

## SECTION 1: CONSTRUCTION

### Filtrex<sup>®</sup> Concrete Washout (SiltSoxx<sup>™</sup>)

#### PURPOSE & DESCRIPTION

Filtrex<sup>®</sup> SiltSoxx<sup>™</sup> is a three-dimensional tubular solids separation and water pollutant filtration device used as a **Concrete Washout** for temporary, passive filtration of sediment-laden effluent and point sources of contaminated water. Concrete washouts can be used as a pretreatment filtration system to separate solids or reduce solids content of contaminated water. Concrete washouts are easy to customize for size, shape, quantity of contaminated effluent and target pollutant removal.

#### APPLICATION

Concrete washouts are used in temporary applications where unfiltered slurry or effluent may adversely affect surface water quality. Common applications for Concrete washouts include:

- Concrete wash-off and wash-out from equipment and trucks.
- Pumping of surface water to allow access to stream banks for stabilization projects.
- Sediment and storm water pond emergency overflow capture and filtration.
- Dredging slurry filtration.
- Animal manure and lagoon slurry filtration at concentrated animal feeding operation (CAFO) sites.
- Non-hazardous industrial effluent and slurry solids separation from point sources.



Customize Size and Configuration

Concrete washouts require adequate site drainage space to allow water to percolate through the concrete washout and drain away from the device, leaving the solid fraction or filtrate within the device. After the water has been separated, the solid portion can be removed with a loader and disposed or land applied, depending upon the constituents within the filtrate. On sites with highly permeable soils, high water tables, or if constituents in unfiltered water may contaminate soil or ground water, an impervious mat or membrane may be placed underneath the concrete washout to prevent soil infiltration and percolation of contaminated water. Passively dewatering solids-laden water prior to hauling and disposal can significantly reduce handling and disposal costs.

#### ADVANTAGES AND DISADVANTAGES

##### Advantages

- Tubular filtration matrix allows for better trapping and removal of solids and soluble pollutants in contaminated water compared to planar geotextile sediment control devices, such as silt fence.
- Concrete washouts can be customized to remove target pollutants from contaminated water, such as phosphorus, petroleum hydrocarbons, turbidity, suspended solids, and some heavy metals.
- Concrete washouts can be customized to handle a variety of water pollutant concentrations, pollutant loads, and water volumes.
- Concrete washouts are available in 8 in (200mm), 12 in (300mm), 18 in (450mm), 24 in (600mm), and 32 in (800mm) diameters for a variety of volumes, flow conditions, and/or customized applications.
- Concrete washouts can be stacked and constructed in a pyramid or equilateral triangle to increase design height and water containment capacity if space is limited.
- Greater surface area contact with soil, relative to planar geotextile devices, reduces potential for contaminated water to undercut the device leading to unfiltered water.
- No trenching is required; therefore soil and plant



roots are not disturbed upon installation.

- Concrete washouts can be installed year around in difficult soil conditions such as frozen or wet ground, and dense and compacted soils, as long as stakes can be driven.
- Concrete washouts can be easily installed on top of impervious mats or membranes, pavement, concrete, and compacted soils.
- Organic matter and humus colloids in FilterMedia™ have the ability to bind and adsorb phosphorus, metals, and hydrocarbons that may be present in contaminated water.
- Microorganisms in compost FilterMedia have the ability to degrade organic pollutants and cycle captured nutrients from contaminated water.
- Soxx™ (mesh netting containment system) allow concrete washouts to be used where water pressure may exist.
- Concrete washouts can be direct seeded at time of application to provide greater stability and pollutant filtration capability once vegetation has established.
- FilterMedia is organic and can be left on site soil after permanent stabilization is complete, used in landscape design, and/or seeded and planted with permanent vegetation.
- FilterMedia improves existing soil structure if spread out and used as a soil amendment after construction activity is complete.
- Concrete washouts may assist in qualification for LEED® Green Building Rating and Certification credits under LEED Building Design & Construction (BD+C), New Construction v4. Awarded credits may be possible from the categories of Sustainable Sites, Water Efficiency,

Materials & Resources, and Innovation. *Note: LEED is an independent program offered through the U.S. Green Building Council. LEED credits are determined on a per project basis by an independent auditing committee. Filtrexx neither guarantees nor assures LEED credits from the use of its products. LEED is a trademark of the U.S. Green Building Council.*

### Disadvantages

- If filler material of concrete washouts is not Filtrexx® Certified™ FilterMedia, hydraulic flow rate and/or sediment and pollutant removal per formance may be diminished.
- If not installed correctly, maintained or used for a purpose or intention that does not meet specifications, performance may be diminished.
- If land surface is extremely bumpy, rocky, or changes elevation abruptly, ground surface contact to concrete washouts may be diminished thereby adversely effecting performance.
- If concrete washouts are placed on a slope, volumetric fill capacity may be reduced.
- If contaminated water breaches or undercuts concrete washout pollutant removal will be greatly diminished.
- Concrete washouts should not be used to filter hazardous or toxic materials from water.

