

# CONCEPTUAL RESIDENTIAL FLOW-THROUGH PLANTER BOX DESIGN

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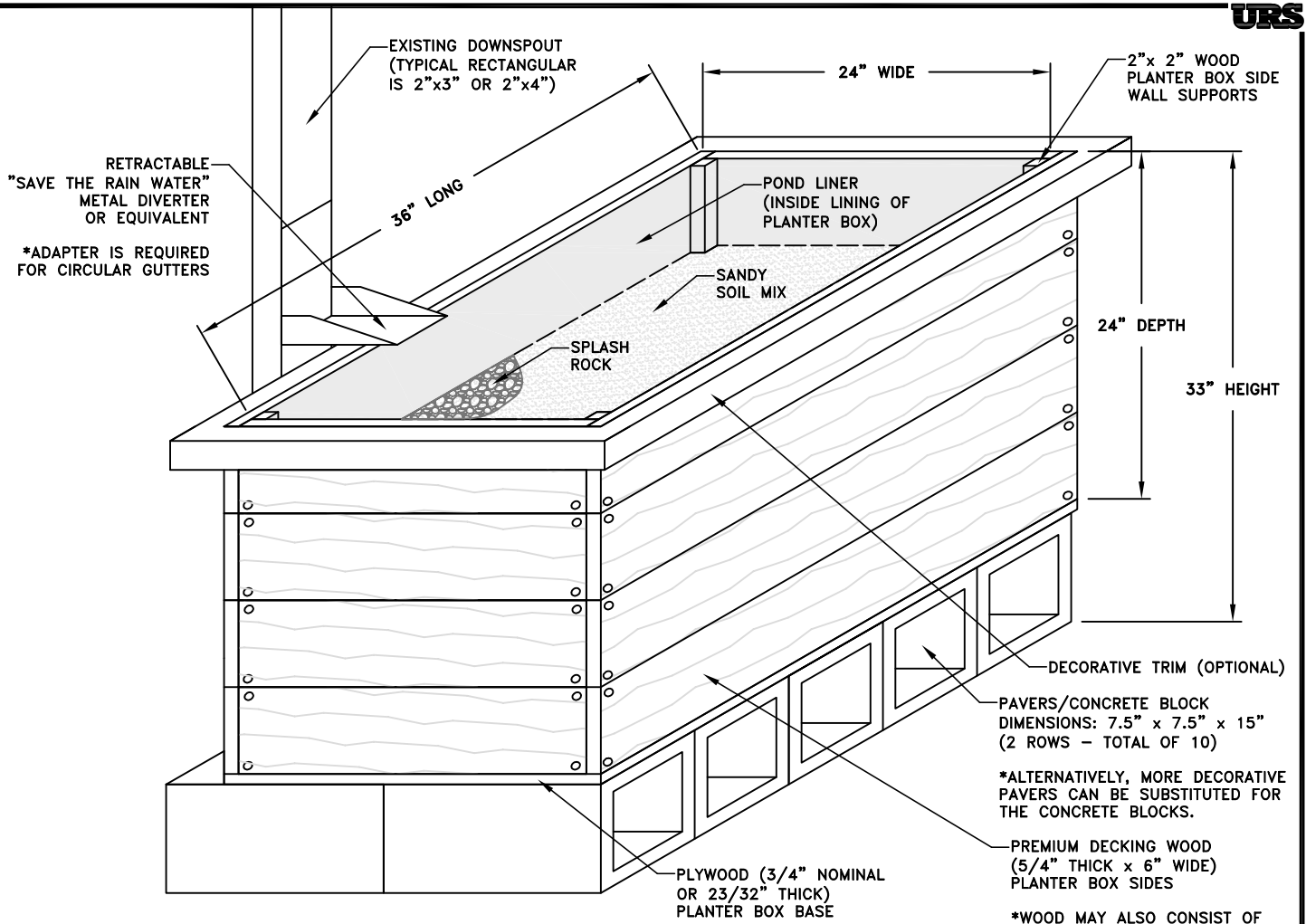
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## MODEL NEIGHBORHOOD PROJECT TYPICAL HOME APPLICATION

