Financial Management Department
Purchasing Division
1112 Manatee Ave W Suite 803
Bradenton, FL 34205
Phone: (941) 749-3074
www.mymanatee.org

email
February 18, 2015

TO: All Interested Bidders

SUBJECT: Invitation for Bid #15-0616DC
Warner Bayou Boat Ramp (North Parking Lot)

ADDENDUM #1

Bidders are hereby notified that this Addendum shall be acknowledged on the Bid Form and made a part of the above named bidding and contract documents.

1. Who is responsible for the density and concrete cylinder tests? Owner or contractor

Response: The County will contract with Ardaman & Associates to provide these services. The Contractor is responsible to coordinate and arrange to have Ardaman on site as required.

2. 1.05 Operation of existing facility states that the facility must be open 24/7?

Response: The existing facility that must remain open includes the portion of the park that is not being worked on, specifically the parking lot on the south side of Riverview Blvd. and the picnic area east of the proposed concrete parking lot.

3. Section 2.06, 6" Pavement. States that the pricing for the 6" paving includes sand leveling course. What is this for?

Response: Sand leveling course is not required.

4. Section 2.07 Temporary pavement markings. Are we to provide temporary paint before final paint?

Response: Temporary pavement markings/paint is not required.

5. Specifications: Section 32 13 13 Concrete Paving
   - 12.2.3 Tie bars and bolt assemblies. Is this 6" paving to be done as per FDOT Concrete paving with dowel bars and load transfer bars?
   - 12.2.4 Provide dowel load transfer devices in all transverse joints. Again, is this to be construed as FDOT Concrete highway paving?

Response: Concrete Dowel bars and load transfer bars are not required.

6. The parking lot as is was said to have 12” of bank run shell in place. Is the intent to only excavate 6” of material then compact and place 6” of concrete? Or as mentioned will we need to excavate the entire 12” of existing material and replace with trucked in stabilizer?

Response: The existing parking lot consist of an approximately 6" thick layer of bank run shell. All of the bank run shell layer shall be removed. The existing material below the 6" shell layer shall be tested. The sub-base material shall be constructed in compliance with the revised specifications as shown on the revised Sheet 5 of the Construction Plan. A previously performed Geotechnical Analysis/Report dated 10/25/2011.

7. Has the engineer had an opportunity to clarify *__Free draining Sub-Base__*?

Response: Refer to the revised specifications on the revised Sheet 5 of the Construction Plans.

8. Should the bottom 6” of existing bank run shell stay in place, does it meet the free draining sub-base specifications? If the material does not meet the specs, can design means be provided by the engineer or county?

Response: Refer to the response to question #6 above.

9. Project specification Section 32 13 13 Section 2 Materials states FDOT Class I concrete which is 3000 PSI

Response: This specification section has been revised. The concrete shall be constructed in compliance with the Construction Plans.

10. Plan sheet 5’concrete paving detail’ states 4000 PSI with Fiber

Response: Correct.

11. Please clarify as to which concrete mix is to be bid

Response: Refer to the concrete specifications on Sheet 5 of the Construction Plans.

12. The plans are calling for the concrete used for the parking lot to be 4000 PSI mix with micro synthetic fibers, with washed shell aggregate. The specifications for the concrete paving call for a Class I Pavement Mix, an FDOT mix which is 3000 PSI. These are very separate requirements, in fact the FDOT does not use mixes with micro fiber reinforcements so it will not be possible to meet both requirements without some small changes. Can someone look into this inconsistency?

Response: The specifications have been revised as noted in previous responses. The concrete shall be constructed in accordance with Sheet 5 of the Construction Plans (4,000 psi with micro synthetic fibers, with washed shell aggregate)

I. Revised Specifications (attached)

01 10 00	Summary of Work 1.05 - Defined area to remain open
01 27 00	Measurement and Payment 2.06 - Removed reference to sand leveling course 2.07 - Removed reference to Temporary Pavement Markings
32 13 13	Concrete Paving 2 - Removed reference to FDOT Class Concrete 12.2.3 - Removed reference to Tie Bars and Bolt Assemblies 12.2.4 - Removed reference Dowel Bars and Load Transfer Devices

II. Revised Plans (attached)

1. Sheet 5 - Revised Concrete Pavement Detail

III. Additional Attachments

1. Joint Spacing Exhibit - This exhibit is a graphical representation of the recommended sawcut/joint locations.
2. Geotechnical Report - This report was previously performed for this project. The report shows the existing soil conditions. Please note that the pavement recommendations in the report are for reference only. Contractors shall bid the specifications in the Construction Plans.
3. Information Conference attendance sign-in sheet.

If you have submitted a bid prior to receiving this addendum you may request in writing that your original, sealed bid be returned to your firm. All sealed bids received will be opened on the date stated.

Bids will be received at Manatee County Purchasing, 1112 Manatee Avenue West, Suite 803, Bradenton, Florida 34205 **until February 23, 2015 at 3:00 P.M.**

Sincerely,

Melissa M. Wendel, CPPO
Purchasing Official

/dcr
Attachments as stated

INFORMATION CONFERENCE: INVITATION FOR BID

IFB #15-0616DC Warner's Bayou Parking Lot

DATE: February 4, 2015 TIME: 10:00 A.M.

TELEPHONE and EMAIL	NAME (PLEASE PRINT)	COMPANY NAME
P-941.749.3074 deborah.carey-reed@mymanatee.org	DEBORAH CAREY-REED	MC PURCHASING
(941) 721-7711 office@tcs-contractors.com	Mark Levy Tampa Contracting Services	Tampa Contracting Services
941-345-3093 Sleand@C-squaredcgc.com therese d@ C-squaredcgc.com 941-355-8515	C-SQUARED Therese DiAgostino FRED DERR	C-SQUARED
RAY@FREDERICKDERRCOMPANY	RAYMOND ROGERS	FREDERICK DERR
749-3097 ALAN.MERONEK@MYMANATEE.ORG	ALAN MERONEK	M.C. PROPERTY MANAGEMENT
749-3003	TOM YARGER	
748-4501 X3831	DEBRA LYNN	M.C.P.M.C.S.

SECTION 01 10 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 Section Includes

Summary of work, other contracts, work sequence, operation of existing facilities, use of premises, Owner furnished products, coordination, cutting and patching

1.02 Summary of Work

A. The project consists of parking lot improvements, consisting of excavation and replacement of the existing shell parking lot with 6" thick broadcast shell concrete pavement (4,000 psi).

B. Furnish all materials, equipment, tools, and labor which is reasonably and properly inferable and necessary for the proper completion of the Work, whether specifically indicated in the Project Plans and Specifications or not.

C. All fees and permits for the permanent construction that are required by controlling agencies or authorities, including fees for the review of Project Plans and Specifications prior to construction, will be procured by the Owner. Other licenses or permits for construction facilities of a temporary nature that are necessary for the prosecution of the work shall be secured and paid for by the Contractor.

D. Repair, replace, or otherwise settle with the Owner, if damage to property or existing facilities occurs, including damage to pavements, utilities, lawns, structures, etc.

E. Construct the Project under a single unit price contract.

1.03 Work Under Other Contracts

A. N/A

1.04 Work Sequence

The Contractor's sequence of work may be of his choosing in order to complete the work in the allowed time frame while accommodating other contractors on site.

1.05 Operation of Existing Facilities

The Owner shall be able to operate contiguous existing facilities (Parking lot south of Riverview Boulevard and picnic area east of construction area) 24 hours per day, 7 days per week.

1.06 Contractor Use of Premises

Confine operations at the site to areas permitted by applicable laws, ordinances, permits, and by the Project Plans and Specifications. Do not unreasonably encumber the site with materials or equipment. Do not load structures with weight that will endanger the structure. The Contractor shall assume full responsibility for protection and safekeeping of products stored on the job site.

1.07 Owner Furnished Products

A. N/A

1.08 Coordination

A. The Contractor shall be fully responsible for the coordination of his work and the work of his employees, subcontractors, and suppliers and to assure compliance with schedules.

B. It is the Contractor's responsibility to coordinate with all the utilities regarding locates, testing, or relocations.

1.09 Cutting and Patching

A. The Contractor shall, at no additional expense to the Owner, perform cutting and patching necessary to the completion of the Project. Perform cutting and patching in a manner to prevent damage to the structure or previously completed work.

B. Refinish surfaces as necessary to provide an even finish. Refinish continuous surfaces to the nearest intersection.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 27 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 Description

A. Payment for all Work done in compliance with the Project Plans and Specifications, inclusive of furnishing all manpower, equipment, materials, and performance of all operations relative to construction of this project, will be made under Bid Items listed herein. Work for which there is not a Bid Item will be considered incidental to the Contract and no additional compensation will be allowed.

B. The Owner reserves the right to alter the Drawings, modify incidental work as may be necessary, and increase or decrease quantities of work to be performed to accord with such changes, including deduction or cancellation of any one or more of the Bid Items. Changes in the work shall not be considered as a waiver of any conditions of the Contract nor invalidate any provisions thereof. When changes result in changes in quantities of Work to be performed, the Contractor will accept payment according to Unit Price Works that appear in the original Contract.

C. Quantities necessary to complete the work as shown on the Drawings or as specified herein shall govern over those shown in the Proposal. The Contractor shall take no advantage of any apparent error or omission in the Drawings or Specifications, and the Engineer shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Project Plans and Specifications.

D. The Engineer will make measurements and determinations as necessary to classify the work within Bid Items and determine the quantities for pay purposes; such decisions will be final after 3 days if the Contractor does not submit a written notice as defined in the following paragraph.

E. If the Contractor differs with the Engineer's classification of the Bid Items or determination of quantities of the Bid Items, he must notify the Engineer in writing within 3 days of the time that the Contractor is informed of the Engineer's decision. Otherwise the Owner will not consider any such difference as a claim for payment.

F. Failure on the part of the Contractor to construct any item to plan or authorized dimensions within the specification tolerances shall result in: reconstruction to acceptable tolerances at no additional cost to the Owner; acceptance at no pay; or, acceptance at reduced final pay quantity or reduced unit price, all at the discretion of the Engineer.

G. Work shall not be considered complete until all testing has been satisfactorily completed and the item of work has demonstrated compliance with plans and specifications.

H. A preliminary monthly application for payment shall be submitted to the Owner/Engineer for review five (5) days prior to the submittal for approval of the Contractor's monthly payment request.

I. Where FDOT Bid Item numbers are shown on the bid form, they generally follow FDOT Bid Item number formatting; however, they are only provided in order to use them for pay application purposes. FDOT Bid Item descriptions do not apply; utilize the descriptions on the bid form and within this section to determine the work associated with each Bid Item.

PART 2 BID ITEMS

2.01 Mobilization

A. Work Includes

Preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site. Work also includes obtaining necessary permits, bonds, and insurance as well as providing temporary construction/security fence and surveying stake out and as-built services to lay out and as-built the proposed improvements.

B. Unit of measurement is lump sum.

C. Payment of this item shall be distributed equally over the first two payment applications.

2.02 Erosion Control

A. Work Includes

Furnishing all necessary labor, equipment, material and transportation necessary to install silt fence and other erosion control measures as indicated on the plans or authorized by the Engineer. Erosion Control Measures includes baffle on stormwater outfall control structure.

B. Unit of measurement is lump sum.

2.03 Grading

A. Work Includes

Furnishing of equipment and labor for the placement and compaction of all embankment and fill material, excavation where required, the grading of all slopes and planting areas, the construction or re-channelization of all ditches and swales, the shaping or reshaping of slopes, stabilization, all final dressing, and all other earthwork operations required for the completion of the project. The work shall also include the construction and maintenance of temporary swales, berms, and settling basins for control of erosion and turbidity related to clearing and grubbing, excavation, and grading of the site.

B. Unit of measurement is lump sum.

2.04 Excavate and Haul Existing Material Off-Site

A. Work Includes

Furnishing of equipment and labor for removal and disposal and/or storage of compacted shell, rip rap and wheel stops as indicated on the plans or authorized by the Engineer. Contractor is responsible to dispose of the removed material to an authorized recycling/dumping facility or otherwise specified location within five (5) miles of the project.

B. Unit of measurement is lump sum.

2.05 Post and Rope

A. Work Includes

Furnishing all necessary labor, equipment, material and transportation necessary to install post and rope as indicated on the drawings.

B. Unit of measurement is linear feet.

2.06 6" Concrete Pavement

A. Work Includes

Excavation and preparation of sub base, forming and poring of concrete base including concrete flume, installation of joints, filler and sealant, removal of excess material, project cleanup, and required labor to complete the work.

B. Unit of measurement is square feet.

2.07 Pavement Markings

A. Work Includes

Permanent pavement marking installation in areas where new paving occurs. New markings to tie to existing markings where applicable.

B. Unit of measurement is lump sum.

2.08 Washed Shell

A. Work Includes

Hauling, grading, leveling, and finishing as indicated on the drawings.

B. Unit of measurement is lump sum.

2.09 Type F Curb and Gutter

A. Work Includes

Furnishing all necessary labor, equipment, material and transportation necessary to install Type F Curb and Gutter as indicated on the drawings.

B. Unit of measurement is linear feet.

2.10 Plantings

A. Work Includes

Soil preparation, bedding, plants, geofabric, mulch, staking (where required), watering, fertilizing, maintenance. It also includes that all plant materials shall be guaranteed for one (1) year from the time of final inspection and interim acceptance shall be alive and in satisfactory growth for each specific kind of plant at the end of the guaranteed period.

B. Unit of measurement is lump sum.

END OF SECTION

SECTION 32 13 13 – CONCRETE PAVING

1. Description

Construct Portland cement concrete pavement in one course, on a prepared subgrade. Use either the fixed-form or the slip-form method of construction. When reinforced cement concrete pavement is specified or required, use concrete reinforced with steel bars or steel fabric, in accordance with details shown in the Plans. The Engineer may require a demonstration of equipment and paving operations.

If any uncontrolled cracks appear during the life of the Contract, remove and replace the cracked concrete at no additional cost. Investigate and implement immediate effective solutions to eliminate further cracks, in consultation with, and subject to the approval of the Engineer.

2. Materials

Materials as per plans.

3. Equipment

3.1 General: Ensure the equipment and tools that are to be used meet the following: The capability of handling materials and performing all parts of the work.

To be of such capacity that the paver operates continuously and at a constant rate of production, with starting and stopping held to a minimum.

When equipment operates on the side forms, use scraping devices to clean accumulations from the top of the forms and wheels.

The forms will be a rigid material and mortar tight. Ensure that the alignment and grade of all forms are in accordance with the Project Plans and Specifications, prior to the placing of concrete.

4. Subgrade Preparation

Keep construction of the subgrade completed for a distance of at least 500 feet ahead of the paving operation. Maintain the finished subgrade in a smooth, compact condition, and restore any areas which are disturbed prior to placing the concrete.

Ensure that the subgrade is within tolerance of the optimum moisture content while placing the concrete. Uniformly apply water ahead of the paving operations, as directed by the Geotechnical Engineer.

Do not allow vehicles to travel on the prepared subgrade between the subgrade trimming machine and the paving operations unless specifically authorized.

Accurately trim the subgrade to the required elevation. Trim high areas to proper elevation. Fill low areas with suitable material, compacted to the specified density, or with concrete placed integrally with the pavement. When slip-form paving, include in the width to be trimmed the areas on which the tracks of the paver will operate.

5. Setting Forms

5.1 General: Accurately set the forms to line and grade and such that they rest firmly, throughout their entire length, upon the subgrade surface. Join forms neatly and tightly, and brace them to resist the pressure of the equipment operating on the forms. Obtain the Engineer’s approval of the alignment and grade of all forms before and immediately prior to the placing of concrete.

Fill any subgrade that is below the established grade at the form line to grade with granular material, in lifts of 1/2 inch or less, for a distance of 18 inches on each side of the pavement edge, and thoroughly compact the material. As an exception, when placing forms on a cement-treated subgrade, the Contractor may use wedging, provided that the wedging system used adequately supports the forms without causing detrimental deflection under the weight of the paving equipment.

6. Protection from Weather

Meet the requirements of FDOT Specification 400-7.1 when placing concrete. When rain appears imminent, stop all paving operations, and cover the surface of the unhardened concrete with the protective covering.

7. Placement of Reinforcement

7.1 General: Where the Plans call for reinforced concrete pavement, place the steel reinforcement in the pavement slab in accordance with the details shown in the Plans. At the time of the concrete placement, ensure that the reinforcing steel is free from any of the following which could impair bonding of the steel with the concrete: dirt, oil, paint, grease, mill scale, and any loose or thick rust. Place the reinforcement as provided below.

7.2 Fabric: Place welded wire reinforcement at right angles to the centerline of the pavement. Lap adjacent sheets of welded wire reinforcement not less than 6 inches. Make the laps only in the longitudinal members. Contractor to provide Engineer reinforcing layout per plan specifications for review and approval.

7.3 Bars: Bar reinforcement is to be placed with securely wired together transverse and longitudinal bars at their intersections. Lap splices not less than 20 times the nominal diameter of the bar, and only in the longitudinal members. Contractor to provide Engineer reinforcing layout per plan specifications for review and approval.

8. Placing Concrete

8.1 Distribution: Distribute the concrete on the subgrade to such depth that, when it is consolidated and finished, the slab thickness required by the Plans will be obtained at all points. The surface will at no point be below the grade specified for the finished surface. Place the concrete on the subgrade in a manner which will require as little rehandling as possible.

Place concrete as near to expansion and contraction joint assemblies as possible without disturbing them. Ensure that workers do not walk in the freshly placed concrete with their boots or shoes coated with earth or other deleterious substances.

8.2 Use of Spreader: Place concrete on the subgrade by an approved spreading device. Do not place concrete from the discharge bucket or hopper onto an assembly without centering the bucket or hopper directly over the assembly.

A spreader is not required in areas where the width of slab varies, intersections, and small or isolated areas where it would be impractical to use a spreader.

8.3 Placement Widths: The Contractor may construct the pavement either in lanes as determined by the longitudinal joints shown in the Plans, or for the full width in one operation. Construct the pavement to the full width of the lane or slab in a single construction operation. When constructing pavement in separate lanes, do not deviate the junction line from the true line shown in the Plans by more than 1/2 inch at any point. Tool the edges of the junction to the radius shown in the Plans.

When constructing pavement in separate lanes, place the lanes adjacent to the low edge of the pavement, as shown on the typical section, first.

8.4 Consolidation Along Forms and Joints: Thoroughly consolidate concrete against and along the faces of all forms, and along the full length on both sides of all joint assemblies, by means of hand-operated, spud-type vibrators. Do not allow vibrators to come in contact with a joint assembly, reinforcement, the subgrade or a side form.