### MATERIAL SPECIFICATIONS

Concrete washouts use only Soxx photodegradable or biodegradable netting materials available from Filtrexx International and are the only mesh materials accepted in creating concrete washouts for any application. For Soxx Material Specifications see Table 4.1.

### FILTERMEDIA™ CHARACTERISTICS

Concrete washouts use only Filtrexx Certified FilterMedia which is a coarse composted material that is specifically designed for removal of solids and soluble pollutants from contaminated water. *FilterMedia can be altered or customized to target specific pollutants in effluent water as approved by the Engineer or Filtrexx International.* All Filtrexx Certified FilterMedia has been third party tested and certified to meet minimum performance criteria defined by Filtrexx International. Performance parameters include hydraulic flow through rate, total solids removal efficiency, total suspended solids removal efficiency, turbidity reduction, nutrient removal efficiency, metals removal efficiency, and motor oil removal efficiency. For information on

ADVANTAGES			
	LOW	MED	HIGH
<b>Installation Difficulty</b>	✓		
<b>Durability</b>		✓	
<b>Solids Filtration</b>			✓
<b>Soluble Pollutant Filtration</b>		✓	
<b>Target Pollutant Removal</b>			✓
<b>Life Cycle Cost</b>	✓		



the physical and chemical properties of Filtrexx Certified FilterMedia refer to the Filtrexx Design Manual, section 5.1. Look for the Filtrexx Certified FilterMedia Seal from our international network of Filtrexx Certified Installers and Manufacturers.



### PERFORMANCE

Performance testing and research on sediment control has been extensive. For a summary of performance testing, research results, and design specifications see Table 4.2. For copies of publications, full reports, or Tech Link summaries visit [www.filtrexx.com](http://www.filtrexx.com)

Successful bidders will furnish adequate research support showing their manufactured product meets or exceeds performance and design criteria outlined in this standard specification. Research or performance testing will be accepted if it meets the following criteria: conducted by a neutral third party, utilizes standard test methods reported by ASTM or referenced in a peer reviewed scientific journal, product and control treatments are tested in triplicate, performance results are reported for product and control (control should be a bare soil under the same set of environmental and experimental conditions), results are peer reviewed, results indicate a minimum 60% TSS removal efficiency and a minimum hydraulic flow through rate of 5 gpm/ft<sup>2</sup>. Bidders shall attach a copy of the research report indicating test methodologies utilized and results.

*Note: the Contractor is responsible for establishing a working erosion and sediment control system and may, with approval of the Engineer, work outside the minimum construction requirements as needed. Where concrete washouts deteriorates or fails, it shall be repaired or replaced with an effective alternative.*

### DESIGN CRITERIA

Concrete washouts are used for temporary filtration and solids separation of non-hazardous slurry and sediment-laden water, by passive means, commonly found on construction sites, dredging operations, and storm water pond overflows.

For engineering design details for concrete washouts see Figure 4.1 and Figure 4.2. For staking details see Figure 4.3. For examples of concrete washout applications see Figure 4.4. For a summary of specifications for product/practice use, performance and design see Table 4.1 and Table 4.2.

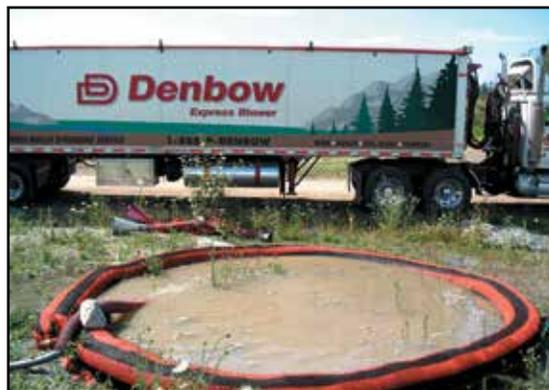
### Planning:

Concrete washouts have a hydraulic flow through rate that will remain constant or progressively decrease depending on solids concentration of influent water and the progressive filling of pores within the FilterMedia. Concrete washouts are to be used for temporary or batch filtration purposes and are not intended for continuous flow or permanent filtration of contaminated effluent water. To allow for potential water volume increase from atmospheric precipitation, the influent volume should never exceed 50% of the containment capacity of the concrete washout. Concrete washouts should never be placed in directional storm water flows or where runoff conditions may compromise the structural base of the concrete washout.

Preconstruction meetings should be conducted to educate construction site personnel about the tools/practices used and acceptable traffic patterns that avoid running over concrete washouts with heavy equipment.

