 feet B.G.S.	SM								71	71
	27.5											
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/24/2004</u>
BORING NO. NHW-12	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>	

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
0					Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
	2.5	Topsoil with roots. Residual, Soft, Red, Micaceous, Clayey SILT.	ML		●	2
	5	Medium Dense changing to Very Dense, Reddish Brown, Silty Coarse to Fine SAND.	SM		●	24
	7.5					
	10	Soil changes to Light Gray in color.				
	12.5	Auger Refusal at 11 feet B.G.S.			● 78 →	78
	15					
	17.5					
	20					
	22.5					
	25					
	27.5					
	30					
	32.5					

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHW-12a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/24/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <input type="checkbox"/> _____ AFTER 24 Hours: <input type="checkbox"/> _____ CAVING> <input type="checkbox"/> _____

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value			
0		Straight Auger.			Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50				
2.5									
5		Auger Refusal at 4 feet B.G.S.							
7.5									
10									
12.5									
15									
17.5									
20									
22.5									
25									
27.5									
30									
32.5									

*Offset 50 feet toward NHW-13
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG

PROJECT: Harbins Alcovy River Park Site PROJECT NO.: MEG 97140.35
 CLIENT: Gwinnett County Parks and Recreation DATE: 9/24/2004
 LOCATION: Refer to Figure 4 ELEVATION:
 DRILLER: KILMAN BROS. LOGGED BY: Akram Hudaib
 DRILLING METHOD: ASTM D 1586 - 3 1/4" H.S.A.
 DEPTH TO - WATER> INITIAL: AFTER 24 Hours: CAVING>

BORING NO. NHW-13

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
0		Topsoil with roots.									0
	2.5	Residual, Very Loose changing to Medium Dense, Brown, Clayey Coarse to Fine SAND.	SC								15
	5										
	7.5										
	10	Medium Dense, Red, Micaceous, Silty Coarse to Fine SAND.	SM								20
	12.5										
	15	Partially Weathered Rock.	PWR								50/2"
	17.5										
	20	Partially Weathered Rock.	PWR								50/6"
	22.5										
	25	Partially Weathered Rock.	PWR								50/1"
	27.5	Boring terminated at 25 feet B.G.S.									
	30										
	32.5										

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHW-15	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value	
						Natural Moisture Content (%) - ▲ Penetration - ●						
						10	20	30	40	50		
0		<u>Topsoil with roots.</u>										
	2.5	Residual, Very Loose changing to Medium Dense, Tan, Clayey Coarse to Fine SAND.	SC									2
	5											14
	7.5											
	10	Medium Dense, Reddish Brown, Micaceous, Silty Coarse to Fine SAND.	SM									18
	12.5											
	15	Soil changes to Black in color.										17
	17.5											
	20	Soil changes to Tan in color.										19
	22.5											
	25	Soil changes to Reddish Brown in color.										23
	27.5	Boring terminated at 25 feet B.G.S.										
	30											
	32.5											

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHW-16	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS	N-Value
						Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
0		Topsoil with roots.					3
	2.5	Residual, Very Loose changing to Medium Dense, Tan, Silty Coarse to Fine SAND.	SM				16
	5						
	7.5	Auger Refusal at 6 feet B.G.S.					
	10						
	12.5						
	15						
	17.5						
	20						
	22.5						
	25						
	27.5						
	30						
	32.5						

Groundwater was not encountered at the time of drilling.



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHW-16a	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	DEPTH TO - WATER> INITIAL: <u>∅</u> AFTER 24 Hours: <u>∅</u> CAVING> <u>£</u>

File: Harbins Alcovy River Park Site Date Printed: 10/22/2004

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	TEST RESULTS					N-Value
						Natural Moisture Content (%) - ▲ Penetration - ●					
						10	20	30	40	50	
	0	Straight Auger.									
	2.5										
	5	Residual, Dense, Tannish Brown, Micaceous, Silty Coarse to Fine SAND.	SM				●				31
	7.5	Auger Refusal at 7 feet B.G.S.									
	10										
	12.5										
	15										
	17.5										
	20										
	22.5										
	25										
	27.5										
	30										
	32.5										

*Offset 50 feet toward NHW-15
 Groundwater was not encountered at the time of drilling.*



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DRILL HOLE LOG	PROJECT: <u>Harbins Alcovy River Park Site</u>	PROJECT NO.: <u>MEG 97140.35</u>
BORING NO. NHW-16b	CLIENT: <u>Gwinnett County Parks and Recreation</u>	DATE: <u>9/22/2004</u>
	LOCATION: <u>Refer to Figure 4</u>	ELEVATION: _____
	DRILLER: <u>KILMAN BROS.</u>	LOGGED BY: <u>Akram Hudaib</u>
	DRILLING METHOD: <u>ASTM D 1586 - 3 1/4" H.S.A.</u>	
File: Harbins Alcovy River Park Site Date Printed: 10/22/2004		DEPTH TO - WATER> INITIAL: <u> </u> AFTER 24 Hours: <u> </u> CAVING> <u> </u>

This information pertains only to this boring and should not be interpreted as being indicative of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	TEST RESULTS	N-Value
0		Straight Auger.			Natural Moisture Content (%) - ▲ Penetration - ● 10 20 30 40 50	
2.5						
5						
7.5						
10						
10		Residual, Medium Dense, Tan, Micaceous, Silty Coarse to Fine SAND.	SM	●	18	
12.5		Auger Refusal at 13 feet B.G.S.				
15						
17.5						
20						
22.5						
25						
27.5						
30						
32.5						

*Offset 50 feet toward NHW-15
 Groundwater was not encountered at the time of drilling.*

KEY TO SYMBOLS

Symbol Description

Strata symbols



Topsoil



Silty sand



Clayey sand



Partially Weathered Rock



Low plasticity
clay



Silt

Misc. Symbols



Water table during
drilling



Water table at
boring completion

Soil Samplers



Standard penetration test

Notes:

1. Exploratory borings were drilled on 9/22/2004 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.