8.5 Slip-Form Paver: When placing concrete with a slip-form paver, operate the paver with a continuous forward movement. If for any reason it is necessary to stop the forward movement of the paver, immediately stop operation of the vibrating or tamping elements. Do not apply tractive force to the paving machine except that which is controlled from the machine.

Do not insert steel tie-bars into the unsupported side of the freshly formed slab. The Contractor may place tie-bars into position prior to extrusion from the paver by insertion through the forms, by insertion through a temporary support form placed against the form slab, or by other means approved by the Engineer. Use a method that results in placement of the tie- bars at the specified locations with no damage or disruption of the concrete.

9. Striking-off, Consolidating, and Finishing Concrete

9.1 General Requirements: Immediately after placing the concrete, strike-off, consolidate, and finish it to produce a finished pavement in accordance with the cross-section, width, and surface finish required by the Project Plans and Specifications. Perform the sequence of operations as follows: strike-off; vibratory consolidation; screeding; floating; removal of laitance; straight-edging; and final surface finish. Except as specified, perform strike-off, consolidation, screeding, and floating by the machine method.

Use equipment that is fully and accurately adjustable to produce a pavement meeting project requirements. Use equipment that is capable of operating in a consistent and smooth manner under all conditions of use.

As soon as possible after screeding while the concrete is plastic, correct all flaws such as cavities, blemishes, marks, or scratches that will not be removed by planing. .

Provide a concrete surface true to grade, cross slope and superelevation, and free of irregularities. If the Engineer permits adding water to assist the finishing operations, apply water as a fog spray by means of approved spray equipment.

9.2 Machine Method: Operate the machine over each area of pavement as few times and at such intervals as is necessary to give proper consolidation and to leave a surface of uniform texture. Avoid excessive operation over a particular area.

Perform strike-off, consolidation, and finishing in a manner such as to avoid damage to, or misalignment of, joint assemblies, reinforcing steel, dowels, and other embedded items. Smooth the surface of the concrete and remove the excess mortar from the surface. Carry a small amount of mortar ahead of the float device as it moves on the surface of the concrete. Operate the machine over the surface of the concrete as many times as required to obtain an acceptable surface, meeting the requirements specified herein. Discard excess mortar beyond the edge of the slab.

10. Edging: After applying the final finish, but before the concrete has become nonplastic, carefully round the edges to a 1/4 inch radius on each side of transverse expansion joints and construction joints and along any structure extending into the pavement. Produce a well-defined and continuous radius, and obtain a smooth, dense mortar finish. Completely remove all concrete from the top of the joint filler.

Check all joints with a straightedge before the concrete has become nonplastic, and, if one side of the joint is higher than the other or the entire joint is higher or lower than the adjacent slabs, make corrections as necessary.

11. Curing

11.1 General: After completing the finishing operations and as soon as the concrete has hardened sufficiently to not mar the surface, cover and cure the entire surface and, when the slip-form method is used, cover and cure the edges of the newly placed concrete in accordance with one or more of the methods described below. In cases where curing requires the use of water, ensure that curing has prior right to use all water supplies.

Continuously cure the freshly placed concrete for a period of 72 hours, exclusive of any periods when the temperature of the surface of the concrete falls below 50ºF.

11.2 Removal of Forms: Do not remove forms from freshly placed concrete for at least 12 hours after placement. Remove forms carefully so as to avoid damage to the pavement. After removing the forms, immediately cure the sides of the slab in the same manner as the surface of the pavement.

12. Joints

12.1 General: Construct joints at the locations and in accordance with the details shown in the FDOT Design Standards, Index Nos. 305 and 306.

12.2 Longitudinal Joints:

12.2.1 Longitudinal Construction Joints: Where the pavement is poured in strips less than the full width of the pavement, construct longitudinal construction joints in accordance with the details shown in the Plans.

12.2.2 Longitudinal Lane-tie Joints: Construct longitudinal lane-tie joints within the limits of a strip of pavement, in accordance with the details shown in the Plans. Construct the plane of weakness by sawing a groove in the hardened concrete. Complete sawing as soon as possible but in no case longer than 72 hours after placing the concrete.

12.3 Transverse Joints:

12.3.1 Transverse Construction Joints: Construct transverse construction joints at the end of all pours and at other locations where the paving operations are stopped for as long as 30 minutes. Do not place construction joints, however, within 10 feet of any other transverse joint or within 10 feet of either end of a section of pavement. If sufficient concrete has not been placed to form a slab at least 10 feet long, remove the excess concrete, back to the last preceding joint. Form the joints by placing a wood or metal bulkhead accurately and securely in place, in a plane perpendicular to the profile and centerline of the pavement. Install dowel bars at the construction joints. Saw or form construction joints, in a manner similar to contraction joints, so that a groove will be formed for holding the joint sealing compound.

12.3.2 Transverse Contraction Joints: Construct transverse contraction joints at the interval indicated in the Plans consisting of planes of weakness created by sawing a groove in the surface of the hardened concrete. Place the groove perpendicular to the surface of the pavement. Install load transfer devices in transverse contraction joints.

Ensure that the sawing equipment does not damage the pavement, and saw the transverse contraction joints as soon as the pavement has hardened to the degree that tearing and raveling are not excessive and before uncontrolled shrinkage cracking begins.

Accomplish the joint sawing in two steps. Make the initial cut 1/8 inch wide by a depth at least 1/3 of the pavement thickness and as soon as possible but in no case longer than 12 hours after placing the concrete. Make a second saw cut, to provide the joint dimensions indicated in the Plans, just prior to sealing the load transfer device.

In cases where a strip of pavement is being placed immediately adjacent to a previously constructed strip of pavement, construct transverse contraction joints using extreme care to time sawing so as to prevent uncontrolled cracks.

Repair any uncontrolled cracks at no additional expense by removing and replacing the pavement across the full width of all affected lanes or shoulders and to the nearest transverse joint in each direction.

After the final sawing, clean the joint, install the bond breaker, and seal the joint.

12.3.3 Transverse Expansion Joints: Form transverse expansion joints using preformed joint filler, and provide them with dowel load transfer, in accordance with the details shown on the FDOT Design Standards.

Form the joints during the placing of the concrete, by securely staking a metal bulkhead accurately in place at the joint location or by other methods which will securely brace and support the joint filler. Where using approved devices to keep the expansion joint filler and dowels securely in place, the Engineer will not require a bulkhead. Protect all transverse expansion joints at the bottom and side edges by a sheet metal strip as specified in FDOT 931-2.1.

Cut the filler to the crown and shape of the slab cross-section and extended it to the subgrade. After installation, ensure that the top is not less than 1 inch, and not more than 1.25 inches, below the finished surface. Furnish the joint filler in lengths not less than the lane widths being poured, except that the Engineer will not require lengths greater than 12 feet. Where more than one section is allowed and used in a joint, securely lace or clip the sections together.

Place the filler normal to the pavement surface. Stake the assembly into position in such a way as to hold the assembly securely in position throughout construction. Ensure that the assembly is true to the line prescribed, subject to a tolerance of 1/4 inch in the width of the slab. Obtain the Engineer’s approval of the assembly and its installation before placing any concrete against it. Obtain the Engineer’s approval of the cross-section and length of the stakes.

When laying the pavement in partial width slabs, place transverse joints in the succeeding slab in line with the like joints in the first slab. In the case of widening existing pavement, place transverse joints in line with like joints in the existing pavement or as otherwise shown in the Plans.

12.4 Expansion Joints Around Structures:

12.4.1 Expansion Joints at Manholes, Meter Boxes and other Projections: Form expansion joints by placing premolded expansion joint material about all structures and features projecting through, into or against the pavement. Ensure that such joints are 1/2 inch in width.

13. Thickness Determinations

13.1 General: After completing the concrete pavement, including any corrective work to meet ride requirement, determine the thickness by one of following methods. The Engineer will select the locations for testing and make the determination of thickness. Sample locations will be taken at various points on the cross-section so that each test represents an area not exceeding 2,500 yd2. Provide traffic control, non-destructive equipment, coring equipment, and operator to obtain the samples.

13.1.1 Core Borings: To determine the actual thickness, drill cores from the pavement and measure thickness in accordance with ASTM C174. Replace the portions of the pavement removed by the borings at no expense to the owner.

13.2 Method of Calculating Average Thickness: The average thickness of the pavement will be determined by using the following method of calculation:

(a) When the thickness of the pavement is more than 1/2 inch greater than the specified thickness, the calculation will be considered as the specified thickness plus 1/2 inch.

(b) The thickness will be calculated as the average thickness for the entire job as a unit.

14. Deficient Thickness

14.1 General: The No payments will be made for any pavement which is more than 1/2 inch less than the specified thickness. Any deficient pavement will be just cause for that portion of the concrete pavement addressed to be suspended until the corrections are to the satisfaction of the Engineer. When the pavement contains no longitudinal construction joint, no payment will be made for the area of such pavement that is the product of the full width of the strip placed as a unit times the sum of the distances each way from the short core or cores to the cores on each side which show measurements within the tolerance limits. When the pavement contains longitudinal construction joints, for the width, the Department will use the width between longitudinal construction joint and the edge of pavement.

14.2 Deficient Pavement Requiring Removal: The Engineer will evaluate areas of pavement found deficient in thickness by more than 1/2 inch and if, in his judgment, the deficiency is enough to seriously impair the anticipated service life of the pavement, remove such areas and replace them with concrete of the thickness shown in the Plans. There will be no additional payment for the area of pavement removed or for the materials or labor involved in its removal. When removing a section of pavement, remove the full length between transverse joints.

14.3 Deficient Pavement Left in Place: If the Engineer determines that the deficiency will not seriously impair the anticipated service life of the pavement, the pavement may be left in place, at no compensation.

14.4 Additional Borings: If the number of cores taken is not sufficient to indicate the thickness of the pavement, additional boring locations may be requested, with prior approval from the Engineer at no additional cost.

15. Opening Pavement to Traffic

Construct an earth berm along each edge of the pavement within 36 hours of finishing any newly placed concrete pavement. Build the berm to the full height of the pavement and at least 18 inches wide, and sufficiently compacted to prevent underwash of the pavement. Maintain the berm until the final shoulders are complete.

Except as provided below, keep the pavement closed to traffic for a minimum period of 14 calendar days after placement of the concrete. The Engineer may permit opening of a section of pavement to traffic at an earlier time provided that representative test cylinders, made in accordance with ASTM C31 and tested in

accordance with ASTM C39, indicate a compressive strength of at least 2200 psi. Cure these test cylinders in a manner identical to the corresponding section of pavement.

Protect the pavement from all traffic, including construction operations, until the specified period of time has elapsed. Protect the pavement from ambient temperatures below 50°F for the calendar days or until the required compressive strength has been attained.

16. Method of Measurement

16.1 Concrete Pavement: The quantities to be paid for will be the plan quantity, in square yards, of plain cement concrete pavement and of reinforced cement concrete pavement, adjusted for average thickness as provided herein.

16.2 Joints and Cracks: Include the cost for cleaning and sealing joints in abutting joints between existing pavement and new pavement.

17. Basis of Payment

Prices and payments will be full compensation for all work specified in this Section, including any preparation of the subgrade not included in the work to be paid for under another Contract item; all transverse and longitudinal joint construction, including tie-bars and dowel bars; the furnishing of test specimens; repair of core holes; and all incidentals necessary to complete the work.

END OF SECTION 32 13 13

"TASK 2" SUBSURFACE EXPLORATIONS FOR PAVEMENT, STORMWATER MANAGEMENT AND GROUNDWATER QUALITY AT WARNER BAYOU BOAT RAMP, RIVERVIEW BOULEVARD, BRADENTON, MANATEE COUNTY, FLORIDA

Ardaman & Associates, Inc.

OFFICES

FLORIDA

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Tallahassee, 3175 West Tharpe Street, Tallahassee, Florida 32303, Phone (850) 576-6131
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A.S.F.E.
American Concrete Institute
American Society for Testing and Materials
Florida Institute of Consulting Engineers

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

October 25, 2011
File No. 11-7333

TO: Manatee County Property Management Dept.
1112 Manatee Avenue West
Bradenton, FL 34205

Attention: Al Meronek and Drain Cushing

SUBJECT: "Task 2" Subsurface Explorations for
Pavement, Stormwater Management and Groundwater Quality at
Warner Bayou Boat Ramp, Riverview Boulevard, Bradenton, Manatee County, Florida

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Gentlemen:

As requested and authorized by Work Assignment No. 71, our firm has completed "Task 2" explorations and analysis of the subsurface soil and groundwater conditions at the subject site. This report will present the results of the explorations and our recommendations.

This report was prepared for the exclusive use of Manatee County Government and their consultants, for specific application to the subject site. Our services have been performed in accordance with generally-accepted engineering practices. No other warranty, expressed or implied, is made.

We appreciate the opportunity to be of your service. Please contact our office when we may be of further service or should you have any questions concerning this report.

Very truly yours,

ARDAMAN & ASSOCIATES, INC.
Certificate of Authorization No. 5950

Jerry H. Kuehn, P.E.
Senior Project Engineer
Fl. License No. 35557

Gary H. Schmidt, P.E.
Vice President
Fl. License No. 12305

JHK/GHS:ly

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1.0 SCOPE

The scope of our services has included the following items:

1. Performing two (2) Standard Penetration Test borings, two (2) auger borings, and one (1) in situ permeability test, to determine the nature of the subsurface soils and existing water table levels.

2. Installing one (1) permanent groundwater monitor well and sampling the well to determine background groundwater quality

3. Reviewing each soil sample obtained in our field exploration program by a geotechnical engineer in the laboratory for further investigation, classification and assignment of laboratory tests.

4. Performing laboratory tests on selected samples.

5. Analyzing the existing subsurface soil and drainage conditions to:
   a. prepare pavement design recommendations,
   b. estimate the seasonal high water table and hydraulic conductivity, and
   c. asses groundwater quality.

6. Preparing this report to document the results of our field exploration program, engineering analyses and recommendations.

Our scope of work also included performing "Task 1" services, which included an assessment of subsurface soil conditions for the proposed restroom structure. These results were presented in a previous report.

2.0 FIELD EXPLORATION

Our field exploration program included conducting two (2) Standard Penetration Test (SPT) borings, two (2) auger borings, installing one (1) piezometer, performing in situ permeability tests in the piezometer, installing one (1) permanent monitor well and collecting groundwater samples from the well. The number and location of these were determined by Manatee County.

The test locations are identified as MW-1, PZ-2, SP-4 and SP-5, and are shown on the attached Figure 1. Also shown on Figure 1 is the location of SP-3 from our "Task 1" explorations. The test borings, piezometer and monitor well were located in the field by visual reference to available site landmarks. The locations should be considered accurate only to the degree implied by the method used. Should more accurate locations be required, a registered land surveyor should be retained.

2.1 Subsurface Soil Borings

The SPT and auger borings were performed to determine the existing water table and subsurface soil conditions to a maximum depth of 15 feet below the existing ground surface. The methods and equipment used in the borings are described in Appendix I of this report.

The soil profiles and water table depths encountered at the time of this exploration are shown on the soil boring logs in Appendix II. The soil descriptions shown on the soil boring logs in Appendix II are based upon the Unified Soil Classification System (ASTM D-2487).

2.2 Permeability Tests

To provide a means of performing in situ horizontal permeability tests, a piezometer was installed at the location of boring PZ-2. Construction details, water level readings and in situ permeability test results for the piezometer are shown on Plate 2 of Appendix III. The in situ permeability tests were performed by the constant-head method, which is described in Appendix I. The test results indicate a saturated horizontal hydraulic conductivity (k_{hs}) of 10 feet/day for the soils within the collection zone (screened interval) of the piezometer. After completion of the test, the piezometer casing was removed from the ground and the hole backfilled with native soil.

2.3 Monitor Well Installation and Sampling

A permanent monitor well was installed at location MW-1, which is shown on the attached Figure 1. A construction diagram for the monitor well is included as Plate 1 of Appendix III and a lithologic log for the well is included in Appendix II.

Our scope of work included obtaining the necessary well construction permit, performing a Standard Penetration Test boring (ASTM D-1586) at the well location, installing the well, developing the well, and sampling the well. Copies of the Southwest Florida Water Management District (SWFWMD) well construction permit and SWFWMD completion report are included in Appendix IV, for your records. The equipment and methods used in the monitor well installation and development are described in Appendix I.

The monitor well was sampled on October 6, 2011. The groundwater sampling was conducted in strict adherence to Florida Department of Environmental Protection Standard Operating Procedures (FDEP SOP-001/01). The samples were collected and placed directly into the laboratory's supplied containers, capped, labeled and packed on ice for transport to the laboratory for analysis. A copy of the field sampling notes, instrument calibration logs, sampling logs and chain-of-custody forms are included in Appendix V. The results will be discussed further in Section 5.3 of this report.

3.0 LABORATORY TESTING

3.1 Soils

Soil samples obtained during our field exploration program were thoroughly examined in our laboratory to obtain an accurate definition of the soil profile. Routine tests were performed on selected samples to aid in classification and to better define the engineering properties. These tests included determining the fines (silt and clay) content. The test results are shown at the respective sample depth on the soil boring logs in Appendix II. Based upon the laboratory test results and visual classification procedures, the soils have been classified in general compliance with the Unified Soil Classification System (ASTM D-2487) by a geotechnical engineer.

In addition, a limerock bearing ratio (LBR) test was performed on a sample of the existing shell material obtained from location SP-4. The test results are included in Appendix III of this report. The results indicate an LBR are value of 174, with a maximum dry density of 129.7 pcf at an optimum moisture content of 7.6%.

3.2 Groundwater

Field measurements of dissolved oxygen, pH, temperature, specific conductance and turbidity were made by Ardaman & Associates at the time of sampling. Laboratory analyses were performed by Test America and included total organic carbon (TOC), mercury, cadmium, copper, lead, zinc, hexavalent chromium, benzene and naphthalene. The results are summarized in the table below and the complete laboratory analytical report is included in Appendix V.

Parameter	MW-1
Dissolved Oxygen (mg/L)	0.18
pH	6.67
Temperature (°C)	26.9
Specific conductance (µS/cm)	23,910
Turbidity (NTU)	0.20
TOC (mg/L)	20
Mercury (µg/L)	U
Cadmium (µg/L)	U
Copper (µg/L)	3.3
Lead (µg/L)	U
Zinc (µg/L)	U
Hexavalent chromium (µg/L)	U
Benzene (µg/L)	U
Naphthalene (µg/L)	U
Notes: U = compound was analyzed for but not detected.	

4.0 HYDROLOGIC LITERATURE REVIEW

We have reviewed pertinent published literature on surficial soil and hydrologic conditions at and near the site. A discussion of this is presented below, plus a summary of water table definitions.