### Orientation:

Concrete washouts are generally designed as circular or rectangular enclosures, usually on flat surfaces. A horseshoe design may be used on sloped surfaces, where the horseshoe bend is placed at the low point on the slope, although storage volume may be reduced. Concrete washout square-shaped cells can be used as a multiphase treatment filtration system if multiple cells are placed in a linear pattern where cell walls abut one another, to allow contaminated water to passively move from one cell to the next by gravitational flow. A gradual step or terrace design on a slope can be used to assist in gravitational flow of water. For more information on this design see Filtrexx Design Manual, Section 2.5, Filtrexx Biofiltration Systems.



Use as Pump Out Filtration



**Level Contour:**

Place concrete washouts on level contours to assist in dissipating concentrated influent and prevent undercutting of device.

**Staking:**

Ends of the concrete washouts should be overlapped and staked (see Figure 4.1) and this seam should be on the highest point of the ring, if possible. In areas of poor ground contact, additional stakes should be added every 2-5 ft (0.6-1.5m). On pavement or concrete applications, concrete washouts should be depressed when installed in order to maximize ground contact.

**Device Function:**

Concrete washouts are a *porous physical barrier* that are specifically designed to contain contaminated water while slowly releasing filtered water as it percolates through the contained FilterMedia. Concrete washouts have the ability to remove solids and soluble pollutants from contaminated water. The pollutant removal process characteristic to concrete washouts combines both filtering and deposition of solids. This is different than methods that rely solely on containment for deposition of solids. Correct installation and maintenance is especially important for proper function and performance.

**Pollutant Removal:**

Concrete washouts are most effective at removing large solids but are also effective at removing small particulates that are often suspended in water. Concrete washouts have the ability to remove soluble pollutants, such as phosphorus and petroleum hydrocarbons (e.g. motor oil), from contaminated water. Pollutant removal efficiency often increases over time, as the filter becomes more restrictive due to the filling of pore spaces. Additional Filtrexx products can be added to the concrete washouts to increase removal efficiency of target pollutants such as turbidity, TSS, and soluble phosphorus. For specific products and their removal efficiency and performance see Table 4.2.

It should be noted that pollutant removal efficiency will be greatly diminished if contaminated water breaches or undercuts the concrete washout.

**Influent and Solids Accumulation:**

Contaminated water and solids accumulation inside Concrete washouts should be no higher than 50% of the height of the Concrete washouts. If additional



Concrete Washout Area

capacity is required solids should be removed, or additional Concrete washouts should be installed (as separate entities, surrounding the original, or to increase the height of the original).

**Vegetated Concrete Washout:**

For long term filtration applications concrete washouts can be direct-seeded at the time of installation to allow vegetation to establish directly in the filtration device. Vegetated concrete washouts will further assist in filtration of solid and soluble pollutants from contaminated water. The option of adding vegetation will be at the discretion of the Engineer. No additional soil amendments or fertilizer are required for vegetation establishment in the concrete washouts. The appropriate seed mix shall be determined by the Engineer.

**Drainage Capacity and Spacing:**

Concrete washouts should be designed to contain a maximum of 50% of their volume capacity. This will prevent breach of concrete washout in the event of a storm. Volume capacity should be designed based on the total or maximum volume of influent or contaminated water the concrete washout can contain. Capacity design should not be based on the solids or dewatered portion of the contaminated water. The following conversions are provided to help in the design of liquid volume transfer to the Concrete washout.

Concrete washouts placed on sloping land will have reduced storage capacity as contaminated water will concentrate on down slope side. Concrete washouts should be placed where there is sufficient drainage area for filtered effluent exiting the concrete washout. For increased filtration performance additional concrete washouts can be placed around



**Table 4.3** Liquid Conversions  
Concrete Washout/Concrete Washout

1 cubic yard	202 gal
1 cubic yard	46656 cubic in
1 cubic yard	27 cubic ft
1 cubic ft	7.5 gal
1 cubic ft	1728 cubic in
1 cubic ft	0.037 cubic yd
1 gallon	231 cubic in
1 gallon	0.13 cubic ft
1 gallon	0.005 cubic yd
1 cubic meter	1,000,000 cc
1 cc	0.000001 cubic m

**Circular:**

$$V = R^2 * \pi * 0.5H$$

**Rectangular:**

$$V = L * W * 0.5H$$

**Where:**

**V = volume (cubic in. or cc)**

**L = inside length of ring (in or cm)**

**W = width of ring (in or cm)**

**H = inside height of ring (in or cm)**

**R = inside radius of ring (in or cm)**

$\pi = 3.14$

the outer circumference of the original Concrete washout. Spacing between additional concrete washouts should be at least 1 ft (300mm).

Concrete washout Soxx may be stacked or constructed in a pyramid design to increase volume capacity within the concrete washout. See Figure 4.2 for design details.

