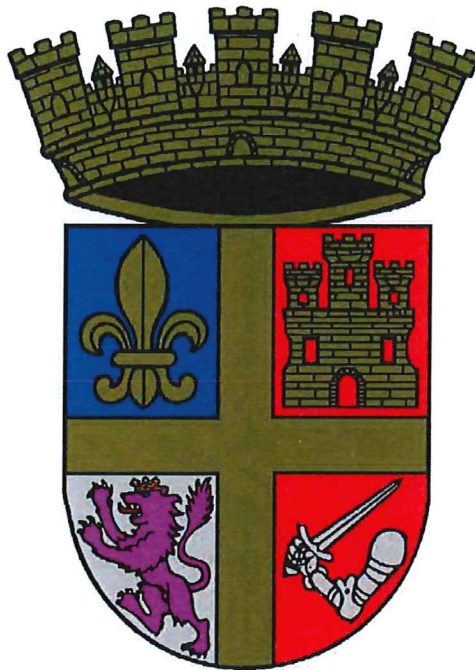


ATTACHMENT A

CITY OF ST. AUGUSTINE STORMWATER VAULT INSPECTION, CLEANING & MAINTENANCE REPORT



REQUEST FOR BID

ISSUED: 2015

PREPARED BY:
PUBLIC WORKS DEPARTMENT
P.O. BOX 210, ST. AUGUSTINE, FL 32085
(904) 825-1040

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City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance

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 - CONTECH Vortech Units
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SCOPE OF SERVICES



City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance

Purpose

Solicit bids from qualified vendors to provide inspection, reporting, cleaning and maintenance services including but not limited to using a Vacuum Truck for collection, removal, transport and disposal of all materials generated during the cleaning of stormwater vaults located throughout the City. These services are in support of the City's National Pollutant Discharge Elimination System (NPDES) Permit and the City's Drainage Structure Inspection and Maintenance Program. The stormwater vaults are utilized to reduce pollutant and sediment loadings to surrounding water bodies; therefore, it is important to document the quantity of sediment and debris removed from each structure. The responsibility of completing the requested services lies with the City's selected vendor. The services cover one year in which each stormwater vault shall be inspected and cleaned on a quarterly basis. At a minimum, at the end of each quarter, the vendor shall provide copies of the inspection forms and invoice to the City's Engineering Division for review, record keeping and payment.

Definitions

- a. Backflow Valve – A device installed between a stormwater vault and outfall to prevent the tidal receiving waterbody from influencing the stormwater vault and collection system.
- b. Confined Space – a space that has limited openings for entry or exit, is large enough for entering and working, and is not designed for continuous worker occupancy. Confined spaces include underground vaults, tanks, storage bins, manholes, pits, silos, underground utility vaults and pipelines.
- c. Debris – sand, silt or other sediment. Debris can also include floatable like materials such as leaves, trees, plastics, cardboard, cans and other solid materials (see Floatable Debris).
- d. Debris Management Site (DMS) – A location where debris is processed, reduced in volume and/or disposed of.
- e. Debris Removal – Picking up the debris with the use of a vacuum truck and taking it to a location for drying/decanting or disposal.
- f. Debris Monitoring – The documentation and reposting of eligible quantities during debris removal activities to ensure that the work complies with the contract scope of services.
- g. Dewatering – The act of pumping water out of a stormwater vault in order to inspect and clean the structure.
- h. Floating Debris – Materials such as plastic jugs, balls, cans, cigarettes, cardboard boxes, leaves and tree limbs and other miscellaneous items that float on the water and are carried into the screen cage or skimmer of the stormwater vault.
- i. Illicit Discharge – The discharge of water pumped from a stormwater vault during dewatering to a receiving waterbody.
- j. Plug – Inflatable, mechanical or non-pressure plug used to isolate a stormwater vault from the stormwater collection system and outfall in order to dewater the structure.

**SCOPE
OF
SERVICES**



**City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance**

- k. Stormwater Vault – An underground structure designed to capture sediment, debris and in some cases nutrients via baffles, cages, filters or hydrodynamic forces from stormwater prior to discharging to an adjacent waterbody.
- l. Tipping Fee – A fee based on weight or volume of debris dumped that is charged by landfills or other waste management facilities to cover their operating and maintenance costs. The fee may also include amounts to cover the cost of closing the current facility and/or opening a new facility.

General Requirements

- a. The vendor acknowledges that time is of the essence and agrees to complete the services as specified. The vendor agrees that all work shall be prosecuted regularly, diligently, and uninterrupted at such a rate to ensure full completion within the time specified.
- b. Vendor must have current City, St. Johns County and State licenses and certification to perform necessary work. License numbers shall be provided within five (5) days notification after bid opening as part of the pre-qualification documents.
- c. If during the course of the work, the vendor encounters unforeseen conditions which impact the scheduled work and which could not be initially evaluated, the vendor shall not proceed without written authorization from the City designee.
- d. The cost of labor shall include all fees necessary in order to complete the work in a manner that is safe and that meets all state and federal regulations for work of this nature, including confine entry space and traffic control.
- e. The bid fees shall include travel, entry, cleaning, pumping, hauling, disposal, stockpiling, tipping fees, direct labor, miscellaneous tools and equipment, site restoration, overhead and total profit.
- f. Vendor shall not invoice the City for any travel or fuel surcharges.
- g. Invoices shall be broken down by date of service, description of service, job classification of Vendor's employee on job, hours worked, amount of material collected, start and end time, and any discounts offered. Invoice must also include the inspection form for the vault and name of the City Inspector or Engineer who verified the hours worked by the vendor.
- h. When possible maintenance shall be performed from the ground surface. Any person performing maintenance activities must have OSHA 24 Hour Hazardous Waste Worker Training. If entering a stormwater vault the individual involved in entering the vault shall be trained in OSHA confined spaces and have required permit. The vendor shall provide the permit-required confined spaces at time of pre-qualification.
- i. The bid shall consider the frequency of cleaning.
- j. Each stormwater vault shall be cleaned quarterly four (4) times a year.
- k. The City currently has thirteen (13) stormwater vaults in service.
- l. The vendor shall submit a proposed cleaning sequence and schedule for the year.

SCOPE OF SERVICES



City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance

-
- m. At a minimum, cleaning shall consist of isolating the stormwater vault from the upstream stormwater collection system and downstream outfall via plug(s) or existing backflow valve, pumping the water within the vault back into the isolated upstream stormwater collection system so that no pumped water discharges directly to the receiving waterbody, entry if necessary, pressure cleaning of the interior to allow thorough vacuuming of the debris, vacuuming of debris within vault, removing any blockage that will affect stormwater flow, filling out the inspection form, taking photographs and documenting the debris removed. See Appendices for specific vault details, cleaning instructions and locations.
 - n. The cycle frequency for cleaning the stormwater vaults, if the contract is extended, may be decreased to two or three times a year as determined by the accumulation of sediment and debris found in year one. At the time of contract extension the City will make the frequency determination.
 - o. Stormwater vault locations and descriptions are provided in the Appendices.
 - p. During the cleaning the vendor shall visually inspect the condition of the stormwater vault including components and document the condition of the structure. The City shall be responsible to verify the condition and repair or replace structures or components as necessary.
 - q. The vendor shall be responsible for flow diversion or prevention to temporarily stop stormwater from entering the vaults during cleaning. Flow diversion or prevention shall be included in the fee.
 - r. Traffic control, pedestrian safety or other safety measures necessary must be in place prior to start of work and shall be included as part of the fee.
 - s. The vendor is responsible for obtaining a temporary meter and backflow assembly if needed to clean the vaults. Water usage cost shall be part of the fee.
 - t. The vendor shall be responsible during the cleaning, not to discharge the decanting water into the receiving waterbody.

Debris Measuring & Inspection Reporting

General Information

Structure I.D.: Identity of structure referenced in the City's GIS Geodatabase and the most recent Storm Vault Locations Map.

Make: Manufacturer.

Model: Specific type of stormwater vault made by the Manufacturer.

Receiving Waterbody: Name of the waterbody that the storm sewer system outfalls.

Quarterly Rainfall (in): Total amount of rainfall since the previous inspection. Data is provided by the City's WWTP.

Weather: Description of weather at the time the inspection is conducted.

Date: Month, day and year the inspection is conducted.

Time: Recorded time of inspection.

SCOPE OF SERVICES



City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance

Inspector(s): Name(s) of all vendor employees present.

Temperature: Average temperature of the day of the inspection.

Physical Observations

Recording the physical observations will be the responsibility of the vendor and shall be completed to the best of their abilities. At a minimum all of the parameters listed under the physical observations shall be recorded by circling all of the applicable features listed next to the parameter. If there is an existing feature not represented on the inspection form the vendor shall describe the feature with the space provided at the end of the physical observations section. Note that the physical observations recorded should be an indicator of the maintenance performed.

Recording the depth of debris/sediment in the stormwater vault shall be based on an average depth where measurements are taken near the four (4) corners of a rectangular vault or by quadrants of circular vaults. The average depth shall be recorded for each chamber in the vault.

Maintenance Performed

The maintenance performed at the time of the inspection shall be one of the following:

- Minimum – lifting the access covers for visual inspection of the structure; or
- Vacuumed – vacuum the structure to remove debris, sediment, etc...

If a repair is required the vendor shall write a brief description of the structure's deficiency so that a service/work order can be generated by the City.

Sediment/Debris Removed

The vendor must record the weight and volume of the sediment/debris removed from each structure.

Additional Comments / Notes

The vendor shall add any information not recorded or represented in the previous sections of the inspection form that is pertinent to the overall maintenance and function of the storm sewer system.

Data Entry By

To be completed by City personnel.

SCOPE OF SERVICES



**City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance**

Licenses, Permits and Equipment

- a. It shall be the responsibility of the vendor to obtain at no additional cost to the City any and all licenses and permits required to complete this service.
- b. The vendor shall be responsible for hauling and properly disposing all material removed in accordance with all local, County, State and Federal regulations.
- c. The vendor shall provide all tools, vehicles and equipment necessary to complete the work in a safe and timely manner.
- d. The vendor shall be responsible to obtain a weight ticket at the disposal facility or to provide the weight of the material being disposed for City reporting.
- e. The vendor shall have a sufficient number of Vacuum Trucks to ensure the work is completed in a timely manner.
- f. A list of all the equipment (including VIN numbers and Florida tag numbers) is required to be provided prior to commencement of the contract.
- g. All equipment used for the performance of this contract shall be properly maintained to protect the operators and the public. Equipment is subject to inspection by the City at any time. Any equipment deemed inoperable, unsafe or improper for the intended use under this contract will be removed from use at the vendor's expense. No equipment maintenance or repairs shall be conducted on City property or time.

Safety

- a. The vendor shall provide all traffic control including barricades, cones, signage, etc. per the current edition of the Manual on Uniform Traffic Control Devices (MUTCD).
- b. The vendor shall at all-time guard against damage or loss to City property and shall be held responsible for replacing or repairing such loss or damage.
- c. The vendor shall be responsible for all aspects of safety including confined entry space and traffic control if necessary.
- d. The vendor shall at all-times guard against injury to City employees. The vendor shall be solely responsible for initiating, maintaining and supervising all safety precautions and shall provide the necessary protection to prevent injury to all employees on the work site and other persons including, but not limited to, the general public.
- e. The vendor shall submit a safety plan including site specific traffic control plans to the City for review and approval prior to commencement of work.

Debris Disposal

- a. The vendor shall dispose debris removed from the vaults at a roll off provided at the City's Waste Water Treatment Plant located at 501 Iberia Street. If the debris is deemed unsuitable for disposal at the City's site then the vendor shall dispose of the material at a proper facility and submit weight tickets along with transport cost for reimbursement.

**SCOPE
OF
SERVICES**

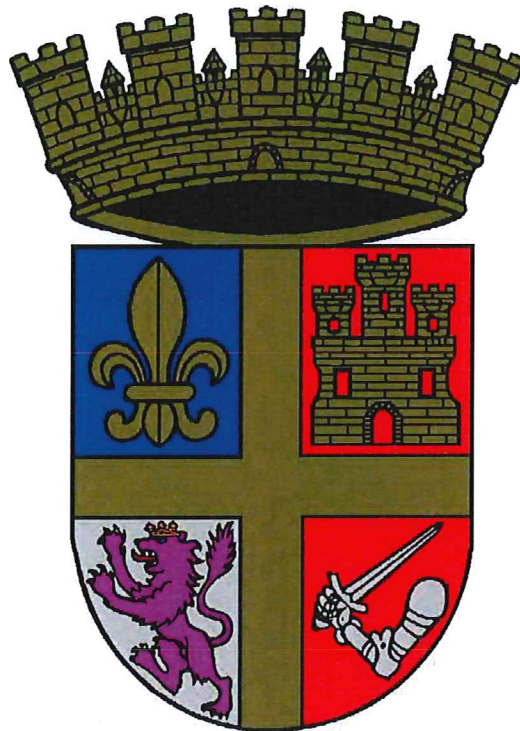


City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance

-
- b. Vendor shall provide a list of debris disposal facilities that will be used if the City's site is unsuitable for the disposal.
 - c. The vendor shall be responsible to handle the debris collected during the Vacuum Truck operation, in a manner that is consistent with the Florida Department of Environmental Protection (DEP) document entitled "Guidance for the Management of Street Sweepings, Catch Basin Sediments and Stormwater System Sediments" (May 3, 2004). A copy of the document is provided in the Appendices.
 - d. If disposing at a landfill, weight tickets will be required as proof and for reporting requirements.
 - e. Debris removed shall be reported in inches (depth) per chamber. In addition, the quantity in truck loads (cubic yards) and tons, and the dates it is delivered at the City facility shall be recorded and reported. The vendor can dispose of the materials at other locations as long as a weight ticket can be provided for reporting purposes.
 - f. Debris disposal is the responsibility of the vendor. Hauling and disposal fees shall be provided for facilities other than the City's disposal site.

APPENDIX A

COST SCHEDULE



PREPARED BY:
PUBLIC WORKS DEPARTMENT
P.O. BOX 210, ST. AUGUSTINE, FL 32085
(904) 825-1040



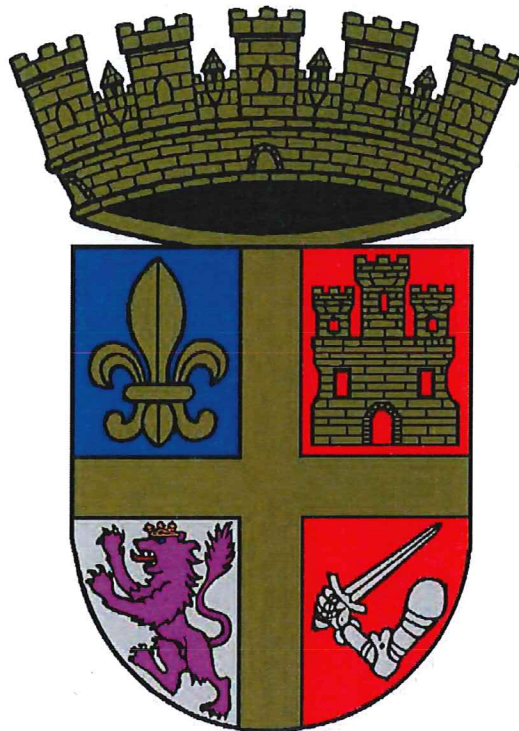
City of St. Augustine
Public Works Department
Stormwater Vault Inspection, Cleaning & Maintenance

**COST
SCHEDULE**

DESCRIPTION OF SERVICES	LOCATION (SEE MAP)	BACKFLOW VALVE	ACCESS	LENGTH (FT)	WIDTH (FT)	DEPTH (FT)	UNIT	UNIT COST (\$/QTR)	QTRS	TOTAL COST (\$)
Perform quarterly stormwater vault maintenance, cleaning & reporting including dewatering, debris hauling & disposal and traffic control as required for the structures listed below:										
CONTECH - VORTECHS7000	1	No	Manhole	14	8	7	EA/QTR		4	
CONTECH - VORTECHS7000	2	No	Manhole	14	8	7	EA/QTR		4	
CONTECH - VORTECHS11000	3	No	Manhole	16	10	7	EA/QTR		4	
SUNTREE - NSBB-10-16-106-RS-4	4	Yes	Manhole	16	10	9	EA/QTR		4	
SUNTREE - NSBB-10-16-106-RS-4	5	Yes	Manhole	16	10	9	EA/QTR		4	
SUNTREE - NSBB-4-8-68-MENENDEZ-1	6	Yes	Manhole	8	4	6	EA/QTR		4	
SUNTREE - NSBB-5-10-77-MENENDEZ-2	7	Yes	Manhole	10	5	6	EA/QTR		4	
SUNTREE - NSBB-5-10-84-MENENDEZ-3	8	Yes	Manhole	10	5	7	EA/QTR		4	
BAYSAVER - XK	9	Yes	Manhole	14	8	15	EA/QTR		4	
BAYSAVER - XK	10	Yes	Manhole	14	8	15	EA/QTR		4	
BAYSAVER - XK	11	Yes	Manhole	12	8	15	EA/QTR		4	
ECOVAULT - TYPE II BB	12	Yes	Manhole	14	8	8	EA/QTR		4	
ECOVAULT - TYPE II BB	13	Yes	Hatch	16	10	10	EA/QTR		4	
									TOTAL BASE BID	
EMERGENCY CLEANING SERVICE RATE (FOUR PERSON CREW PER HOUR)										\$




APPENDIX B

STORMWATER VAULTS LOCATION MAP



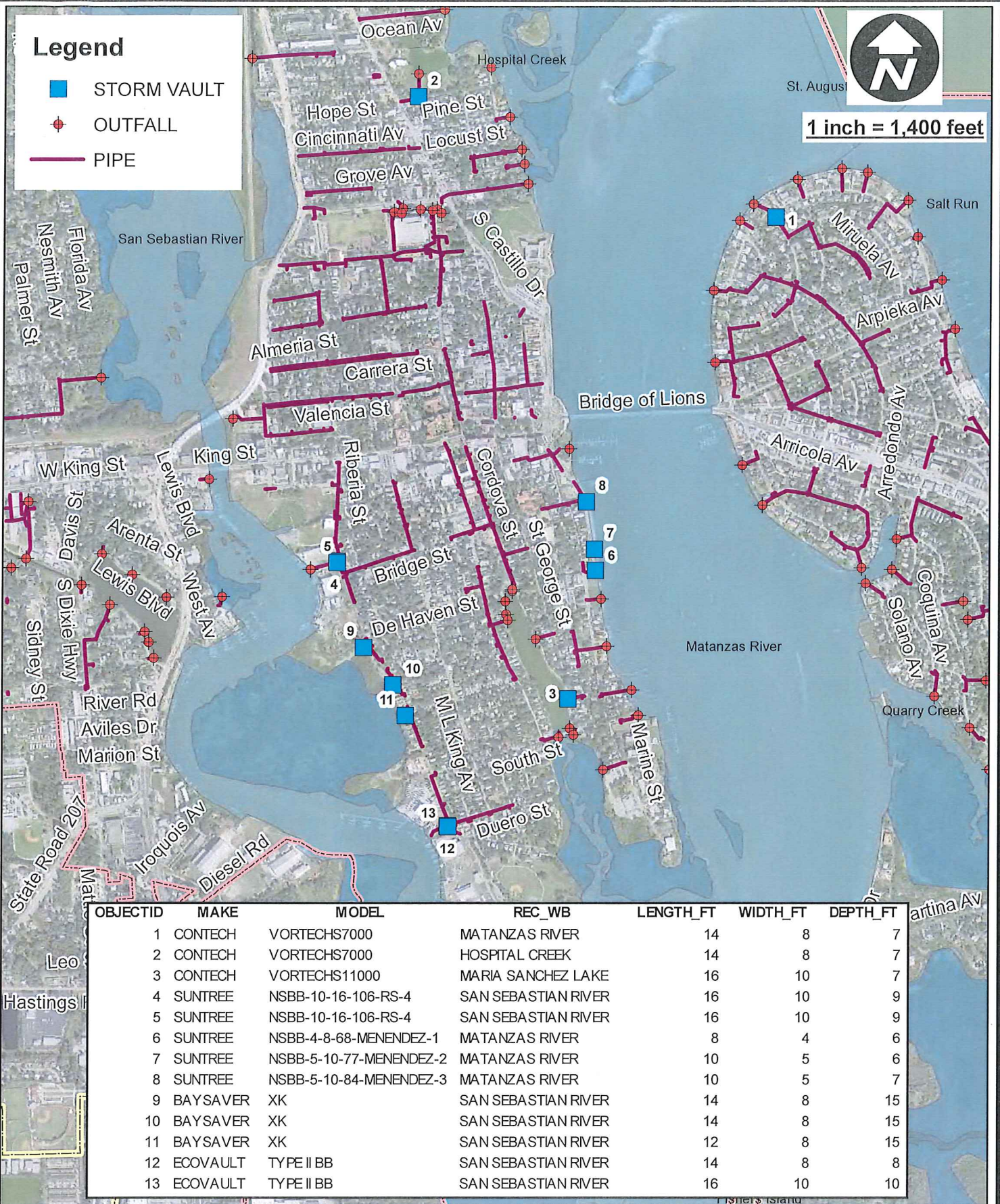
PREPARED BY:
PUBLIC WORKS DEPARTMENT
P.O. BOX 210, ST. AUGUSTINE, FL 32085
(904) 825-1040