4.1 Water Table Definitions

The site vicinity is underlain by the unconfined surficial aquifer system, which consists primarily of relatively permeable, sandy sediments overlying an aquiclude that exists at some depth below the ground surface. This aquiclude hydraulically separates the surficial aquifer from the deeper artesian aquifer systems.

The water table in the surficial aquifer generally occurs within a few to several feet below the ground surface. The water table is defined as the surface at which the fluid pressure in the pores of the porous medium (i.e. soil) is equal to atmospheric pressure. The water table level is revealed by the level at which water stands in a shallow open hole (or well) which penetrates into the surficial deposits just deep enough to encounter standing water in the bottom.

Under natural conditions, the water table aquifer is recharged primarily by rainfall and discharges primarily by evapotranspiration and by lateral seepage to surface waters (streams, ditches, etc.). Seasonal variations in rainfall and evapotranspiration cause the water table to

fluctuate. The seasonal high water table is the highest level that is reached during the year. Of course, the seasonal high water table varies from year to year, primarily due to rainfall variations from year to year.

For a typical year in Manatee County, over 60% of the annual rainfall occurs during the four months of June through September. During this period, the water table gradually rises to its highest level, which typically occurs in August to September. During the relatively dry portion of the year (from October to May), the water table recedes to lower levels, typically reaching the lowest level in May.

The U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS), defines the seasonal high water table as the highest level of a saturated zone in the soil in most years. This definition refers to a saturated zone, rather than the true water table, which is defined above. Due to capillary rise, the saturated zone may extend a few to several inches above the water table. This is because the capillary zone is a saturated zone above the water table where the fluid (pore water) pressure is less than atmospheric pressure. Therefore, water from the capillary zone will not flow into a borehole which penetrates the aquifer. Only in the area below the water table, where the pore water pressure is greater than atmospheric pressure, will the water flow into an open borehole. The height of capillary rise is generally less than six inches above the water table in most of the surficial sandy soils typical of the area, but may be greater if the surficial soils are more silty or clayey. The seasonal high water table may, therefore, be somewhat lower than that reported in the USDA-NRCS soil surveys.

In the USDA-NRCS soil surveys, a range of seasonal high water tables is listed for each of the defined surficial soil types. The water table is estimated to be at or above this level for at least one month during most years. These estimates are based mainly on evidence of a saturated zone (grayish colors or mottles) and are generally applicable to an undrained soil condition (i.e. no artificial drainage).

The Southwest Florida Water Management District (SWFWMD) defines the seasonal high water table as the elevation to which the water table can be expected to rise during a normal wet season. For the purpose of designing stormwater management systems, it is our objective to

estimate the seasonal high water table as the elevation the water table is expected to be at or above for no more than a few (approximately two to four) weeks during a year of average climatic conditions. Our estimated seasonal high water tables for the site will be presented later in this report.

4.2 Review of USDA-NRCS Soil Survey

The United States Department of Agriculture, Natural Resources Conservation Service (NRCS) "Soil Survey of Manatee County, Florida" (issued 1983) indicates the predominant surficial soil type on the site to be Canaveral sand (filled). The NRCS describes this as a nearly level, moderately well trained to somewhat poorly drained soil that consist of sand and shells that have been dredged or excavated from water areas and been leveled and smoothed, mainly for urban use. In general, the fill material ranges from about 20 to more than 80 inches in thickness and ranges from about 10 to 80 percent shell or shell fragments.

The NRCS indicates the seasonal high water table to be at a depth in the range of 1.0 to 3.0 feet below the ground surface. Our site-specific estimate of the seasonal high groundwater table will be presented in Section 5.2 of this report.

5.0 ANALYSES AND RECOMMENDATIONS

Our scope of work included preparing pavement design recommendations, estimating the seasonal high groundwater table and assessing groundwater quality. These will be discussed separately, as follows.

5.1 Pavement Design

The thicknesses of the existing surficial shell materials were measured at locations SP-4 and SP-5, and were found to be approximately 6 inches thick. Laboratory test results indicate the shell at SP-4 to have an LBR value of 174, which would indicate an adequate pavement base material, if adequately compacted.

As requested, we have prepared recommendations for the following pavement options:

- Light duty concrete (automobiles - parking areas)
- Heavy duty concrete (trucks - boat maneuvering areas)
- Heavy duty asphalt (driveway/aprons)

- Shell parking areas and driveways
- Gravel parking areas and driveways

We recommend that the following design criteria be incorporated into the project general specifications.

Light Duty Concrete Pavement

Paving Component	Thickness	Description
Stabilized Subbase	6"	In situ or borrow material stabilized by blending with shell to a minimum LBR of 40%, compacted to 98% of Modified Proctor maximum density (AASHTO T-180), Florida DOT Sec. 160.
Concrete Pavement	4.5"	Minimum 4000 psi 28-day compressive strength, saw cut to minimum 1/4 depth (1 1/8 inches) in 10-foot grid pattern (both directions), Florida DOT Sec. 350.

Heavy Duty Concrete Pavement

Paving Component	Thickness	Description
Stabilized Subbase	8"	In situ or borrow material stabilized by blending with shell to a minimum LBR of 40%, compacted to 98% of Modified Proctor maximum density (AASHTO T-180), Florida DOT Sec. 160.
Concrete Pavement	5.5"	Minimum 4000 psi 28-day compressive strength, saw cut to 1/4 depth (1 3/8 inches) in 12-foot grid pattern (both directions), Florida DOT Sec. 350.

Heavy Duty Asphalt Pavement

Paving Components	Thickness	Description
Stabilized Subbase	6"	In situ or borrow material stabilized by blending with shell to a minimum LBR of 40, compacted to 98% of Modified Proctor maximum density (AASHTO T-180), Florida DOT Sec. 160, Type B.
Base	8"	Shell base or crushed concrete (graded aggregate) base per Florida DOT Sec. 285, minimum LBR = 100. Compacted to 98% of Modified Proctor maximum density.

Asphalt Surface	2"	Type S-1 asphalt, compacted to 95% of laboratory density, as determined by Marshall Stability Test, Florida DOT Sec. 333 (2000 edition).

Shell or Gravel Parking and Driveway

Paving Components	Thickness	Description
Compacted Subgrade	12"	In situ soils compacted to at least 95% of Modified Proctor maximum density (AASHTO T-180)
Surface	6"	Shell base or graded aggregate base per Florida DOT Sec. 285, minimum LBR = 100. Compacted to 98% of Modified Proctor maximum density.

5.2 Seasonal High Groundwater Table and Hydraulic Conductivity

The seasonal high groundwater table was estimated at test location PZ-2, for use in design of the proposed stormwater retention pond. Based upon review of a topographic survey (prepared by George F Young Inc.) of the site, the existing ground surface elevation is approximately 2.1 feet NAVD88 at this location.

On September 14, 2011, the groundwater table was encountered at a depth of 1.4 feet below the ground surface, which would correspond to an elevation of approximately 0.7 feet NAVD88. Based upon our review of the NRCS Soil Survey and our field explorations, we estimate the seasonal high groundwater table elevation to be 0.9 feet NAVD88 at location PZ-2.

The results of the in situ permeability test performed within the piezometer at PZ-2 indicates a saturated horizontal hydraulic conductivity (k_{hs}) of 10 feet/day. Based upon our experience and noting the soil stratification at the site, the unsaturated vertical hydraulic conductivity (k_{vu}) of the near surface soils would likely be in the range of 10 to 30 percent of this, or approximately 1 to 3 feet per day. These values are intended for use in the design of stormwater infiltration systems. Other values may be more suitable for other intents.

5.3 Groundwater Quality Monitoring

The results of the groundwater sampling event on October 6, 2011 were presented in Section 3.2 of this report. The results indicate a total organic carbon (TOC) concentration of 20 mg/L and a copper concentration of 3.3 µg/L at monitor well MW-1. These values are greater than the screening values of 10 mg/L for TOC and 2.9 µg/L for copper from the Florida DEP "Generic Permit for the Discharge of Produced Ground Water from Any Non-Contaminated Site Activity."

We recommend that the monitor well be resampled for copper to verify the above result. We also recommend resampling for TOC, PAH, VOA, EDB and TPH in order to determine if the TOC is naturally occurring and if it is therefore feasible to request an exemption for TOC per paragraph (3)(a) of the Generic Permit. We are proceeding with this resampling and will forward the results, when available.

6.0 CLOSURE

The analyses and recommendations submitted in this report are based upon the results of subsurface borings performed at the locations indicated on the attached Figure 1. This report does not reflect any variations which may occur between the borings. While the borings are representative of the subsurface conditions at the respective locations and for their respective vertical reaches, local variations characteristic of the subsurface materials of the region are anticipated and may be encountered.

The boring logs and related information are based upon the driller's logs and visual examination of selected samples in the laboratory. The delineation between soil types shown on the logs is approximate, and the description represents our interpretation of the subsurface conditions at the designated boring location on the particular date drilled. The absence of a water table listed on a boring log does not indicate that the water table is not within the boring depth, unless expressly stated so.

APPENDIX I

SOIL BORING, SAMPLING & TEST METHODS

SOIL BORING, SAMPLING AND TESTING METHODS

Standard Penetration Test

The Standard Penetration Test (SPT) is a widely accepted method of in situ testing of foundation soils (ASTM D-1586). A 2-foot long, 2-inch O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each 6 inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load. The following tables relate N-values to a qualitative description of soil density and, for cohesive soils, an approximate unconfined compressive strength (Qu):

Cohesionless Soils:

N-Value	Description
0 to 4	Very loose
4 to 10	Loose
10 to 30	Medium dense
30 to 50	Dense
Above 50	Very dense

Cohesive Soils:

N-Value	Description	Qu (ton/ft^2)
0 to 2	Very soft	Below 0.25
2 to 4	Soft	0.25 to 0.50
4 to 8	Medium stiff	0.50 to 1.0
8 to 15	Stiff	1.0 to 2.0
15 to 30	Very stiff	2.0 to 4.0
Above 30	Hard	Above 4.0

The tests are usually performed at 5-foot intervals. However, more frequent or continuous testing is done by our firm through depths where a more accurate definition of the soils is required. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is a bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, NX-size flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid.

Representative split-spoon samples from each sampling interval and from every different stratum are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary. After thorough examination and testing of the samples, the samples are discarded unless prior arrangements have been made. After completion of a test boring, the hole is kept open until a steady state groundwater level is recorded. The hole is then sealed, if necessary, and backfilled.

Auger Borings

Auger borings are used when a relatively large, continuous sampling of soil strata close to ground surface is desired. A 4-inch diameter, continuous flight, helical auger with a cutting head at its end is screwed into the ground in 5-foot sections. It is powered by the rotating action of the Kelly bar of a rotary drill rig. The sample is recovered by withdrawing the auger out of the ground without rotating it. The soil sample so obtained is classified and representative samples put in bags or jars and brought back to the laboratory for further classification and testing.

Laboratory Test Methods

Soil samples returned to our laboratory are examined by a geotechnical engineer or geotechnician to obtain more accurate descriptions of the soil strata. Laboratory testing is performed on selected samples as deemed necessary to aid in soil classification and to further define engineering properties of the soils. The test results are presented on the soil boring logs at the depths at which the respective sample was recovered, except that grain size distributions or selected other test results may be presented on separate tables, figures or plates as described in this report. The soil descriptions shown on the logs are based upon a visual-manual classification procedure in general accordance with the Unified Soil Classification System (ASTM D-2488-84) and standard practice. Following is a list of abbreviations which may be used on the boring logs or elsewhere in this report.

-200 - Fines Content (percent passing the No. 200 sieve); ASTM D1140
DD - Dry Density of Undisturbed Sample; ASTM D2937
Gs - Specific Gravity of Soil; ASTM D854
k - Hydraulic Conductivity (Coefficient of Permeability)
LL - Liquid Limit; ASTM D423
OC - Organic Content; ASTM D2974
pH - pH of Soil; ASTM D2976
PI - Plasticity Index (LL-PL); ASTM D424
PL - Plastic Limit; ASTM D424
Qp - Unconfined Compressive Strength by Pocket Penetrometer;
Qu - Unconfined Compressive Strength; ASTM D2166 (soil), D7012 (rock)
SL - Shrinkage Limit; ASTM D427
ST - Splitting Tensile Strength; ASTM D3967 (rock)
USCS - Unified Soil Classification System; ASTM D2487, D2488
w - Water (Moisture) Content; ASTM D2216

Soil Classifications

The soil descriptions presented on the soil boring logs are based upon the Unified Soil Classification System (USCS), which is the generally accepted method (ASTM D-2487 and D-2488) for classifying soils for engineering purposes. The following modifiers are the most commonly used in the descriptions.

For Sands:	Modifier	Fines, Sand or Gravel Content*
	"with silt" or "with clay"	5% to 12% fines
	"silty" or "clayey"	12% to 50% fines
	"with gravel" or "with shell"	15% to 50% gravel or shell

For Silts or Clays:	Modifier	Fines, Sand or Gravel Content*
	"with sand"	15% to 30% sand and gravel; and % sand > % gravel
	"sandy"	30% to 50% sand and gravel; and % sand > % gravel
	"with gravel"	15% to 30% sand and gravel; and % sand < % gravel
	"gravelly"	30% to 50% sand and gravel; and % sand < % gravel

* may be determined by laboratory testing or estimated by visual/manual procedures. Fines content is the combined silt and clay content, or the percent passing the No. 200 sieve.

Other soil classification standards may be used, depending on the project requirements. The AASHTO classification system is commonly used for highway design purposes and the USDA soil textural classifications are commonly used for septic (on-site sewage disposal) system design purposes.

Well Installation and Development

Monitor well installation using hollow-stem auger is done in the following manner. Before starting, equipment is cleaned so that no oil, grease, cement grout, and/or soil is present on the hollow-stem auger or drill rod string. The bottom of the auger is plugged with a wooden plug and the auger is drilled into the soil to the bottom of the collection zone. The hollow-stem auger is then filled with clean water, the auger pulled up about 0.5 foot and held in place, and the plug pushed or driven from the bottom of the auger using the drill rod string. Water is added to the hollow-stem auger, as needed, to keep the hydraulic head greater than the groundwater table and the depth inside the hollow stem is checked to be sure excessive soil has not come into the auger.

The monitor well casing string consists of flush joint casing, end caps, screen section, and riser pipe, threaded together with 0-ring seals. A centralizer may be attached about midway on the screen section.

A filter pack of graded silica sand is placed in the annular space surrounding the screen, from the well bottom to above the screen. While adding filter pack, the auger is pulled, always keeping about 0.5 foot of filter pack inside the hollow-stem auger. The gradation of the filter material is typically #6-20, although #20-30 silica sand may be used.

Above the filter pack, about 6 inches of bentonite pellets is added to form a seal and/or 3 inches of fine sand is added to prevent grout intrusion. This is then compacted, using a tamper. A second seal layer may be added using the same procedure.

Grouting of annular space between well casing and borehole above the seal is done using a tremie pipe or is poured from the surface if the grout depth is less than about 3 feet. The tremie pipe is

lowered inside the hollow stem auger to about 3 feet above seal so as not to jet the seal away. The auger is removed in 5-foot sections during Grouting, refilling with grout between the removal of each section.

For security, a protective casing or manhole-style cover may be placed over the well casing and a 2-foot square concrete pad poured. Upon completion, the well cover or cap can be locked with a padlock.

Well development is performed at least 24 hours after installation. Development removes silt and finer particles from the water bearing formation around the screen, leaving a zone of coarser particles. The water flows more easily through the larger uniform voids of the developed zone. The well development is done by surging water in and out through the screen openings, bringing fines into the screen and then removing these fines from the well by pumping. For small diameter shallow wells, a bailer can produce very satisfactory results. Rapidly dropping the bailer to the bottom produces the required surge and the extraction of fines from the well is obtained by bailing out the suspended fines produced from the surge. For wells where the water level is less than about 25 feet below ground, pumping can be done with either a peristaltic or a centrifugal pump. A mechanical surge block is used in combination with the peristaltic pump, while with a centrifugal pump a large diameter hose can be used not only for pumping but also for surging by rapid up and down motion of the hose.

In Situ Permeability Test In Piezometers and Monitor Wells (Falling-Head Method)

After allowing the water level within the piezometer (PZ) or monitor well (MW) to stabilize, in situ permeability tests were performed. These tests are used to determine the horizontal or vertical (depending upon the PZ/MW geometry) hydraulic conductivity (k) of the soils below the water table and within the collection zone of the PZ/MW. In general, horizontal permeability tests are performed within PZ/MW's having a collection zone (screened or filter-packed interval) that is long relative to its diameter. Vertical permeability tests are generally performed within a PZ that consists of an open-bottom casing, without a screened section, driven into the soil at the test depth.

The test is performed by either rapidly filling the PZ/MW casing with clear water to create a rise of the water level, or by rapidly removing a volume of water with a bailer or pump to create a drop of the water level within the casing. The latter is also known as a "slug test," referring to the removal of a "slug" of water from the casing. In the case of an environmental water quality monitoring well, the "slug test" would be performed as it does not involve the addition of foreign water to the MW.

The recovery (rise or fall) of the water level is then measured versus time, using either an electronic tape measure or an electronic pressure transducer probe with digital output and/or data logger. This water level data and PZ/MW dimension data is then used to calculate the horizontal or vertical "k" based upon the methods of Hvorslev (1951) or Bouwer and Rice (1976).

Hvorslev, M.J. (1951), "Time Lag and Soil Permeability in Groundwater Observations," U.S. Army Corps of Engineers, Waterways Experiment Station Bulletin 36, Vicksburg, Mississippi.

Bouwer, H., and Rice, R. C. (1976), "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells," Water Resource Res., Vol 12, No. 3, pp.423-428.

Kruseman, G.P., de Ridder, N.A. (1990), Analysis and Evaluation of Pumping Test Data, Second Edition, International Institute for Land Reclamation Improvement, The Netherlands, pp 244 - 247.

Butler, Jr., James J., (1998), The Design, Performance and Analysis of Slug Tests, Lewis Publishers, Boca Raton, pp 105 - 109.

Andreyev, Nicholas E., and Wiseman, Lee P., (1989), Stormwater Retention Pond Infiltration Analysis in Unconfined Aquifers, Southwest Florida Water Management District, pp 3-7 - 3-9.

In Situ Permeability Test In Piezometers and Monitor Wells (Constant-Head Method)

After allowing the water level within the piezometer (PZ) or monitor well (MW) to stabilize, in situ permeability tests were performed. These tests are used to determine the horizontal or vertical (depending upon the PZ/MW geometry) hydraulic conductivity (k) of the soils below the water table and within the collection zone of the PZ/MW. In general, horizontal permeability tests are performed within PZ/MW's having a collection zone (screened or filter-packed interval) that is long relative to its diameter. Vertical permeability tests are generally performed within a PZ that consists of an open-bottom casing, without a screened section, driven into the soil at the test depth.