**INSTALLATION**

- Concrete washouts used for solids separation and filtration of soluble pollutants from contaminated water shall meet Filtrexx Soxx Material Specifications and use Filtrexx Certified FilterMedia.
- Contractor is required to be Filtrexx Certified Installer as determined by Filtrexx International. Certification shall be considered current if appropriate identification is shown during time of bid or at time of application (call Filtrexx at 877-542-7699 for a current list of installers). Look for the Filtrexx Certified Installer Seal.
- Concrete washouts shall be placed at locations indicated on plans as directed/ specified by the Engineer. Concrete washouts should be installed in a manner that effectively filters solids and soluble pollutants from contaminated water.
- Concrete washouts may be manufactured onsite at time of application or pre-manufactured and delivered to site for installation.
- Installation of concrete washouts shall ensure that the containment area within the concrete washout is sufficient to handle the rate and volume of contaminated influent water.
- Installation of concrete washouts shall ensure that the containment area within the concrete washout is sufficient to allow for receiving water to properly flow through the filter concrete washout filtration system.
- Stakes shall be installed through the middle of the concrete washout on 5 ft (1.5m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) wooden stakes.
- Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
- Standard diameter size of concrete washouts for concrete washouts is 18 in (450mm). For applications where rate or volume of contaminated water addition is high the Engineer may specify 24 in (600mm) or 32 in (800mm) diameter concrete washouts, a stack design, or an equilateral triangle or pyramid design.
- If stack or pyramid design is specified, concrete washout Soxx should decrease in diameter with each layer of concrete washout Soxx.
- Concrete washouts may be installed on top of impermeable mats or membranes to prevent percolation of contaminated water into soil. Local ordinances may require the use of additives to reduce ph contamination in runoff.
- Concrete washouts shall not be placed near concentrated or high sheet flows of storm runoff which may compromise the structural base of the concrete washout.
- Vegetated concrete washouts may be seeded at the time of manufacture and installation to create a contained 'green or living bio-filter'. These may be left intact once construction phase is complete. The appropriate seed mix, live stakes, and/or sprigs shall be specified by the Engineer.



14. Concrete washouts installed on paved surfaces should be stabilized along the outer circumference using concrete blocks for structural support.

### INSPECTION

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Concrete washouts should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through and solids removal. If rainfall becomes excessive, additional concrete washouts may be required to contain the added water volume. Water height within the concrete washouts should remain 4 in below the lowest point of the rim to allow for storm water volume additions. If overflow, undercutting, or leaking between concrete washouts occurs, maintenance should be conducted immediately.

### MAINTENANCE

1. The contractor shall maintain the concrete washouts in a functional condition at all times and it shall be routinely inspected.
2. If a concrete washout has been damaged, it shall be repaired, or replaced if beyond repair.
3. The contractor shall remove solids or filtrate from the inside of the concrete washout when solids accumulation has reached 1/2 of the effective height of the concrete washout, or as directed by the engineer. As an alternative, another concrete washout may be installed on top of, or in a pyramid design to increase the containment capacity of the concrete washout.
4. If concrete washouts become clogged with debris or solids, they shall be maintained so as to assure proper hydraulic flow through. Overflow or undercutting of contaminated water is not acceptable.
5. If minor undercutting occurs, the areas may be plugged with sand, soil or additional FilterMedia. If undercutting continues, a new concrete washout should be installed and leveling or minor grading of ground surface may be required to increase surface contact with concrete washout.
6. Concrete washouts shall be maintained until contaminated water has fully percolated through the device.
7. The FilterMedia and filtrate may be dispersed on site once solids separation is complete only if there are no concerns with soil and water contamination, or as determined by the engineer.

### DISPOSAL/RECYCLING

FilterMedia is an organic, composted product manufactured from locally generated organic, natural, and biologically based materials. Once all soil has been stabilized and construction activity has been completed, the FilterMedia may be dispersed with a loader, rake, bulldozer or similar device and may be incorporated into the soil as an amendment or left on the soil surface to aid in permanent seeding or landscaping. Leaving the FilterMedia on site reduces removal and disposal costs. The mesh netting material will be extracted from the FilterMedia and disposed of properly by the contractor. The photodegradable mesh netting material (Soxx) may degrade if left on site. Biodegradable mesh netting material is available and may eliminate the need and cost of removal and disposal.

The filtrate or solid material left after separation from water within the concrete washout shall be disposed of properly. If material is of landscape quality it may be dispersed and used on-site for landscaping, planting, seeding, or as a soil amendment. If filtrate is contaminated, it shall be disposed of in an environmentally acceptable manner compliant with all local, state and federal regulations.

### METHOD OF MEASUREMENT

Bid items shall show measurement as a specified diameter per linear ft (linear meter) of 'X inch (X mm) diameter Filtrex<sup>®</sup> Concrete washouts/SiltSoxx<sup>™</sup>', installed, as specified by the Engineer.

Engineer shall notify Filtrex of location,



Filtrex Concrete Washout



description, and details of project prior to the bidding process so that Filtrexx can provide design aid and technical support.