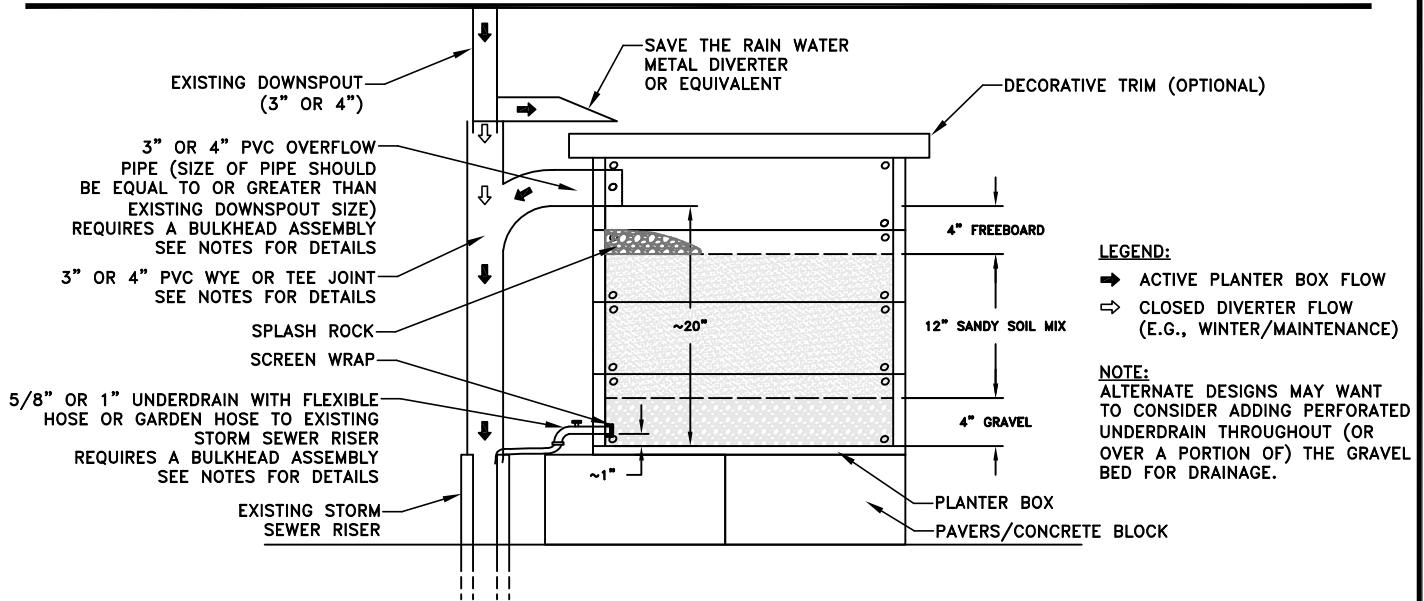
### DRAWING LIST

- FIGURE 1A – FLOW-THROUGH PLANTER BOX LAYOUT AND SIDE VIEW  
FIGURE 1B – DETAILS AND NOTES  
FIGURE 1C – MATERIALS LIST AND BUDGETARY COST ESTIMATE





**CONCEPTUAL PLANTER BOX LAYOUT**  
(NOT TO SCALE)



**CONCEPTUAL PLANTER BOX SIDE VIEW**  
(NOT TO SCALE)

Job: PWD
Prepared by: JJ
Checked by: TF
Date: 08/27/2009

**CONCEPTUAL PLANTER BOX DESIGN**  
 MODEL NEIGHBORHOOD PROJECT  
 TYPICAL HOME APPLICATION  
 FLOW-THROUGH PLANTER BOX LAYOUT AND SIDE VIEW  
 PHILADELPHIA, PA

**CONCEPTUAL RESIDENTIAL FLOW-THROUGH PLANTER BOX**

**NOTE:** THIS CONCEPTUAL PLANTER BOX DESIGN IS PROTOTYPICAL AND FURTHER TESTING AND DEVELOPMENT ARE REQUIRED.

PREFABRICATED WOOD BOXES, PLASTIC BINS, OR METAL LIVESTOCK TYPE WATERING TROUGHS ARE ALL POTENTIAL OPTIONS TO BUILDING A SIMILAR STORMWATER PLANTER BOX. HOWEVER, THE DIMENSIONS AND SIZES PRESENTED IN THIS APPLICATION ARE SPECIFIC TO THE DESIGN.

STRUCTURAL DESIGN OF THE PLANTER BOX IS THE RESPONSIBILITY OF THE BUILDER.

**FLOW-THROUGH PLANTER BOX DETAILS:**

**• DOWNSPOUT DIVERTER OPTIONS:**

- **OPTION 1** – SMALL PORCH APPLICATION (7' LENGTH x 14' WIDTH OR 100 SQUARE FEET). INSTALL A DOWNSPOUT DIVERTER (VARIOUS MAKES/MODELS – SEE LIST BELOW) TO ALLOW ALL OF THE PORCH RUNOFF TO FLOW INTO THE PLANTER BOX:
  - SAVE THE RAIN WATER METAL DIVERTER ([www.rainbarrelsource.com](http://www.rainbarrelsource.com))
  - INLINE AND OFFSET DOWNSPOUT DIVERTER ([www.rainbarrel.net/diverter.html](http://www.rainbarrel.net/diverter.html))
  - [www.aquabarrel.com](http://www.aquabarrel.com)