Legend

-  STORM VAULT
 OUTFALL
 PIPE



St. August

1 inch = 1,400 feet**City of St. Augustine**

PUBLIC WORKS DEPARTMENT

P.O. Box 210, St. Augustine, FL 32085 Phone: (904) 825-1040

STORM VAULT LOCATIONS

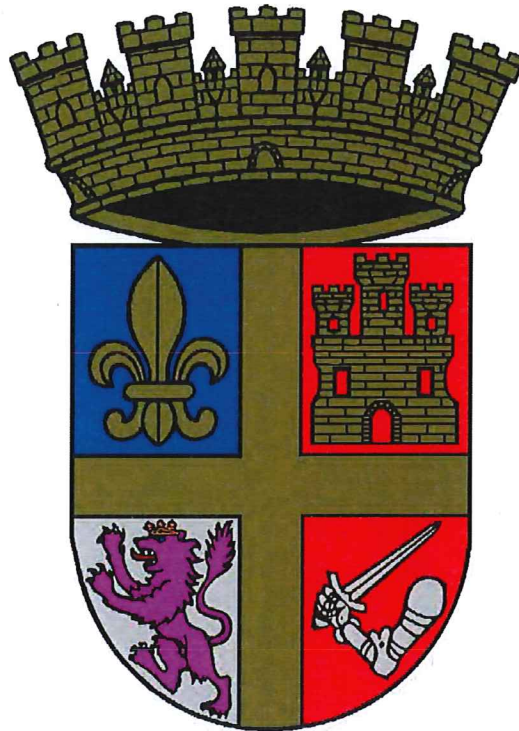
Existing City Water & Sewer Utilities Map

SHEET

1 of 1

APPENDIX C

INSPECTION FORM



PREPARED BY:
PUBLIC WORKS DEPARTMENT
P.O. BOX 210, ST. AUGUSTINE, FL 32085
(904) 825-1040

____ Quarter



City of St. Augustine
Public Works Department
Stormwater Vault Inspection Form

General Information

Structure I.D.: _____ Date & Time: _____
Make: _____ Inspector(s): _____
Model: _____
Receiving Waterbody: _____ Weather Conditions: _____
Quarterly Rainfall (in): _____ Temperature (°F): _____

Physical Observations (Circle all that are applicable)

Precipitation in the past 3-days: Yes No
Flow: None Trickle Steady High
Color of flow (if present): None Yellow Brown Green Gray Other
Odor: None Sewage Sulfide Oil Gas Other
Turbidity: None Cloudy Opaque
Floatables: None Sheen Plastics Sewage Grease Other
Deposits: None Sediment Oil Grease Other
Vegetation: None Minor Moderate Excessive
Sediment in Structure: None 1/4 Full 1/2 Full 3/4 Full Plugged
Ave. Sediment Depth per Chamber (in): _____
Structure Condition: Excellent Good Fair Poor Other
Structure Damage: None Cracking Spalling Corrosion Other
Other (expand on subjects above circled Other): _____

Cleaning & Maintenance Performed (Circle all that are applicable)

Minimum	Vacuumed	Repair Required
Repair Description: _____		

Sediment/Debris Removed

Weight (TN): _____ Average Volume (CY): _____

Additional Comments / Notes

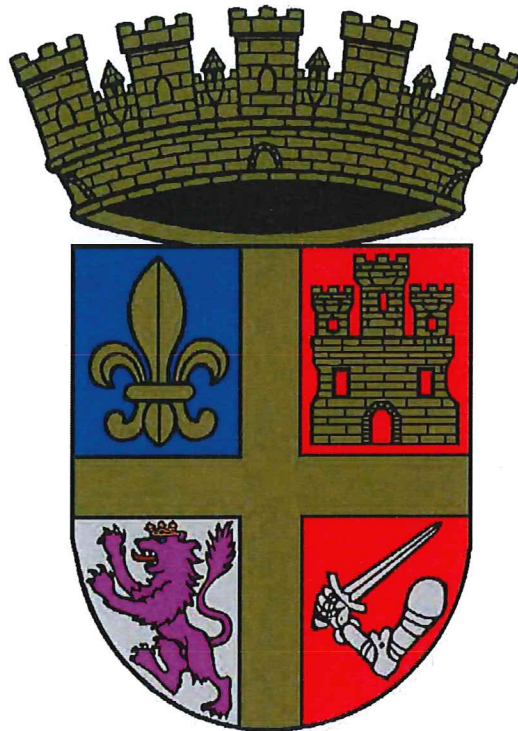
Data Entry By (City to fill out)

Name: _____ Date: _____

APPENDIX D

DEPARTMENT OF ENVIRONMENTAL PROTECTION

**GUIDANCE FOR THE MANAGEMENT OF STREET
SWEEPINGS, CATCH BASIN SEDIMENTS AND
STORMWATER SYSTEM SEDIMENTS (FINAL, 2004)**



PREPARED BY:
PUBLIC WORKS DEPARTMENT
P.O. BOX 210, ST. AUGUSTINE, FL 32085
(904) 825-1040

GUIDANCE FOR THE MANAGEMENT OF STREET SWEEPINGS, CATCH BASIN SEDIMENTS AND STORMWATER SYSTEM SEDIMENTS

FINAL

May 3, 2004



Prepared by:

Department of Environmental Protection
Solid Waste Section
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DISCLAIMER

The information contained in this document is intended for guidance only. It is not a rule and does not create any standards or criteria that must be followed by the regulated community. While the management and use of street sweepings, catch basin sediments and stormwater system sediments in accordance with this guidance is not expected to result in contamination of ground water or surface water or to pose a significant threat to human health, compliance with this document does not relieve the owner or operator from the responsibility for complying with the Department's rules nor from any liability for environmental damages caused by the use of these materials.

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1. Summary of the 95% UCL Average Concentrations for Chemicals of Concern

APPENDICES

- A. Focus Group Members
- B. Stormwater Discharge Associated with Industrial Activity
- C. Department Solid Waste Contacts

1.0 BACKGROUND

Historically, street sweepings in Florida were disposed of at Class III landfills. These landfills are allowed to receive wastes that "are not expected to produce leachate which poses a threat to public health or the environment," Rule 62-701.200(14), Florida Administrative Code (F.A.C.). Prior to January 6, 1993, Chapter 62-701, F.A.C. allowed trash to be disposed of at Class III landfills and the term "trash" was defined to include street sweepings. Because of concerns that the term "trash" was too all-encompassing, the Department removed this term from the rule in 1993. As a result, street sweepings could no longer be disposed of in Class III landfills without approval by the Department, and had to go to permitted, lined landfills (i.e., usually Class I landfills). This position was stated in a Department memorandum dated April 28, 1998 (DEP, 1998).

Within a few years after this rule change, the Department began to find large piles of street sweepings stored by municipalities. In some cases this practice required local governments to obtain permits for solid waste management facilities. Several municipalities began expressing frustration to the Department over increased disposal costs of street sweepings at Class I landfills. Concerns were also expressed about the proper management of other wastes such as catch basin sediments and stormwater system sediments. The Department maintained that all of these materials were regulated as solid wastes (DEP, 1999). At a Contaminated Soils Forum meeting in 1998, the Department agreed to form a Focus Group to study these wastes (i.e., street sweepings, stormwater system sediments and catch basin sediments) and evaluate possible disposal and management options for them. The individuals that agreed to serve on this Focus Group are shown in APPENDIX A.

Three Focus Group planning meetings were held in 1999. Some research on stormwater system sediments and street sweepings had already been conducted and was considered by the Focus Group (Cox, 1998 and Brinkmann, 1999). It was decided that before appropriate disposal and management options could be proposed, a more comprehensive chemical characterization of these wastes would be required. Dr. Tim Townsend, University of Florida, was selected to conduct this research. The Department contributed \$100,000 from EPA Section 319 Grant Funds to this research. Eleven other organizations, including municipalities and counties, contributed an additional \$75,000 to this project. These contributors were:

- St. Lucie County Public Works
- Reedy Creek Improvement District
- City of Fort Myers
- Sarasota County Public Works
- City of Winter Park
- Palm Beach County Solid Waste Authority
- Brevard County Surface Water Management
- Seminole County Stormwater Division
- City of Orlando
- City of Lake Worth
- Florida Association of Stormwater Utilities

Dr. Townsend began this research in September 2000. Approximately 300 separate samples of street sweepings, catch basin sediments and stormwater system sediments were collected over a period of 15 months from 20 different sampling

locations in Florida. These samples were analyzed for a number of chemical parameters including volatile and semi-volatile organic compounds, pesticides, herbicides, metals and leachable inorganic ions. Townsend presented results from both total analyses and analyses of leaching tests using the Synthetic Precipitation Leaching Procedure (SPLP), EPA Method 1312. In order to identify potential chemicals of concern, the individual total analysis results were compared with the Department's soil cleanup target levels and the leachability results were compared with the Department's ground water cleanup target levels. These cleanup target levels are found in Chapter 62-777, F.A.C., and were used as guidance in determining which constituents in the waste might pose human health risks. The final results of this research were presented on December 31, 2002 (Townsend, 2002).

During a meeting of the Focus Group on December 2, 2002, the Department was asked to calculate the 95% Upper Confidence Limits (UCLs) for the average concentrations of all the chemicals of concern identified in the Townsend study. It was believed that this information would help the Focus Group make recommendations on the proper disposal and beneficial use of the three waste streams.

A draft report evaluating the data was prepared by the Department and discussed by the Focus Group at a meeting on October 28, 2003. A final version of this report was prepared on November 10, 2003 (DEP, 2003). A summary of the results of the Department's data evaluation report is presented in TABLE 1. At the October 28th meeting, the Focus Group made recommendations on the disposal and beneficial use of the three waste streams and asked the Department to prepare a guidance memorandum or document summarizing these recommendations.

2.0 PURPOSE

The purpose of this document is to provide guidance to the regulated community and Department staff on the disposal and beneficial use of street sweepings, catch basin sediments and stormwater system sediments. This document is not a rule and does not create any standards or criteria that must be followed by the regulated community.

3.0 DEFINITIONS

For the purposes of this document, the following definitions apply.

"Catch Basin Sediments" means the solid fraction of materials, consisting primarily of soil, rocks, asphalt, vegetative matter and possibly small amounts of solid waste, collected in settling structures designed to receive stormwater runoff from roads. It may also contain small amounts of other solid wastes that are often discarded along roads.

"Industrial stormwater systems" means stormwater systems that receive stormwater discharges associated with industrial activities.

"Non-industrial stormwater systems" means stormwater systems that do not receive stormwater discharges associated with industrial activities.

"Stormwater discharges associated with industrial activities" has the meaning given it in Rule 62-620.200(45), F.A.C., incorporating by reference 40 CFR 122.26(b)(14). (This language is included in APPENDIX B).

"Stormwater System Sediments" means the solid fraction of materials, consisting primarily of soil, vegetative matter and possibly small amounts of solid waste, collected in permitted stormwater treatment systems (this does not include roadside ditches or canals). It may also contain small amounts of other solid wastes that may be washed into the system during rainfall events.

"Street Sweepings" means materials consisting primarily of soil, rocks, asphalt, leaves and other vegetative matter generated during the routine cleaning of roads. It may also contain small amounts of other solid wastes that are often discarded along roads. It does not include material generated during the cleanup of an oil or hazardous chemical spill.

4.0 GENERAL GUIDANCE FOR DISPOSAL AND BENEFICIAL USE

The disposal and beneficial use options contained in this document were recommended by the Focus Group and accepted as appropriate for these wastes by the Department. They were based on the results of the Townsend study and the results of further data evaluations by the Department that are summarized in TABLE 1.

The management of street sweepings, catch basin sediments and stormwater system sediments in accordance with the guidance contained in this document is not expected to pose a significant threat to human health or the environment. However, the options described in this document assume these wastes are not contaminated by petroleum products or other hazardous chemicals such as might occur as a result of a spill or the cleanup of a spill. If it is reasonable to assume the wastes are contaminated, by petroleum products or other hazardous chemicals, then the generator should seek further guidance before proceeding with disposal or beneficial use of the wastes by contacting the Department's District office in the District where the wastes are located. A list of contacts and addresses for the Tallahassee and District offices is provided in APPENDIX C.

Many counties and municipalities have National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) permits that require the wastes addressed in this document to be managed "properly" and "pursuant to Department rules." This document is intended to provide guidance to permittees on the interpretation and implementation of these requirements.

5.0 GUIDANCE FOR DISPOSAL

5.1 Street Sweepings

Street sweepings may be disposed of in a permitted Class I or II landfill or a permitted waste-to-energy (WTE) facility. If there is no reason to believe that the street sweepings are contaminated, such as being impacted through a chemical spill, and if they are not mixed with excessive amounts of Class I wastes, then they may also be disposed of at a permitted Class III landfill. Street sweepings are not considered to be construction and demolition debris and as such may not be disposed of at a construction and demolition debris disposal facility.

The Focus Group indicated that street sweepings typically contained additional amounts of trash that averaged between 20 to 25 percent by volume of the collected waste. In some cases, depending where the street sweepings were collected, they could contain as much as 40 percent by volume of trash. The composition of this trash fraction can vary. It may consist of discarded materials like paper, glass or plastic that would not be expected to produce a leachate that would pose a threat to public health or the environment. It may also be contaminated with Class I wastes. This trash mixed with the street sweepings can affect the way it should be managed.

If the street sweepings are mixed with significant amounts of Class I wastes, then they must be disposed of at a Class I or II landfill or at a WTE facility. However, if the Class I wastes are separated from the street sweepings, then the street sweepings can be disposed of at a Class III landfill. Depending on the nature of the Class I wastes mixed with the street sweepings, they may either be separated from the street sweepings by hand or separated through the use of screens. If screens are used, the Focus Group recommended a single screening step with a screen size of approximately 1-inch by 1-inch be used. Other screen sizes or separation techniques may be used if approved by the Department. The separated Class I wastes will, of course, need to be disposed of at a permitted Class I or II landfill or a permitted WTE facility.

The Focus Group recognized that street sweepings may need to be accumulated before they can be disposed of at a landfill. This will require the temporary storage of the wastes. Street sweepings that do not require screening may be stored in open areas without leachate controls. Street sweepings that will require screening, as well as separated Class I wastes, must be stored so that leachate and litter are controlled. Examples would include storage in covered roll-offs, storage on impervious surface and under roof, or storage indoors.

Accumulated street sweepings must be disposed of as soon as practical but may be staged for no longer than three months unless a longer storage time is approved by the Department. The separated Class I wastes must be disposed of at a Class I or II landfill or at a WTE facility at a frequency no less than weekly.

5.2 Catch Basin Sediments

Since this waste is usually collected with vacuum trucks, it will initially be mixed with the liquids that also accumulate in the catch basins. Catch basin sediments may be disposed of in Class I or II landfills. They may also be disposed of in Class III landfills provided there is no reason to believe they are contaminated, such as being impacted through a chemical spill. If they are mixed with excessive amounts of Class I wastes, then they will need to be screened, as described in Section 5.1, before disposal at a Class III landfill. Prior to disposal, the catch basin sediments must be sufficiently dewatered so that they do not meet the definition of liquid wastes contained in Rule 62-701.200(72), F.A.C. Catch basin sediments are not considered to be construction and demolition debris and as such may not be disposed of at a construction and demolition debris disposal facility.

Catch basin sediments may be stockpiled for a long enough time to achieve adequate dewatering (i.e. Rule 62-701.200(72), F.A.C.) and to accumulate sufficient quantities of the sediments for transportation to the landfill. They do not need to be covered when stockpiled for dewatering since exposure to the air and the sun will help to dry the sediments. However, they may not be stockpiled in a way that may adversely impact surface water bodies or potable wells or in a way that would create a public or sanitary nuisance. The liquids from dewatering must be collected and disposed of at a wastewater treatment plant, a permitted stormwater treatment system (preferably the ones currently receiving liquids from the catch basins) or another disposal location approved by the Department. They may not be disposed of in any other artificial surface water body, in waters of the state, or into a stormwater conveyance system that does not discharge into a permitted stormwater treatment system.

If Class I wastes are screened from the sediments, then these wastes will need to be stored in green boxes and covered with a tarp or under a roof to control leaching. The screened Class I wastes must be disposed of at a Class I or II landfill or at a WTE facility at a frequency no less than weekly.

5.3 Stormwater System Sediments

Stormwater system sediments are generated when the sediments accumulate to the point that the system ceases to function for its original intended use and requires maintenance or cleaning. The Focus Group believed it was necessary to distinguish sediments generated from the maintenance of stormwater systems into two groups: those that receive runoff from industrial areas (i.e., industrial stormwater systems) and those that do not (i.e., non-industrial stormwater systems).

Sediments from non-industrial stormwater systems may be disposed of in Class I or II landfills. They may also be disposed of in a Class III landfills, in a manner similar to street sweepings in Section 5.1, provided there is no reason to believe they are contaminated, such as being impacted through a chemical spill. If they are mixed with excessive amounts of Class I wastes, then they will need to be screened, as described

in Section 5.1, before disposal at a Class III landfill. Prior to disposal, the stormwater system sediments must be sufficiently dewatered so that they are not considered a liquid pursuant to Rule 62-701.200(72), F.A.C.

Sediments from industrial stormwater systems may be disposed of in Class I or II landfills provided they are first dewatered pursuant to Rule 62-701.200(72), F.A.C. They may not be disposed of in Class III landfills unless approved by the Department. This may require additional testing of the sediments and the generator should seek further guidance before proceeding with disposal of the wastes by contacting the Department's District office in the District where the wastes are located (see APPENDIX C).

Neither industrial nor non-industrial stormwater system sediments are considered to be construction and demolition debris. Consequently, neither of these wastes may be disposed of at a construction and demolition debris disposal facility.

During system maintenance, the sediments may be stockpiled adjacent to the system from which they are removed. The sediments may be stockpiled there long enough to achieve adequate dewatering (i.e. Rule 62-701.200(72), F.A.C.) and to accumulate sufficient quantities of the sediments for transportation to the landfill. They do not need to be covered when stockpiled for dewatering since exposure to the air and the sun will help to dry the sediments. However, they may not be stockpiled in a way that may adversely impact surface water bodies or potable wells or in a way that would create a public or sanitary nuisance. If the sediments are stockpiled in any other locations, then the liquids from dewatering must be collected and disposed of at a wastewater treatment plant or stormwater system unless an alternate disposal method is approved by the Department.

If Class I wastes are screened from the sediments, then these wastes will need to be stored in green boxes and covered with a tarp or under a roof to control leaching. The screened Class I wastes must be disposed of at a Class I or II landfill or at a WTE facility at a frequency no less than weekly.

6.0 GUIDANCE FOR BENEFICIAL USE

6.1 Street Sweepings

Street sweepings may be used as initial cover at Class I or II landfills. They may also be used as initial cover at Class III landfills if they could otherwise be disposed of at that same landfill. In order to be used as initial cover at any landfill, the street sweepings must also be able to meet the requirements for initial cover contained in Rule 62-701.200(59), F.A.C. and may require a solid waste permit modification for the landfill using the wastes.

In accordance with Rule 62-701.220(2)(g), F.A.C., street sweepings may be beneficially used without the need for further testing in road construction or road

maintenance. While it is not specifically stated, the Department has interpreted this rule to include street sweepings. This interpretation was explained in a Department memorandum dated September 13, 2001 (DEP, 2001).¹

Street sweepings may also be beneficially used in nonresidential areas as construction or industrial fill or as a soil amendment provided any benzo(a)pyrene in the street sweepings will not create a significant threat to public health or the environment as managed. In no case may it be used within 200 feet of a potable well or as fill below the water table or in bodies of water. The generator of the street sweepings must use the wastes according to the terms of this document only in projects that are under its control; generators are not allowed to distribute or sell the wastes for use by others unless authorized by the Department.

If a generator wishes to beneficially use street sweepings in a manner other than as allowed above, it must provide additional testing results that demonstrate that the material is not expected to create a significant threat to the environment or public health. If the results indicate that the 95% UCL for the average concentration of benzo(a)pyrene in the street sweepings does not exceed the Department's residential direct exposure criteria and the material's potential threat is no greater than the 95% UCLs calculated in Table 1 for street sweepings, then the material may have unlimited distribution.

Except for use as landfill initial cover, street sweepings shall not be beneficially used if there is reason to believe that they are contaminated, such as being impacted through a chemical spill, or they are excessively mixed with Class I wastes, unless the Class I wastes are removed by screening. To remove the Class I wastes, the street sweepings must be screened through both a coarse screen, such as 1-inch square size, and a fine screen, such as 5 to 10 millimeters square size, i.e., double-screened. Other screen sizes may be used if approved by the Department.

The street sweepings may need to be accumulated before they can be beneficially used. This will require the temporary storage of the wastes. Street sweepings that do not require double screening may be stored in open areas without leachate controls. Street sweepings that will require double screening, as well as separated Class I wastes, must be stored so that leachate and litter are controlled. Examples would include storage in covered roll-offs, storage on impervious surface and under roof, or storage indoors.