#### ADDITIONAL INFORMATION

For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at [www.filtrexx.com](http://www.filtrexx.com)

Filtrexx International, Technical Support  
61 N Clev-Mass Rd, Ste E, Akron, OH 44333  
877-542-7699 | 234-466-0810 (fax)  
[www.filtrexx.com](http://www.filtrexx.com) | [info@filtrexx.com](mailto:info@filtrexx.com)  
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BioSoxx, CECB [Compost Erosion Control Blanket], CSWB [Compost Storm Water Blanket], DitchChexx, EdgeSaver, FilterCell, FilterMedia, FilterSoxx, GrowingMedia, InletSoxx, LivingWall, Lockdown, NitroLoxx, PhosLoxx, SiltSoxx, Soft Blocks, and Soxx are Trademarks of Filtrexx International.

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**TABLES & FIGURES:**

**Table 4.1. Filtrexx® Soxx™ Material Specifications.**

Material Type	Cotton BioSoxx™	5 mil High Density Polyethylene (HDPE)	5 mil High Density Polyethylene (HDPE)	Multi-Filament Polypropylene (MFPP, previously HDPP)	Multi-Filament Polypropylene SafteySoxx™	Multi-Filament Polypropylene DuraSoxx®	Multi-Filament Polypropylene DuraSoxx® (Heavy Duty)
Material Characteristic	Biodegradable	Oxo-degradable	Photodegradable	Photodegradable	Photodegradable	Photodegradable	Photodegradable
Design Diameters	8 in (200mm), 12 in (300mm)	8 in (200mm), 12 in (300mm), 18 in (400mm)	5 in (125mm), 8 in (200mm), 12 in (300mm), 18 in (400mm)	8 in (200mm), 12 in (300mm), 18 in (400mm), 24 in (600mm), 32 in (800mm)	8 in (200mm), 12 in (300mm), 18 in (400mm)	8 in (200mm), 12 in (300mm), 18 in (400mm), 24 in (600mm), 32 in (800mm)	5 in (125mm), 8 in (200mm), 12 in (300mm), 18 in (400mm)
Mesh Opening	1/8 in (3mm)	3/8 in (10mm)	3/8 in (10mm)	3/8 in (10mm)	1/8 in (3mm)	1/8 in (3mm)	1/8 in (3mm)
Tensile Strength	ND	26 psi (1.83 kg/cm²)	26 psi (1.83 kg/cm²)	44 psi (3.09 kg/cm²)	202 psi (14.2 kg/cm²)*	202 psi (14.2 kg/cm²)	242 psi (16.99 kg/cm²)
% Original Strength from Ultraviolet Exposure (ASTM G-155)	ND	ND	23% at 1000 hr	100% at 1000 hr	100% at 1000 hr	100% at 1000 hr	100% at 1000 hr
Functional Longevity/ Project Duration***	up to 12 months**	6 mo-3.5 yr	9 mo-4 yr	1-4 yr	2-5 yr	2-5 yr	2-5 yr

\* Tested at Texas Transportation Institute/Texas A&M University (ASTM 5035-95).

\*\* Data based on Caltrans research and specifications

\*\*\* Functional longevity ranges are estimates only. Site specific environmental conditions may result in significantly shorter or longer time periods.

**Table 4.2. Filtrexx® Concrete Washout Performance and Design Specifications Summary.**

Design Diameter	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Effective Height	6.5 in (160mm)	9.5 in (240mm)	14.5 in (360mm)	19 in (480mm)	26 in (650mm)	The Ohio State University, Ohio Agricultural Research and Development Center	Transactions of the American Society of Agricultural & Biological Engineers, 2006
Effective Circumference	25 in (630mm)	38 in (960mm)	57 in (1450mm)	75 in (1900mm)	100 in (2500mm)		
Density (when filled)	13 lbs/ft (20 kg/m)	32 lbs/ft (50 kg/m)	67 lbs/ft (100 kg/m)	133 lbs/ft (200 kg/m)	200 lbs/ft (300 kg/m)	Soil Control Lab, Inc	
Air Space	20%	20%	20%	20%	20%	Soil Control Lab, Inc	
Maximum continuous length	unlimited	unlimited	unlimited	unlimited	unlimited		
Staking Requirement	10 ft (3m)	10 ft (3m)	10 ft (3m)	10 ft (3m)	10 ft (3m)		
Maintenance Requirement (sediment accumulation removal at X height)	3.25 in (80mm)	4.75 in (120mm)	7.25 in (180mm)	9.5 in (240mm)	13 in (325mm)		

(continued on next page)