- **OPTION 2** – LARGER ROOFTOP DRAINAGE AREA APPLICATION (GREATER THAN 100 SQUARE FEET). INSTALL AN INLINE DOWNSPOUT DIVERTER: THE GARDEN WATER SAVER (AVAILABLE AT: [www.gardenwatersaver.com](http://www.gardenwatersaver.com)) THAT HAS A 5/8" OUTLET (DIAMETER OF AN AVERAGE GARDEN HOSE) TO LIMIT AND DIVERT FLOW FROM THE ROOF TO THE PLANTER BOX. SEE LINK BELOW FOR A VIDEO INSTALLATION DEMONSTRATION:
  - THIS OLD HOUSE VIDEO OF RAIN BARREL AND DIVERTER INSTALLATION: <http://www.thisoldhouse.com/toh/video/0,,20045365,00.html>

THIS DIVERTER LIMITS THE FLOW TO THE PLANTER BOX BY PREVENTING THE ENTIRE RAIN FALL FROM ENTERING AND OVERWHELMING THE PLANTER BOX.

**• SOIL**

A MIX OF 60% SAND, 10% TOPSOIL, AND 30% COMPOST IS RECOMMENDED.

**• LINER**

POND LINER IS INSTALLED TO KEEP THE PLANTER BOX WATER TIGHT. FUTURE DESIGN DEVELOPMENT SHOULD BE CONSIDERED USING PLASTIC AS A SUBSTITUTE TO USING WOOD (AS PRESENTED IN THIS DESIGN) SO THAT A PLASTIC POND LINER IS NOT NECESSARY. POND LINER CAN BE WRAPPED OVER TOP BOARD OF THE PLANTER BOX. DECORATIVE TRIM DRILLED TO TOP BOARD WILL AFFIX THE LINER IN PLACE. THE WEIGHT OF THE GRAVEL AND SOIL SHOULD SECURE CONTACT OF THE LINER WITHIN THE PLANTER BOX ELIMINATING THE NEED TO AFFIX THE LINER TO THE SIDES/BOTTOM OF THE BOX.

**• PEA GRAVEL DRAIN**

A FOUR INCH GRAVEL LAYER IS INCLUDED AT THE BOTTOM OF THE PLANTER BOX TO OFFER DRAINAGE. AN OUTLET NEAR THE BOTTOM OF THE PLANTER BOX ALLOWS WATER TO FLOW OUT AND BACK INTO THE STORM SEWER. USE CLEAN WASHED GRAVEL WITH NO FINES.

**• SPLASH ROCK**

ADD 2-3 INCH LAYER OF RIVER PEBBLES UNDER THE DOWNSPOUT DIVERTER IN THE PLANTER BOX TO DISSIPATE ENERGY.

**• PLUMBING (BULK HEAD ASSEMBLY)**

A BULKHEAD FITTING IS A PLUMBING ASSEMBLY TO ALLOW WATER TO PASS THROUGH A SEALED WALL OF A CONTAINER. TO CONSTRUCT THIS FITTING THE FOLLOWING WILL BE NECESSARY (SIZES WILL VARY BASED UPON THE SIZE OF THE HOLE CUT INTO THE PLANTER BOX WALLS): PVC MALE AND FEMALE ELECTRICAL CONDUIT ADAPTERS, A BUNA-N RUBBER DRAIN GASKET, AND A SHORT PIECE OF PVC PIPE. AN EXAMPLE OF A BULK HEAD ASSEMBLY IS PROVIDED AT THE FOLLOWING WEBSITE: (<http://www.trueutex.com/bulkhead.htm>).

**PLANTER BOX PLANT RECOMMENDATIONS\***

COMMON NAME	SCIENTIFIC NAME	MOISTURE PREFERENCE	HEIGHT (FEET)
New England aster	Aster novae-angliae 'Purple Dome'	AVERAGE TO MOIST	1-2
Feather reed grass	Calamagrostis x acutiflora 'Karl Foerster'	AVERAGE TO MOIST	5-6
Marsh marigold	Caltha palustris	MOIST TO WET	1-2
White turtlehead	Chelone glabra	MOIST TO WET	2-4
Blue flag	Iris hexagona	MOIST TO WET	3-4
Common rush	Juncus roemerianus	MOIST TO WET	2-3
Great blue lobelia	Lobelia siphilitica	MOIST TO WET	2-3
Sensitive fern	Onoclea sensibilis	MOIST TO WET	1-2
Red switch grass	Panicum virgatum 'Shenandoah'	AVERAGE TO MOIST	2-3
Brown-eyed susan	Rudbeckia fulgida 'Goldstrum'	AVERAGE TO MOIST	1-3