The test is performed by filling the PZ/MW casing with clear water and measuring the flow rate required to maintain a constant water level near the top of the PZ/MW casing. The test is continued until the flow rate becomes constant. The water level, flow rate and PZ/MW dimension data are then used to calculate the horizontal or vertical "k."

If the collection zone is entirely below the water table, "k" is calculated based upon the methods of Hvorslev (1951). If the collection zone is partially or entirely above the water table, "k" is calculated based upon the methods of the U.S.B.R. (1977) or Zanger (1953), depending upon test and water table conditions.

The horizontal permeability test geometry and procedure are very similar to the "constant head open-hole test" described in SWFWMD (1988) for exfiltration trench design. The hydraulic conductivity (k) calculated as described in the preceding paragraph is "k" as defined by Darcy's Law (Q=kia) and is not equivalent to the SWFWMD exfiltration trench hydraulic conductivity (K), however. The SWFWMD exfiltration trench "K" is actually a conductance (or leakance) factor and should only be applied accordingly.

Hvorslev, M.J. (1951), "Time Lag and Soil Permeability in Groundwater Observations," U.S. Army Corps of Engineers, Waterways Experiment Station Bulletin 36, Vicksburg, Mississippi.

Southwest Florida Water Management District (1988), "Management and Storage of Surface Waters - Permit Information Manual," Vol. I., SWFWMD, Brooksville, Florida.

U.S. Bureau of Reclamation (1977), Ground Water Manual, U.S. Government Printing Office, Washington D.C.

Zanger, C.N. (1953), "Theory and Problems of Water Percolation," U.S. Bureau of Reclamation, Engineering Nomograph No. 8.

APPENDIX II

SOIL BORING LOGS

BORING LOCATION: see Figure 1

DATE DRILLED: 9/13/11 **START:** **FINISH:**

GROUND SURFACE ELEVATION:

WATER TABLE DEPTH: 2.7 **TIME:** **DATE:** 9/13/11

CLIENT: Manatee County Property Management Dept.

PROJECT: Warner Bayou Boat Ramp

LOCATION: 59th Street, Bradenton, Manatee County, Florida

DRILL CREW: DP/MO **LOGGED BY:** DP

DRILL MAKE & MODEL: CME-45 **BIT:** 4" auger point **DRILLING RODS:**

DRILLING METHOD: auger **WEATHER CONDITIONS:**

DEPTH, FT.	ELEVATION, FT	BLOW COUNTS PER 6-INCHES	SPT N-VALUE	SAMPLE NO.	GRAPHIC LOG	USCS	SOIL DESCRIPTION	PERCENT FINES	ORGANIC CONTENT (%)	WATER CONTENT (%)	LIQUID LIMIT	PLAST. INDEX
0				1		SP	light gray fine sand with shell					
2.5				2		SP	brown fine sand with shell					
5				3		SP	dark brown fine sand with shell					
7.5				4		SP	dark brownish gray fine sand (trace shell)					
10				5		SP	dark gray fine sand (trace shell)					
12.5				6		SP	brownish gray fine sand (trace shell)					
15							end of boring					
17.5												

Ardaman & Associates, Inc.

Geotechnical, Environmental and Materials Consultants

REVIEWED BY: Jerry H. Kuehn, P.E. **FILE NO:** 11-7333 **BORING NO.:** MW-1

BORING LOCATION: see Figure 1

DATE DRILLED: 9/13/11 **START:** **FINISH:**
GROUND SURFACE ELEVATION:
WATER TABLE DEPTH: N.D. **TIME:** **DATE:**

CLIENT: Manatee County Property Management Dept.
PROJECT: Warner Bayou Boat Ramp
LOCATION: 59th Street, Bradenton, Manatee County, Florida
DRILL CREW: DP/MO **LOGGED BY:** DP

DRILL MAKE & MODEL: CME-45 **BIT:** 4" auger point **DRILLING RODS:**
DRILLING METHOD: auger **WEATHER CONDITIONS:**

DEPTH, FT.	ELEVATION, FT	BLOW COUNTS PER 6-INCHES	SPT N-VALUE	SAMPLE NO.	GRAPHIC LOG	USCS	SOIL DESCRIPTION	PERCENT FINES	ORGANIC CONTENT (%)	WATER CONTENT (%)	LIQUID LIMIT	PLAST. INDEX
0				1		SP	pale grayish brown fine sand (trace shell)	1.1				
2.5												
5				2		SP	dark gray fine sand (trace shell)					
				3		SP	grayish brown fine sand (trace shell)	2.7				
7.5												
10				4		SP	dark gray fine sand with shell	3.7				
				5		SP	dark brownish gray fine sand (trace shell)					
12.5												
15							end of boring					
17.5												

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

REVIEWED BY: Jerry H. Kuehn, P.E. **FILE NO:** 11-7333 **BORING NO.:** **PZ-2**

BORING LOCATION: see Figure 1 (proposed restroom)
DATE DRILLED: 9/13/11 **START:** **FINISH:**
GROUND SURFACE ELEVATION:
WATER TABLE DEPTH: 2.2 **TIME:** **DATE:** 9/13/11

CLIENT: Manatee County Property Management Dept.
PROJECT: Warner Bayou Boat Ramp
LOCATION: 59th Street, Bradenton, Manatee County, Florida
DRILL CREW: DP/MO **LOGGED BY:** DP

DRILL MAKE & MODEL: CME-45 **BIT:** 2-3/8" tricone **DRILLING RODS:** AW
DRILLING METHOD: rotary with SPT **WEATHER CONDITIONS:**

DEPTH, FT.	ELEVATION, FT	BLOW COUNTS PER 6-INCHES	SPT N-VALUE	SAMPLE NO.	GRAPHIC LOG	USCS	SOIL DESCRIPTION	PERCENT FINES	ORGANIC CONTENT (%)	WATER CONTENT (%)	LIQUID LIMIT	PLAST. INDEX
0				1		SP	dark gray fine sand with organics (topsoil)					
		3-5-12	17	2		SP	pale brown fine sand (trace shell)					
2.5		15-10-10	20	3								
		5-4-5	9									
				4		SP	brown fine sand (trace shell)					
5		7-10-10	20	5		SP	grayish brown fine sand (trace shell)					
		8-8-6	14	6		SP	brown fine sand (trace shell)					
7.5		4-3-3	6	7		SP	dark grayish brown fine sand (trace shell)					
		3-2-3	5									
10							end of boring					
12.5												
15												
17.5												

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

REVIEWED BY: Jerry H. Kuehn, P.E. **FILE NO:** 11-7333 **BORING NO.:** SP-3

BORING LOCATION: see Figure 1

DATE DRILLED: 9/13/11 **START:** **FINISH:**

GROUND SURFACE ELEVATION:

WATER TABLE DEPTH: 2.7 **TIME:** **DATE:** 9/13/11

CLIENT: Manatee County Property Management Dept.

PROJECT: Warner Bayou Boat Ramp

LOCATION: 59th Street, Bradenton, Manatee County, Florida

DRILL CREW: DP/MO **LOGGED BY:** DP

DRILL MAKE & MODEL: CME-45 **BIT:** 2-3/8" tricone **DRILLING RODS:** AW

DRILLING METHOD: rotary with SPT **WEATHER CONDITIONS:**

DEPTH, FT.	ELEVATION, FT	BLOW COUNTS PER 6-INCHES	SPT N-VALUE	SAMPLE NO.	GRAPHIC LOG	USCS	SOIL DESCRIPTION	PERCENT FINES	ORGANIC CONTENT (%)	WATER CONTENT (%)	LIQUID LIMIT	PLAST. INDEX
0				1		SW-SM	sandy shell with silt					
		9-9-12	21	2		SP	pale brown fine sand (trace shell)					
2.5		11-11-11	22			SP	grayish brown fine sand (trace shell)					
		9-10-11	21	3		SP	gray fine sand with shell					
5		5-3-2	5	4			end of boring					
7.5												
10												
12.5												
15												
17.5												

Ardaman & Associates, Inc.

Geotechnical, Environmental and Materials Consultants

REVIEWED BY: Jerry H. Kuehn, P.E. **FILE NO:** 11-7333 **BORING NO.:** **SP-4**

BORING LOCATION: see Figure 1

DATE DRILLED: 9/13/11 **START:** **FINISH:**

GROUND SURFACE ELEVATION:

WATER TABLE DEPTH: 2.7 **TIME:** **DATE:** 9/13/11

CLIENT: Manatee County Property Management Dept.

PROJECT: Warner Bayou Boat Ramp

LOCATION: 59th Street, Bradenton, Manatee County, Florida

DRILL CREW: DP/MO **LOGGED BY:** DP

DRILL MAKE & MODEL: CME-45 **BIT:** 2-3/8" tricone **DRILLING RODS:** AW

DRILLING METHOD: rotary with SPT **WEATHER CONDITIONS:**

DEPTH, FT.	ELEVATION, FT	BLOW COUNTS PER 6-INCHES	SPT N-VALUE	SAMPLE NO.	GRAPHIC LOG	USCS	SOIL DESCRIPTION	PERCENT FINES	ORGANIC CONTENT (%)	WATER CONTENT (%)	LIQUID LIMIT	PLAST. INDEX
0				1		SW-SM	sandy shell with silt					
		12-7-8	15	2		SP	dark brown fine sand (trace shell)					
				3								
2.5	▼	15-24-25	49	4		SP	gray fine sand (trace shell)					
						SP	grayish brown fine sand					
		14-10-11	21	5								
5						SP	dark brown fine sand					
		3-5-4	9	6								
							end of boring					
7.5												
10												
12.5												
15												
17.5												

Ardaman & Associates, Inc.

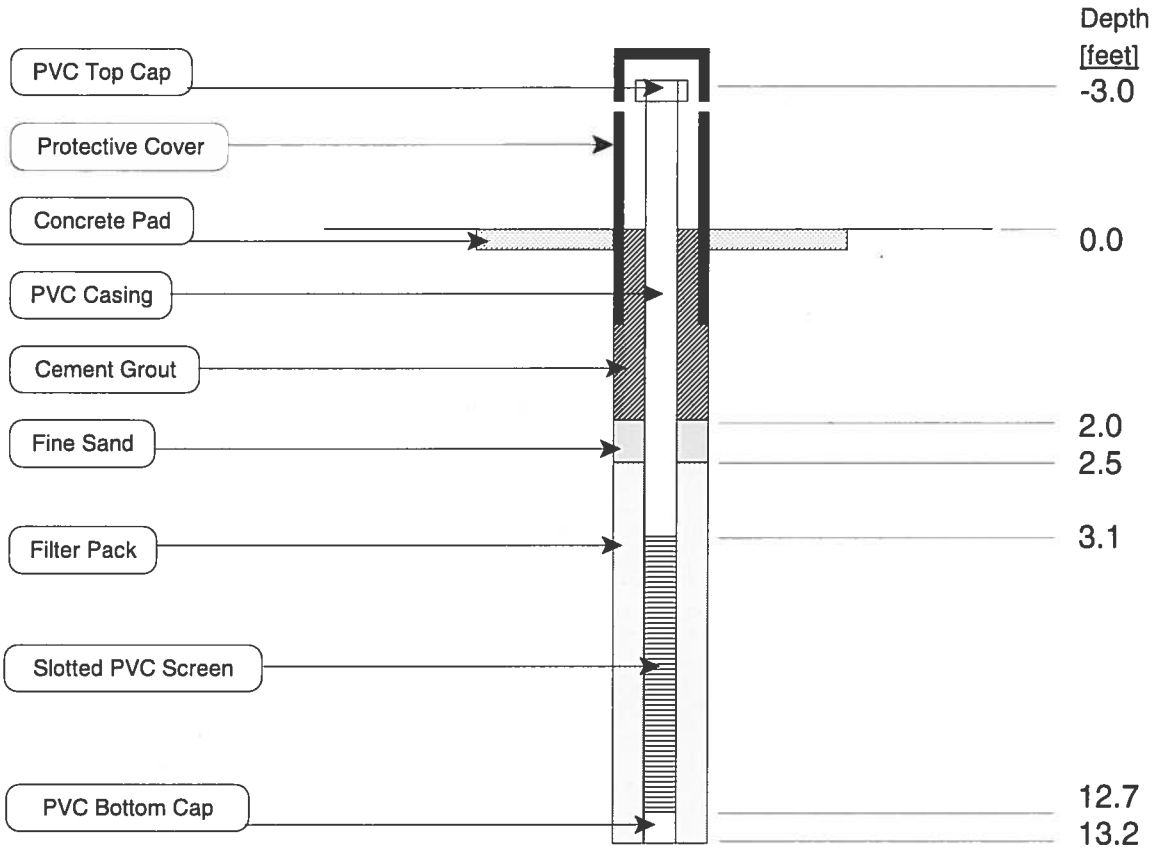
Geotechnical, Environmental and Materials Consultants

REVIEWED BY: Jerry H. Kuehn, P.E. **FILE NO:** 11-7333 **BORING NO.:** **SP-5**

APPENDIX III

PLATES

MONITOR WELL INSTALLATION RECORD



Monitor Well No.:	**MW-1**	**Date Installed:**	09/14/11
Borehole Dia. [inch]:	6.00	**Top of Pipe Elev. [ft, NGVD]:**	N.A.
Casing/Screen Dia. [inch]:	2.0	**Ground Elev. [ft, NGVD]:**	N.A.
Casing Type:	Schedule 40 PVC, flush-threaded joints		
Screen Type:	Schedule 40 PVC, flush-threaded joints, 0.010" slots		
Top Cap Type:	Slip-on PVC cap, with vent hole		
Tailpipe Type:	Same as casing, with threaded PVC bottom cap		
Protective Cover Type:	4"x4"x5' aluminum box with hinged, lockable lid		
Concrete Pad Size:	2' x 2' x 4" thick		
Cement Grout Type:	Neat Portland cement grout		
Fine Sand Type:	Washed fine sand from borehole cuttings, approx. 40/140 graded		
Filter Pack Type:	20/30 graded silica sand		

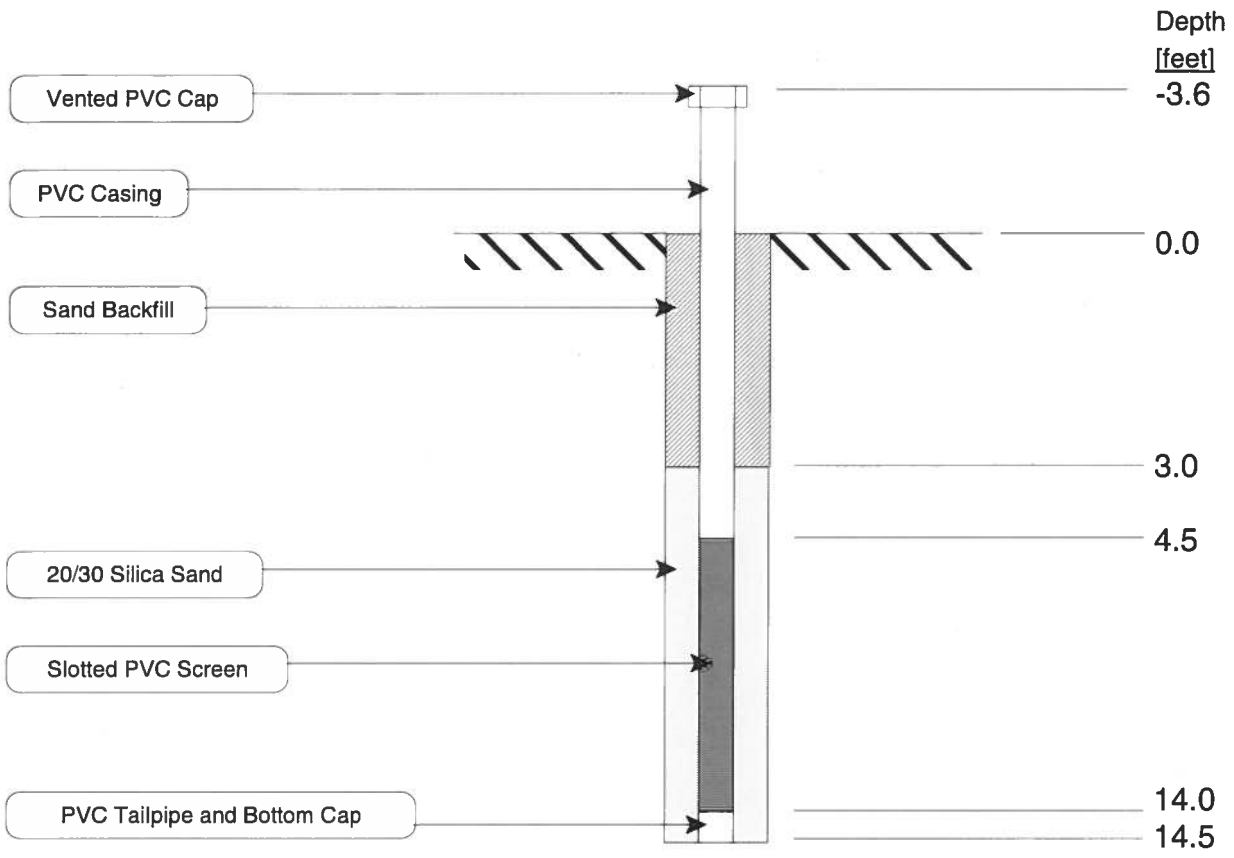
LITHOLOGIC LOG: See attached soil boring log No. MW-1

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

Warner Bayou Boat Ramp,
59th Street, Bradenton,
Manatee County, Florida

DRAWN BY: JK	CHECKED BY:	DATE: 10/21/11
FILE NO. 11-7333	APPROVED BY:	PLATE 1

IN SITU HORIZONTAL PERMEABILITY TEST



Piezometer No.:	**PZ-2**	**Date Installed:**	09/14/11
Boring Diameter [inch]:	6.0	**Top of Pipe Elev. [ft, NGVD]:**	N.A.
PVC Diameter [inch]:	2.00	**Ground Elev. [ft, NGVD]:**	N.A.
Casing Type:	Schedule 40 PVC		
Screen Type:	Schedule 40 PVC, 0.0010" slots		

HYDRAULIC CONDUCTIVITY (k) of Collection Zone = 10 feet/day
3.7E-03 cm/sec

LITHOLOGIC LOG: See soil boring log PZ-2

WATER LEVEL READINGS		
Date	Below Top [feet]	Water Elev. [ft, NGVD]
09/14/11	5.01	N.A.