**Table 4.2.** Filtrex<sup>®</sup> Concrete Washout Performance and Design Specifications Summary. *(continued)*

Design Diameter	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
<b>Design &amp; Performance</b>							
Initial Maintenance Requirement based on Rainfall-Runoff*	22 in (55 cm); 1109 L/linear m	32 in (80 cm); 1388 L/linear m	42 in (105 cm); 1825 L/linear m	64 in (160 cm); 2776 L/linear m	86 in (215 cm); 3885 L/linear m	The University of Georgia & Auburn University	
Functional Longevity**	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr	6 mo – 5 yr		
Maximum Slope Length (<2%)	600 ft (183m)	750 ft (229m)	1000 ft (305m)	1300 ft (396m)	1650 ft (500m)	The Ohio State University, Ohio Agricultural Research and Development Center	Filtrex <sup>®</sup> Design Tool™, Filtrex <sup>®</sup> Library #301, Filtrex <sup>®</sup> Tech Link #3304 & #3311
Hydraulic Flow Through Rate	7.5 gpm/ft (94 L/min/m)	11.3 gpm/ft (141 L/min/m)	15.0 gpm/ft (188 L/min/m)	22.5 gpm/ft (281 L/min/m)	30.0 gpm/ft (374 L/min/m)	The Ohio State University, Ohio Agricultural Research and Development Center; University of Guelph, School of Engineering/ Watershed Research Group	Filtrex <sup>®</sup> Tech Link #3311 & #3313, #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006, Second Interagency Conference on Research in Watersheds, 2006
P Factor (RUSLE)	0.1-0.32	0.1-0.32	0.1-0.32	0.1-0.32	0.1-0.32	USDA ARS Environmental Quality Lab/ University of Georgia	American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006
Sediment Storage Capacity***	174 cu. in (2850cc)	396 cu. in (6490cc)	857 cu. in (14040cc)	1631 cu. in (26840cc)	2647 cu. in (43377 cc)		Filtrex <sup>®</sup> Tech Link #3314
Total Solids Removal	98%	98%	98%	98%	98%	Soil Control Lab, Inc	International Erosion Control Association, 2006
Total Suspended Solids Removal	78%	78%	78%	78%	78%	USDA ARS Environmental Quality Lab	Filtrex <sup>®</sup> Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006



**Table 4.2.** Filtrexx® Concrete Washout Performance and Design Specifications Summary. *(continued)*

Design Diameter	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Design & Performance							
Turbidity Reduction	63%	63%	63%	63%	63%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Clay (<0.002mm) Removal	65%	65%	65%	65%	65%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Silt (0.002-0.05mm) Removal	64%	64%	64%	64%	64%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
TSS Removal w/PAM	97%	97%	97%	97%	97%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
TSS Removal w/ Flocculent	97%	97%	97%	97%	97%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Turbidity Reduction w/PAM	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006
Turbidity Reduction w/ Flocculent	94%	94%	94%	94%	94%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings , 2006

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**Table 4.2.** Filtrex® Concrete Washout Performance and Design Specifications Summary. *(continued)*

Design Diameter	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
Design & Performance							
Total Phosphorus Removal	34%	34%	34%	34%	34%	USDA ARS Environmental Quality Lab	Filtrex® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006
Reactive Phosphorus Removal	38%	38%	38%	38%	38%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006
Total Phosphorus Removal w/ Nutrient Agent	60%	60%	60%	60%	60%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006
Reactive Phosphorus Removal w/ Nutrient Agent	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	Filtrex® Tech Link #3308; American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006
Nitrate-N Removal	25%	25%	25%	25%	25%	USDA ARS Environmental Quality Lab	American Society of Agricultural & Biological Engineers Meeting Proceedings, 2006
Ammonium-N Removal	15%	15%	15%	15%	15%	USDA ARS Environmental Quality Lab	Filtrex® Tech Link
Ammonium-N Removal w/ Nutrient Agent	33%	33%	33%	33%	33%	USDA ARS Environmental Quality Lab	Filtrex® Tech Link
Motor Oil Removal w/ Hydrocarbon Agent	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	International Erosion Control Association, 2006
Diesel Fuel Removal w/ Hydrocarbon Agent	99%	99%	99%	99%	99%	USDA ARS Environmental Quality Lab	Filtrex® Tech Link
Gasoline Removal w/ Hydrocarbon Agent	54%	54%	54%	54%	54%	USDA ARS Environmental Quality Lab	Filtrex® Tech Link