Street sweepings destined for beneficial use that also require screening must be double-screened in accordance with this section within three months of collection unless otherwise approved by the Department. Street sweepings that are double-screened, and street sweepings that do not require screening, may be stockpiled for up to six

¹ NOTE: This memorandum does not specifically address the beneficial use of catch basin sediments or stormwater system sediments. The applicability of the rule to these and other materials that may be generated during road maintenance activities will have to be determined on a case-by-case basis or in an addendum to the memorandum.

months prior to beneficial use unless otherwise approved by the Department. Street sweepings that are not destined for beneficial use must be disposed of as described in Section 5.1.

If Class I wastes are screened from the street sweepings, then these wastes will need to be stored in green boxes and covered with a tarp or under a roof to control leaching. The screened Class I wastes must be disposed of at a Class I or II landfill or at a WTE facility at a frequency no less than weekly.

6.2 Catch Basin Sediments

Catch basin sediments may be beneficially used in a manner similar to street sweepings in Section 6.1 provided they are dewatered first and there is no reason to believe they are contaminated, such as being impacted by a chemical spill. Prior to beneficial use, the catch basin sediments must be sufficiently dewatered so that they do not meet the definition of liquid wastes contained in Rule 62-701.200(72), F.A.C. If they are mixed with excessive amounts of Class I wastes, then they will need to be double-screened, as described in Section 6.1, before being beneficially used. Catch basin sediments that are not destined for beneficial use must be disposed as described in Section 5.2.

If a generator wishes to beneficially use catch basin sediments in a manner other than as allowed above, it must provide additional testing results which demonstrate that the material is not expected to create a significant threat to the environment or public health. If the results indicate that the material's potential threat is no greater than the 95% UCLs calculated in Table 1 for street sweepings, then the material may have unlimited distribution.

The liquids from dewatering may be disposed of at a wastewater treatment plant, a stormwater system (preferably the ones currently receiving liquids from the catch basins) or another disposal location approved by the Department. They may not be disposed of in any other artificial surface water body, in waters of the state, or into a stormwater conveyance system that does not discharge into a permitted stormwater treatment system.

Catch basin sediments may be stockpiled long enough to achieve adequate dewatering (i.e. Rule 62-701.200(72), F.A.C.) and to accumulate sufficient quantities of the sediments for beneficial use. They do not need to be covered when stockpiled for dewatering since exposure to the air and the sun will help to dry the sediments. However, they may not be stockpiled in a way that may adversely impact surface water bodies or potable wells or in a way that would create a public or sanitary nuisance and the liquids from dewatering must be collected and disposed of as described above.

If Class I wastes are screened from the sediments, then these wastes will need to be stored in green boxes and covered with a tarp or under a roof to control leaching.

The screened Class I wastes must be disposed of at a Class I or II landfill or at a WTE facility at a frequency no less than weekly.

6.3 Stormwater System Sediments

As described in Section 5.3, the Focus Group believed it was necessary to distinguish sediments generated from the maintenance of stormwater systems into two groups: those that receive runoff from industrial areas (i.e., industrial stormwater systems) and those that do not (i.e., non-industrial stormwater systems).

Sediments from non-industrial stormwater systems may be beneficially used in a manner similar to street sweepings in Section 6.1 provided they are dewatered first and there is no reason to believe they are contaminated, such as being impacted by a chemical spill. Prior to beneficial use, the stormwater system sediments must be sufficiently dewatered so that they are not considered a liquid by Rule 62-701.200(72), F.A.C. Sediments from industrial stormwater systems may not be beneficially used without prior approval by the Department. This may require additional testing of the sediments and the generator should seek further guidance before proceeding with disposal of the wastes by contacting the Department's District office in the District where the wastes are located (see APPENDIX C).

During system maintenance, the sediments may be stockpiled adjacent to the system from which they are removed and allowed to dewater their liquids back into the system. If the sediments are stockpiled in any other locations, then the liquids from dewatering must be collected and disposed of at a wastewater treatment plant or stormwater system unless an alternate disposal method is approved by the Department.

Stormwater system sediments may be stockpiled long enough to achieve adequate dewatering (i.e. Rule 62-701.200(72), F.A.C.) and to accumulate sufficient quantities of the sediments for beneficial use. They do not need to be covered when stockpiled for dewatering since exposure to the air and the sun will help to dry the sediments. However, they may not be stockpiled in a way that may adversely impact surface water bodies or potable wells or in a way that would create a public or sanitary nuisance and the liquids from dewatering must be managed as described above.

If Class I wastes are screened from the sediments, then these wastes will need to be stored in green boxes and covered with a tarp or under a roof to control leaching. The screened Class I wastes must be disposed of at a Class I or II landfill or at a WTE facility at a frequency no less than weekly.

REFERENCES

- Brinkmann, Robert, et al., 1999, Chemical and Physical Characteristics of Street Sweeping Sediments in Tampa, Florida, Report # 98-12, Florida Center for Solid and Hazardous Waste Management, Gainesville, Florida, May.
- Cox, J. H., et al., 1998, Characterization of Stormwater Contaminated Sediment and Debris for Determining Proper Disposal Methods, Final Report, Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, Florida, August 13.
- DEP (Department of Environmental Protection), 1998, "Street Sweepings and Sediments from Stormwater Systems," Memorandum # SWM-21.27 from Mary Jean Yon to County Solid Waste Directors, April 28.
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- DEP (Department of Environmental Protection), 2001, "Debris from Road Construction or Maintenance," Memorandum # SWM-19.14 from Chris McGuire and Richard Tedder to District Waste Program Administrators and District Solid Waste Engineers, September 13.
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- Townsend, T. G., et al., 2002, Characterization of Stormwater Sediments, Catch Basin Sediments, and Street Sweepings in Florida for Disposal and Reuse, Final Report, Florida Center for Solid and Hazardous Waste Management, Gainesville, Florida, December 31.

TABLE 1. Summary of the 95% UCL Average Concentrations for Chemicals of Concern

Chemicals of Concern	FDEP RES. SCTL (mg/kg)	FDEP LEACH. SCTL (mg/L)	All Sources		Street Sweepings		Catch Basins		Storm Systems	
			95 % UCL	Decision	95 % UCL	Decision	95 % UCL	Decision	95 % UCL	Decision
Total Metal (mg/kg)										
Arsenic	0.8		0.811	Exceeds	0.722	OK	0.963	Exceeds	1.165	Exceeds
Barium	110		17.35	OK	13.25	OK	24.01	OK	35.29	OK
Copper	110		14.42	OK	12.59	OK	23.21	OK	16.11	OK
Lead	400		11.35	OK	10.63	OK	17.85	OK	14.42	OK
Chromium	210		8.5	OK	7.5	OK	12.7	OK	12.5	OK
Leachable Parameters (mg/L)										
Arsenic		0.010	0.0031	OK	0.0036	OK	0.0031	OK	0.0043	OK
Lead		0.015	0.004	OK	0.0037	OK	0.0056	OK	0.0036	OK ²
Beta-BHC		0.00002	0.000065	Exceeds	0.000055	OK ¹	0.000054	OK ¹	0.000109	Exceeds
4-4 DDT		0.0001	0.000069	OK	0.000065	OK	0.000057	OK	0.000104	Exceeds
Aluminum		0.2	0.52	Exceeds	0.52	Exceeds	0.58	Exceeds	1.09	Exceeds
Iron		0.3	0.53	Exceeds	0.41	Exceeds	0.45	Exceeds	0.499	Exceeds
Leachable Background (mg/L)										
Aluminum		0.2	2.56	Exceeds						
Iron		0.3	0.99	Exceeds						

BADL = Best Available Detection Limit
¹ = OK when using BADLs.
² = OK without the outliers.

APPENDIX A
FOCUS GROUP MEMBERS

Caroline Klos City of Tampa (replacement for Brad Baird)	John Cox City of Tallahassee
Ron Jones Brevard County	Kevin McCann City of Orlando
Eric Livingston Department of Environmental Protection	Donald Mahaffey Sweeping Corporation of America
Mike Morrow Walt Disney World	Alan Obaigbena Florida Department of Transportation
Susan Pelz Department of Environmental Protection (replacement for Bob Butera)	Richard Rachal Department of Environmental Protection
Louis Reis Florida Department of Transportation	Sam Levin S2Li
Nancy Woodley City of Venice	

APPENDIX B STORMWATER DISCHARGE ASSOCIATED WITH INDUSTRIAL ACTIVITY (printed February 2, 2004)

Rule 62-620.200(45) F.A.C.

(45) "Stormwater Discharge Associated with Industrial Activity" is as defined in 40 CFR 122.26(b)(14).

40 CFR 122.26(b)(14)

(14) *Storm water discharge associated with industrial activity* means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under this part 122. For the categories of industries identified in this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are federally, State, or municipally owned or operated that meet the description of the facilities listed in paragraphs (b)(14)(i) through (xi) of this section) include those facilities designated under the provisions of paragraph (a)(1)(v) of this section. The following categories of facilities are considered to be engaging in "industrial activity" for purposes of paragraph (b)(14):

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) in paragraph (b)(14) of this section);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283), 29, 31, 32 (except 323), 33, 34, 37;

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; (inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/ operator; inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials, nor sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim);

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that receive or have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221–25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (b)(14) (i)–(vii) or (ix)–(xi) of this section are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR part 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with section 405 of the CWA;

(x) Construction activity including clearing, grading and excavation, except operations that result in the disturbance of less than five acres of total land area. Construction activity also includes the disturbance of less than five acres of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb five acres or more;

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, and 4221–25;

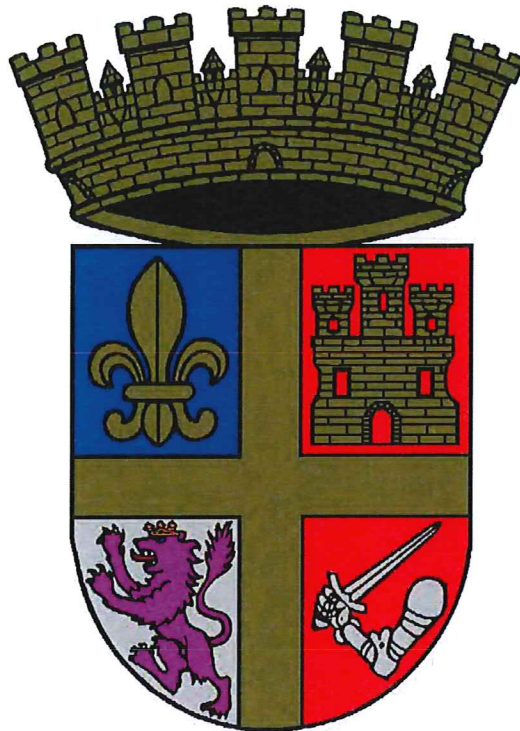
APPENDIX C
DEPARTMENT SOLID WASTE CONTACTS
(updated December 5, 2003)

Northwest District:	Marshall Seymore, P.E. Department of Environmental Protection 160 Governmental Center Pensacola, Florida 32501 850/595-8360 Marshall.Seymore@dep.state.fl.us
Northeast District:	Mary Nogas, P.E. Department of Environmental Protection 7825 Baymeadows Way, Suite B200 Jacksonville, Florida 32256-7590 904/807-3300 Mary.Nogas@dep.state.fl.us
Central District:	Jim Bradner, P.E. Department of Environmental Protection 3319 Maguire Boulevard, Suite 323 Orlando, Florida 32803-3767 407/894-7555 James.Bradner@dep.state.fl.us
Southwest District:	Susan Pelz, P.E. Department of Environmental Protection 3804 Coconut Palm Drive Tampa, Florida 33619 813/744-6100
Southeast District:	Joe Lurix Department of Environmental Protection 400 North Congress Avenue West Palm Beach, Florida 33401 561/681-6600 Joe.Lurix@dep.state.fl.us
South District:	Ghaus Minhaj, P.E. Department of Environmental Protection 2295 Victoria Avenue Fort Myers, Florida 33901-3881 941/332-6975 Ghousuddin.Minhaj@dep.state.fl.us
Tallahassee:	Richard Tedder, P.E. Department of Environmental Protection 2600 Blair Stone Road, MS# 4565 Tallahassee, Florida 32399-2400 850/245-8735 Richard.Tedder@dep.state.fl.us

APPENDIX E

STORMWATER VAULTS

SPECIFICATIONS AND CLEANING INSTRUCTIONS

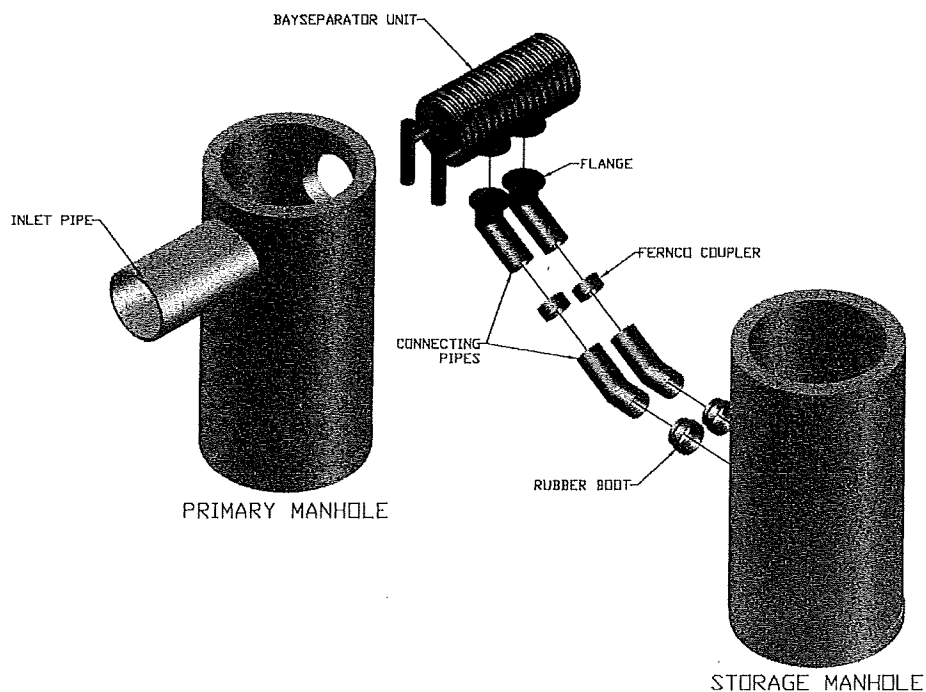


PREPARED BY:
PUBLIC WORKS DEPARTMENT
P.O. BOX 210, ST. AUGUSTINE, FL 32085
(904) 825-1040



BaySeparator

Technical and Design Manual



www.BaySaver.com

Maintenance

One of the advantages of the BaySeparator™ systems is the ease of maintenance. Like any system that collects pollutants, the BaySeparator™ systems must be periodically maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in each manhole through a 30" manhole cover. This allows them to gain unobstructed access to the full depth of the system. There is no confined space entry necessary for inspection or maintenance.

Vacuum hoses can reach the entire sump area of both manholes to remove sediments and trash. The entire maintenance procedure typically takes less than an hour.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor. Contact BaySaver Technologies Inc. at 1-800-229-7283 for a list of approved contractors in your area.

Inspection and Cleaning

Periodic inspection is required to determine the need for and frequency of maintenance. Inspections should be performed initially every six (6) months. Typically, the system needs to be cleaned every 12 to 36 months, depending on site conditions. The system needs to be cleaned when 2 feet of sediment (1.5 feet for the 1/2K model) has accumulated in the bottom of either structure or when visual inspection shows a large accumulation of debris or oil.

Measuring Sediment Depth

You can determine the sediment depth by lowering a pole into the manhole until it hits the sediment and measuring the distance from the bottom of the pole to the water line mark on the pole. If this is less than 6 feet (4.5 feet for the 1/2K model), the system needs to be cleaned.

Maintenance Instructions

1. For each BaySeparator™ system, there are 2 manholes to clean: the **Primary Manhole** and **Storage Manhole**.
2. Remove the manhole covers to provide access to the pollutant storage.
3. **Storage Manhole:** Use a vacuum truck or other similar equipment to remove all water, debris, oils, and sediment.
4. **Storage Manhole:** Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the rinse water.
5. **Primary Manhole:** Use a submersible pump to pump the bulk of the water from the Primary Manhole into the clean Storage Manhole. Stop pumping when the water surface falls to one foot above the accumulated sediments.
6. **Primary Manhole:** Use a vacuum truck or other similar equipment to remove all remaining water, debris, and sediment.
7. **Primary Manhole:** Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the rinse water.
8. **Both Manholes:** On sites with a high water table or other conditions which may cause flotation, it is necessary to fill the manholes with clean water after maintenance
9. Replace the two manhole covers.
10. Dispose of the polluted water, oils, sediment, and trash at an approved facility.
 - Most local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for any required permits and/or conditions to discharge the liquid.
 - Many places require the pollutants removed from BaySeparator™ systems to be treated in a leachate treatment facility. Check with local regulators about disposal requirements.
11. Additional local regulations may apply to the maintenance procedure.

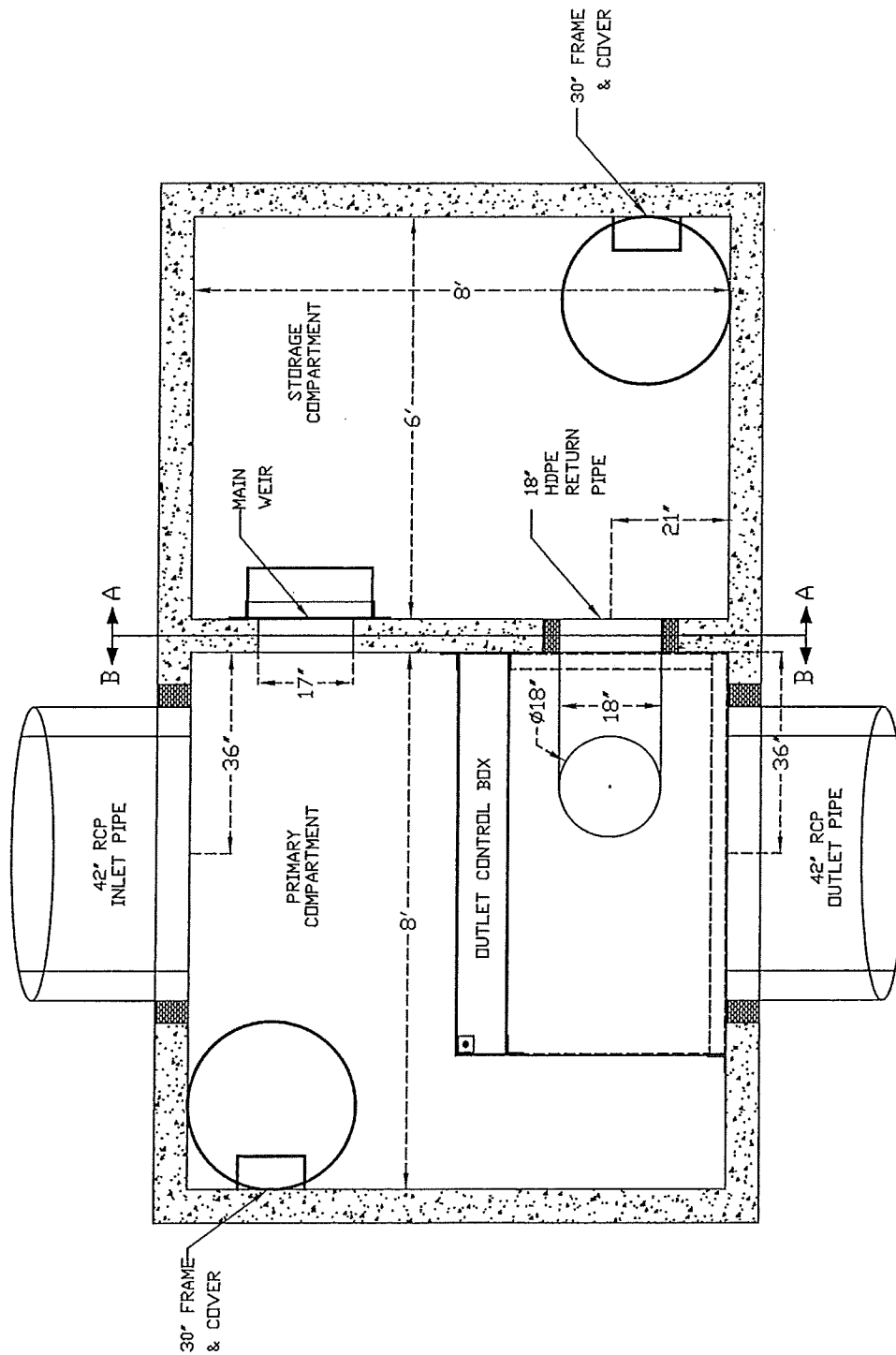
This procedure is intended to remove all the collected pollutants from the system while minimizing the volume of water that must be disposed. Additional local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor; therefore maintenance should be performed only by a qualified contractor.

BAYSAVER TECHNOLOGIES, INC.

Summary

- Access the pollutants through the two manhole covers.
- See the entire floor/sump area of each manhole from the surface.
- No confined space entry for inspection or maintenance.
- During maintenance, transfer “clean” water from the Primary to the Storage Manhole, minimizing the amount of water for disposal.