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

Warner Bayou Boat Ramp
59th Street, Bradenton,
Manatee County, Florida

DRAWN BY: JK	CHECKED BY:	DATE: 8/21/11
FILE NO. 11-7333	APPROVED BY:	PLATE 2

Ardaman & Associates, Inc.
78 Sarasota Center Boulevard
Sarasota, Florida 34240
(941)922-3526, Fax (941)377-7659
Florida Certificate of Authorization No. 00005950

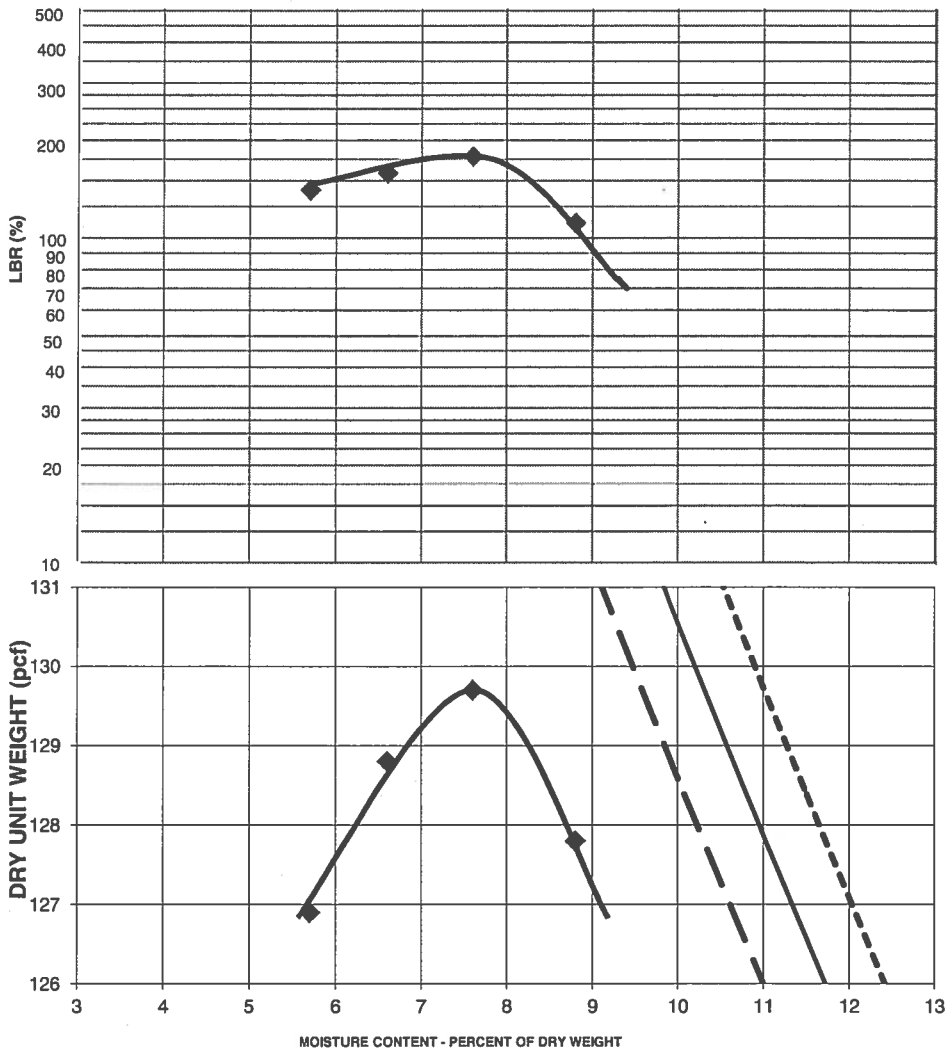
ACCREDITED CMEC LABORATORY

REPORT OF LIMEROCK BEARING RATIO DESIGNATION FM 5-515

Project: Warner Bayou Boat Ramp
Bradenton, Florida

File No.: 11-7333
Copies:

Reported to: Manatee County Property Management Dept.



LBR VALUE
174.0

REMARKS:	
% pass 1-1/2":	
% pass 3/4":	
% pass 1/2":	96.5
% pass 3/8":	94.2
% pass No. 4:	87.8
% pass No. 10:	75.4
% pass No. 40:	55.2
% pass No. 50:	
% pass No. 60:	47.3
% pass No. 100:	30.3
% pass No. 200:	12.0

MAX. DRY DENSITY (PCF):
129.7
OPTIMUM MOISTURE (%)
7.6

Curves of 100% Saturation for Specific Gravity Equal to:
- 2.60
- 2.65
- 2.70

Sample No.: LBR-1 Sample Location: SP-4
Description: Brownish gray sandy shell with silt
Proposed use: base Date Sampled: 9/31/11 By: M. Ochs

Jerry H. Kuehn, P.E.
FL License No. 35557

APPENDIX IV

S.W.F.W.M.D. MONITOR WELL INSTALLATION PERMIT AND COMPETION REPORT

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

☒ Southwest
☐ Northwest
☐ St. Johns River
☐ South Florida
☐ Suwannee River
☐ DEP
☒ Delegated Authority (If Applicable) **MANATEE**

PLEASE FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

The water well contractor is responsible for completing this form and forwarding the permit application to the appropriate delegated authority where applicable.

Permit No. **815485**
Florida Unique ID **2011-4449**
Permit Stipulations Required (See Attached) **23, 39, 48, 49**
62-524 Quad No. **Q2921** Delineation No.
CUP/WUP Application No.

ABOVE THIS LINE FOR OFFICIAL USE ONLY

1. **MANATEE COUNTY PARK (59TH ST EP O BOX 1000** | **BRADENTON** | **FL** | **34206** | **(941)749-3097**
*Owner, Legal Name if Corporation | *Address | *City | *State | *ZIP | *Telephone Number

2. **5800 RIVERVIEW BLVD** | **N/A**
*Well Location - Address, Road Name or Number, City

3. **3047600006**
*Parcel ID No. (PIN) or Alternate Key (Circle One) | Lot | Block | Unit

4. **20** *Section or Land Grant | **34** *Township | **17** *Range | **MANATEE** *County | Subdivision | Check if 62-524: ___ Yes **X** No

5. **Daniel Peace** *Water Well Contractor | **9418** *License Number | **(941) 922-3526** *Telephone Number | **dpeace@ardaman.com** E-mail Address

6. **78 SARASOTA CENTER BLVD** *Water Well Contractor's Address | **SARASOTA** City | **FL** State | **34240** ZIP

7. *Type of Work: **X** Construction ___Repair ___Modification ___Abandonment *Reason for Repair, Modification, or Abandonment

8. *Number of Proposed Wells **1**

9. *Specify Intended Use(s) of Well(s):

___Domestic ___Landscape Irrigation ___Agricultural Irrigation ___Site Investigation
___Bottled Water Supply ___Recreation Area Irrigation ___Livestock **X** Monitoring
___Public Water Supply (Limited Use/DOH) ___Nursery Irrigation ___Test
___Public Water Supply (Community or Non-Community/DEP) ___Commercial/Industrial ___Earth-Coupled Geothermal
___Class I Injection ___Golf Course Irrigation ___HVAC Supply
Class V Injection: ___Recharge ___Commercial/Industrial Disposal ___Aquifer Storage and Recovery ___Drainage ___HVAC Return
Remediation: ___Recovery ___Air Sparge ___Other (Describe)
___Other (Describe) (Note: Not all types of wells are permitted by a given permitting authority)

Date Stamp
Received:
Sep 8, 2011 10:56 am
Official Use Only

10. *Distance from Septic System if ≤200 ft. 11. Facility Description **county park** 12. Estimated Start Date **09/08/2011**

13. *Estimated Well Depth **15** ft. *Estimated Casing Depth **5.0** ft. *Primary Casing Diameter **2** in. Open Hole: From ___ To ___ ft.

14. Estimated Screen Interval: From **5.0** To **15.0** ft.

15. *Primary Casing Material: ___Black Steel ___Galvanized **X** PVC ___Stainless Steel ___Not Cased ___Other:

16. Secondary Casing: ___Telescope Casing ___Liner ___Surface Casing Diameter ___ in.

17. Secondary Casing Material: ___Black Steel ___Galvanized ___PVC ___Stainless Steel ___Other

18. *Method of Construction, Repair, or Abandonment: **X** Auger ___Cable Tool ___Jetted ___Rotary ___Sonic
___Combination (Two or More Methods) ___Hand Driven (Well Point, Sand Point) ___Hydraulic Point (Direct Push)
___Horizontal Drilling ___Plugged by Approved Method ___Other (Describe)

19. Proposed Grouting Interval for the Primary, Secondary, and Additional Casing:
From **0.0** To **3.0** Seal Material (___Bentonite___Neat Cement **X** Other **Slurry Grout**)
From ___ To ___ Seal Material (___Bentonite___Neat Cement___Other___)
From ___ To ___ Seal Material (___Bentonite___Neat Cement___Other___)
From ___ To ___ Seal Material (___Bentonite___Neat Cement___Other___)

20. Indicate total number of existing wells on site **0** List number of existing unused wells on site **0**

21. *Is this well or any existing well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ___Yes **X** No If yes, complete the following: CUP/WUP No. ___ District Well ID No. ___

22. Latitude **27 30 33.79** Longitude **82 37 01.71**

23. Data Obtained From: ___GPS **X** Map ___Survey Datum: ___NAD 27 **X** NAD 83 ___WGS 84

I hereby certify that I will comply with the applicable rules of Title 40, Florida Administration Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided in this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after completion of the construction, repair, modification, or abandonment authorized by this permit, or the permit expiration, whichever occurs first.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of his responsibilities as stated above. Owner consents to allowing personnel of this WMD or Delegated Authority access to the well site during the construction, repair, modification, or abandonment authorized by this permit.

Digitally Signed *Signature of Contractor | **9418** *License No. | **Digitally Signed** *Signature of Owner or Agent | **10/20/2011** *Date

DO NOT WRITE BELOW THIS LINE - FOR OFFICIAL USE ONLY

Approval Granted By **Wes Ripperger** **STATUS: ISSUED** Issue Date **09/08/2011** Expiration Date **12/07/2011** Hydrologist Approval ___ Initials

Fee Received $**145.00** Receipt No. **10273** Check No. ___

THIS PERMIT IS NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD OR DELEGATED AUTHORITY. THE PERMIT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL CONSTRUCTION, REPAIR, MODIFICATION, OR ABANDONMENT ACTIVITIES.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

Comments:

General Site Map of Proposed Well Location

N

Well location is in Warners Bayou Park, which is along the north side of Riverview Blvd to the east of 59th St West

Identify known roads and landmarks. Give distances from all reference points or structures, septic systems, sanitary hazards, and contamination sources, if applicable.

STATE OF FLORIDA WELL COMPLETION REPORT

☒ Southwest
☐ Northwest
☐ St. Johns River
☐ South Florida
☐ Suwannee River
☐ DEP
☒ Delegated Authority (If Applicable) MANATEE

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

Date Stamp
Received:
Oct 17, 2011 12:55 pm
Official Use Only

1. *Permit Number 815485 *CUP/WUP Number _____ *DID Number _____ 62-524 Delineation No. _____

2. *Number of permitted wells constructed, repaired, or abandoned 1 *Number of permitted wells not constructed, repaired, or abandoned 0

3. *Owner's Name MANATEE COUNTY PARK (59TH ST BOAT RAMP) 4. *Completion Date 09/14/2011 5. Florida Unique ID _____

6. 5800 RIVERVIEW BLVD N/A
*Well Location - Address, Road Name or Number, City, ZIP

7. *County MANATEE *Section 20 Land Grant _____ *Township 34 *Range 17

8. Latitude 27 30 33.79 Longitude 82 37 01.71

9. Data Obtained From: ____GPS X Map ____Survey Datum: ____NAD 27 X NAD 83 ____WGS 84

10. *Type of Work: X Construction ____Repair ____Modification ____Abandonment

11. *Specify Intended Use(s) of Well(s):
____Domestic
____Bottled Water Supply
____Public Water Supply (Limited Use/DOH)
____Public Water Supply (Community or Non-Community/DEP)
____Class I Injection
____Landscape Irrigation
____Recreation Area Irrigation
____Agricultural Irrigation
____Livestock
____Nursery Irrigation
____Commercial/Industrial
____Golf Course Irrigation
____Site Investigation
X Monitoring
____Test
____Earth-Coupled Geothermal
____HVAC Supply
____HVAC Return
Class V Injection: ____Recharge ____Commercial/Industrial Disposal ____Aquifer Storage and Recovery ____Drainage
Remediation: ____Recovery ____Air Sparge ____Other (Describe) _____
____Other (Describe) _____

12. *Drill Method: X Auger ____Cable Tool ____Rotary ____Combination (Two or More Methods) ____Jetted ____Sonic
____Horizontal Drilling ____Hydraulic Point (Direct Push) ____Other _____

13. *Measured Static Water Level 2.7 ft. Measured Pumping Water Level _____ ft. After _____ Hours at _____ GPM

14. *Measuring Point (Describe) ground lev Which is 0 ft. X Above ____Below Land Surface *Flowing: ____Yes ____No

15. *Casing Material: ____Black Steel ____Galvanized X PVC ____Stainless Steel ____Not Cased ____Other _____

16. *Total Well Depth 13.1 ft. Cased Depth 3.1 ft. *Open Hole: From _____ To _____ ft. *Screen: From _____ To _____ ft. Slot Size _____

17. *Abandonment: ____Other (Explain) _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____

18. *Surface Casing Diameter and Depth:
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____

19. *Primary Casing Diameter and Depth:
Dia 2.00 in. From 0.00 ft. To 3.10 ft. No. of Bags 1.00 Seal Material (Check One): X Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____

20. *Liner Casing Diameter and Depth:
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____

21. *Telescope Casing Diameter and Depth:
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ____Neat Cement ____Bentonite ____Other ____

22. Pump Type (If Known):
____Centrifugal ____Jet ____Submersible ____Turbine
Horsepower _____ Pump Capacity (GPM) _____
Pump Depth _____ ft. Intake Depth _____ ft.

23. Chemical Analysis (When Required):
Iron _____ ppm Sulfate _____ ppm Chloride _____ ppm
____Laboratory Test ____Field Test Kit

24. Water Well Contractor:

*Contractor Name Daniel Peace *License Number 9418 E-mail Address dpeace@ardaman.com

*Contractor's Signature Digitally Signed
(I certify that the information provided in this report is accurate and true.)
*Driller's Name (Print or Type) Daniel Peace

FORM LEG-R.005.02 (06/10) Rule 40D-3.411 (1)(a), F.A.C. EFFECTIVE DATE: 9/12/2010

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From (ft.)	To (ft.)	Color	Grain Size (F, M, C)	Material
0.0	2.5	GRAY	FINE	SAND AND SHELL
2.5	5.0	BROWN	FINE	SAND AND SHELL
5.0	8.0	BROWN	FINE	SAND
8.0	13.0	GRAY	FINE	SAND

Comments:

***Detailed Site Map of Well Location**

N

Give distances from all reference points or structures, septic systems, sanitary hazards, and contamination sources within 500 ft. of well.

APPENDIX V

GROUNDWATER SAMPLING AND ANALYSIS FOR MW-1

Location 11-7333 Date 10.06.11

Project / Client Warner Bayou 59th Street Boat Ramp, Riverview Blvd. & 59th St. NW, Bradenton, Manatee Co.

In conjunction with the application for the Generic Permit for proposed dewatering activities, a monitor well was installed on-site 09.14.11.

Collected (1) grab groundwater sample from monitoring well, MW-1.

Sampling was conducted in general accordance with DEP-SOP-001/01.

See Field Calibration Log and Groundwater Sampling Log for details. All field instruments PASSED calibration acceptance criteria. (Quantitative bracketing of conductivity was not achieved. Field measurements were higher than available standard solutions on hand.)

Sampling was for analytes of concern as listed in Table 1 of the Generic Permit. Ultra trace metal protocol "Clean Hands, Dirty Hands" was used for sample collection of Mercury. Equipment blank was also collected for Mercury analysis.

Samples packed on wet ice for transport to Test America in Tampa for lab analysis.

Field work performed by Michael Eggleston and Phil Howe. Notes prepared by M. Eggleston.

Location Date

Project / Client

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants

FIELD CALIBRATION LOG

DEP-SOP-001/01, FT 1000 General Field Testing and Measurement

Project ID: Warner Bayou / 11-7333 Date: 10/06/11

FT 1100 pH	Initials	Date	Time	Standard SU	Exp. Date	Catalog #	Lot #	Reading SU	Pass or Fail
					Acceptance Criteria: +/- 0.2 standard pH units of buffer				
(CAL) ICV CCV			13:11	7.00	10/12	159812	0288-02	7.02	(P) F
(CAL) (ICV) CCV			13:13	4.00	09/12	159809	0257-04	4.01	(P) F
CAL ICV (CCV)			15:15	7.00				6.97	(P) F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F

FT 1200 Conductivity	Initials	Date	Time	Standard µS/cm	Exp. Date	Catalog #	Lot #	Reading µS/cm	Pass or Fail
					Acceptance Criteria: +/- 5% of standard value				
(CAL) (ICV) CCV			13:18	1409	08/12	LC18780-2	0236-08	1408	(P) F
CAL ICV (CCV)			15:05	1409	"			1444	(P) F
CAL ICV (CCV)			15:11	10000	08/12	LC18777-2	0221-15	10130	(P) F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F

FT 1500 DO	Initials	Date	Time	Bara. Pres. mBar	Readings			Saturation* mg/L	Pass or Fail
					mg/L	Temp °C	% DO		
					Acceptance Criteria: +/- 0.3 mg/L of theoretical value				
(CAL) (ICV) CCV	MA	10.6.11	13:16	1020	7.54	30.6	100.8	7.48	(P) F
CAL ICV (CCV)			15:02		6.93	34.7	99.2	6.98	(P) F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F

FT 1600 Turbidity	Initials	Date	Time	Standard NTU	Exp. Date	Catalog #	Lot #	Reading NTU	Pass or Fail
					Acceptance Criteria: +/- 10% ≤ 10 NTU; +/- 5% > 100 NTU				
(CAL) (ICV) CCV			13:20	1000	12/12	39845	10612	996.8	(P) F
(CAL) (ICV) CCV			13:20	10.0	12/12	39845	10613	9.99	(P) F
(CAL) (ICV) CCV			13:20	0.02	12/12	39845	10605	0.02	(P) F
CAL ICV (CCV)			15:06	10.0				10.04	(P) F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F
CAL ICV CCV									P F

CAL - Initial Calibration; **ICV** - Initial Calibration Verification; **CCV** - Continuing Calibration Verification

* Theoretical value; interpolated from Table FT 1500-1: Solubility of Oxygen in Water

Note: If calibration verification fails, report readings as estimated noted with a "J" data qualifier on the Groundwater Sampling Log.