**Table 4.2.** Filtrexx® Concrete Washout Performance and Design Specifications Summary. *(continued)*

Design Diameter	8 in (200mm)	12 in (300mm)	18 in (450mm)	24 in (600mm)	32 in (800mm)	Testing Lab/ Reference	Publication(s)
<b>Design &amp; Performance</b>							
Cadmium (Cd) Removal w/ Heavy Metal Agent	73%	73%	73%	73%	73%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Chromium (Cr) Removal w/ Heavy Metal Agent	47%	47%	47%	47%	47%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Copper (Cu) Removal w/ Heavy Metal Agent	70%	70%	70%	70%	70%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Nickel (Ni) Removal w/ Heavy Metal Agent	69%	69%	69%	69%	69%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Lead (Pb) Removal w/ Heavy Metal Agent	73%	73%	73%	73%	73%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Zinc (Zn) Removal w/ Heavy Metal Agent	53%	53%	53%	53%	53%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Iron (Fe) Removal	22%	22%	22%	22%	22%	Soil Control Lab, Inc	
Manganese (Mn) Removal	8%	8%	8%	8%	8%	Soil Control Lab, Inc	
Total coliform Removal	67%	67%	67%	67%	67%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
E. coli Removal	67%	67%	67%	67%	67%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Enterococcus Removal	47%	47%	47%	47%	47%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
E. coli Removal w/ Bacteria Agent	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Fecal coliform Removal w/ Bacteria Agent	98%	98%	98%	98%	98%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Enterococcus Removal w/ Bacteria Agent	91%	91%	91%	91%	91%	USDA ARS Environmental Quality Lab	Filtrexx® Tech Link
Other Recommended Uses	Inlet Protection, Check Dams, Slope Interruption	Inlet protection, Check Dams, Concrete Washout, Filtration System, Slope Interruption	Check Dams, Concrete Washout, Filtration System	Check Dams, Concrete Washout, Filtration System	Check Dams, Concrete Washout, Filtration System		

\* Based on rainfall intensity of 12.5 cm (5 in)/hr applied to a bare clay loam soil at a 10% slope; runoff flow rate of 108 ml/sec/linear m (0.52 gpm/linear ft); and mean runoff volume of 230 L/m<sup>2</sup> (6.3 g/ft<sup>2</sup>).

\*\* Functional Longevity is dependent on mesh material type, UV exposure, freeze/thaw frequency, region of US/Canada, runoff-sediment frequency/duration/loading, and adherence to specified maintenance requirement. Functional longevity ranges are estimates only. Site specific environmental conditions may result in significantly shorter or longer time periods.

\*\*\* Sediment Storage Capacity = sediment accumulation behind (directly upslope) + within the device.