BaySaver Technologies can assist in coordinating a maintenance contractor in the installation area, or work directly with owners who wish to perform their own maintenance. Contact BaySaver Technologies at 1-800-229-7283 (1-800-BaySaver) for more information

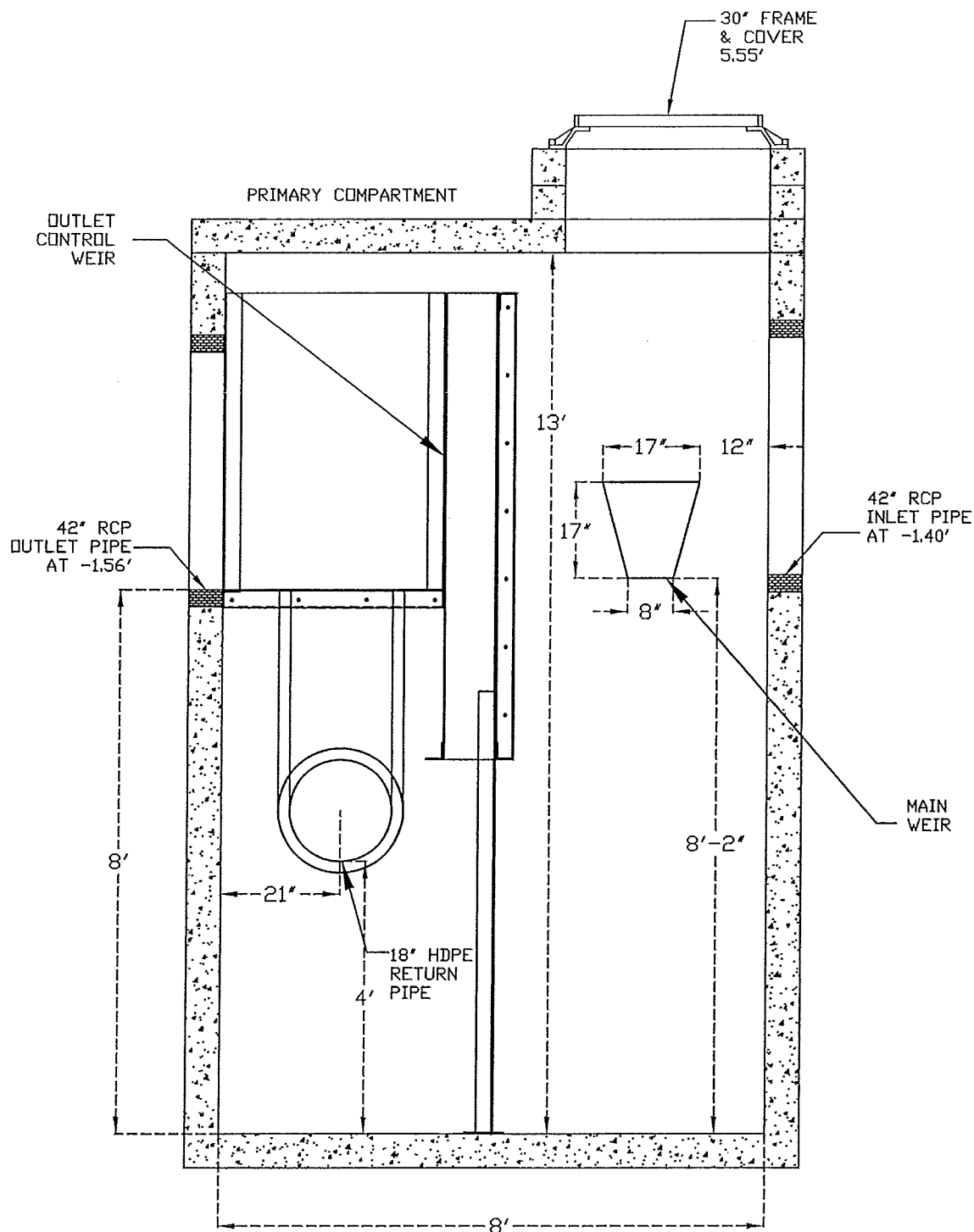


NOTES:
 1) Submittal drawings for approval.
 2) Wall thickness determined by soil conditions and local regulations.
 3) Vault to meet ASTM standards.
 4) Structural design not provided by BTI.

BAYSAVER
 1030 Deer Hollow Drive
 Mt. Airy, MD 21771
 (301) 829-6470

DESIGNED:	TEP
DRAWN:	PR
CHECKED:	EKH
DATE:	3/22/12
SCALE:	N.T.S.
SHEET:	1 OF 3

RIBERIA STREET IMPROVEMENTS
ST. AUGUSTINE - FL
PLAN VIEW
XK BAYSAVER SYSTEM
SC-05 DETAILS



NOTES:

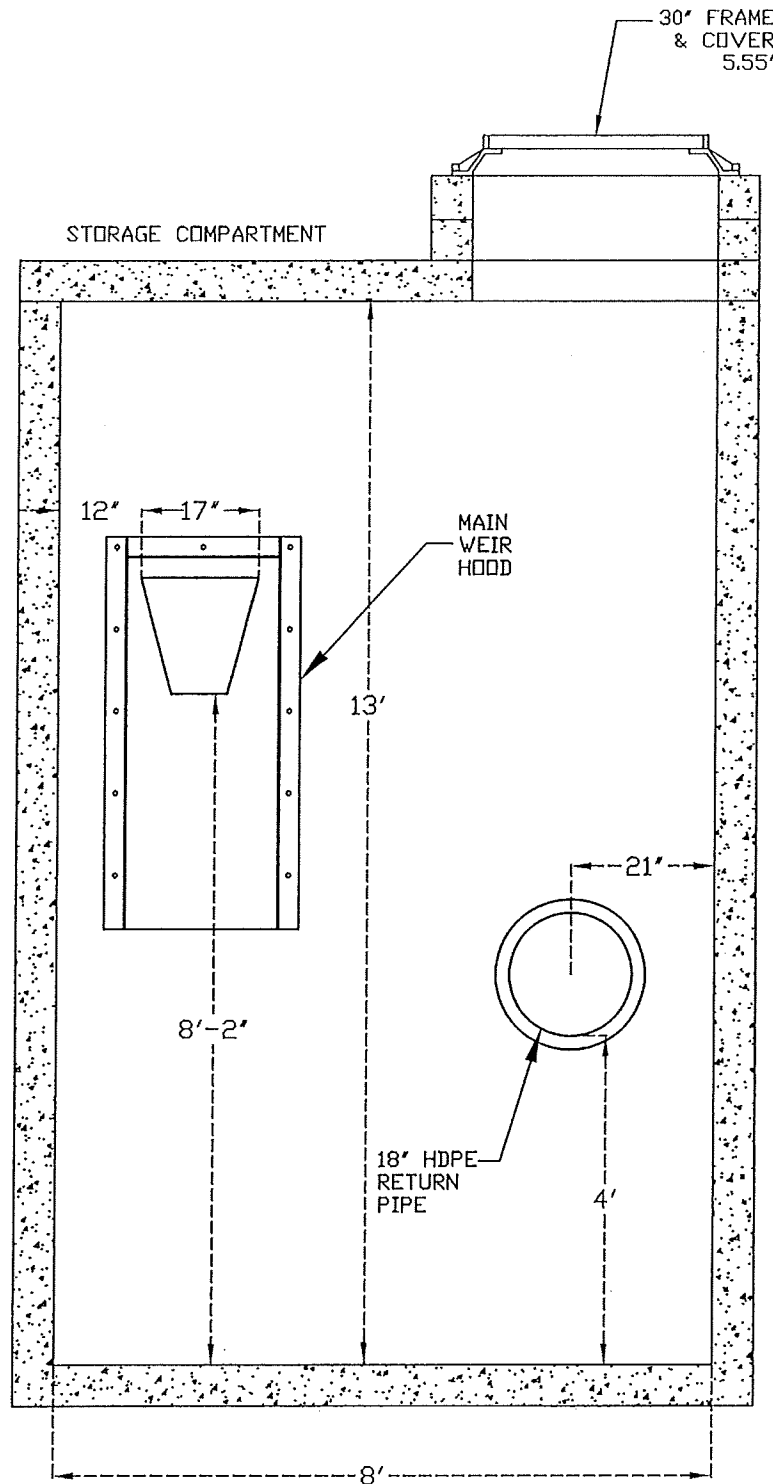
- 1) Submittal drawings for approval.
- 2) Wall thickness determined by soil conditions and local regulations.
- 3) Vault to meet ASTM standards.
- 4) Structural design not provided by BTI.

BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED:	TEP
DRAWN:	PR
CHECKED:	EKH
DATE:	3/22/12
SCALE:	N.T.S.
SHEET:	2 OF 3

**RIBERIA STREET IMPROVEMENTS
ST. AUGUSTINE - FL
SECTION B-B VIEW
XK BAYSAVER SYSTEM
SC-05 DETAILS**



NOTES:

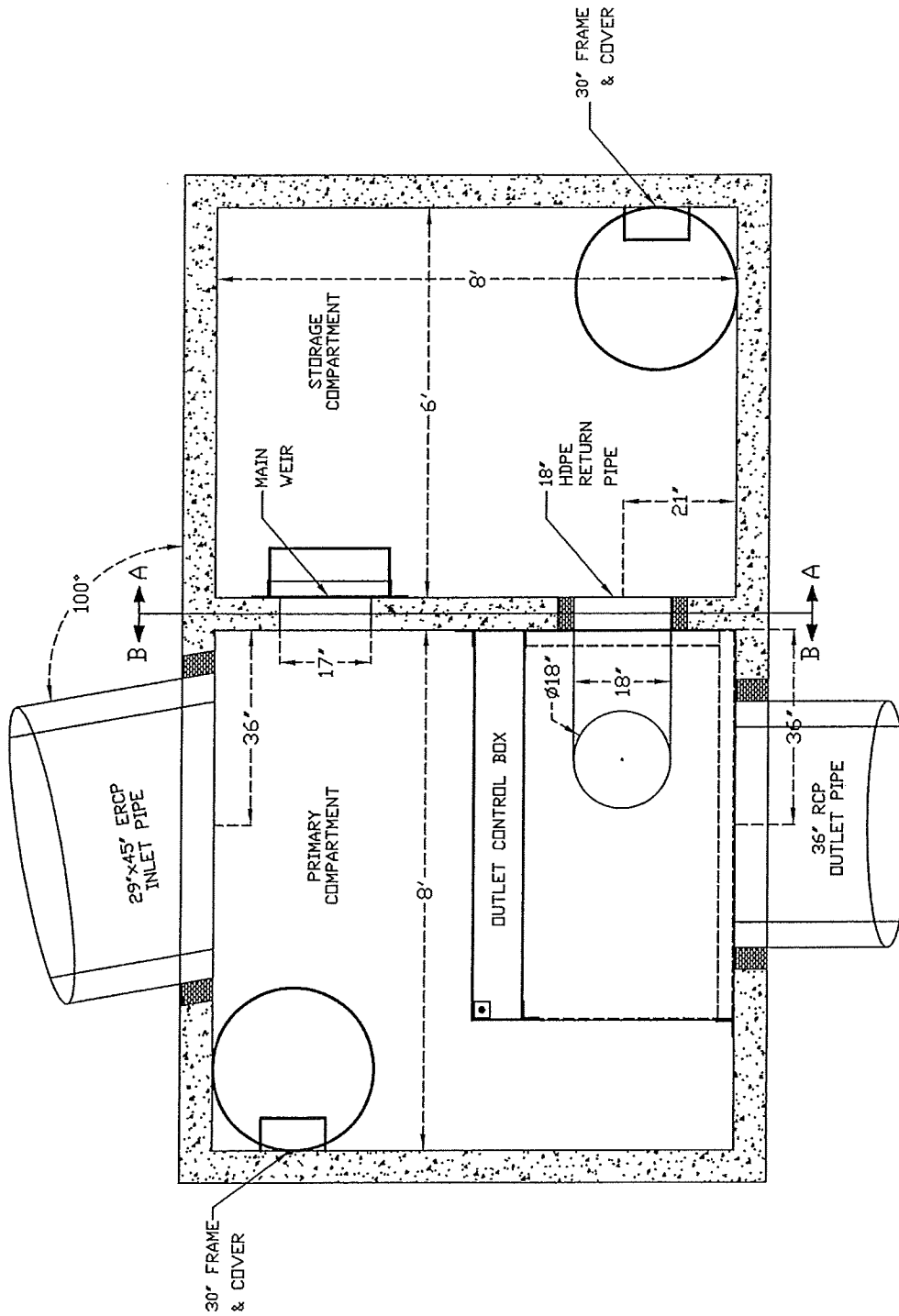
- 1) Submittal drawings for approval.
- 2) Wall thickness determined by soil conditions and local regulations.
- 3) Vault to meet ASTM standards.
- 4) Structural design not provided by BTL.

BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED:	TEP
DRAWN:	PR
CHECKED:	EKH
DATE:	3/22/12
SCALE:	N.T.S.
SHEET:	3 OF 3

**RIBERIA STREET IMPROVEMENTS
ST. AUGUSTINE - FL
SECTION A-A VIEW
XK BAYSAVER SYSTEM
SC-05 DETAILS**



NOTES:

- 1) Submittal drawings for approval.
- 2) Wall thickness determined by soil conditions and local regulations.
- 3) Vault to meet ASTM standards.
- 4) Structural design not provided by BTI.

BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED: TEP

DRAWN: PR

CHECKED: EKH

DATE: 3/22/12

SCALE: N.T.S.

SHEET: 1 OF 3

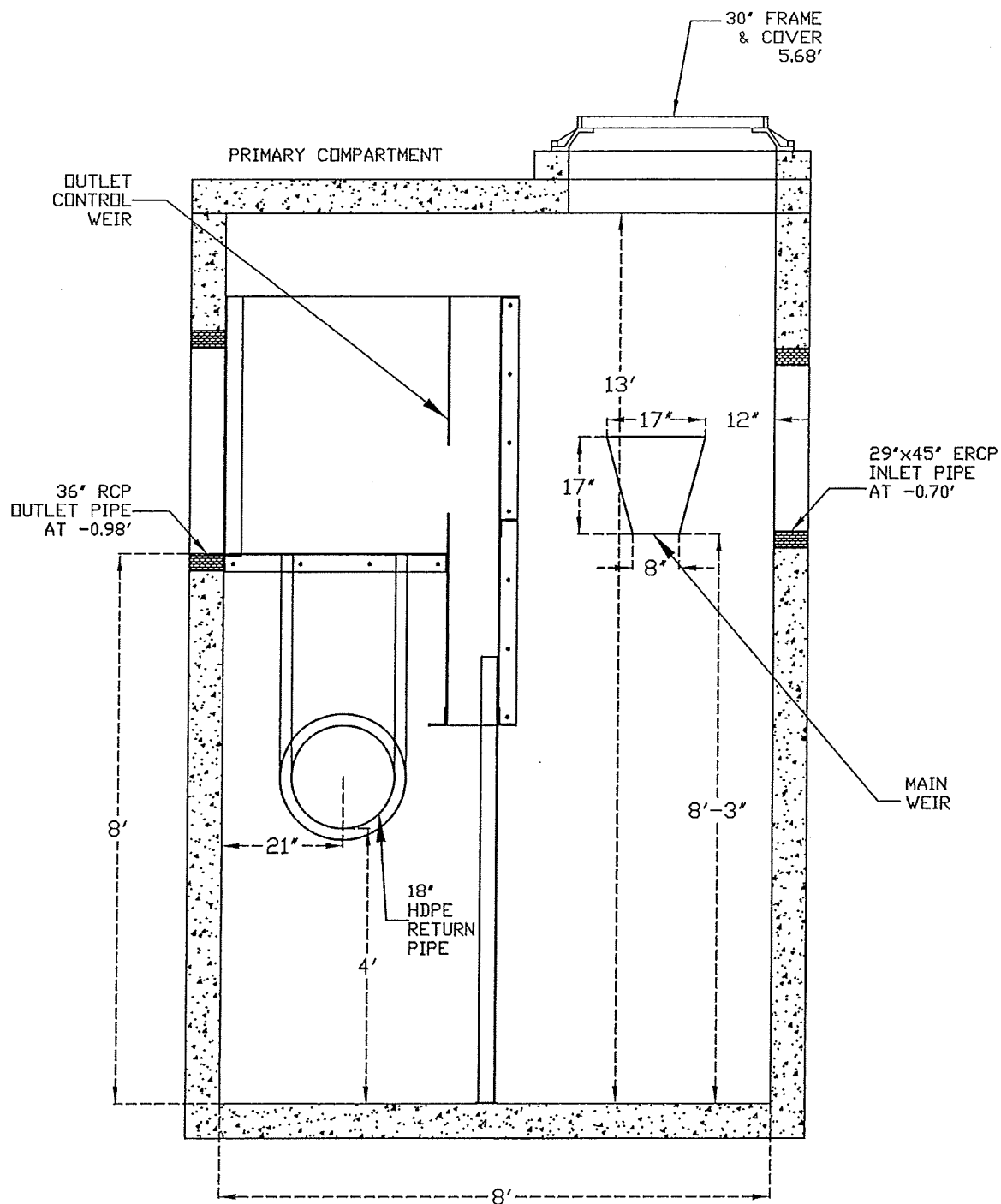
RIBERIA STREET IMPROVEMENTS

ST. AUGUSTINE - FL

PLAN VIEW

XK BAYSAVER SYSTEM

SC-06 DETAILS



NOTES:

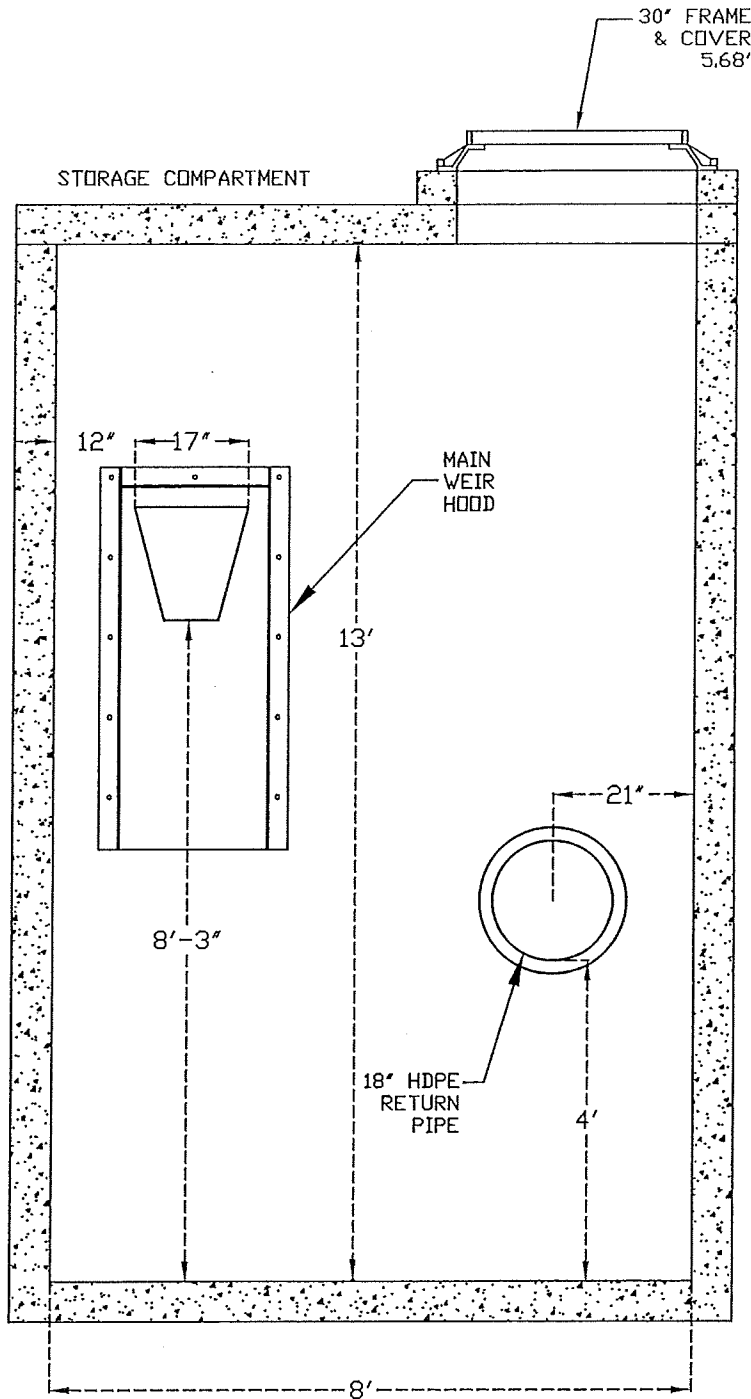
- 1) Submittal drawings for approval.
- 2) Wall thickness determined by soil conditions and local regulations.
- 3) Vault to meet ASTM standards.
- 4) Structural design not provided by BTI.

BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED:	TEP
DRAWN:	PR
CHECKED:	EKH
DATE:	3/22/12
SCALE:	N.T.S.
SHEET:	2 OF 3

**RIBERIA STREET IMPROVEMENTS
ST. AUGUSTINE - FL
SECTION B-B VIEW
XK BAYSAVER SYSTEM
SC-06 DETAILS**



NOTES:

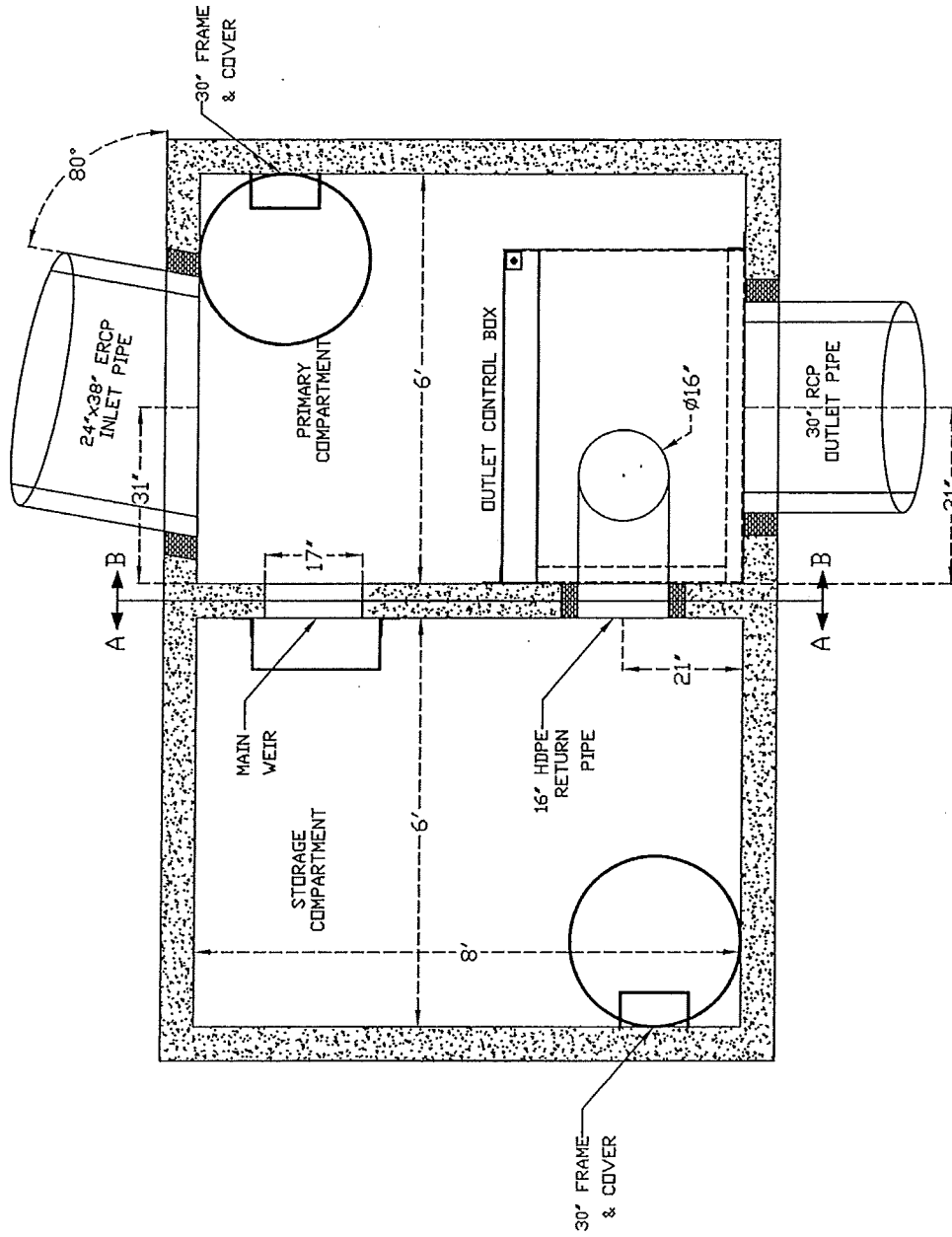
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BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED:	TEP
DRAWN:	PR
CHECKED:	EKH
DATE:	3/22/12
SCALE:	N.T.S.
SHEET:	3 OF 3

**RIBERIA STREET IMPROVEMENTS
ST. AUGUSTINE - FL
SECTION A-A VIEW
XK BAYSAVER SYSTEM
SC-06 DETAILS**



NOTES:

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- 3) Vault to meet ASTM standards.
- 4) Structural design not provided by BTI.

BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED: TEP

DRAWN: PR

CHECKED: EKH

DATE: 2/29/12

SCALE: N.T.S.

SHEET: 1 OF 3

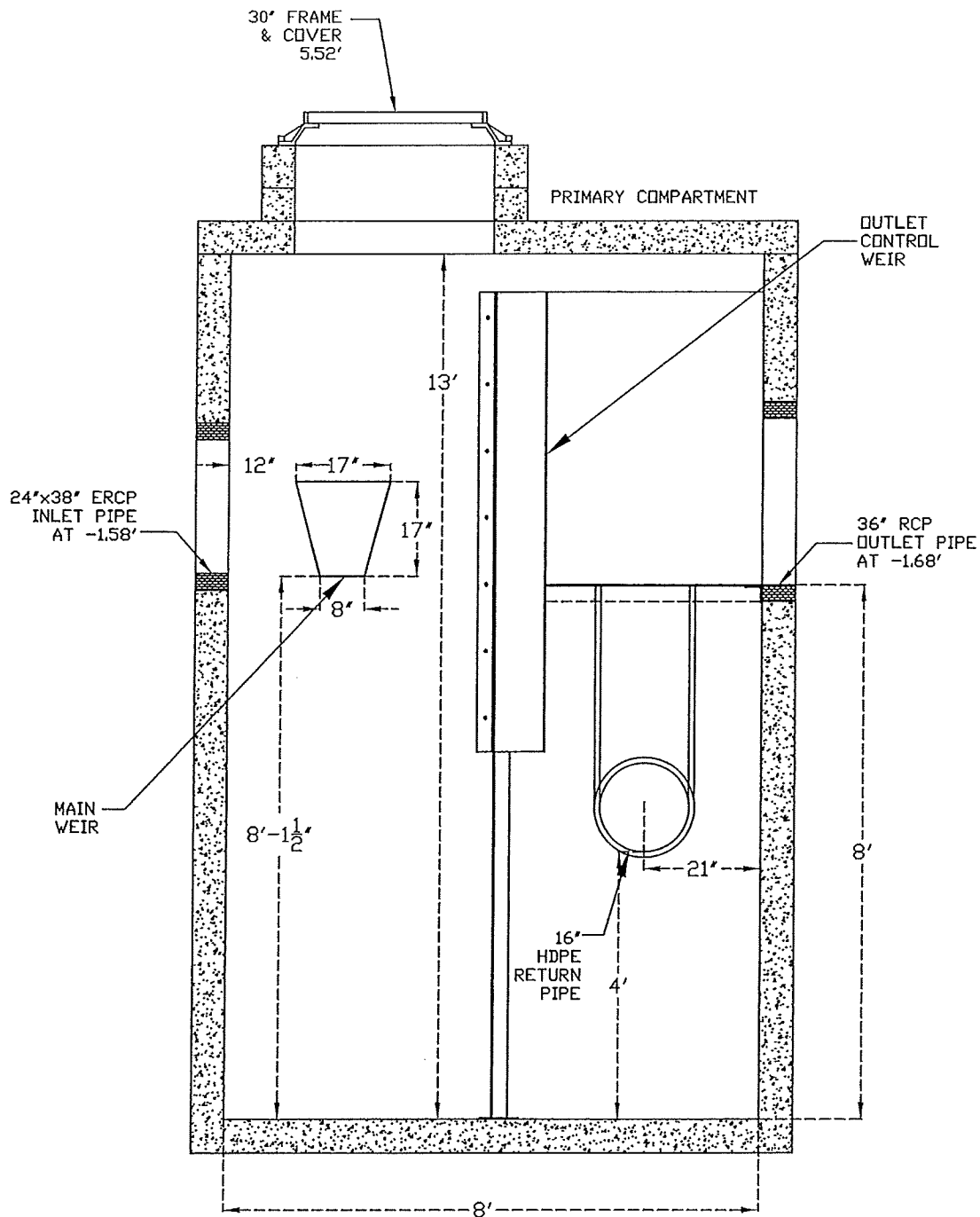
RIBERIA STREET IMPROVEMENTS

ST. AUGUSTINE - FL

PLAN VIEW

XK BAYSAVER SYSTEM

SC-07 DETAILS



NOTES:

- 1) Submittal drawings for approval.
- 2) Wall thickness determined by soil conditions and local regulations.
- 3) Vault to meet ASTM standards.
- 4) Structural design not provided by BTI.

BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED: TEP

DRAWN: PR

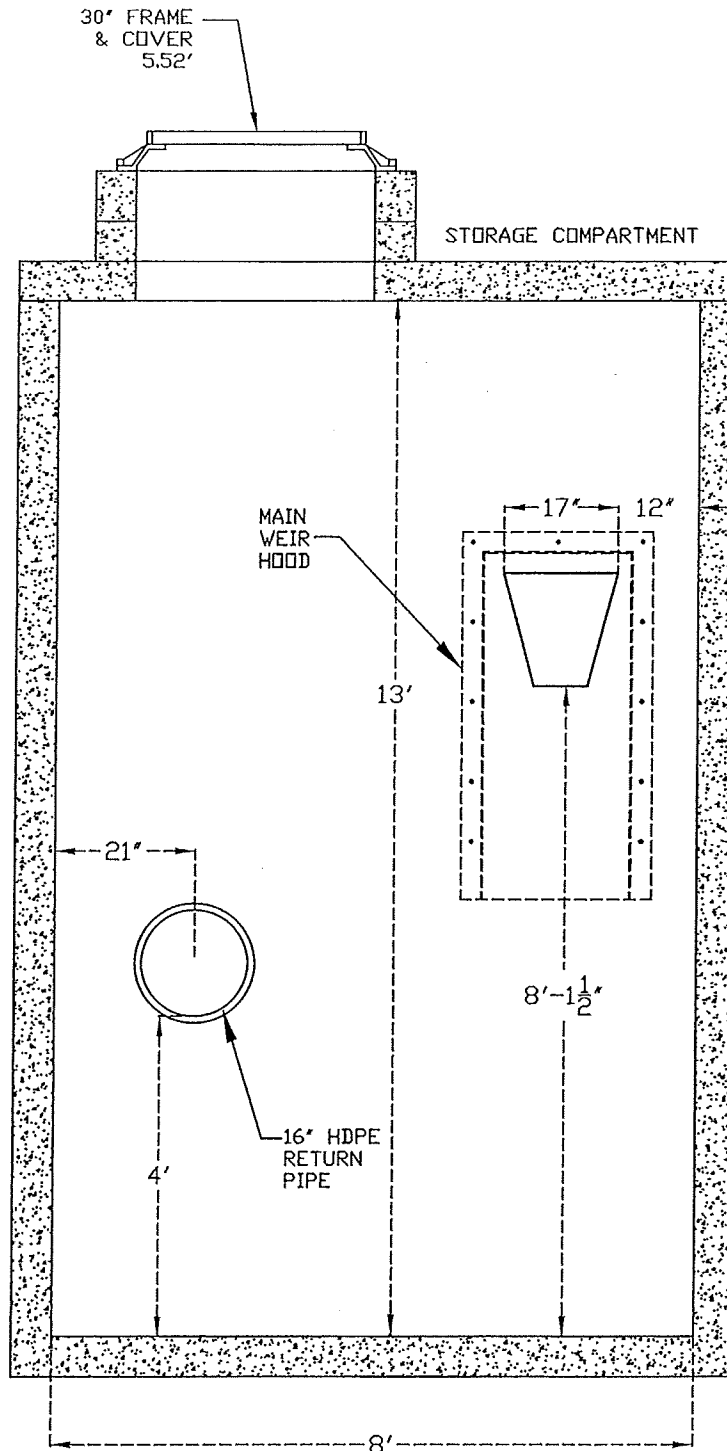
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DATE: 2/29/12

SCALE: N.T.S.

SHEET: 2 OF 3

RIBERIA STREET IMPROVEMENTS
ST. AUGUSTINE - FL
SECTION B-B VIEW
XK BAYSAVER SYSTEM
SC-07 DETAILS



NOTES:

- 1) Submittal drawings for approval.
- 2) Wall thickness determined by soil conditions and local regulations.
- 3) Vault to meet ASTM standards.
- 4) Structural design not provided by BTL.

BAYSAVER

1030 Deer Hollow Drive
Mt. Airy, MD 21771
(301) 829-6470

DESIGNED: TEP

DRAWN: PR

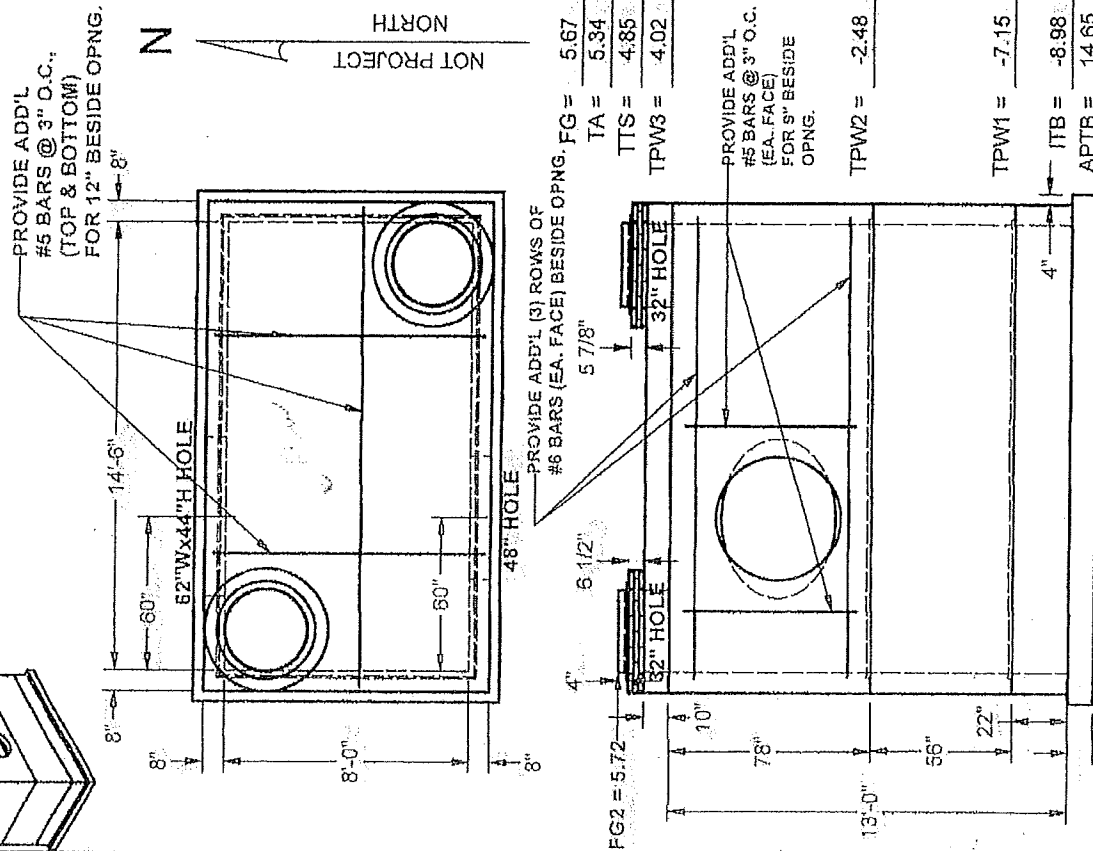
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DATE: 2/29/12


SCALE: N.T.S.

SHEET: 3 OF 3

**RIBERIA STREET IMPROVEMENTS
ST. AUGUSTINE - FL
SECTION A-A VIEW
XK BAYSAVER SYSTEM
SC-07 DETAILS**

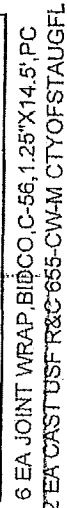
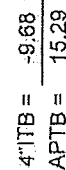
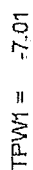
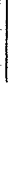
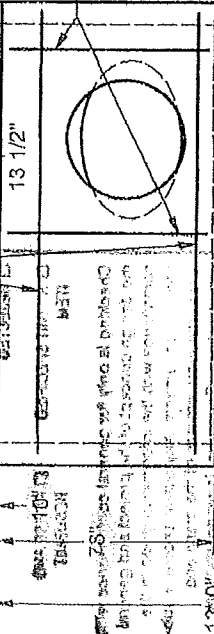
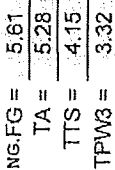
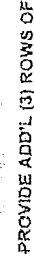
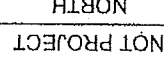
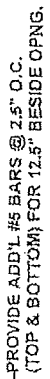


8'x14.5' BAYSAVER BOX # _____ 1 ea									
SPECIFICATIONS									
1	BASE STEEL - #5 @ 6" O.C.E.W. (Top)#5 @ 6" O.C.E.W. (Bot)								
2	WALL STEEL- #4 @ 8" Vert. #6 @ 5" Hor(In Mat)#4 @ 8" Vert.#6 @ 5" Hor(Out Mat)								
3	RISER STEEL- #4 @ 8" Vert. #6 @ 5" Hor(In Mat)#4 @ 8" Vert.#6 @ 5" Hor(Out Mat)								
4	TOP SLAB STEEL - #5 @ 8" O.C.E.W. (Top)#5 @ 8" O.C.E.W. (Bot)								
5	BEND HORIZ. WALL STEEL AROUND CORNERS								
6	HOOK VERT. WALL STEEL 12" INTO BASE								
7	6000 PSI, Grade 60 (400 MPa) steel reinforcement								
SPECIAL NOTES: 3 FLAT TOP									
0 ALL INTERNAL COMPONENTS FROM OTHERS, INSTALLED BY MASCI									
0 INTERNAL BAFFLE WALLS BUILT IN FIELD BY CONTRACTOR									
PC #	WEIGHT	PIECE DESCRIPTION					PRODUCT CODE		
4	17076	174L x 096W x 08WWall x 010H, TopSlab_Eng					ST17409612TS000		
3	28064	174L x 096W x 08WWall x 078H, Riser_Eng					SS174096094R08N000		
2	22244	174L x 096W x 08WWall x 056H, Riser_Eng					SS174096560R08N000		
1	29538	174L x 096W x 08WWall x 022H, MonoBaseExt_Eng					SS174096024E08X000		
PC #	DEG DIR	PIPE SIZE	PIPE INVERT	HOLE SIZE	BOOT TYPE	HOLE INVERT	HOLE RAISE		
3	N	28x45 RCP	-0.70	62"Wx44"H (60" CAL OFF W. WALL)	NONE	-1.33	14"		
3	S	36 RCP	-0.98	46" (60" CAL OFF W. WALL)	NONE	-1.48	12"		
RIBERIA STREET BAYSAVER BOXES RE									
DESIGN BY: LRM									
MASCI CONSTRUCTION INC									
DATE: 4/18/2012									
ORDER #: 10487274				SCALE: 1:65			DESCRIPTION:		
REVISED DATE:									



Hanson
HEIDELBERGCEMENT Group

Date: _____



8'x12.5' BAYSAVER BOX # SC-07
1 ea

SPECIFICATIONS

1	BASE STEEL - #5 @ 6" O.C.E.W. (Top); #5 @ 6" O.C.E.W. (Bot)
2	WALL STEEL - #4 @ 8" Vert; #5 @ 5" Hor (In Mat); #4 @ 8" Vert; #5 @ 5" Hor (Cl Mat)
3	RISER STEEL - #4 @ 8" Vert; #5 @ 5" Hor (In Mat); #4 @ 8" Vert; #5 @ 5" Hor (Cl Mat)
4	TOP SLAB STEEL - #5 @ 5" O.C.E.W. (Top); #5 @ 5" O.C.E.W. (Bot)
5	BEND HORIZ. WALL STEEL AROUND CORNERS
6	HOOK VERT. WALL STEEL 12" INTO BASE
7	4500 PSI, Grade 60 (400 MPa) steel reinforcement
SPECIAL NOTES: 3 FLAT TOP	
0 ALL INTERNAL COMPONENTS FROM OTHERS, INSTALLED BY MASCI	

SPECIAL NOTES: 3 FLAT TOP

0 ALL INTERNAL COMPONENTS FROM OTHERS, INSTALLED BY MASCI

Ø INTERNAL BAFFLE WALLS BUILT IN FIELD BY CONTRACTOR

PC #	WEIGHT	PIECE DESCRIPTION	PRODUCT CODE
4	14743	150L x 096W x 08Wall x 010H, TopSlab_Eng	ST15003612T5000
3	26162	150L x 096W x 08Wall x 078H, Riser_Eng	SS150096034R66N00
2	16739	150L x 096W x 08Wall x 046H, Riser_Eng	SS150096046R06N00
1	29929	150L x 096W x 08Wall x 032H, MonoBaseExt_Eng	SS150095936E08X200

[illegible]

DESIGN BY: LRM

DATE: 4/18/2012

SCALE:

DESCRIPTION.

NOTATION.



