

Monitoring and Maintenance Plan

**The Standard at Athens/Former
Athens Hardware Brownfields Site**

Athens, Clarke County, Georgia

1.0 CORRECTIVE ACTION SUMMARY

Type 5 risk reduction standards (RRS) allow the use of engineered control measures such as placement of a cap to control the regulated substances on the property where the regulated substances are located (§ 391-3-19-.07(10)(a)). The buildings and associated infrastructure cover nearly all of the subject property (see attached Figure 1) and prevent direct exposure to the soils and reduce infiltration of rainfall through the affected soils. Therefore, the corrective action selected for the subject property encompasses maintenance of the buildings and other impervious surfaces for compliance with the Type 5 RRS. In addition, the use of groundwater at the property for any purpose is prohibited by an Environmental Covenant on the property. Annual Inspections (see Section 2.0) will be performed to evaluate the integrity of the controls.

Before any buildings are removed or demolished, an amendment to the approved Prospective Purchaser Corrective Action Plan (CAP) will be submitted to the Georgia Environmental Protection Division (EPD) describing measures that will be taken to maintain the foundations and control exposure to contaminated soil and infiltration of precipitation. If the foundations or other impervious surfaces are to be removed, an amendment to the approved CAP will first be submitted to EPD describing the corrective action that will be used to bring the underlying portions of the property where such foundations or impervious surface have been removed into compliance with the Type 1, 2, 3, or 4 Risk Reduction Standards as defined in Georgia Rules of Hazardous Site Response Section 391-3-19-.07.

Those unpaved areas not covered by buildings or other impervious surfaces are covered with a minimum of 2 feet of clean fill from an off-site source. An impermeable liner placed beneath the clean fill and over the original soil in these areas prevents infiltration of precipitation into the underlying soils. Under-drains within the fill convey storm water to a central below-grade retention basin, except along the perimeter of the property, where the liners are graded to direct infiltration off of the property. A Permit System (see Section 3.0) has been developed to protect the liners and underdrain (as well as paved areas) in the event of excavations for utility repair or other purposes, and a Contingency Plan (see Section 4.0) has been developed to address instances of unintended non-compliance with the approved CAP or Permit System, responses that must be taken prior to approval of a CAP addendum or permit, and responses to unintended breaching, damage, or removal of engineered controls.

A central below-grade retention basin temporarily holds stormwater on site before discharge to the Athens-Clarke County municipal system in order to regulate the flow to the municipal storm sewer system. The retention basin contains storm water in four, 100-foot-long, 96-inch-diameter, corrugated metal pipes. A

cleanout/observation well installed in the gravel backfill around the corrugated metal pipes monitors the potential presence of water in the basin.

Utility workers were not on the property during the initial construction phase, and therefore, would not have come into contact with on-site soil. During the initial construction phase of the project, all utility work was performed by the same construction workers addressed in the Risk Assessment. All future utility work will be done in accordance with this Monitoring and Maintenance Plan to ensure that the impermeable liner is not breached.

2.0 ANNUAL INSPECTIONS

The property will be inspected annually by a qualified environmental professional to evaluate the integrity of the engineered controls. The Annual Inspections will include a visual reconnaissance of the property, as well as interviews with property management concerning site conditions, non-use of groundwater, and the status of repairs or recommendations (if any) since the last Annual Inspection. The Annual Inspections will not address issues beyond the scope of the approved CAP, such as building code compliance, zoning issues, structural integrity, fitness for occupancy, etc.

During the Annual Inspections, the on-site buildings and the parking structure will be visually confirmed to exist at the locations shown on attached Figure 1. The integrity of the buildings, the parking structure, and cover materials will be evaluated during the Annual Inspections. In the instance where buildings or the parking structure have been removed or demolished in accordance with an approved CAP Amendment, the integrity of the remaining foundations will be inspected. Identifiable conditions that could allow exposure to the underlying soil or infiltration of precipitation will be brought to the attention of property management and repairs will be recommended.

Paved areas will be inspected for signs of cracks or other openings that might allow the infiltration of precipitation or exposure to soil. If identified, the cracks or other openings will be pointed out to property management along with recommendations for repair.