Field Instrument Documentation		
Description	Manufacturer / Model #	Serial #
Portable pH/Temp. Meter	YSI EcoSense / pH100	JC03145
Portable Conductivity/Temp. Meter	YSI EcoSense / EC300	JC00834
Portable pH/Conductivity/Temp. Meter	Oakton / pH/CON 10 (35630-02)	166655
Portable DO/Temp. Meter	YSI EcoSense / DO200	JC05681
Portable Turbidimeter	HF Scientific / MicroTPW	201002170
Hygro./Therm./Baro./Dew Point Pen	Control Company / 4247	101883793

Comments:

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants

GROUNDWATER SAMPLING LOG

DEP-SOP-001/01, FS 2200 Groundwater Sampling

SITE NAME: Warner Bayou 59th St. Boat Ramp	SITE LOCATION: Riverview Blvd & 59th St NW, Bradenton	
WELL NO: MW-1	SAMPLE ID:	DATE: 10/06/11

PURGING DATA

WELL DIAMETER (inches): 2.0	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 8.7 feet to 18.7 feet	STATIC DEPTH TO WATER (feet): 5.48	PURGE PUMP TYPE OR BAILER: Master Flex Low Flow PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (19.2 feet – 5.48 feet) X 0.16 gallons/foot = 2.20 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 6.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 6.5	PURGING INITIATED AT: 13:02	PURGING ENDED AT: 13:58	TOTAL VOLUME PURGED (gallons): 8.0

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or (µS/cm)	DISSOLVED OXYGEN (circle units) (mg/L) or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
13:21	2.8	2.8	0.15	5.82	6.65	26.5	23,340	0.32	0.61	clear, pale yellow	Sulfur
13:38	2.2	5.0	0.15	5.82	6.61	27.0	23,710	0.28	0.60	Same	Same
13:44	1.0	6.0	0.15	5.83	6.65	26.9	23,860	0.21	0.27	Same	Same
13:51	1.0	7.0	0.14	5.83	6.67	26.9	23,900	0.18	0.14	Same	Same
13:58	1.0	8.0	0.14	5.85	6.67	26.9	23,910	0.18	0.20	Same	Same

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Michael Eggleston / Phil Hawe / AAI	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 14:00	SAMPLING ENDED AT: 14:30
PUMP OR TUBING DEPTH IN WELL (feet): 6.5	TUBING MATERIAL CODE: PE, S	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
	2	AG	1 L	4°C	N/A		625-Naphthalene		
	1	PE	250mL	HNO_3 + 4°C	Premeasured		200.7-Cd, Cu, Pb, Zn		
	1	PE	125mL	4°C	N/A		3500_CR_B-Cr(Hexavalent)		
	3	CG	40mL	HCl + 4°C	Premeasured		624_5mL-Benzene		
	3	AG	40mL	H_2SO_4 + 4°C	Premeasured		5310C - TOC		
	5	CG	40mL	4°C	N/A		1631E - Low Level Hg		

REMARKS: Equipment Blank collected for 1631E. "Clean Hands, Dirty Hands" used to collect for 1631E. Purge water reacted with equipment resulting in temporary black staining.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

TestAmerica Tampa
6712 Benjamin Road Suite 100
Tampa, FL 33634
Phone (813) 885-7427 Fax (813) 885-7049

COPY

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Michael Eggleston	Lab PM: Robertson, Nancy	Carrier Tracking No(s):	COC No: 660-37522-12220.1
Client Contact: Mr. Jerry Kuehn	Phone:	E-Mail: nancy.robertson@testamericainc.com		Page: Page 1 of 1
Company: Ardaman & Associates Inc.				Job #:

Address: 78 Sarasota Center Blvd	Due Date Requested: N/A
City: Sarasota	TAT Requested (days): STANDARD
State, Zip: FL, 34240	
Phone: 941-922-3526(Tel)	PO #: Purchase Order not requir
Email: JKuehn@ardaman.com	WO #:
Project Name: Warner Bayou / 11-7333	Project #: 66004542
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	5310C - Total Organic Carbon	200.7 - Cadmium, Copper, Lead, Zinc	624_5ml - Benzene	625 - Naphthalene	3500_CR_B - Chromium (hexavalent)	1631E - Low Level Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	D	A	N	N	N		
MW-1	10.06.11	14:00	G	Water	N		X	X	X	X	X	X	15	
TRIP BLANK	—	—	—	Water					X				2	
EQUIPMENT BLANK	10-06-11	14:36	G	Water	N							X	3	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date: 9/30/11	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
AAI	10-7-11 / 0805	AAI		10-7-11 0805	TA TPA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Bottle Order Information

Bottle Order: Warner Bayou
Bottle Order #: 12220
Date Order Posted: 9/30/2011 3:47:42PM
Order Status: Ready To Process
Prepared By: Nancy Robertson
Deliver By Date: ***10/3/2011 9:00:00AM***
Lab Project Number: 66004542

Order Completion Information

Filled by:
Sent Date:
Sent Via:
Tracking #:

Sets	Bottles/Set	Qty	Bottle Type Description	Preservative	Method	Matrix	Sample Type	Comments	Lot #
~~1~~	~~3~~	~~3~~	~~Voa Vial 40ml Amber - with Sulfuric Acid~~	~~Sulfuric Acid~~	~~5310C - Total Organic Carbon~~	~~Water~~	~~Normal~~		
1	1	1	Plastic 250ml - with Nitric Acid	Nitric Acid	200.7 - Cadmium, Copper, Lead, Zinc	Water	Normal		
1	3	3	Voa Vial 40ml - Hydrochloric Acid	Hydrochloric Acid	624_5ml - Benzene	Water	Normal		
1	2	2	Amber Glass 1 liter - unpreserved	None	625 - Naphthalene	Water	Normal		
1	1	1	Plastic 125mL - unpreserved	None	3500_CR_B - Chromium (hexavalent)	Water	Normal		
1	0	0	Voa Vial 40ml - unpreserved	None	1631E - Low Level Mercury	Water	Normal	Low Level Mercury kit	
1	2	2	Voa Vial 40ml - Hydrochloric Acid	Hydrochloric Acid	624_5ml - Benzene	Water	Trip Blank		

Notes to Field Staff:

Health and Safety Notes:

Preservative	Comment
Hydrochloric Acid	CAUTION! CONTAINS 1:1 HYDROCHLORIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Nitric Acid	CAUTION! STRONG OXIDIZER! CONTAINS 1:1 NITRIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Sulfuric Acid	CAUTION! CONTAINS 1:1 SULFURIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.

Relinquished By	Company	Date	Time	Received By	Company	Seal #:
						Seal #:
						Seal #:
Relinquished By	Company	Date	Time	Received By	Company	Seal #:
						Seal #:
						Seal #:

Please notify us immediately if an error is found in shipment

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Tampa
6712 Benjamin Road
Suite 100
Tampa, FL 33634
Tel: (813)885-7427

TestAmerica Job ID: 660-43968-1
Client Project/Site: Warner Bayou-11-7333

For:
Ardaman & Associates Inc.
78 Sarasota Center Blvd
Sarasota, Florida 34240

Attn: Mike Eggleston

Authorized for release by:
10/20/2011 12:00:51 PM

Nancy Robertson
Project Manager II
nancy.robertson@testamericainc.com

Table of Contents

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.
J1	Estimated value; value may not be accurate. Surrogate recovery outside of criteria.

Metals

Qualifier	Qualifier Description
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates the analyte was detected in both the sample and the associated method blank.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

General Chemistry

Qualifier	Qualifier Description
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Job ID: 660-43968-1

Laboratory: TestAmerica Tampa

Narrative

Job Narrative
660-43968-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
No analytical or quality issues were noted.

GC/MS Semi VOA
Method 625: Surrogate recovery for the following sample was outside control limits: MW-1 (660-43968-1). Evidence of matrix interference is present; therefore, re-extraction and re-analysis was not performed. The sample is flagged with J1.

No other analytical or quality issues were noted.

Metals
Method 1631E: The method blank for batch 141830 had an estimated result at the MDL.

Method 1631E: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 141830 were outside control limits. The associated laboratory control sample and duplicate (LCS/LCSD) recoveries met acceptance criteria.

Method 1631E: Routine preservation and digestion of samples analyzed by EPA 1631E consists of the addition of 0.6mL bromine monochloride (BrCl) solution. Additional BrCl and a dilution was required to ensure complete sample oxidation for the following sample: MW-1 (660-43968-1). An additional method digestion blank, with like amounts of BrCl, was prepared and analyzed with the samples. The mercury concentration in this additional method blank is less than the reporting limit.

No other analytical or quality issues were noted.

General Chemistry
Method SM 3500 CR B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries associated with batch 116165 could not be calculated due to matrix interference. (660-43968-1 MS), (660-43968-1 MSD). The sample is flagged with J3.

No other analytical or quality issues were noted.

Detection Summary

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Client Sample ID: MW-1 — Lab Sample ID: 660-43968-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	3.3	I	10	2.9	ug/L	1		200.7 Rev 4.4	Total Recovera
Total Organic Carbon	20		1.0	0.35	mg/L	1		5310 C	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 660-43968-2

No Detections

Client Sample ID: MW-1 Field Blank — Lab Sample ID: 660-43968-3

No Detections

Client Sample Results

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Client Sample ID: MW-1
Date Collected: 10/06/11 14:00
Date Received: 10/07/11 08:05

Lab Sample ID: 660-43968-1
Matrix: Water

Method: 624 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.50	ug/L			10/10/11 10:28	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*70 - 130*		*10/10/11 10:28*	*1*
Dibromofluoromethane	*99*		*70 - 130*		*10/10/11 10:28*	*1*
Toluene-d8 (Surr)	*95*		*70 - 130*		*10/10/11 10:28*	*1*

Method: 625 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.22	U	9.6	0.22	ug/L		10/10/11 13:27	10/12/11 17:29	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*51*		*34 - 130*	*10/10/11 13:27*	*10/12/11 17:29*	*1*
2-Fluorobiphenyl	*50*		*36 - 124*	*10/10/11 13:27*	*10/12/11 17:29*	*1*
Terphenyl-d14	*11*	*J1*	*14 - 148*	*10/10/11 13:27*	*10/12/11 17:29*	*1*

Method: 1631E - Mercury, Low Level (CVAFS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0010	U	0.0025	0.0010	ug/L		10/12/11 10:50	10/17/11 10:22	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	1.0	U	4.0	1.0	ug/L		10/07/11 11:08	10/10/11 10:39	1
Copper	3.3	I	10	2.9	ug/L		10/07/11 11:08	10/10/11 10:39	1
Lead	2.0	U	10	2.0	ug/L		10/07/11 11:08	10/10/11 10:39	1
Zinc	5.0	U	20	5.0	ug/L		10/07/11 11:08	10/10/11 10:39	1

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	20		1.0	0.35	mg/L			10/17/11 21:12	1
Chromium (hexavalent)	5.0	U J3	10	5.0	ug/L			10/07/11 13:00	1

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Client Sample ID: Trip Blank
Date Collected: 10/06/11 00:00
Date Received: 10/07/11 08:05

Lab Sample ID: 660-43968-2
Matrix: Water

Method: 624 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.50	ug/L			10/10/11 13:17	1

Surrogate	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*108*		*70 - 130*		*10/10/11 13:17*	*1*
Dibromofluoromethane	*104*		*70 - 130*		*10/10/11 13:17*	*1*
Toluene-d8 (Surr)	*96*		*70 - 130*		*10/10/11 13:17*	*1*

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Client Sample ID: MW-1 Field Blank
Date Collected: 10/06/11 14:36
Date Received: 10/07/11 08:05

Lab Sample ID: 660-43968-3
Matrix: Water

Method: 1631E - Mercury, Low Level (CVAFS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00020	U	0.00050	0.00020	ug/L		10/12/11 10:50	10/17/11 10:30	1

Surrogate Summary

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Method: 624 - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
660-43968-1	MW-1	103	99	95
660-43968-1 MS	MW-1	100	104	98
660-43968-2	Trip Blank	108	104	96
660-43987-A-1 DU	Duplicate	103	99	96
LCS 660-116097/3	Lab Control Sample	99	101	99
MB 660-116097/5	Method Blank	103	100	98

Surrogate Legend

BFB = 4-Bromofluorobenzene
DBFM = Dibromofluoromethane
TOL = Toluene-d8 (Surr)

Method: 625 - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		NBZ	FBP	TPH
Lab Sample ID	Client Sample ID	(34-130)	(36-124)	(14-148)
660-43901-D-2-B MS	Matrix Spike	67	60	31
660-43968-1	MW-1	51	50	11 J1
660-43968-1 DU	MW-1	65	60	14
LCS 660-116073/2-A	Lab Control Sample	55	54	62
MB 660-116073/1-A	Method Blank	63	61	66

Surrogate Legend

NBZ = Nitrobenzene-d5
FBP = 2-Fluorobiphenyl
TPH = Terphenyl-d14

Method: 624 - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 660-116097/5
Matrix: Water
Analysis Batch: 116097

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.50	ug/L			10/10/11 08:48	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*70 - 130*		*10/10/11 08:48*	*1*
Dibromofluoromethane	*100*		*70 - 130*		*10/10/11 08:48*	*1*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/10/11 08:48*	*1*

Lab Sample ID: LCS 660-116097/3
Matrix: Water
Analysis Batch: 116097

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Benzene	20.0	19.8		ug/L		99	37 - 151

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*99*		*70 - 130*
Dibromofluoromethane	*101*		*70 - 130*
Toluene-d8 (Surr)	*99*		*70 - 130*

Lab Sample ID: 660-43968-1 MS
Matrix: Water
Analysis Batch: 116097

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Benzene	0.50	U	20.0	20.9		ug/L		105	37 - 151

Surrogate	*MS % Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene	*100*		*70 - 130*
Dibromofluoromethane	*104*		*70 - 130*
Toluene-d8 (Surr)	*98*		*70 - 130*

Lab Sample ID: 660-43987-A-1 DU
Matrix: Water
Analysis Batch: 116097

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Benzene	0.50	U	0.50	U	ug/L		NC	31

Surrogate	*DU % Recovery*	*DU Qualifier*	*Limits*
4-Bromofluorobenzene	*103*		*70 - 130*
Dibromofluoromethane	*99*		*70 - 130*
Toluene-d8 (Surr)	*96*		*70 - 130*

Method: 625 - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 660-116073/1-A
Matrix: Water
Analysis Batch: 116226

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 116073

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.23	U	10	0.23	ug/L		10/10/11 13:27	10/12/11 14:29	1

Surrogate	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*63*		*34 - 130*	*10/10/11 13:27*	*10/12/11 14:29*	*1*
2-Fluorobiphenyl	*61*		*36 - 124*	*10/10/11 13:27*	*10/12/11 14:29*	*1*
Terphenyl-d14	*66*		*14 - 148*	*10/10/11 13:27*	*10/12/11 14:29*	*1*

Lab Sample ID: LCS 660-116073/2-A
Matrix: Water
Analysis Batch: 116226

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 116073

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Naphthalene	100	45.8		ug/L		46	21 - 133

Surrogate	*LCS % Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*55*		*34 - 130*
2-Fluorobiphenyl	*54*		*36 - 124*
Terphenyl-d14	*62*		*14 - 148*

Lab Sample ID: 660-43901-D-2-B MS
Matrix: Water
Analysis Batch: 116226

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 116073

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Naphthalene	0.23	U	99.0	57.0		ug/L		58	21 - 133

Surrogate	*MS % Recovery*	*MS Qualifier*	*Limits*
Nitrobenzene-d5	*67*		*34 - 130*
2-Fluorobiphenyl	*60*		*36 - 124*
Terphenyl-d14	*31*		*14 - 148*

Lab Sample ID: 660-43968-1 DU
Matrix: Water
Analysis Batch: 116226

Client Sample ID: MW-1
Prep Type: Total/NA
Prep Batch: 116073

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Naphthalene	0.22	U	0.22	U	ug/L		NC	36

Surrogate	*DU % Recovery*	*DU Qualifier*	*Limits*
Nitrobenzene-d5	*65*		*34 - 130*
2-Fluorobiphenyl	*60*		*36 - 124*
Terphenyl-d14	*14*		*14 - 148*

Method: 1631E - Mercury, Low Level (CVAFS)

Lab Sample ID: MB 400-141830/1-A
Matrix: Water
Analysis Batch: 141888

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 141830

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000252	I	0.00050	0.00020	ug/L		10/17/11 07:51	10/17/11 08:28	1

Lab Sample ID: LCS 400-141830/2-A
Matrix: Water
Analysis Batch: 141888

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 141830

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	0.00500	0.00475		ug/L		95	79 - 121

Lab Sample ID: LCSD 400-141830/3-A
Matrix: Water
Analysis Batch: 141888

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 141830

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Mercury	0.00500	0.00471		ug/L		94	79 - 121	1	20

Lab Sample ID: 400-59990-B-1-A MS
Matrix: Water
Analysis Batch: 141888

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 141830

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	0.0012	V J3	0.00500	0.00331	J3	ug/L		42	71 - 125

Lab Sample ID: 400-59990-C-1-A MSD
Matrix: Water
Analysis Batch: 141888

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 141830

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Mercury	0.0012	V J3	0.00500	0.00317	J3	ug/L		40	71 - 125	4	24

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 660-115993/1-A
Matrix: Water
Analysis Batch: 116068

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 115993

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	1.0	U	4.0	1.0	ug/L		10/07/11 11:08	10/10/11 09:59	1
Copper	2.9	U	10	2.9	ug/L		10/07/11 11:08	10/10/11 09:59	1
Lead	2.0	U	10	2.0	ug/L		10/07/11 11:08	10/10/11 09:59	1
Zinc	5.0	U	20	5.0	ug/L		10/07/11 11:08	10/10/11 09:59	1

Lab Sample ID: LCS 660-115993/2-A
Matrix: Water
Analysis Batch: 116068

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 115993

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Cadmium	1000	1010		ug/L		101	85 - 115
Copper	1000	1000		ug/L		100	85 - 115
Lead	1000	1040		ug/L		104	85 - 115
Zinc	1000	1030		ug/L		103	85 - 115

Lab Sample ID: 660-43882-D-2-B MS
Matrix: Water
Analysis Batch: 116068

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 115993

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Cadmium	1.0	U	1000	1020		ug/L		102	85 - 115
Copper	2.9	U	1000	1000		ug/L		100	85 - 115
Lead	2.0	U	1000	1040		ug/L		104	85 - 115
Zinc	5.0	U	1000	1030		ug/L		103	85 - 115

Lab Sample ID: 660-43882-D-2-C MSD
Matrix: Water
Analysis Batch: 116068

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 115993

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Cadmium	1.0	U	1000	1010		ug/L		101	85 - 115	1	20
Copper	2.9	U	1000	1000		ug/L		100	85 - 115	0	20
Lead	2.0	U	1000	1040		ug/L		104	85 - 115	1	20
Zinc	5.0	U	1000	1030		ug/L		103	85 - 115	1	20

Method: 5310 C - Total Organic Carbon - SM 20th Ed.