Hanson
HEIDELBERGCEMENT Group

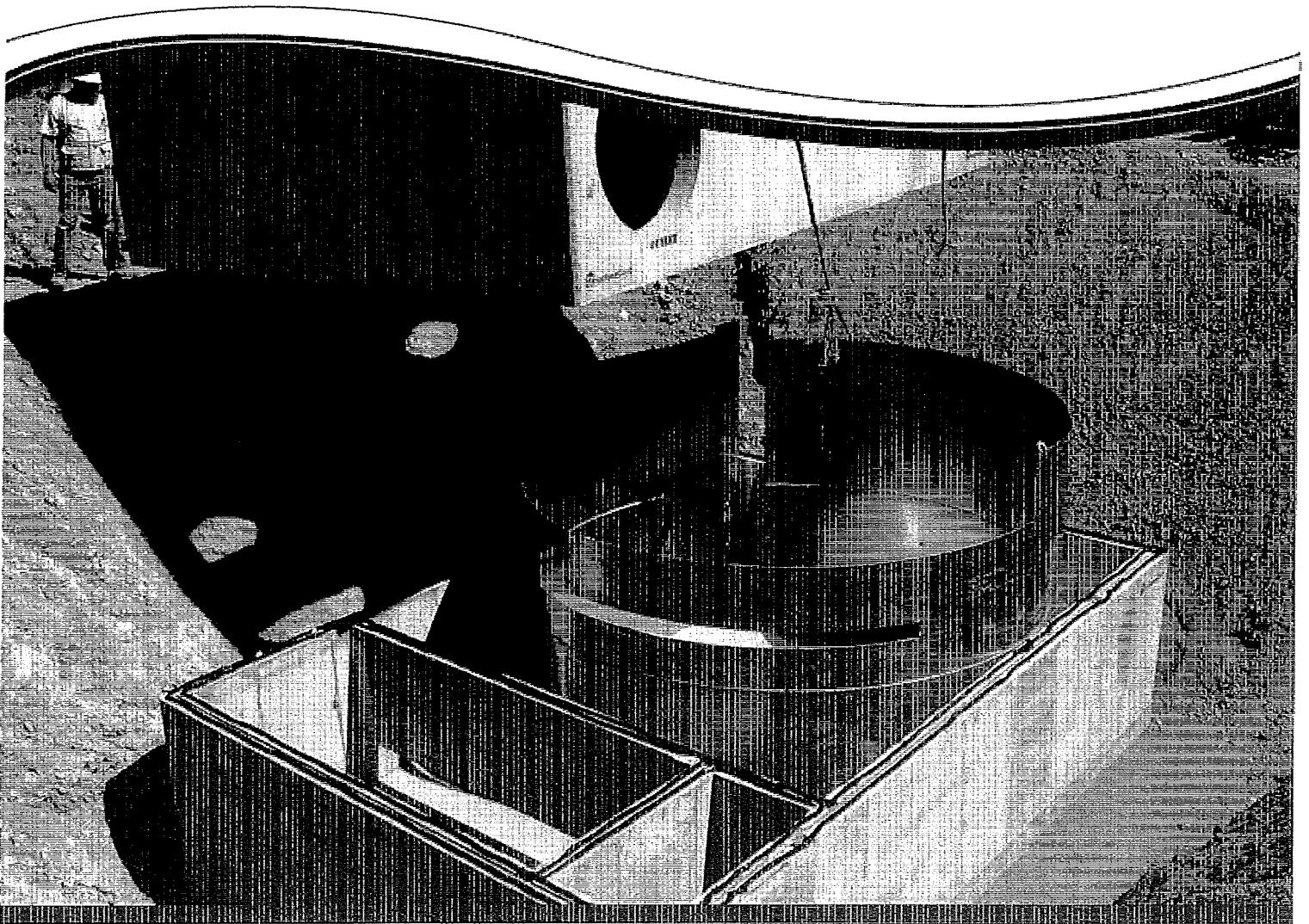
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5-072-072-06-00-MH-T-JS-M-2-0

4/18/2012

10487274SC-07.14v

Vortechs® Guide Operation, Design, Performance and Maintenance



Vortechs®

The Vortechs system is a high-performance hydrodynamic separator that effectively removes finer sediment (e.g. 50-microns (μm), oil, and floating and sinking debris. The swirl concentration operation and flow controls work together to minimize turbulence and provide stable storage of captured pollutants. Precast models can treat peak design flows up to 30-cfs (850-L/s); cast-in-place models handle even greater flows. A typical system is sized to provide a specific removal efficiency of a predefined particle size distribution (PSD).

Operation Overview

Stormwater enters the swirl chamber inducing a gentle swirling flow pattern and enhancing gravitational separation. Sinking pollutants stay in the swirl chamber while floatables are stopped at the baffle wall. Vortechs systems are usually sized to efficiently treat the frequently occurring runoff events and are primarily controlled by the low flow control orifice. This orifice effectively reduces inflow velocity and turbulence by inducing a slight backwater that is appropriate to the site.

During larger storms, the water level rises above the low flow control orifice and begins to flow through the high flow control. Any layer of floating pollutants is elevated above the invert of the Floatables Baffle Wall, preventing release. Swirling action increases in relation to the storm intensity, while sediment pile remains stable. When the storm drain is flowing at peak capacity, the water surface in the system approaches the top of the high flow control. The Vortechs system will be sized large enough so that previously captured pollutants are retained in the system, even during these infrequent events.

As a storm subsides, treated runoff decants out of the Vortechs system at a controlled rate, restoring the water level to a dry-weather level equal to the invert of the inlet pipe. The low water level facilitates easier inspection and cleaning, and significantly reduces maintenance costs by reducing pump-out volume.

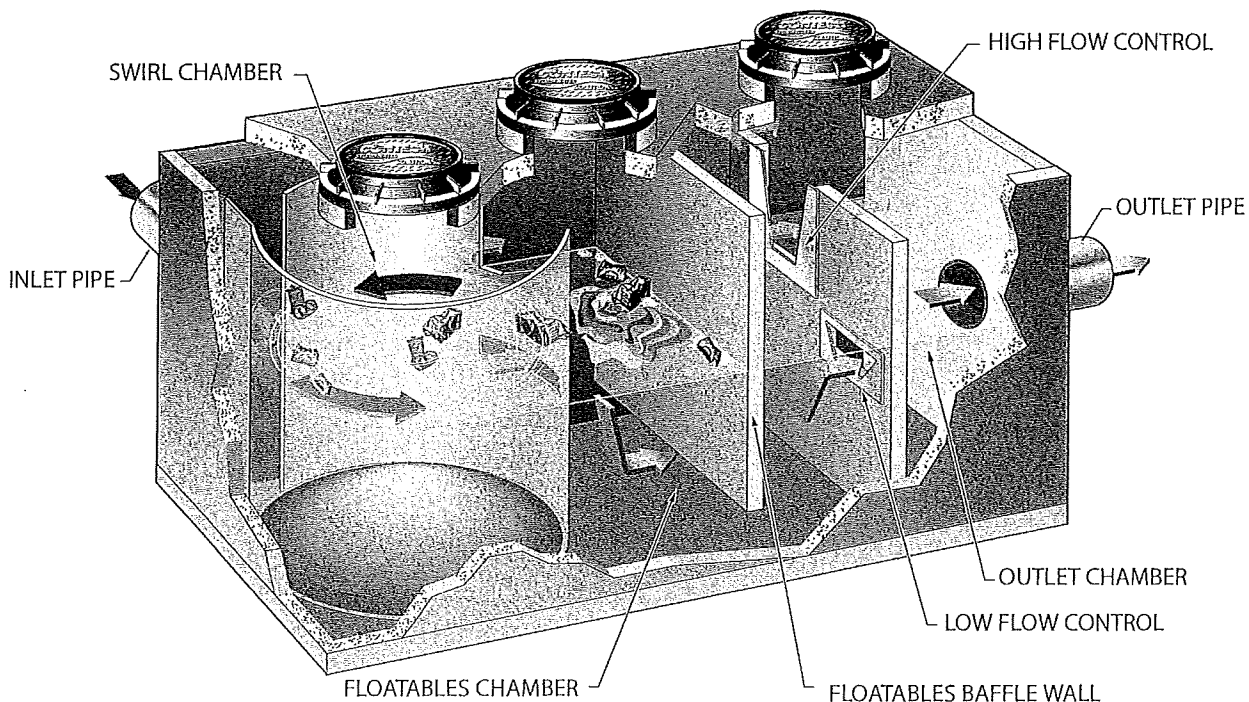
Design Basics

Each Vortechs system is custom designed based on site size, site runoff coefficient, regional precipitation intensity distribution, and anticipated pollutant characteristics. There are two primary methods of sizing a Vortechs system. The first is to determine which model size provides the desired removal efficiency at a given flow for a defined particle size or PSD. The second and more in depth method is the summation of Rational Rainfall Method™ which uses a summation process described below in detail and is used when a specific removal efficiency of the net annual sediment load is required.

Typically Vortechs systems are designed to achieve an 80% annual solids load reduction based on lab generated performance curves for either 50- μm particles, or a particle gradation found in typical urban runoff (see performance section of this manual for more information).

The Rational Rainfall Method™

Differences in local climate, topography and scale make every site hydraulically unique. It is important to take these factors into consideration when estimating the long-term performance of any stormwater treatment system. The Rational Rainfall Method combines site-specific information with laboratory generated performance data, and local historical precipitation records to estimate removal efficiencies as accurately as possible.



Maintenance

The Vortechs system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit, e.g., unstable soils or heavy winter sanding will cause the swirl chamber to fill more quickly but regular sweeping will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant deposition and transport may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. Inspections should be performed twice per year (i.e. spring and fall) however more frequent inspections may be necessary in equipment washdown areas and in climates where winter sanding operations may lead to rapid accumulations. It is useful and often required as part of a permit to keep a record of each inspection. A simple inspection and maintenance log form for doing so is provided on the following page, and is also available on conteches.com.

The Vortechs system should be cleaned when inspection reveals that the sediment depth has accumulated to within 12 to 18 inches (300 to 450 mm) of the dry-weather water surface elevation. This determination can be made by taking two measurements with a stadia rod or similar measuring device; one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. **Note:** To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.

Cleaning

Cleaning of the Vortechs system should be done during dry weather conditions when no flow is entering the system. Clean-out of the Vortechs system with a vacuum truck is generally the most effective and convenient method of excavating pollutants from the system. If such a truck is not available, a "clamshell" grab may be used, but it is difficult to remove all accumulated pollutants using a "clamshell".

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use adsorbent pads to solidify the oil since these pads are usually much easier to remove from the unit individually and less expensive to dispose of than the oil/water emulsion that may be created by vacuuming the oily layer. Floating trash can be netted out if you wish to separate it from the other pollutants.

Cleaning of a Vortechs system is typically done by inserting a vacuum hose into the swirl chamber and evacuating this chamber of water and pollutants. As water is evacuated, the water level outside of the swirl chamber will drop to a level roughly equal to the crest of the lower aperture of the swirl chamber. The water outside the swirl chamber should remain near this level throughout pumping as the bottom and sides

of the swirl chamber are sealed to the tank floor and walls. This "water lock" feature prevents water from migrating into the swirl chamber, exposing the bottom of the baffle wall and creating excess pump-out volume. Floating pollutants will decant into the swirl chamber as the water level is drawn down. This allows most floating material to be withdrawn from the same access point above the swirl chamber. Floating material that does not decant into the swirl chamber during draw down should be skimmed from the baffle chamber. If maintenance is not performed as recommended, sediment may accumulate outside the swirl chamber. If this is the case, it may be necessary to pump out other chambers. It is advisable to check for sediment accumulation in all chambers during inspection and maintenance.

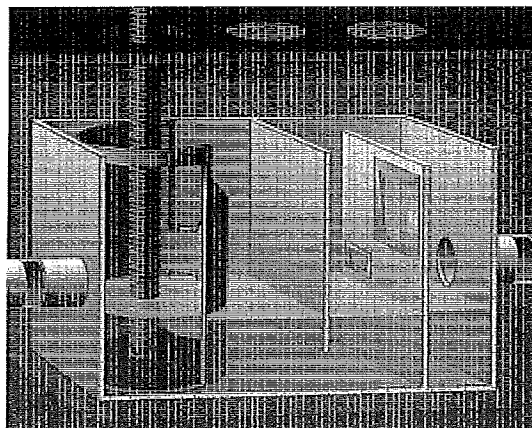
These maintenance recommendations apply to all Vortechs systems with the following exceptions:

1. It is strongly recommended that when cleaning systems larger than the Model 16000 the baffle chamber be drawn down to depth of three feet prior to beginning clean-out of the swirl chamber. Drawing down this chamber prior to the swirl chamber reduces adverse structural forces pushing upstream on the swirl chamber once that chamber is empty.
2. Entry into a Vortechs system is generally not required as cleaning can be done from the ground surface. However, if manned entry into a system is required the entire system should be evacuated of water prior to entry regardless of the system size.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure proper safety precautions. If anyone physically enters the unit, Confined Space Entry procedures need to be followed.

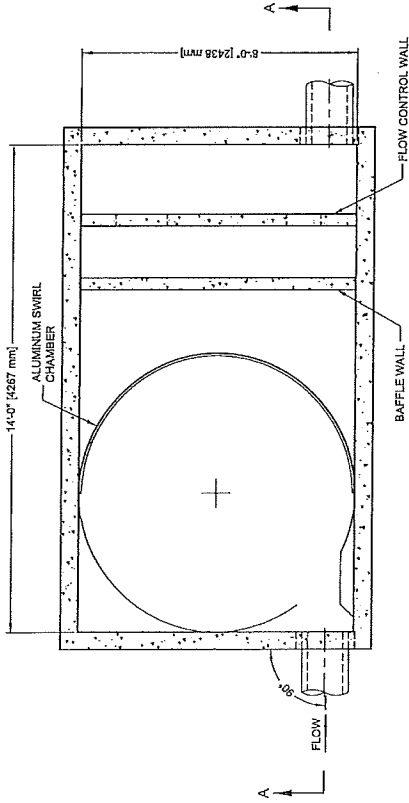
Disposal of all material removed from the Vortechs system should be done in accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.

Contech has created a network of Certified Maintenance Providers (CCMP's) to provide maintenance on Vortechs systems. To find a CCMP in your area please visit www.conteches.com/maintenance.

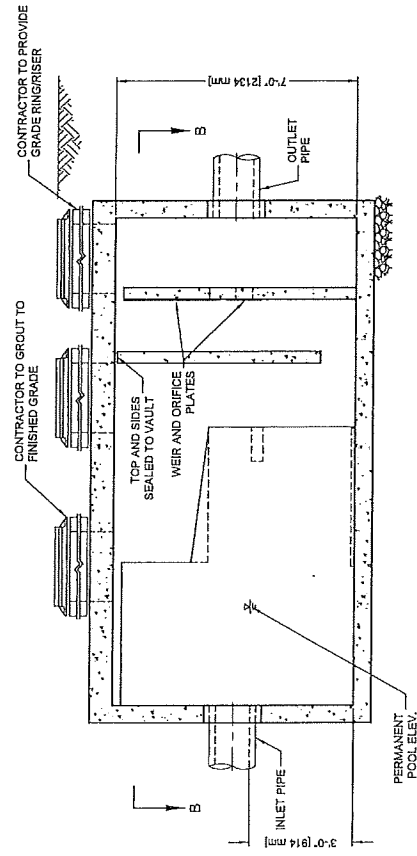


VORTECHS 7000 DESIGN NOTES

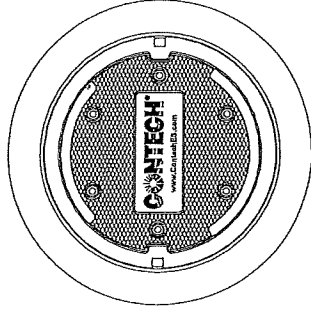
VORTECHS 7000 RATED TREATMENT CAPACITY IS 11 CFS, OR PER LOCAL REGULATIONS. IF THE SITE CONDITIONS EXCEED RATED TREATMENT CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
THE STANDARD INLET/OUTLET CONFIGURATION IS SHOWN. FOR OTHER CONFIGURATION OPTIONS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.conteches.com



SECTION B-B



SECTION A-A



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS					
STRUCTURE ID					
WATER QUALITY FLOW RATE (CFS)					
PEAK FLOW RATE (CFS)					
RETURN PERIOD OF PEAK FLOW (YRS)					
PIPE DATA:					
INLET PIPE 1	I.E.	MATERIAL		DIAMETER	
INLET PIPE 2					
OUTLET PIPE					
RIM ELEVATION					
ANTI-FLOTATION BALLAST			WIDTH		HEIGHT
NOTES/SPECIAL REQUIREMENTS:					
* PER ENGINEER OF RECORD					

- GENERAL NOTES**
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 - DIMENSIONS MARKED WITH (I) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
 - FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.conteches.com
 - VORTECHS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
 - STRUCTURE SHALL BE DESIGNED TO MEET A 150 PSF AND CASTINGS SHALL MEET A 3000 PSI LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
 - INLET PIPE(S) MUST BE PERPENDICULAR TO THE VAULT AND AT THE CORNER TO INTRODUCE THE FLOW TANGENTIALLY TO THE SWIRL CHAMBER. DUAL INLETS NOT TO HAVE OPPOSING TANGENTIAL FLOW DIRECTIONS.
 - OUTLET PIPE(S) MUST BE DOWN STREAM OF THE FLOW CONTROL BAFFLE AND MAY BE LOCATED ON THE SIDE OR END OF THE VAULT. THE FLOW CONTROL WALL MAY BE TURNED TO ACCOMMODATE OUTLET PIPE KNOCKOUTS ON THE SIDE OF THE VAULT.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL, DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE VORTECHS STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLY STRUCTURE.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ENSURE WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.



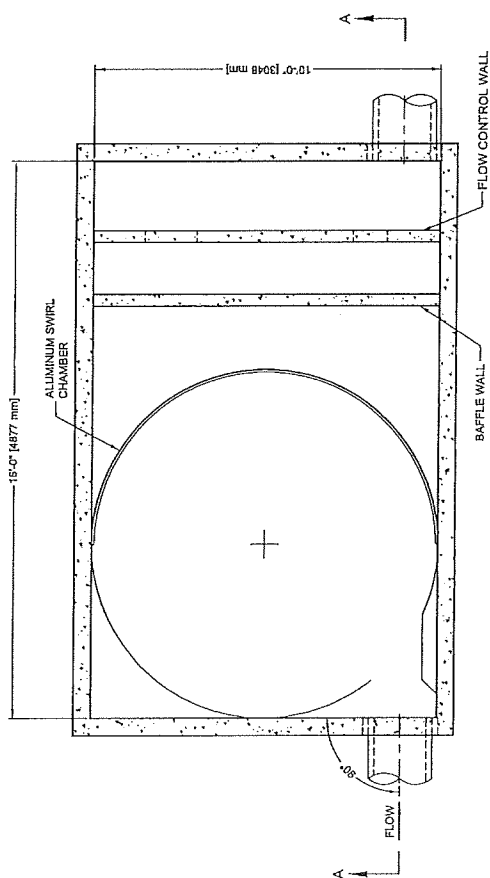
CONTECH
ENGINEERED SOLUTIONS LLC

www.conteches.com
8025 Centre Pointe Dr., Suite 400, West Chester, OH 45088
800-338-1122 513-645-7000 513-645-7933 FAX

VORTECHS 7000
STANDARD DETAIL

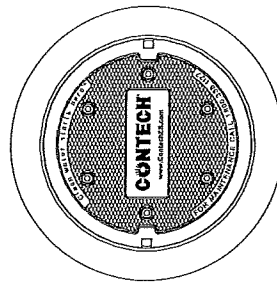
VORTECHS 11000 DESIGN NOTES

VORTECHS 11000 RATED TREATMENT CAPACITY IS 173 CFS, OR PER LOCAL REGULATIONS. IF THE SITE CONDITIONS EXCEED RATED TREATMENT CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
THE STANDARD INLET/OUTLET CONFIGURATION IS SHOWN. FOR OTHER CONFIGURATION OPTIONS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS REPRESENTATIVE. www.ContechES.com



SECTION B-B

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.