Unlike the other paved areas that overlie contaminated soil, the Courtyard Area overlies bedrock. As such, the purpose of the concrete liner is to prevent infiltration of stormwater into the subsurface. A graded aggregate base (GAB) overlies the concrete liner and is covered by brick pavers, synthetic grass, planter beds, and the "water feature" (see Figures 2 and 3). The brick pavers and synthetic grass will be inspected for deterioration, and the planter beds will be inspected for dead and root-bound vegetation and soil erosion. Likewise, the "water feature", or ornamental pond, will be inspected for cracks and leaks. If structural failures are identified, these will be pointed out to property management and recommendations for repairs will be made.

Unpaved areas with clean fill and an impermeable liner will also be evaluated during the Annual Inspections. These areas will be inspected for evidence of gullying, erosion, or other forms of soil runoff, and for weeds or other non-landscaped vegetation that might interfere with the integrity of the drainage system.

No penetrations of the fill material shall occur without a permit (see Section 3.0); however, if identified during the Annual Inspections, unpermitted penetrations of the fill material will be pointed out to property management and recommendations for removal, replacement, or repair will be provided in accordance with the Contingency Plan (see Section 4.0).

The environmental professional who conducts the inspection will look for any obvious and visible indications of the potential presence of groundwater wells, and confirm with property management that groundwater is not being used for any purpose, including without limitation, potable water use, irrigation, cooling, or fire suppression. The potential presence of water in the cleanout/observation well installed in the gravel backfill of the central below-grade retention basin will be evaluated by lowering a water-level indicator to the bottom of the well. Some moisture should be anticipated due to condensation and precipitation, but if more than two feet of water is present above the bottom of the cleanout/observation well, property management will be instructed to evaluate the retention basin for potential leakage.

During each Annual Inspection, the attached Evaluation Form will be completed. A copy of the Evaluation Form signed by a person responsible for the property, along with a brief narrative describing the inspection, will be provided to Georgia EPD within 30 days of the inspection. After the first year, the Evaluation Form from the previous year's inspection will be reviewed with property management during each Annual Inspection to evaluate how recommendations for repairs have been implemented.

3.0 PERMIT SYSTEM

From time to time, it might become necessary to penetrate the paved and unpaved areas in order to perform maintenance and utility work. A written permit for non-emergency work must be approved by property management no later than 30 days before the work commences. The permit shall be prepared by an environmental professional and specify that the excavation will be performed in accordance with work procedures to:

- prevent infiltration;
- protect the liners overlying the contaminated soil; and
- prevent contaminated soil from being brought to the surface.

The work shall be performed in accordance with a Health and Safety Plan (HASP) to be included in the permit. A qualified environmental professional shall be present on-site to oversee this work.

Emergency utility repairs that cannot wait 30 days for a permit (e.g., natural gas leaks, sewage backups, etc.) shall be performed without a permit but following the procedures below.

If the liners overlying the contaminated soil are breached, then repairs shall be made within 24 hours in accordance with the Contingency Plan (see Section 4.0). An incident report documenting the breach and repair shall be submitted to EPD no later than 30 days following the incident. A qualified environmental professional shall be present on the property to oversee these repairs.

Ground-Penetration Procedures

Before excavation or other ground-penetrating work is performed, the depth to the impermeable liner and the locations of under-drains shall be verified by reviewing the site plans, and the depth and locations shall be noted in the permit. Use of ground-penetrating radar or other tools may be necessary to confirm site conditions prior to excavation. In the unpaved areas not covered by buildings and other impervious surfaces, the liner underlies a minimum of 2 feet of fill. Where utility lines are brought in across the unpaved areas, the liner occurs beneath the utility lines. As the utility lines are typically buried at depths of approximately 4 feet, the thickness of the fill in these areas is approximately 6 feet.

The depth of the excavation shall not exceed the identified depth to the liner, and care shall be taken not to disturb or damage the under-drain system. The permit shall specify the procedures that will be used to avoid damage to the liner and under-drain system. The use of large excavating equipment, such as large-

bucket excavators and backhoes, shall be avoided where possible and digging by hand is preferred (the fill material is much less resistant than native soil). The permit shall specify the equipment that will be used.

The contractor performing the excavation in an area where the liner is located shall have 10-mil or thicker high-density polyethylene (HDPE) sheeting and extrusion welding equipment on site during the excavation to expedite repairs, if necessary. Access to these areas by on-site residents and retail workers will be prevented through proper barricades and associated signage.