**Figure 4.1.** Engineering Design Drawing for Concrete Washout

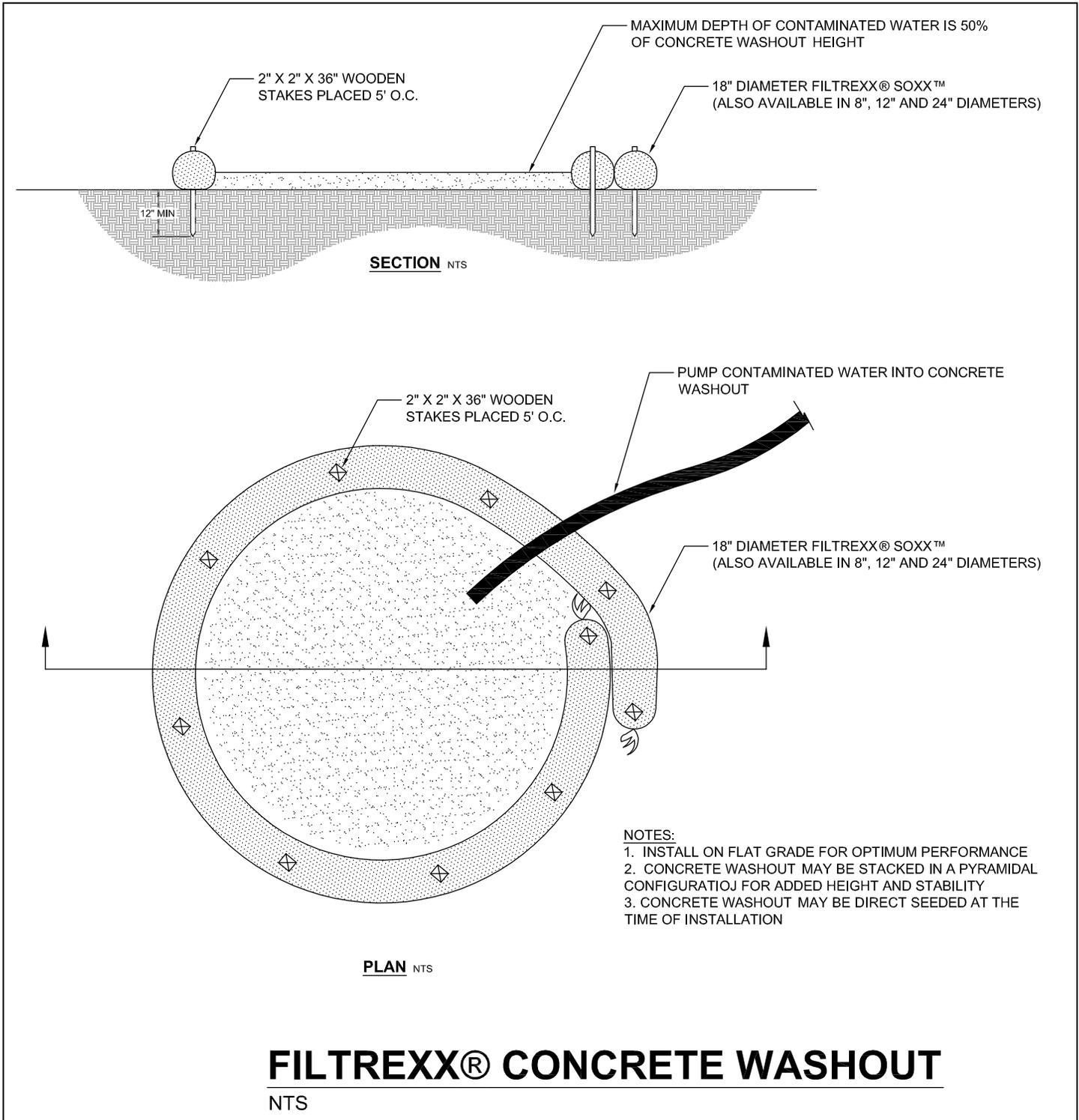
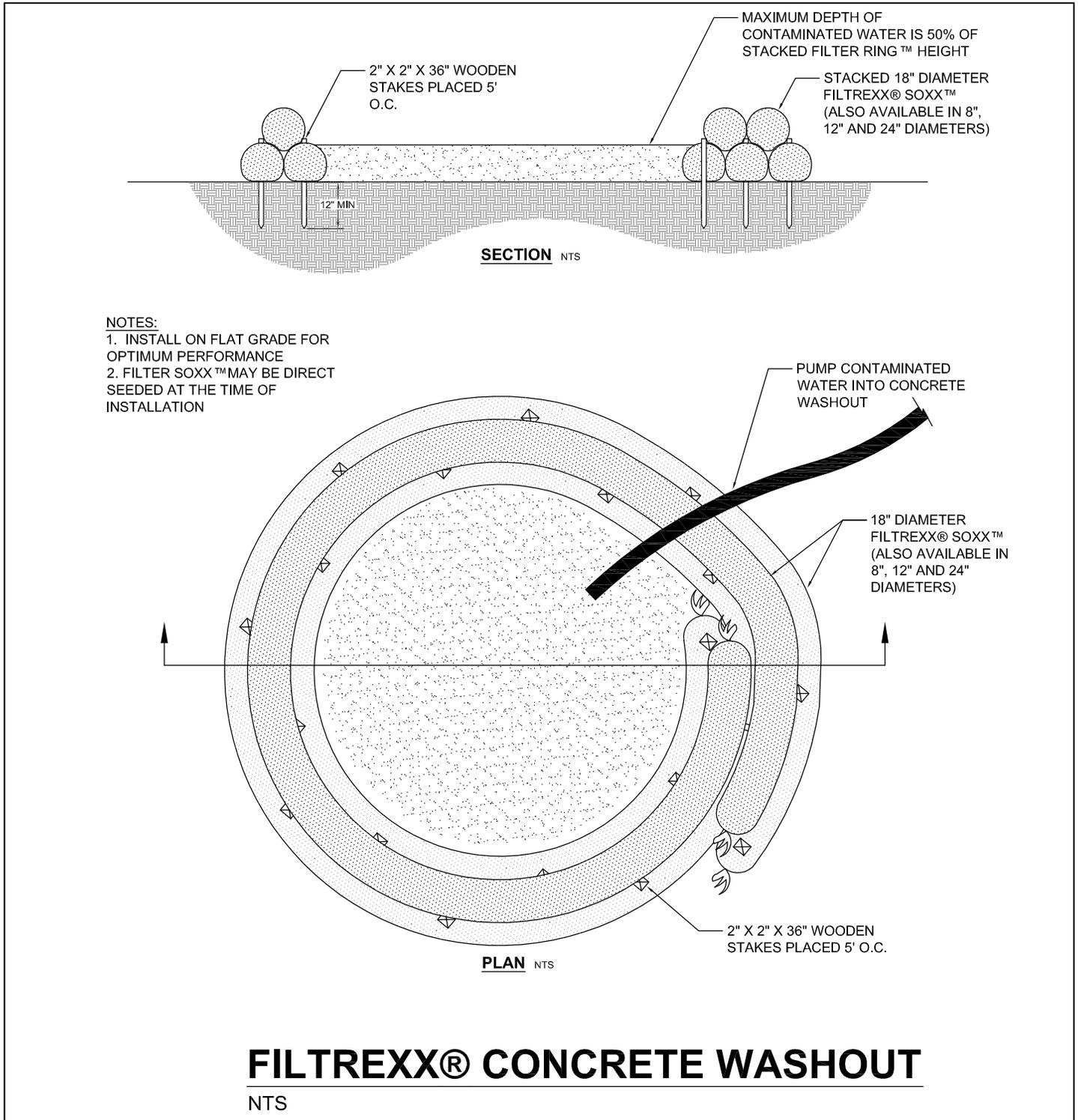


Figure 4.2. Engineering Design Drawing for Stacking Concrete Washout Soxx™ to Increase Design Height & Volume Capacity



**Figure 4.3.** Engineering Design Drawing for Staking of Concrete Washout