SITE SPECIFIC DATA REQUIREMENTS

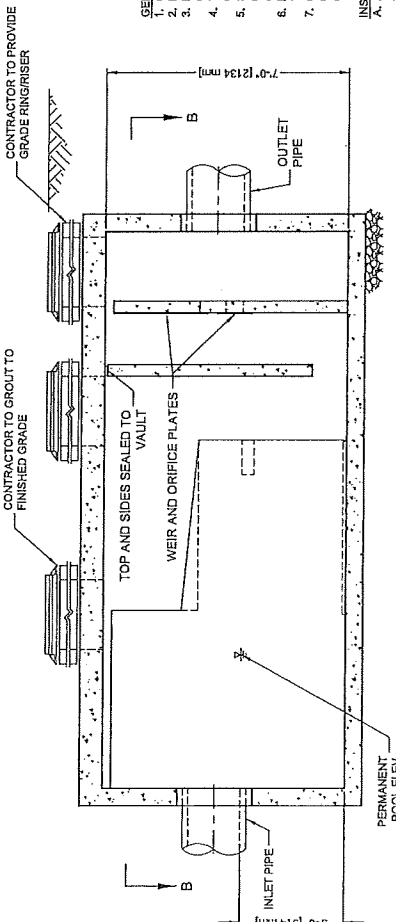
STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS)	*
PEAK FLOW RATE (CFS)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
PIPE DATA:	
INLET PIPE 1	I.E. MATERIAL DIAMETER
INLET PIPE 2	" " " "
OUTLET PIPE	" " " "
RIM ELEVATION	*
ANTI-FLOTATION BALLAST	WIDTH HEIGHT
NOTES/SPECIAL REQUIREMENTS:	*

* PER ENGINEER OF RECORD

- GENERAL NOTES**
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 - DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
 - FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
 - VORTECHS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
 - CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS OF EXISTING CONDITIONS AND CONFIRM ACTUAL GROUNDWATER ELEVATION. ENGINEER OF RECORD TO PROVIDE.
 - INLET PIPE(S) MUST BE PERPENDICULAR TO THE VAULT AND AT THE CORNER TO INTRODUCE THE FLOW TANGENTIALLY TO THE SWIRL CHAMBER. DUAL INLETS NOT TO HAVE OPPOSING TANGENTIAL FLOW DIRECTIONS.
 - OUTLET PIPE(S) MUST BE DOWN STREAM OF THE FLOW CONTROL BAFFLE AND MAY BE LOCATED ON THE SIDE OR END OF THE VAULT. THE FLOW CONTROL WALL MAY BE TURNED TO ACCOMMODATE OUTLET PIPE KNOCKOUTS ON THE SIDE OF THE VAULT.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL, DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE VORTECHS 11000 STRUCTURE WITH SUFFICIENT CLUTCHES PROVIDED.
- CONTRACTOR TO PROVIDE SUFFICIENT BACKFILL ONLY NEARLY BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLY STRUCTURE.
- CONTRACTOR TO PROVIDE SUFFICIENT BACKFILL AND GRADE TO MAINTAIN ALL INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS INVERTED PROPERLY DURING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.



SECTION A-A



THIS PRODUCT MAY BE
REGISTERED OR PATENTED IN
THE UNITED STATES AND OTHER COUNTRIES.

CONTECH
ENGINEERED SOLUTIONS LLC
www.ContechES.com

9025 Conite Pkwy Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7030 513-645-7893 FAX

VORTECHS 11000
STANDARD DETAIL

www.EcoSenseInt.com

George Dussich, CEO/President
Randall N. Burden, Director of
Engineering

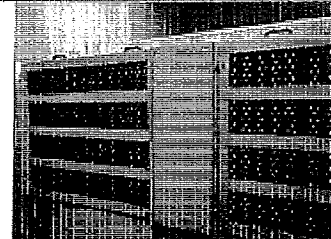
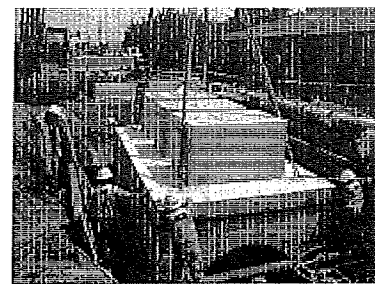


The ESI EcoVault is a precast
concrete stormwater treatment
structure that removes:

Sediments
Nutrients
Trash
Metals
Oil and Grease
Organics

Baffle Buddy Cassette Filter contains
patented modified alumino silicate, ESI
MZ Filter medium, designed to absorb
cations and anions such as:

Phosphates
Hydrocarbons
Dissolved Heavy Metals
PCB, BTX, PCE, THM
Pentachlorophenol
Creosote
Non-ionic surfactants



EcoVault's Baffle Buddy Cassette Filter
media removal rates have been verified
by independent laboratories.

Ask about improved dissolved
oxygen levels in your storm
water treatment system

ESI
EcoSense International

EcoVault™

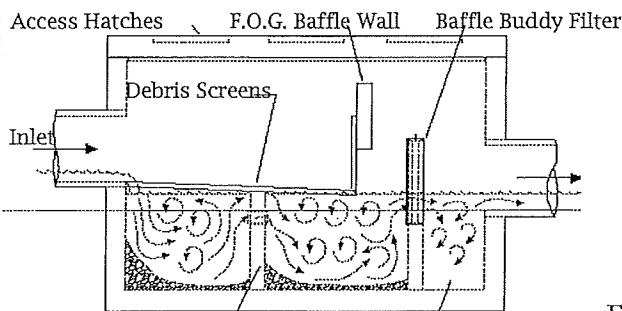
Simple Solutions to Water Pollution

EcoSense International, Inc.

P.O. Box 540562
Merritt Island, Florida

Phone: 321-449-0324
Fax: 321-449-0325
operations@ecosenseint.com

Phosphorus
Absorptive
media!

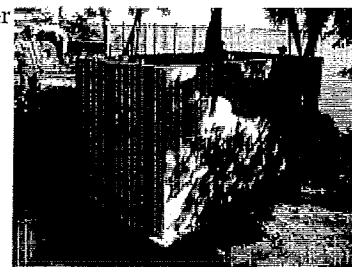


Multi-piece construction to minimize
lifting and freight.

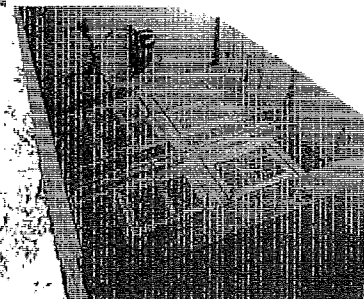
Baffle Buddy Filter becomes the
final internal weir wall.

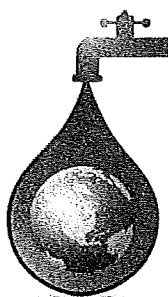
Debris screens are made of
aluminum or Stainless Steel.

ESI MZ Filter medium is superior to tradi-
tional clay materials because it is rigid
and stable, even in aqueous conditions.



EcoVault treats the con-
tinuous flow while debris
screens span the entire
box, creating extensive
storage volume.

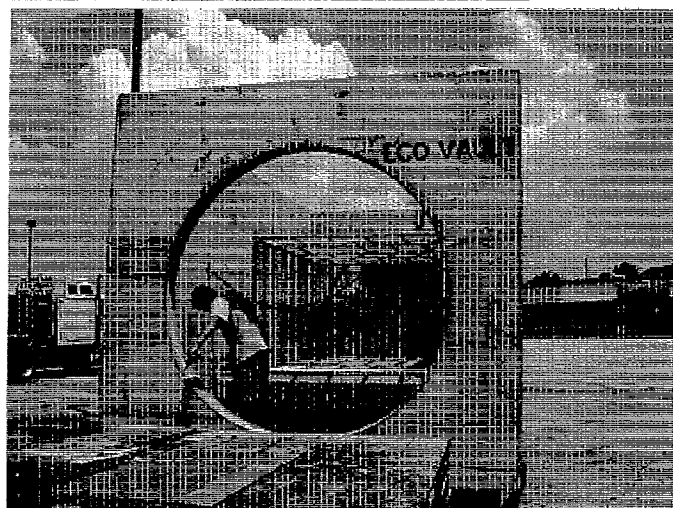




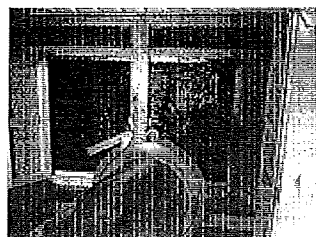
Technology is based on slowing the flow's velocity to facilitate settling.

Baffles impede forward movement of settling particles.

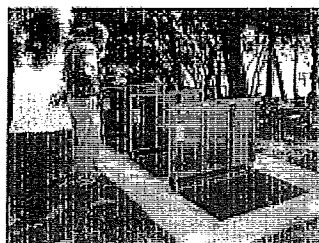
Debris screens raise trash and leaves out of the water to greatly reduce decomposition.



Model Size L x W (ft x ft)	Typical Pipe Size (in)	80% TSS Removal Efficiency Flow (cfs)	Screen Storage Capacity (cf)	Sediment Chamber Capacity (cf)	Total Contaminant Capacity (cf)
5x11	12 to 30	15	87	150	237
6x12	18 to 36	24	144	201	345
8x14	30 to 54	32	324	321	645
8x16	36 to 54	40	360	369	729
10x16	42 to 66	45	550	465	1015
12x20	54 to 72	55	1008	945	1953



Servicing the EcoVault is easy with the accessible hatches and requires a vacuum truck.



Custom sizes are available to meet your specific application

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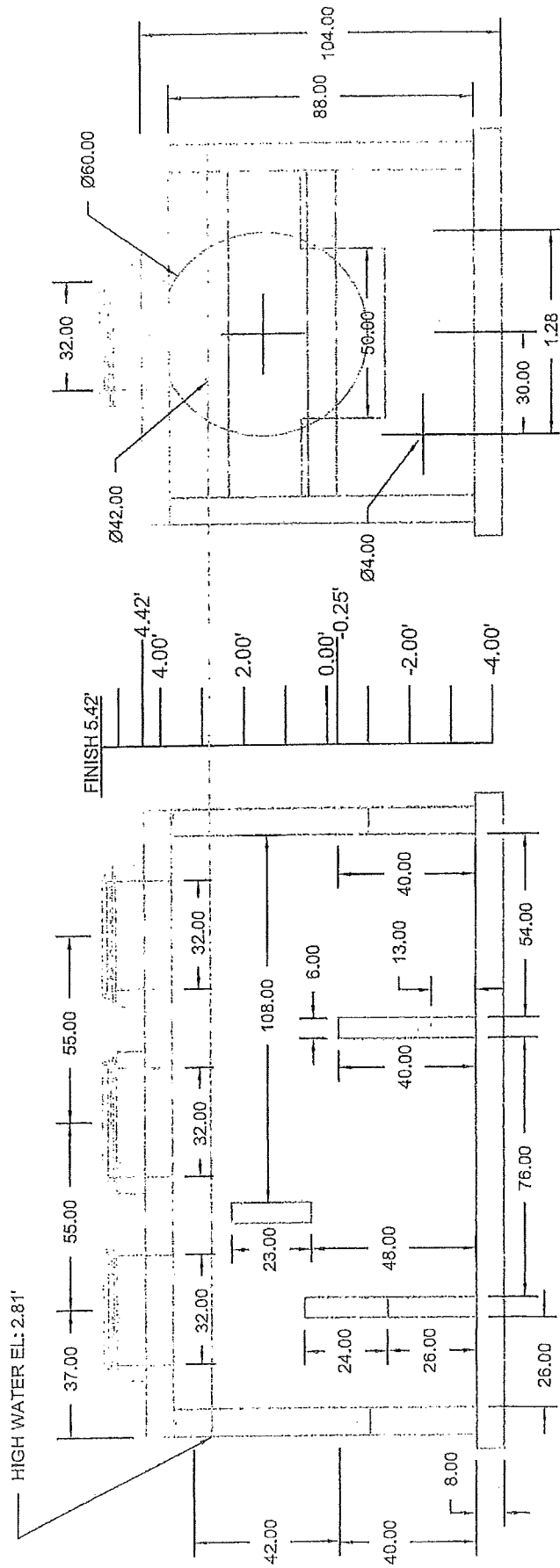
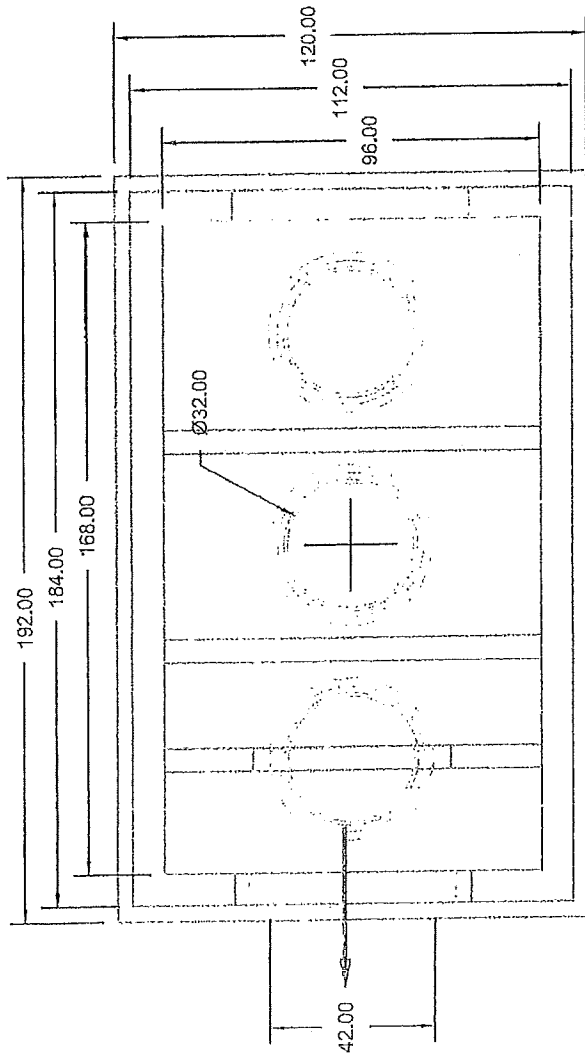
Session

- (1) STRUCTURE TO BE CONSTRUCTED TO AASHTO H-20 LOAD RATING
- (2) ALL DIMENSIONS ARE IN INCHES
- (3) CONNECTING PIPES: 42" RCP @ EL. -0.25'
- (4) ACCESS: USF-655U R & C, (3 PLCS) TO BE CAST ON FIELD POURED RISERS

NO. 1000

2000

383/2



DRAWN BY: BRACKETT

LLCS

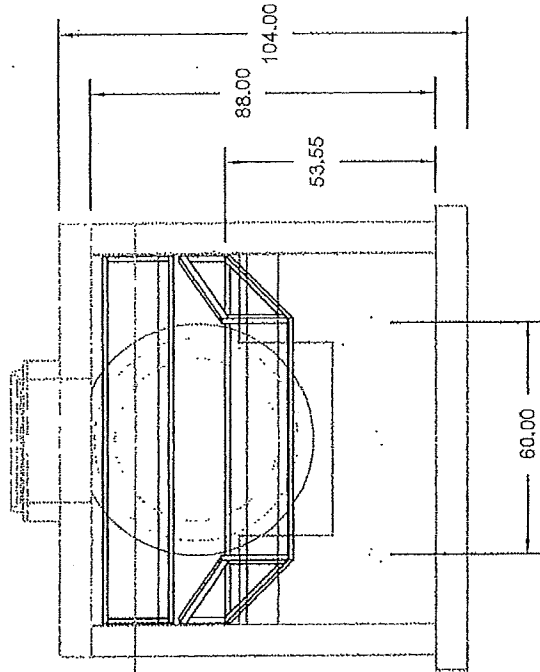
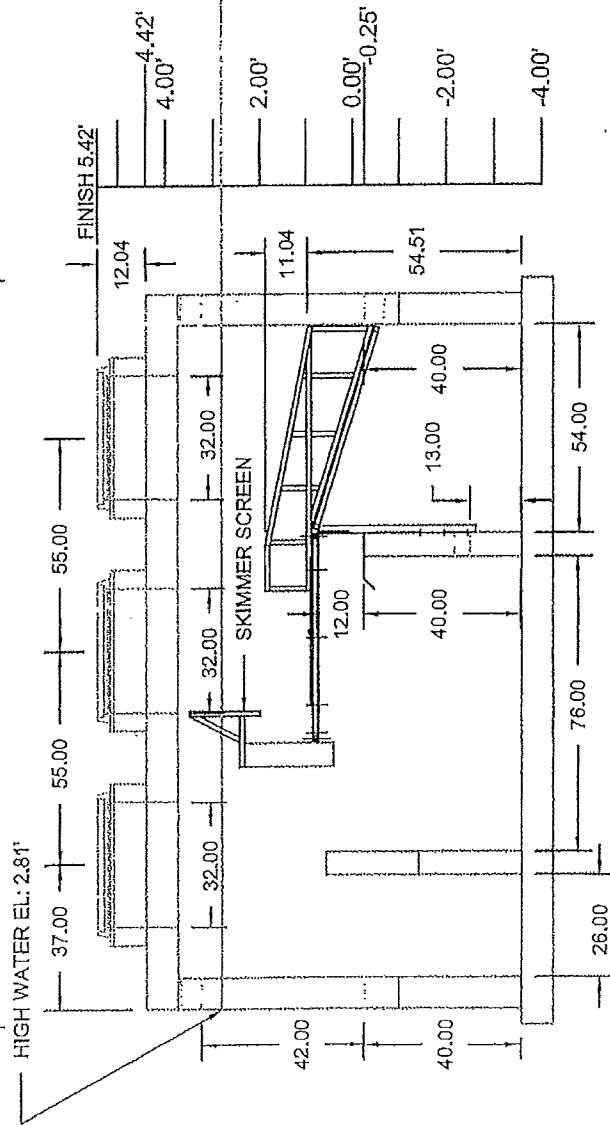
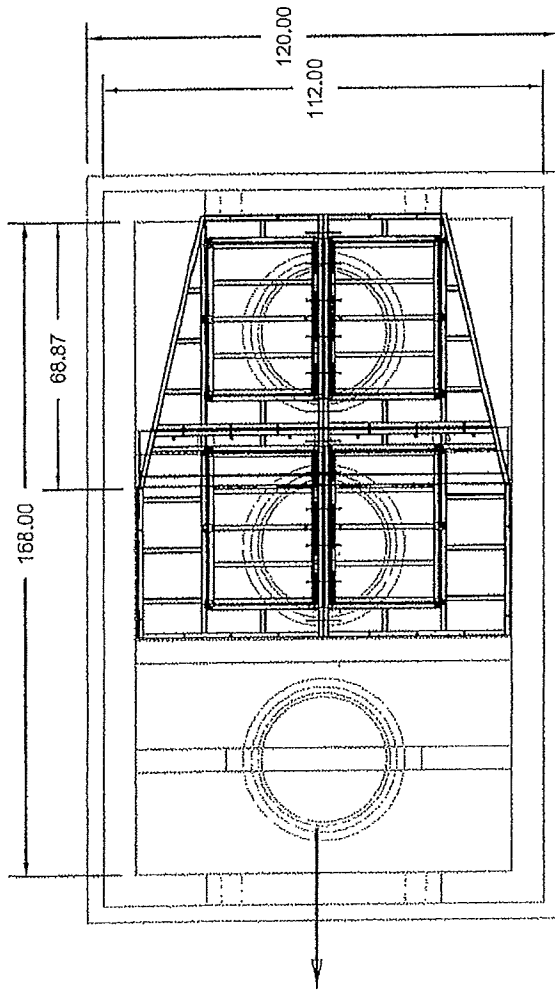
FOR THIS

DATE: 03.14.12

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NOTES:

- (1) STRUCTURE TO BE CONSTRUCTED TO AASHTO H-20 LOAD RATING
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- (4) ACCESS, USF-655U R & C, (3 PLOS) TO BE CAST ON FIELD POURED RISERS



DRAWN BY: BRACKETT

APPROVED BY:

EcoSense

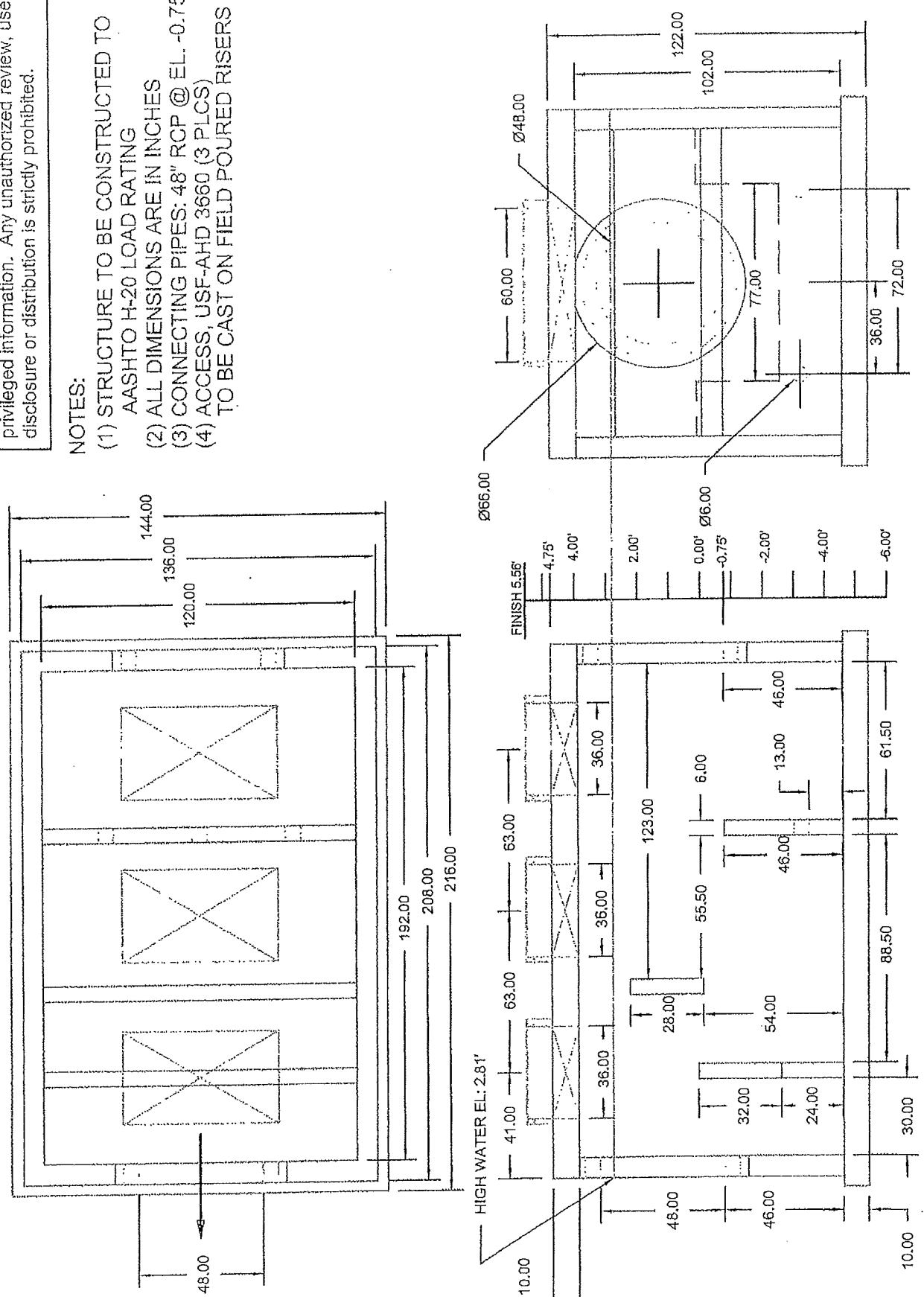
SHT: 2 OF 4

DATE: 03-14-12

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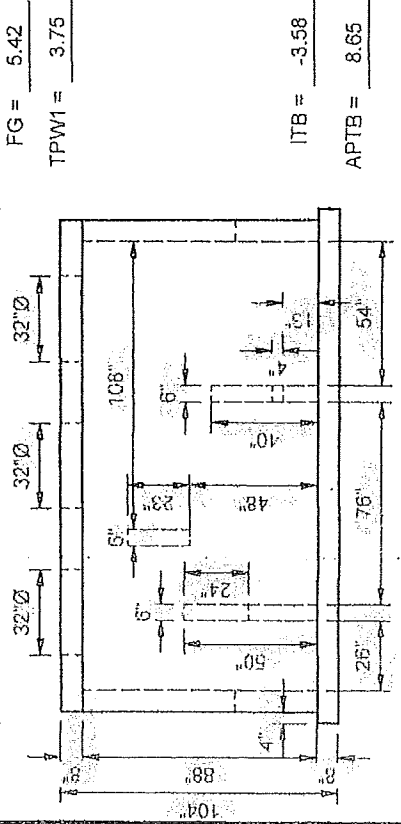
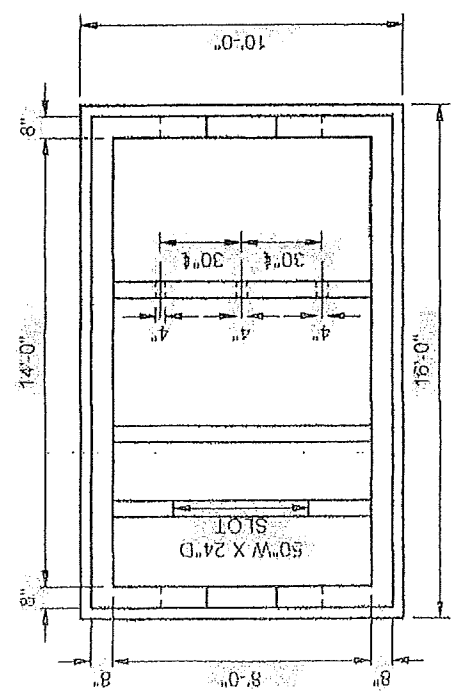
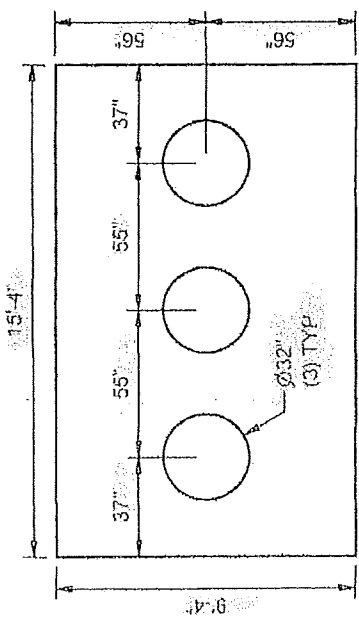
NOTES:

- (1) STRUCTURE TO BE CONSTRUCTED TO AASHTO H-20 LOAD RATING
- (2) ALL DIMENSIONS ARE IN INCHES
- (3) CONNECTING PIPES: 48" RCP @ EL. -0.75'
- (4) ACCESS, USF-AHD 3660 (3 PLCS) TO BE CAST ON FIELD POURED RISERS




DATE: 03-14-12

8EA JOINT WRAP,BIDCQ,C-56,1.25"X14.5".PC
3EA CAST USF RNG 655
3EA CAST USF CVR U STORM


$$\begin{array}{r} \text{FG} = 5.42 \\ \text{TPW1} = 3.75 \end{array}$$
$$\begin{array}{r} \text{ITB} = -3.58 \\ \text{APTB} = 8.65 \end{array}$$

SPECIFICATIONS									
1	BASE STEEL - #5 @ 5" Short #4 @ 4" Long (Top)								
2	WALL STEEL - #4 @ 6" Vert. #5 @ 5" Hor (In Mat) #4 @ 6" Vert #5 @ 5" Hor (Out Mat)								
3	TOP SLAB - #5 @ 7" O.C.E.W.								
4									
5									
6	4000 PSI								
7	Grade 60 (400 MPa) steel reinforcement								
SPECIAL NOTES: 0 INTERNALS PROVIDED BY ECOSENSE									
0 INTERNALS INSTALLED BY HANSON									
2	3/32" DIA DRILLINGS								
PC #	WEIGHT	PIECE DESCRIPTION				PRODUCT CODE			
2	12636	168L x 096W x 08Wall x 08H, TopSlab_Eng				ST16303612V7000			
1	51374	168L x 096W x 08Wall x 08H, MonoBaseEx_Eng				SS16303608408X30			
PC #	DEG DIR	PIPE SIZE	PIPE INVERT	HOLE SIZE	BOOT TYPE	HOLE INVERT	HOLE RAISE		
1	E	42RCP	-0.25	60	NONE	-1	31"		
1	W	42RCP	-0.25	50	NONE	-1	31"		
RIBERIA STREET ECOVAULT								DESIGN BY: JAL	
ECOSENSE								DATE: 3/15/2012	
ORDER # 10497043								SCALE: 1:60	
REVISED DATE:								DESCRIPTION:	



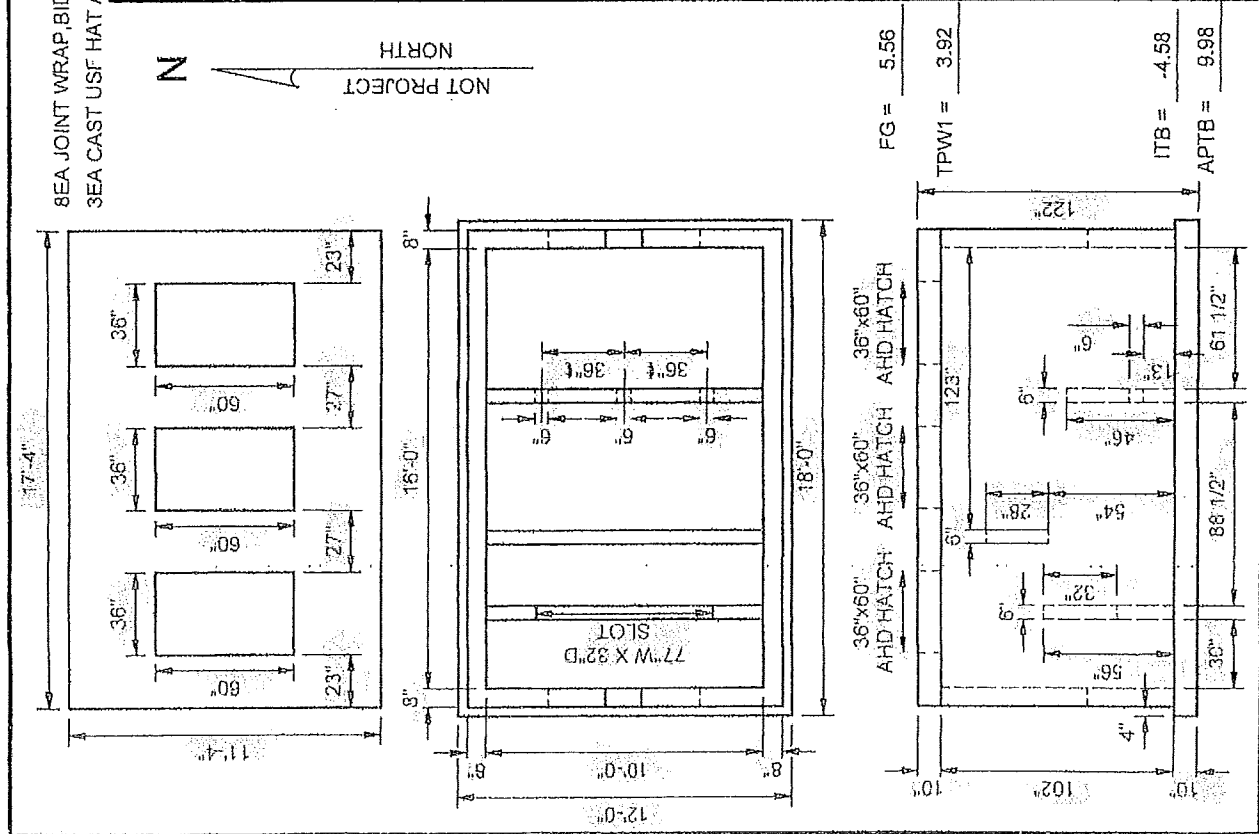
Carlow 5' into 15' 3" Top 16' 6"
 (Note) 11' 3" - 700 Landing

10407043B04.klw

OCO, C-56, 1.25"X14.5", PC										10'X16' ECOVAULT #										BB04																			
AHD 36"X60 ALUM DBL DR (W/ OPEN SPRING ASST/BIT PAINT)																				1 ea																			
SPECIFICATIONS																																							
1										BASE STEEL - #5 @ 5" O.C.E.W. (Top); #5 @ 5" O.C.E.W. (Bot)																													
2										WALL STEEL - #5 @ 7" Vert; #5 @ 5" Hor (In Mat); #5 @ 7" Vert; #6 @ 5" Hor (OL Mat)																													
3										TOP SLAB - #4 @ 6" O.C.E.W.																													
4																																							
5																																							
6										4000 PSI																													
7										Grade 60 (400 MPa) steel reinforcement																													
SPECIAL NOTES:										0 INTERVALS PROVIDED BY ECOSENSE																													
0										INTERVALS INSTALLED BY HANSON																													
2 (3) 36"X60 AHD HATCH										2 HATCHES CAST-IN TO FIELD POURED RISERS																													
PC #					WEIGHT					PIECE DESCRIPTION										PRODUCT CODE																			
2					18931					192L x 120W x 08Wall x 010H, TopSlab_Eng										ST19212012VT000																			
1					75528					192L x 120W x 08Wall x 102H, MonoBaseExt_Eng										SS192120105B05X006																			
PC #					DEQ/DIR					PIPE SIZE					PIPE INVERT					HOLE SIZE					BOOT TYPE					HOLE INVERT					HOLE RAISE				
1					E					48 RCP					-0.75					86					NONE					-1.5					37"				
1					W					48 RCP					-0.75					86					NONE					-1.5					37"				
RIBERIA STREET ECOVAULT																														DESIGN BY: JAL									
ECOSENSE															DATE: 3/15/2012																								
ORDER #: 10497043															SCALE: 1:70																								
REVISED DATE:															DESCRIPTION:																								

Hanson

HEIDELBERGCEMENTGroup



3/15/2012

S-080-048-08-00-VV-T-SC-0.0-0

Suntree

Technologies Inc.

798 Clearlake Road, Suite 2, Cocoa, FL 32922

Tel: 321-637-7552 Fax: 321-637-7554

www.suntreetech.com

Nutrient Separating Baffle Box

(PATENTED)

Recommended Service Procedure

Description

The frequency of service should be 1 – 4 times per year determined by the accumulation of sediment and debris in the Nutrient Separating Baffle Box. The service will include cleaning the screen system, removing collected sediment from the baffle chambers and inspecting the Storm Boom for replacement in the skimmer system.

The primary method used to service the Nutrient Separating Baffle Box is by vacuuming with a Vactor type unit.

Vacuum Servicing

1. Open the hatches or manholes on top of the Baffle Box.
2. Vacuum the debris and sediment accumulated on the screen system.
3. Swing open the screen system to expose the sediment collection chambers.
4. Vacuum the sediment collected in each of the chambers.
5. Inspect the oil skimmer system Storm Boom for oil accumulation. Change Storm Boom if significantly contaminated.
6. Swing down the screen system, and close the hatches or replace the manhole covers.

Nutrient Separating Baffle Box

- Fits Within Existing Easements
- Hydrocarbon Removal
- Almost No Head Loss
- Always Treats Entire Flow
- Retrofits Existing Systems
- Easy & Quick To Install
- Meets NPDES Phase 2

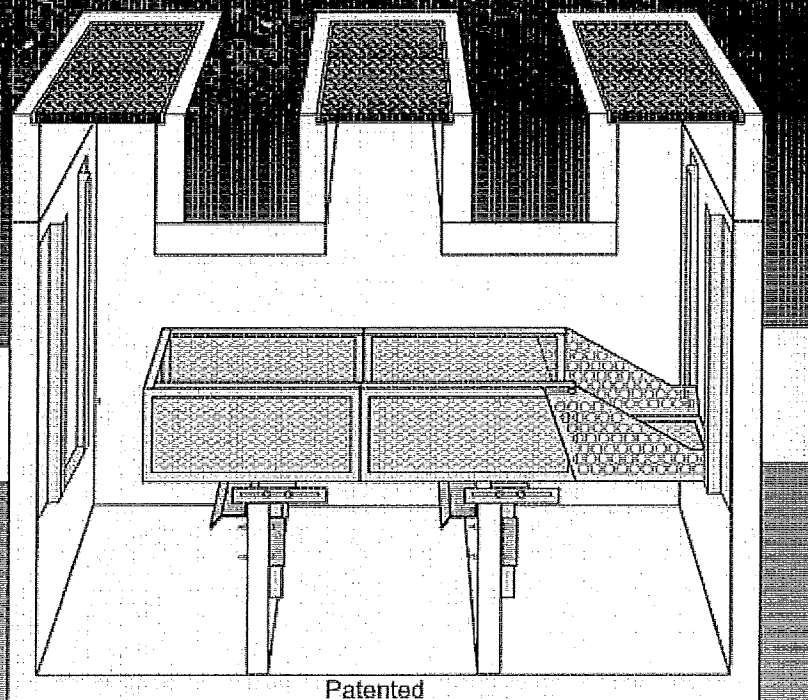
*The 2nd
Generation
Baffle Box*

Up To
90% Removal
Of Total Suspended Solids
at less than half the
cost of competing
systems.

Suntree
Technologies Inc.

798 Clearlake Road
Cocoa, FL 32922

Ph: 321-637-7552



Patented

www.suntreetech.com

Nutrient Separating Baffle Box

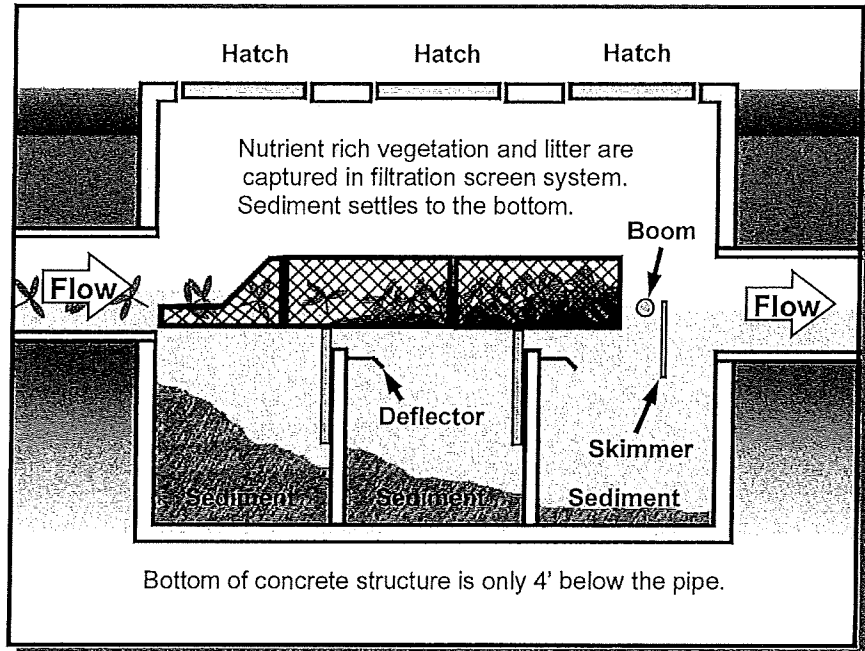
Functional Description

During The Storm Event

Captures foliage,
litter, sediment,
phosphates,
hydrocarbons...
Everything!

*Turbulence
deflectors prevent
captured sediment
from
re-suspending.*

Hydrocarbons
collect in front of
skimmer and are
absorbed by
Storm Boom.



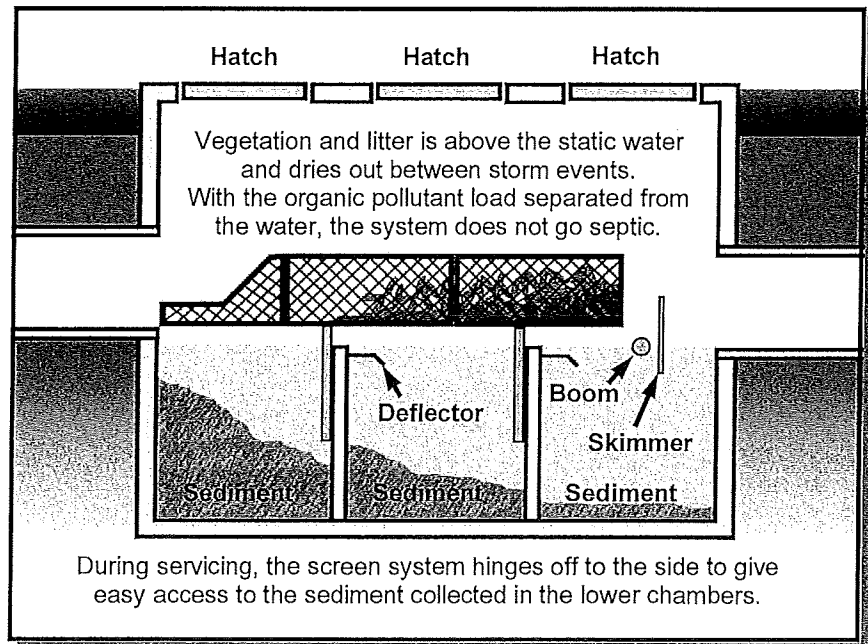
Patented

The System Stays Healthy!

*Nutrient pollutant
load is not lost to
static water and
flushed out at the
next storm event.*

Separating
organic matter
from the static
water prevents
bacterial buildup.

After The Storm Event



No Chance For A Bacterial Discharge!

Sizing The Nutrient Separating Baffle Box

Because the entire flow is always treated and head loss is so minimal, determining the appropriate size of *Nutrient Separating Baffle Box* for a project is more often an element of pipe size than flow rate.

Model #	Inside Width	Inside Length	Standard Height *	Recommended Pipe Sizes
NSBB-2-4	2'	4'	5'	4" to 12"
NSBB-3-6	3'	6'	7'	8" to 18"
NSBB-4-8	4'	8'	7'	12" to 18"
NSBB-5-10	5'	10'	7'	12" to 30"
NSBB-6-12	6'	12'	7'	18" to 36"
NSBB-8-14	8'	14'	8' 4"	36" to 54"
NSBB-10-14	10'	14'	8' 4"	42" to 60"
NSBB-10-16	10'	16'	10' 5"	48" to 72"
NSBB-12-20	12'	20'	11'	54" to 72"

Custom sizes are available.

*Height can vary as needed

Please Call Suntree For Assistance Or Advice

- Because water flow is not ducted off line for treatment, head loss is minimal and comparable to a large square catchbasin. Because of this, existing stormwater systems can be retrofitted with a Nutrient Separating Baffle Box, without compromising the original design specifications of the existing stormwater system.
- All structures are load rated for at least H-20. Standard wall construction of the structure is 6" thick steel re-enforced concrete. Concrete wall thickness can be more heavily reinforced and thicker upon request.
- A wide variety of manhole lids and hatches, and dampers to block off water flow during servicing, can be incorporated into the structure.
- Screen systems have stainless steel screens bolted into a heavy duty aluminum framework. The screen systems are hinged to give easy access to the lower chambers, and have a wide range of adjustments to accommodate unforeseen variables during installation.