4.0 CONTINGENCY PLAN

This Contingency Plan has been developed for the event that the engineered controls at the subject property are breached. Examples of breaches of the engineered controls that may activate the Contingency Plan include:

- The on-site buildings or parking structure are removed or demolished without a CAP amendment approved by the Georgia EPD describing the measures to maintain the foundations and control exposure to contaminated soil and infiltration of precipitation.
- The liners or under-drains are damaged during excavation work.
- Excavation work at the site is performed without an approved permit.

Note that excavations for emergency utility repairs (e.g., gas leaks, sewage backups, etc.) do not require a permit but shall follow the procedures identified in Section 3.0 and will trigger the Contingency Plan.

If on-site buildings or the parking structure are removed or demolished without a prior CAP amendment approved by Georgia EPD, the qualified environmental professional will evaluate whether the resulting conditions allow infiltration of water through the underlying soil or allow exposure to soil. If either of these conditions exists, interim measures, such as placement of plastic sheeting over the area, will be initiated to control infiltration and/or exposure. A subsequent CAP amendment will then be prepared demonstrating how the conditions will be remedied or how compliance with Type 1, 2, 3, 4, or 5 Risk Reduction Standards will be achieved. An incident report, and if necessary, the CAP amendment, shall be submitted to EPD no later than 30 days following the incident.

Should evidence of an unpermitted excavation or other ground penetrating activity be discovered during the Annual Inspections, the environmental professional will notify property management and initiate an investigation of the potential damage to the liner and under-drain system (if present at the unpermitted excavation). If evidence of an unpermitted excavation or other ground penetrating activity is identified at other times by property management, they shall immediately contact the environmental professional to request an investigation of the potential damage to the liner and under-drain system (if present at the unpermitted location).

If the liners and under-drains are damaged during a permitted excavation, then repairs shall be commenced, and, if possible, completed, within 24 hours. The repair will take priority over the other activities and, to the extent allowed by safety, other work at the excavation site shall cease until the repair is completed. An incident report documenting the breach and repair shall be submitted to EPD no later than 30 days following

the incident. A qualified environmental professional shall be present on the property to oversee these repairs.

The permit shall require that the contractor performing the excavation in an area where the lining is located have 10-mil or thicker HDPE sheeting and extrusion welding equipment on site during the excavation to minimize potential delays in the repair. Seams for the replacement liner or patch shall be sealed using extrusion welding or equivalent technique; hand-held hot-air welding will not be allowed for patches or repair welds (hand-held hot-air welding can be used for temporary tacking before final extrusion welding). Patches should have a continuous rounded edge with no distinct corners that could catch during covering with fill material.

Workers performing the repair should minimize their exposure to the underlying soil in accordance with the health-and-safety procedures specified in the HASP. Such procedures may include wearing long-sleeved shirts and work gloves to reduce the amount of skin potentially in contact with the underlying soil. On-site residents and retail workers will be restricted from these areas with the use of appropriate barricades and signage.

5.0 REPORTING AND RECORDKEEPING REQUIREMENTS

Annually, but no later than December 31 of each year, completed copies of the attached evaluation form and reports documenting necessary repairs will be submitted to EPD. These documents and the abovementioned permits and incident reports should also be kept on the premises of the property for a minimum of three years.