Lab Sample ID: MB 640-86098/6
Matrix: Water
Analysis Batch: 86098

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.35	U	1.0	0.35	mg/L			10/17/11 13:39	1

Lab Sample ID: LCS 640-86098/7
Matrix: Water
Analysis Batch: 86098

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	10.0	8.97		mg/L		90	80 - 120

Lab Sample ID: LCSD 640-86098/8
Matrix: Water
Analysis Batch: 86098

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Total Organic Carbon	10.0	9.07		mg/L		91	80 - 120	1	25

Lab Sample ID: 640-35589-F-1 MS
Matrix: Water
Analysis Batch: 86098

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	4.9		5.00	9.65		mg/L		96	80 - 120

Lab Sample ID: 640-35589-G-1 MSD
Matrix: Water
Analysis Batch: 86098

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Total Organic Carbon	4.9		5.00	9.47		mg/L		92	80 - 120	2	25

Method: 5310 C - Total Organic Carbon - SM 20th Ed. (Continued)

Lab Sample ID: 660-43968-1 DU
Matrix: Water
Analysis Batch: 86098

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	20		19.4		mg/L		1	25

Method: SM 3500 CR B - Chromium, Hexavalent

Lab Sample ID: MB 660-116165/3
Matrix: Water
Analysis Batch: 116165

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	5.0	U	10	5.0	ug/L			10/07/11 13:00	1

Lab Sample ID: LCS 660-116165/4
Matrix: Water
Analysis Batch: 116165

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Chromium (hexavalent)	20.0	19.0		ug/L		95	85 - 115

Lab Sample ID: 660-43968-1 MS
Matrix: Water
Analysis Batch: 116165

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	% Rec	% Rec. Limits
Chromium (hexavalent)	5.0	U J3	20.0	5.0	U J3	ug/L		0	85 - 115

Lab Sample ID: 660-43968-1 MSD
Matrix: Water
Analysis Batch: 116165

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Chromium (hexavalent)	5.0	U J3	20.0	5.0	U J3	ug/L		0	85 - 115	NC	20

QC Association Summary

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

GC/MS VOA

Analysis Batch: 116097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-43968-1	MW-1	Total/NA	Water	624	
660-43968-1 MS	MW-1	Total/NA	Water	624	
660-43968-2	Trip Blank	Total/NA	Water	624	
660-43987-A-1 DU	Duplicate	Total/NA	Water	624	
LCS 660-116097/3	Lab Control Sample	Total/NA	Water	624	
MB 660-116097/5	Method Blank	Total/NA	Water	624	

GC/MS Semi VOA

Prep Batch: 116073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-43901-D-2-B MS	Matrix Spike	Total/NA	Water	3520C	
660-43968-1	MW-1	Total/NA	Water	3520C	
660-43968-1 DU	MW-1	Total/NA	Water	3520C	
LCS 660-116073/2-A	Lab Control Sample	Total/NA	Water	3520C	
MB 660-116073/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 116226

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-43901-D-2-B MS	Matrix Spike	Total/NA	Water	625	116073
660-43968-1	MW-1	Total/NA	Water	625	116073
660-43968-1 DU	MW-1	Total/NA	Water	625	116073
LCS 660-116073/2-A	Lab Control Sample	Total/NA	Water	625	116073
MB 660-116073/1-A	Method Blank	Total/NA	Water	625	116073

Metals

Prep Batch: 115993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-43882-D-2-B MS	Matrix Spike	Total Recoverable	Water	200.7	
660-43882-D-2-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.7	
660-43968-1	MW-1	Total Recoverable	Water	200.7	
LCS 660-115993/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
MB 660-115993/1-A	Method Blank	Total Recoverable	Water	200.7	

Analysis Batch: 116068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-43882-D-2-B MS	Matrix Spike	Total Recoverable	Water	200.7 Rev 4.4	115993
660-43882-D-2-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	200.7 Rev 4.4	115993
660-43968-1	MW-1	Total Recoverable	Water	200.7 Rev 4.4	115993
LCS 660-115993/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	115993
MB 660-115993/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	115993

Prep Batch: 141830

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-59990-B-1-A MS	Matrix Spike	Total/NA	Water	1631E	
400-59990-C-1-A MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
660-43968-1	MW-1	Total/NA	Water	1631E	
660-43968-3	MW-1 Field Blank	Total/NA	Water	1631E	
LCS 400-141830/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-141830/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-141830/1-A	Method Blank	Total/NA	Water	1631E	

Metals (Continued)

Analysis Batch: 141888

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-59990-B-1-A MS	Matrix Spike	Total/NA	Water	1631E	141830
400-59990-C-1-A MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	141830
660-43968-1	MW-1	Total/NA	Water	1631E	141830
660-43968-3	MW-1 Field Blank	Total/NA	Water	1631E	141830
LCS 400-141830/2-A	Lab Control Sample	Total/NA	Water	1631E	141830
LCSD 400-141830/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	141830
MB 400-141830/1-A	Method Blank	Total/NA	Water	1631E	141830

General Chemistry

Analysis Batch: 86098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
640-35589-F-1 MS	Matrix Spike	Total/NA	Water	5310 C	
640-35589-G-1 MSD	Matrix Spike Duplicate	Total/NA	Water	5310 C	
660-43968-1	MW-1	Total/NA	Water	5310 C	
660-43968-1 DU	MW-1	Total/NA	Water	5310 C	
LCS 640-86098/7	Lab Control Sample	Total/NA	Water	5310 C	
LCSD 640-86098/8	Lab Control Sample Dup	Total/NA	Water	5310 C	
MB 640-86098/6	Method Blank	Total/NA	Water	5310 C	

Analysis Batch: 116165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-43968-1	MW-1	Total/NA	Water	SM 3500 CR B	
660-43968-1 MS	MW-1	Total/NA	Water	SM 3500 CR B	
660-43968-1 MSD	MW-1	Total/NA	Water	SM 3500 CR B	
LCS 660-116165/4	Lab Control Sample	Total/NA	Water	SM 3500 CR B	
MB 660-116165/3	Method Blank	Total/NA	Water	SM 3500 CR B	

Lab Chronicle

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Client Sample ID: MW-1

Lab Sample ID: 660-43968-1

Date Collected: 10/06/11 14:00
Matrix: Water
Date Received: 10/07/11 08:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	624		1	116097	10/10/11 10:28	EC	TAL TAM
Total/NA	Prep	3520C			116073	10/10/11 13:27	BK	TAL TAM
Total/NA	Analysis	625		1	116226	10/12/11 17:29	SCC	TAL TAM
Total/NA	Prep	1631E			141830	10/12/11 10:50	BG	TAL PEN
Total/NA	Analysis	1631E		1	141888	10/17/11 10:22	BG	TAL PEN
Total Recoverable	Prep	200.7			115993	10/07/11 11:08	SR	TAL TAM
Total Recoverable	Analysis	200.7 Rev 4.4		1	116068	10/10/11 10:39	GF	TAL TAM
Total/NA	Analysis	5310 C		1	86098	10/17/11 21:12	AJN	TAL TAL
Total/NA	Analysis	SM 3500 CR B		1	116165	10/07/11 13:00	TS	TAL TAM

Client Sample ID: Trip Blank

Lab Sample ID: 660-43968-2

Date Collected: 10/06/11 00:00
Matrix: Water
Date Received: 10/07/11 08:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Analysis	624		1	116097	10/10/11 13:17	EC	TAL TAM

Client Sample ID: MW-1 Field Blank

Lab Sample ID: 660-43968-3

Date Collected: 10/06/11 14:36
Matrix: Water
Date Received: 10/07/11 08:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			141830	10/12/11 10:50	BG	TAL PEN
Total/NA	Analysis	1631E		1	141888	10/17/11 10:30	BG	TAL PEN

Laboratory References:

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001
TAL TAL = TestAmerica Tallahassee, 2846 Industrial Plaza Drive, Tallahassee, FL 32301, TEL (850)878-3994
TAL TAM = TestAmerica Tampa, 6712 Benjamin Road, Suite 100, Tampa, FL 33634, TEL (813)885-7427

Certification Summary

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Tampa	Alabama	State Program	4	40610
TestAmerica Tampa	Florida	NELAC	4	E84282
TestAmerica Tampa	Georgia	State Program	4	905
TestAmerica Tampa	USDA	USDA		P330-11-00177
TestAmerica Pensacola	Alabama	State Program	4	40150
TestAmerica Pensacola	Arizona	State Program	9	AZ0710
TestAmerica Pensacola	Arkansas	State Program	6	88-0689
TestAmerica Pensacola	Florida	NELAC	4	E81010
TestAmerica Pensacola	Georgia	Georgia EPD	4	N/A
TestAmerica Pensacola	Illinois	NELAC	5	200041
TestAmerica Pensacola	Iowa	State Program	7	367
TestAmerica Pensacola	Kansas	NELAC	7	E-10253
TestAmerica Pensacola	Kentucky	Kentucky UST	4	53
TestAmerica Pensacola	Louisiana	NELAC	6	30976
TestAmerica Pensacola	Maryland	State Program	3	233
TestAmerica Pensacola	Massachusetts	State Program	1	M-FL094
TestAmerica Pensacola	Michigan	State Program	5	9912
TestAmerica Pensacola	New Hampshire	NELAC	1	2505
TestAmerica Pensacola	New Jersey	NELAC	2	FL006
TestAmerica Pensacola	North Carolina	North Carolina DENR	4	314
TestAmerica Pensacola	Oklahoma	State Program	6	9810
TestAmerica Pensacola	Pennsylvania	NELAC	3	68-00467
TestAmerica Pensacola	Rhode Island	State Program	1	LAO00307
TestAmerica Pensacola	South Carolina	State Program	4	96026
TestAmerica Pensacola	Tennessee	State Program	4	TN02907
TestAmerica Pensacola	Texas	NELAC	6	T104704286-11-3
TestAmerica Pensacola	USDA	USDA		P330-10-00407
TestAmerica Pensacola	Virginia	NELAC	3	918
TestAmerica Pensacola	Washington	State Program	10	C915
TestAmerica Pensacola	West Virginia	West Virginia DEP	3	136
TestAmerica Tallahassee	Florida	NELAC	4	E81005
TestAmerica Tallahassee	Louisiana	NELAC	6	30663
TestAmerica Tallahassee	New Jersey	NELAC	2	FL012
TestAmerica Tallahassee	Oklahoma	State Program	6	9986
TestAmerica Tallahassee	Texas	NELAC	6	T104704459-11-2
TestAmerica Tallahassee	USDA	USDA		P330-08-00158

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Method	Method Description	Protocol	Laboratory
624	Volatile Organic Compounds (GC/MS)	40CFR136A	TAL TAM
625	Semivolatile Organic Compounds (GC/MS)	40CFR136A	TAL TAM
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN
200.7 Rev 4.4	Metals (ICP)	EPA	TAL TAM
5310 C	Total Organic Carbon - SM 20th Ed.	SM20	TAL TAL
SM 3500 CR B	Chromium, Hexavalent	SM	TAL TAM

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
EPA = US Environmental Protection Agency
SM = "Standard Methods For The Examination Of Water And Wastewater",
SM20 = "Standard Methods For The Examination Of Water And Wastewater", 20th Edition."

Laboratory References:

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001
TAL TAL = TestAmerica Tallahassee, 2846 Industrial Plaza Drive, Tallahassee, FL 32301, TEL (850)878-3994
TAL TAM = TestAmerica Tampa, 6712 Benjamin Road, Suite 100, Tampa, FL 33634, TEL (813)885-7427

Sample Summary

Client: Ardaman & Associates Inc.
Project/Site: Warner Bayou-11-7333

TestAmerica Job ID: 660-43968-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-43968-1	MW-1	Water	10/06/11 14:00	10/07/11 08:05
660-43968-2	Trip Blank	Water	10/06/11 00:00	10/07/11 08:05
660-43968-3	MW-1 Field Blank	Water	10/06/11 14:36	10/07/11 08:05

TestAmerica Tampa
6712 Benjamin Road Suite 100
Tampa, FL 33634
Phone (813) 885-7427 Fax (813) 885-7049

660-43968

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

10/20/2011

Client Information	Sampler: Michael Eggleston	Lab PM: Robertson, Nancy	Carrier Tracking No(s):	COC No: 660-37522-12220.1
Client Contact: Mr. Jerry Kuehn	Phone:	E-Mail: nancy.robertson@testamericainc.com		Page: Page 1 of 1
Company: Ardaman & Associates Inc.				Job #:
Address: 78 Sarasota Center Blvd	Due Date Requested: N/A			
City: Sarasota	TAT Requested (days): STANDARD			
State, Zip: FL, 34240				
Phone: 941-922-3526(Tel)	PO #: Purchase Order not requir			
Email: JKuehn@ardaman.com	WO #:			
Project Name: Warner Bayou / 11-7333	Project #: 66004542			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	5310C - Total Organic Carbon	200.7 - Cadmium, Copper, Lead, Zinc	624_5ml - Benzene	625 - Naphthalene	3500_CR_B - Chromium (hexavalent)	1631E - Low Level Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	D	A	N	N	N		
MW-1	10.06.11	14:00	G	Water	N		X	X	X	X	X	X	15	
TRIP BLANK	—	—	—	Water					X				2	
EQUIPMENT BLANK	10-06-11	14:36	G	Water	N							X	3	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date: 9/30/11	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Michael Eggleston AAI	10-7-11 / 0805	AAI		10-7-11 0805	TA TPA

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.7-C CW07

Login Sample Receipt Checklist

Client: Ardaman & Associates Inc.

Job Number: 660-43968-1

Login Number: 43968
List Number: 1
Creator: Redding, Charles S

List Source: TestAmerica Tampa

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	3.7 degrees C Cu-07
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Login Sample Receipt Checklist

Client: Ardaman & Associates Inc.

Job Number: 660-43968-1

Login Number: 43968
List Number: 1
Creator: Chea, Vanda

List Source: TestAmerica Pensacola
List Creation: 10/12/11 09:13 AM

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Login Sample Receipt Checklist

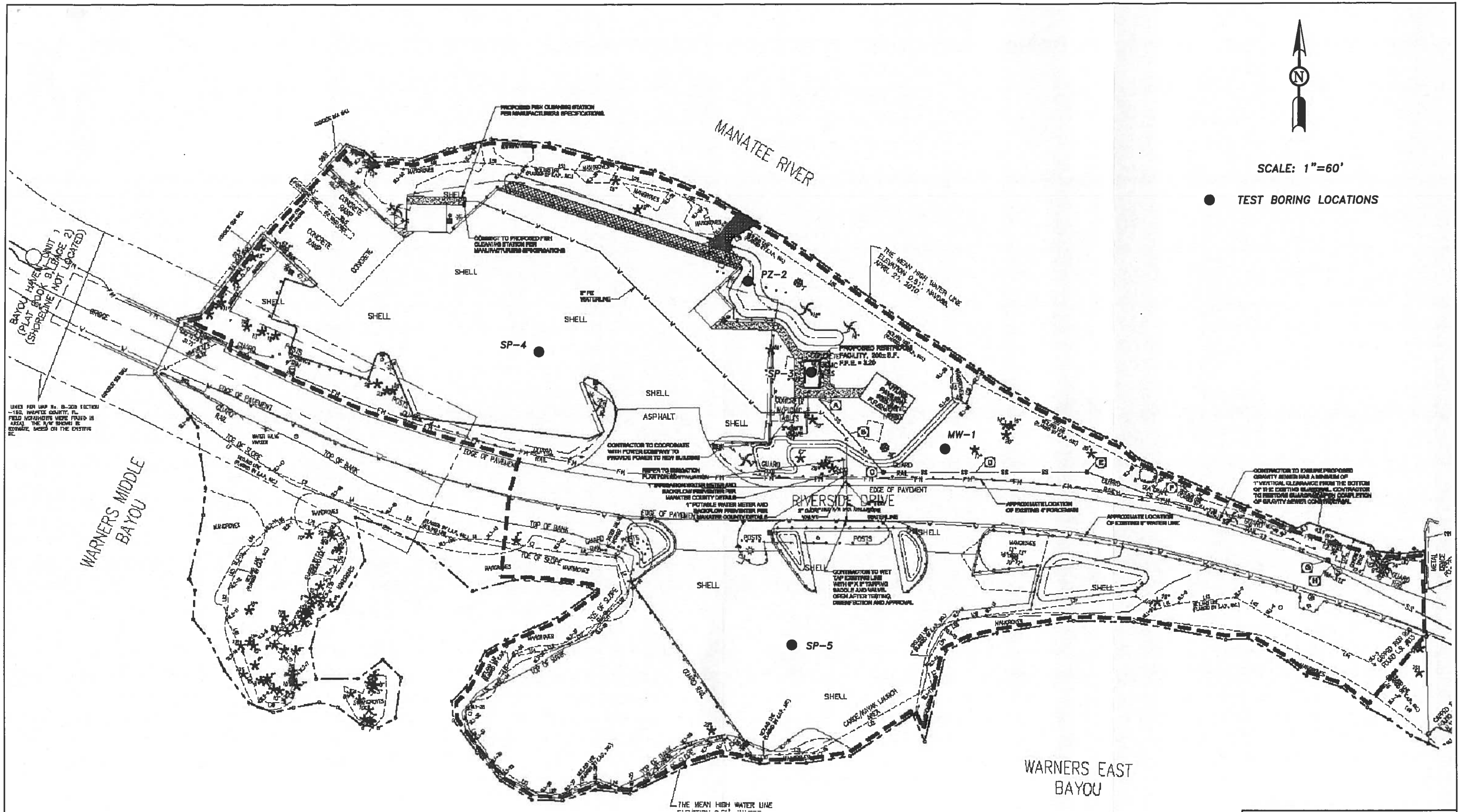
Client: Ardaman & Associates Inc.