Evaluation Form
Standard at Athens/Former Athens Hardware Brownfields Site

		YES	NO	NA
BUILDING AREAS	<ul style="list-style-type: none"> Are site buildings present at the locations indicated on the attached map? <p>If no, was a CAP amendment submitted to EPD describing the measures to maintain the building foundations and control exposure to contaminated soil and infiltration of precipitation?</p> <ul style="list-style-type: none"> Are there obvious (i.e. cracks in walls, cracks in foundations) and observable indications of conditions that would prevent the existing buildings from prohibiting direct exposure to underlying soil or that would allow infiltration of precipitation? <p>If yes, then make recommendations to property management on the necessary repairs.</p> <ul style="list-style-type: none"> If the buildings were demolished in accordance with an approved CAP amendment, are the remaining foundations free of obvious and observable cracks, openings, or other conduits for infiltration of precipitation or exposure to soil? <p>If no, then make recommendations to property management on the necessary repairs.</p>			
PARKING DECK	<ul style="list-style-type: none"> Are there obvious (i.e. cracks in walls, cracks in foundations) and observable indications of conditions that would prevent the parking deck from prohibiting direct exposure to underlying soil or that would allow infiltration of precipitation? <p>If yes, then please make recommendations to property management for repairs.</p> <ul style="list-style-type: none"> Is the parking structure present at the locations indicated on the attached map? <p>If no, was a corrective action plan amendment submitted to the Georgia EPD describing the measures to maintain the foundations and control exposure to contaminated soil and infiltration of precipitation?</p> <ul style="list-style-type: none"> If the parking structure was removed or demolished in accordance with an approved CAP Amendment, are the remaining foundations free of obvious and observable cracks, openings, or other potential conduits for infiltration of precipitation or exposure to soil? <p>If no, provide property management with recommendations for repair.</p>			

PAVED AREAS	<ul style="list-style-type: none"> • Is site pavement at the locations indicated on the attached map? • Is the pavement free of obvious and observable cracks, openings, or other potential conduits for infiltration of precipitation or exposure to soil? <p>If no, provide property management with recommendations for repair.</p>			
UNPAVED AREAS	<ul style="list-style-type: none"> • Are there indications of soil runoff, erosion or gullyng at any of the unpaved areas? • Is non-landscape vegetation growing in any of the unpaved areas? • Are there posts, poles or other penetrations of the fill in the unpaved areas that might have an adverse impact on the liner and underdrain systems? • Is there ponding along the perimeter of the property? <p>If yes to any of the above, provide property management with recommendations for repair.</p>			
COURTYARD	<ul style="list-style-type: none"> • Are the pavers free of cracks, openings, or other conduits such that the underlying sand and/or GAB is visible? • Has the synthetic grass been worn away such that the underlying GAB is visible? <p>If yes to either of the above, make recommendations for repair or replacement to property management.</p> <ul style="list-style-type: none"> • Is the vegetation in the planter beds free of dead and root-bound vegetation? • Has the soil or ground cover eroded in the planter beds such that the grading has been altered? <p>If yes to either of the above, make recommendations to property management on the necessary steps to ensure that the vegetation is healthy.</p> <ul style="list-style-type: none"> • Are there visible signs of cracks in the water feature? <p>If yes, make recommendations to property management to repair visible cracks within 48-hours of discovery.</p>			

RETENTION BASIN	<ul style="list-style-type: none"> • Is more than two feet of water present at the bottom of the cleanout/observation well present in the central, below-grade retention basin? <p>If yes, test the integrity of the basin by pumping out the water and seeing if it returns following the next rainfall event. If it does, additional testing/evaluation may be needed.</p>			
GROUND PENETRATIONS	<ul style="list-style-type: none"> • Were any permitted ground penetrating activities performed on the property within the past year? • Were any unpermitted ground penetrating activities performed on the property within the past year? • Was an environmental professional present during the ground penetrating activities? • Is there evidence of ground penetrating activities performed on the property within the past year for which property management is unaware? <p>If yes, please point these out to property management and make recommendations for any necessary repairs or replacement of underlying materials. These should be done in accordance with the Contingency Plan.</p>			
CONTINGENCY PLAN	<ul style="list-style-type: none"> • Have any of the engineered controls been breached such that the procedures of the Contingency Plan was activated? • If so, were the repairs performed in accordance with the Contingency Plan? • If the procedures of the Contingency Plan were activated, was an incident report sent to the EPD? 			
GROUNDWATER	<ul style="list-style-type: none"> • Have any wells (monitoring, drinking water, irrigation, heat-pump, etc.) been installed on the property? • Is groundwater being used for any purpose on the property? <p>If yes, cease and desist water use immediately and provide property management with recommendations for proper well closure.</p>			

ATTACHMENTS? Yes ____ No ____

CERTIFICATION

I certify that I have personally examined and am familiar with the information in this evaluation form and all attachments and that based on my inquiry of those persons immediately responsible for completion of this evaluation, I believe the information is true, accurate, and complete.

Name and Official Title

Signature

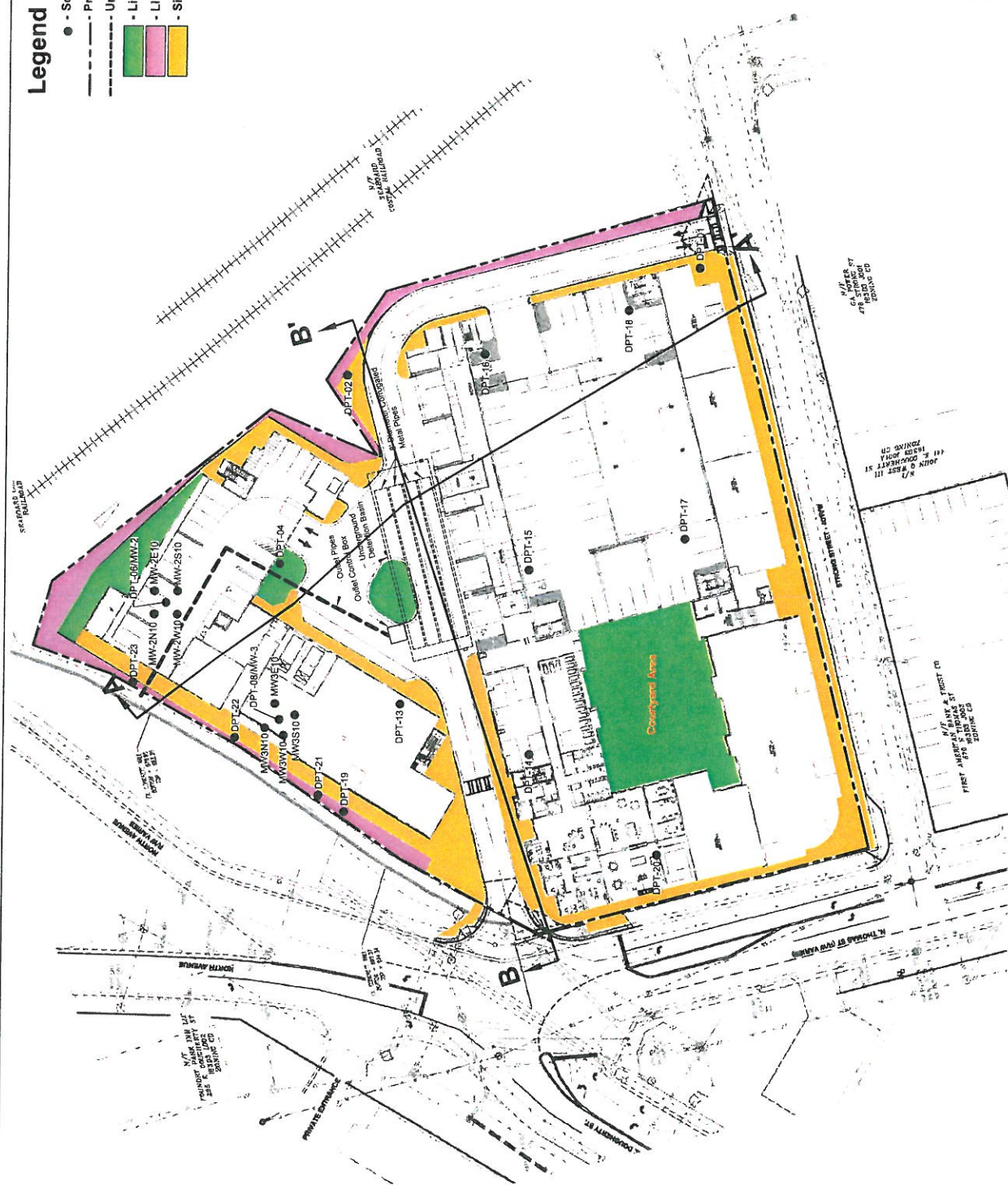
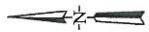
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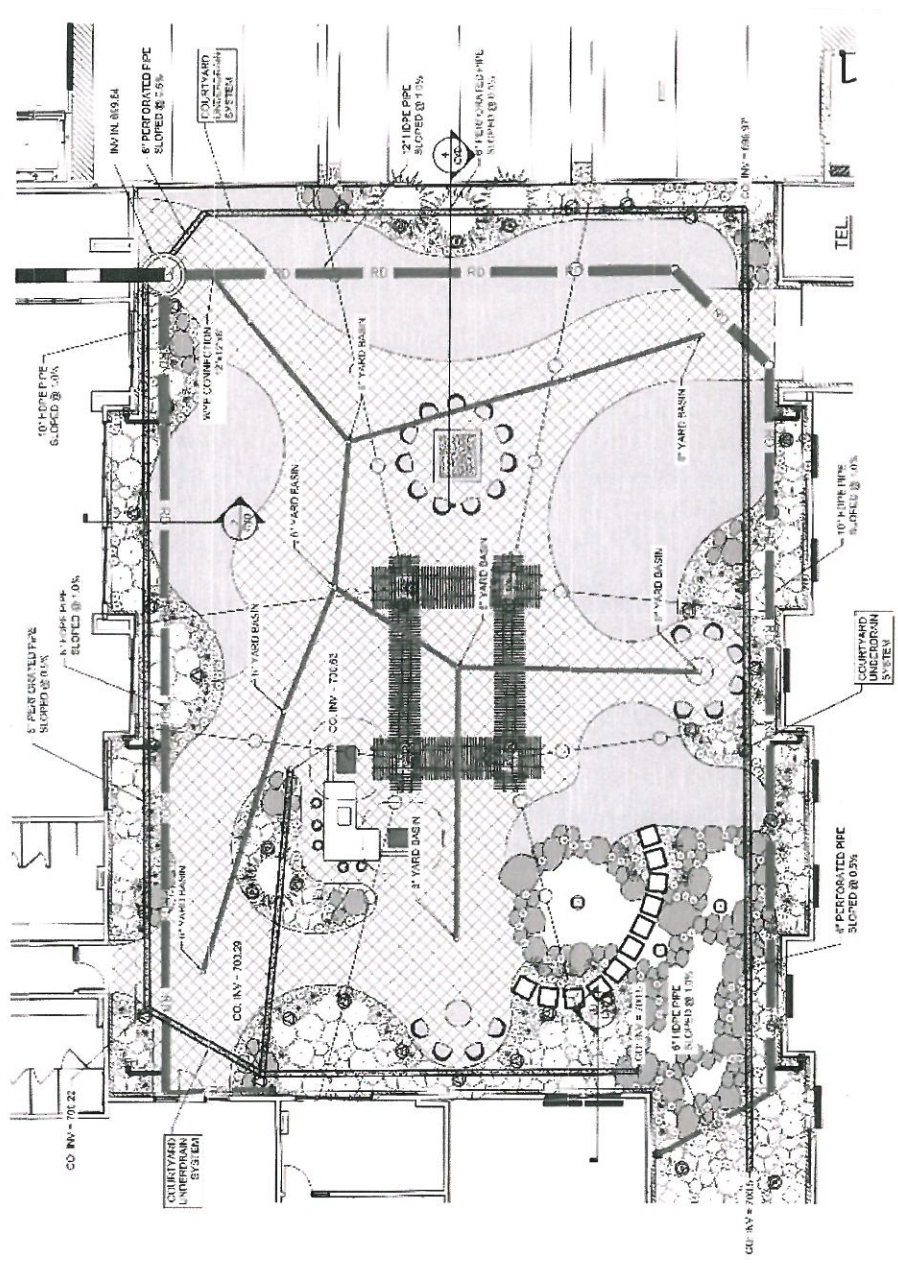
● - Soil Boring Location
 --- - Property Boundary
 --- - Underground Detention Basin
 ■ - Liner with under drain - 10,689 SF
 ■ - Liner without under drain - 4,543 SF
 ■ - Sidewalk - 16,329 SF

[illegible]

Former Athens Hardware Brownfields Site
606 North Thomas Street
Athens, Georgia 30601
Future Development

ATHENS 3442






Legend

-  Planter Beds
-  Brick Pavers
-  Synthetic Turf

NO.	DATE	BY	CHKD.	APP.	REVISION
1	04/23/06
2
3
4
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8
9
10



FORMER ATHENS HARDWARE
BROWNFIELDS SITE
ATHENS, GEORGIA 30601

PROJECT NO. 042306

DATE 04/23/06