Job Number: 660-43968-1

Login Number: 43968
List Number: 1
Creator: Mitchell, Travis X

List Source: TestAmerica Tallahassee
List Creation: 10/11/11 10:37 AM

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	



Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

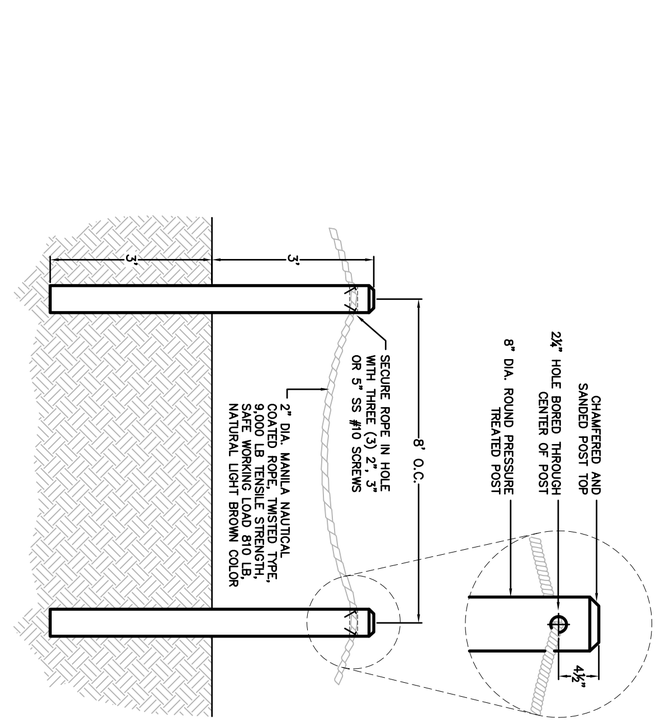
Test Locations

Warner Bayou 59th St. Boat Ramp

Manatee County, Florida

DRAWN BY: KGS	CHECKED BY:	DATE: 9/14/11
FILE NO. 11-7333	APPROVED BY:	FIGURE: 1

Base PDF Image By: CPH



POST AND ROPE DETAIL
N.T.S.

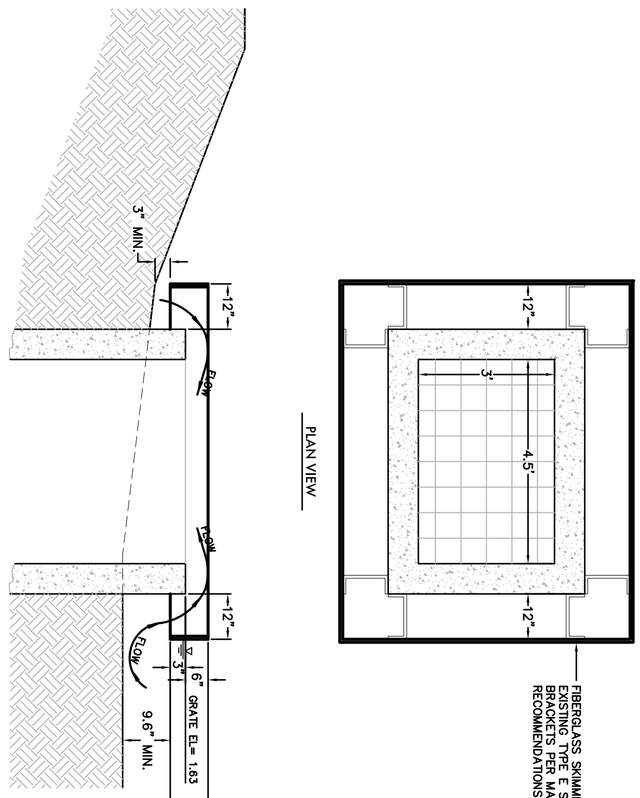
6" THICK CONCRETE PAVEMENT – 4,000 PSI CONCRETE WITH MICRO SYNTHETIC FIBER REINFORCEMENT (MINIMUM 1.5 LBS PER CUBIC YARD OF CONCRETE) WASHED SHELL AGGREGATE (OR OTHER AVERAGE SIZE) SHALL BE BROADCAST ONTO FRESH CONCRETE TO ENSURE SLAG OR STRAIGHT CEMENT IS USED IN THE MIX INSTEAD OF USING FLY ASH. CONTRACTOR TO PROVIDE 5' X 5' TEST POUR FOR COUNTY AND ENGINEER OF RECORD REVIEW AND APPROVAL PRIOR TO INSTALLATION OF CONCRETE PARKING LOT. SEVERAL OF THE TEST POURS MAY BE NECESSARY TO ACHIEVE THE DESIRED RESULT. THE COST OF THE TEST POURS AND CEMENT FINISHING SHALL BE INCLUDED IN THE BASE BID. SEE NOTE #1.

6" THICK SUB-BASE – IN STU OR BORROW MATERIAL CONSISTING OF FREE SPANNING MATERIAL LESS THAN A NO. 200 SIEVE, PLASTICITY INDEX NOT TO EXCEED 20 AND A MINIMUM LBR OF 40, COMPACTED TO AT LEAST 98% OF MODIFIED PROCTOR MAXIMUM DENSITY (AASHTO T-180).

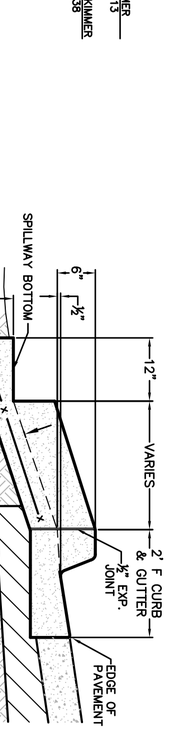
CONCRETE PAVEMENT DETAIL
N.T.S.

NOTES:

1. CONTROL JOINTS SHALL BE CUT AS SOON AS INITIAL SET OCCURS (NO LATER THAN THE FOLLOWING MORNING) AND SHALL BE PLACED IN AN APPROXIMATELY SQUARE PATTERN AND LIMITED TO AN AREA OF ABOUT 144 S.F. KEEP THE CONCRETE WET TO REDUCE SHRINKAGE. CONTRACTOR SHALL APPLY SEALANT AT ALL JOINTS.
2. CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS USED TO INSTALL BROADCAST SHELL CONCRETE. A SUGGESTED MEANS AND METHOD IS TO SEED THE APPROVED SHELL AGGREGATE ON THE SLAB SURFACE IMMEDIATELY AFTER THE CONCRETE AND BEEN PLACED AND BULL FLOATED. AGGREGATE TO BE PLACED UNIFORMLY ON TO THE SURFACE AND EMBEDDED WITH A BULL FLOAT UNTIL COMPLETED COVERED BY A THIN LAYER OF CONCRETE. CONTRACTOR TO HOSE DOWN THE CONCRETE UNTIL THE TOP OF THE DECORATIVE SHELL IS REVEALED.



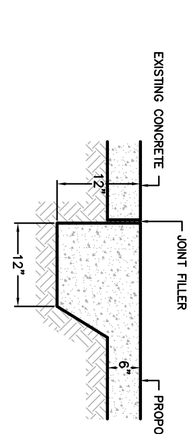
DEBRIS SKIMMER DETAIL
N.T.S.



TYPE "F" BARRIER CURB & GUTTER

A) CLASS 1 CONCRETE 3,000 P.S.I. AT 28 DAYS.
B) CURB AND GUTTER SHALL MEET THE SPECIFICATIONS ESTABLISHED BY FLORIDA D.O.T. STANDARD SPECIFICATIONS, PER F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 300, LATEST REVISION.

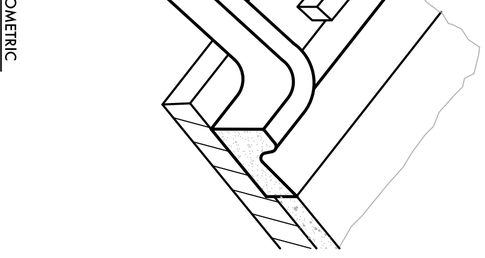
MANATEE COUNTY TRANSPORTATION DEPARTMENT	TYPE F CURB & GUTTER	201.2
REV.BY / DATE		
6/12/07 DATE OF B.O.C.C. APPROVAL		



ISOLATION JOINT
N.T.S.

NOTES:

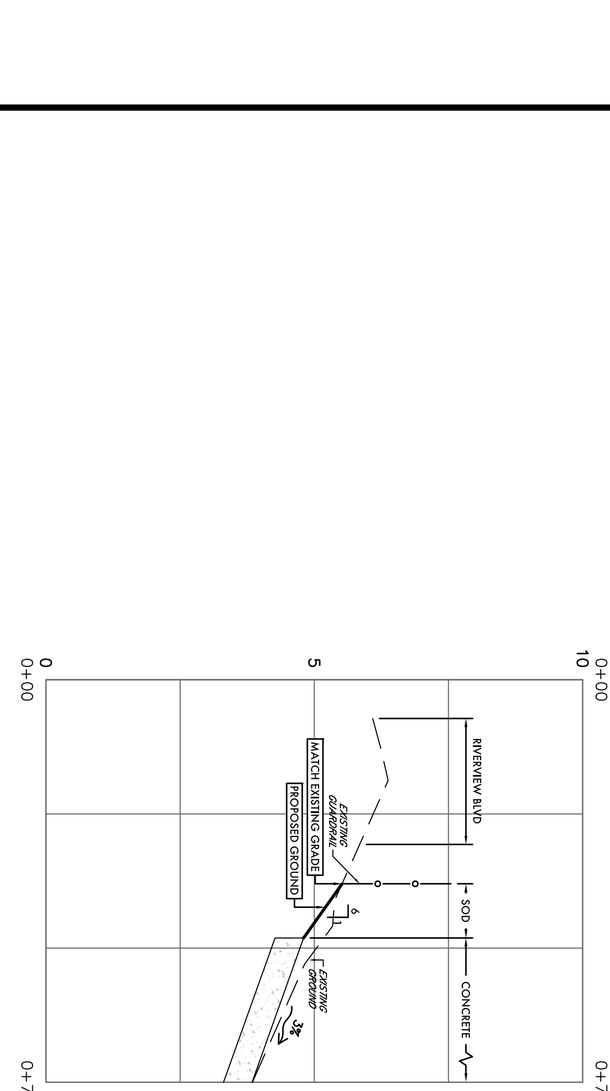
1. ISOLATION JOINTS WITH PREFORMED JOINT FILLER PER FDOT INDEX 932-1.1 IS REQUIRED WHERE NEW CONCRETE ABUTS EXISTING CONCRETE SLAB. A 1" THICK THICKENED EDGE SHALL BE INSTALLED AT ISOLATION JOINTS OR WHERE NEW CONCRETE ABUTS EXISTING CONCRETE SLAB.



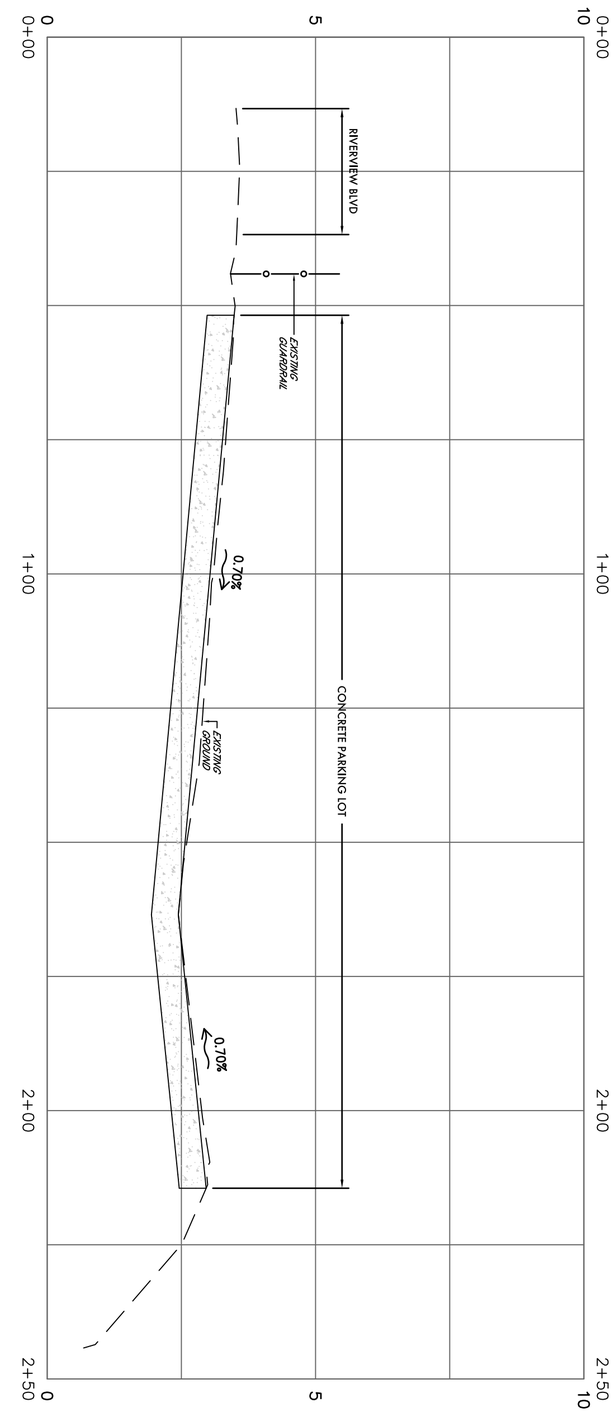
ISOMETRIC

SECTION

TYPE "F" CURB CONCRETE SPILLWAY DETAIL
N.T.S.



SECTION A–A
SCALE: H: 1"=20' V: 1"=2'



SECTION B–B
SCALE: H: 1"=20' V: 1"=2'

SECTION C–C
SCALE: H: 1"=20' V: 1"=2'

ELEVATION

DESIGNED	N. KRAGT
DRAWN	M. CONLEY
DATE	2/17/15
JOB NO.	43692
SCALE	AS NOTED
SHEET	5

CROSS-SECTIONS AND DETAILS

FOR:

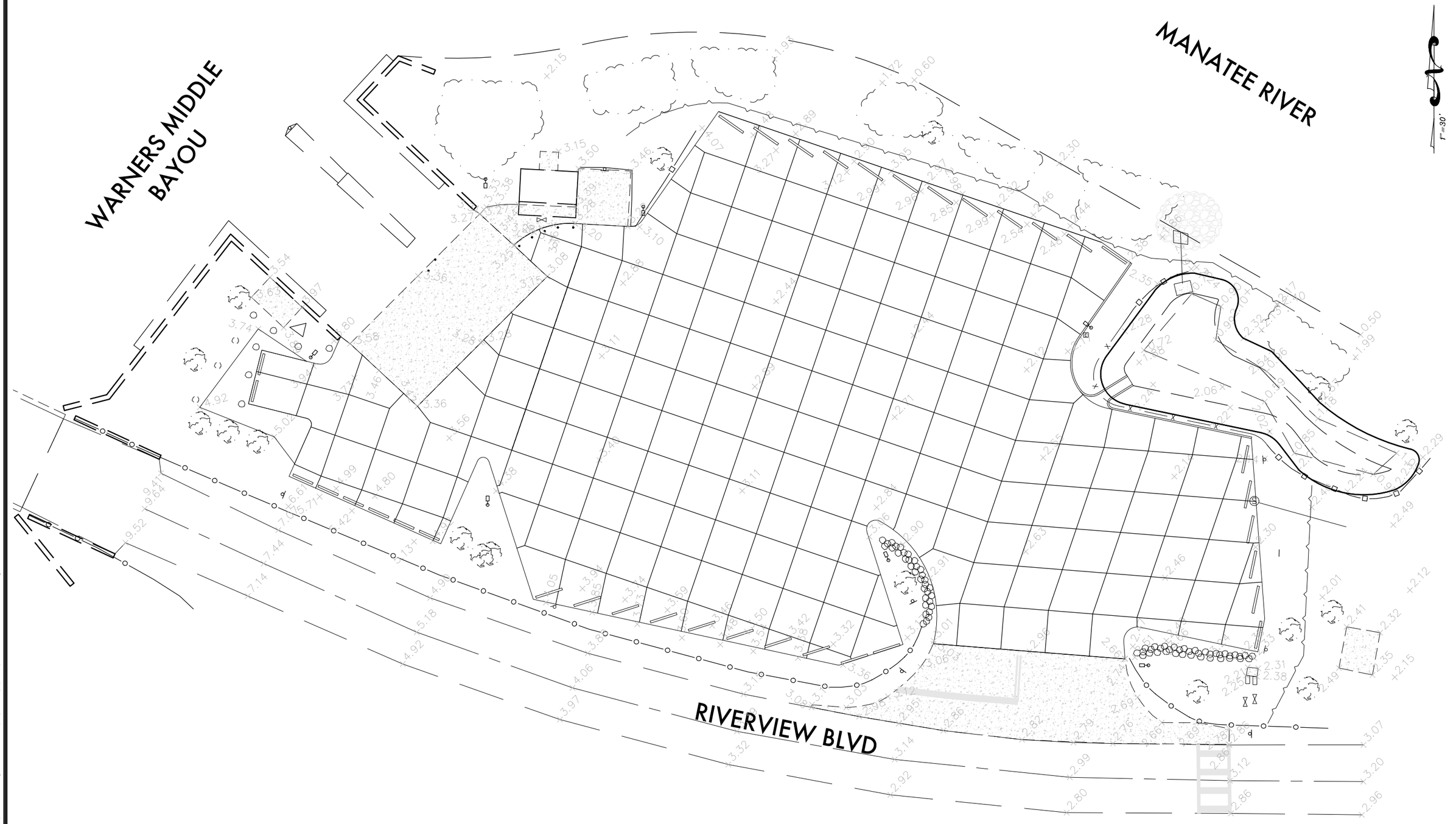
WARNER'S BAYOU BOAT RAMP

LOCATED IN:
SECTION 20, TOWNSHIP 34 SOUTH, RANGE 17 EAST
CITY OF BRADENTON, FLORIDA

REVISIONS
1 ADDENDUM #1
2
3
4
5
6
7

ZNS|ENGINEERING
ENGINEERS | PLANNERS | SURVEYORS
CA 0027476 LB 0006982
LANDSCAPE ARCHITECTS
LC 0000365
201 5th AVENUE DRIVE EAST BRADENTON, FL 34208
E-MAIL: ZNS@ZNSENG.COM | TELEPHONE: 941.748.8080 | FAX: 941.748.3316

NATHAN J. KRAGT
PROFESSIONAL ENGINEER #69272
SIGNATURE



DESIGNED N. KRAGT
DRAWN MLC
DATE 10/2/2014
JOB NO. 43692
SCALE 1"=30'

REVISIONS
1
2
3
4
5
6

ZNS ENGINEERING
ENGINEERS | PLANNERS | SURVEYORS
EB 0027476 LB 0006982
LANDSCAPE ARCHITECTS | ENVIRONMENTAL CONSULTANTS
LC 0000365
201 5th AVENUE DRIVE EAST BRADENTON, FL 34208
E-MAIL: ZNS@ZNSENG.COM | TELEPHONE 941.748.8080 | FAX 941.748.3316

JOINT SPACING EXHIBIT

FOR:

WARNER'S BAYOU BOAT RAMP

LOCATED IN:
SECTION 20, TOWNSHIP 34 SOUTH, RANGE 17 EAST
MANATEE COUNTY, FLORIDA

NATHAN J. KRAGT
PROFESSIONAL ENGINEER #69272

SIGNATURE

SHEET 1

Fri, 06 Feb 2015 – 9:35am X:\Acad\Warner's Bayou Boat Ramp (43692)\ENG\WBBR EB FCPA JOINT.dwg