**SOURCES:**

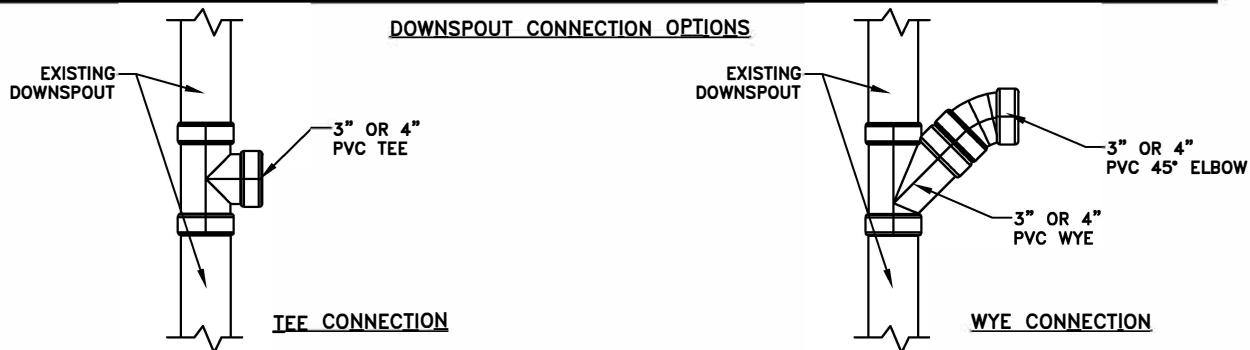
1. STORMWATER PLANTER DESIGN SHOWCASE (PHILADELPHIA WATER DEPARTMENT POWERPOINT PRESENTATION "GREEN CITIES, CLEAN WATERS PROMOTING A GREEN INFRASTRUCTURE VISION FOR THE CITY OF PHILADELPHIA"; [http://www.anacostia.net/temporary/workshops/lid\\_pdf/abrams\\_r-lid\\_anacostia\\_watershed.pdf](http://www.anacostia.net/temporary/workshops/lid_pdf/abrams_r-lid_anacostia_watershed.pdf))

**SIMPLIFIED SEQUENCE OF CONSTRUCTION:**

- CONSTRUCT PLANTER BOX NOT INCLUDING DECORATIVE TRIM AROUND THE TOP EDGE.
- INSTALL POND LINER – OVERLAP TOP BOARD OF PLANTER BOX AND SECURE BY SCREWING DECORATIVE TRIM (OVERTOP LINER) TO TOP BOARD. LEAVE SOME SLACK IN THE LINER SO GRAVEL/SOIL CAN STRETCH LINER AS IT FILLS THE BOX.
- INSTALL PLANTER BOX UNDERDRAIN AND OVERFLOW CONNECTIONS.
- INSTALL GRAVEL LAYER THEN PRE-MIXED SOIL MEDIA OVERTOP GRAVEL.
- INSTALL DOWNSPOUT DIVERTER – MODEL DEPICTED IS INSTALLED 2-3 INCHES ABOVE THE PLANTER BOX. CUT OUT APPROPRIATE SIZED SECTION OF THE DOWNSPOUT AND INSERT THE DIVERTER INLINE. THIS WILL ALLOW FOR THE DIVERTER TO BE CLOSED WHEN NOT IN USE (DURING WINTER AND WHEN DESIRED FOR MAINTENANCE, ETC.) AND FLOW TO BE RETURNED TO THE STORM SEWER DRAIN.
- INSTALL 2-3 INCH LAYER OF SPLASH ROCK (RIVER PEBBLES) OVER TOP OF SOIL MEDIA COVERING AN APPROXIMATELY 12-18" AREA BELOW THE LOCATION WHERE THE DOWNSPOUT DIVERTER DEPOSITS WATER INTO THE BOX.
- INSTALL PLANTS. IN GENERAL, SPACE PLANTS 12" (ON-CENTER) AND PLANT TALLER GROWING SPECIES IN THE BACK OF THE BOX AND SMALLER PLANTS IN THE FRONT.
- WATER PLANTS 3 TIMES PER WEEK FOR THE FIRST MONTH FOLLOWING INSTALLATION.

**ADDITIONAL REFERENCE**

- PLANTER (NUMBER SW-130, SIMPLIFIED/PRESUMPTIVE DESIGN APPROACH) STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS, PORTLAND, OREGON BUREAU OF ENVIRONMENTAL SERVICES ([www.portlandonline.com/bes/index.cfm?f=47953&](http://www.portlandonline.com/bes/index.cfm?f=47953&))



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**FIGURE 1B**

**MATERIALS LIST AND BUDGETARY COST ESTIMATE**

ITEM	MAKE/MODEL/DESCRIPTION	UNIT COST	QUANTITY	TOTAL ESTIMATED COST
DOWNSPOUT DIVERTER	THE RAIN WATER SAVER OR THE SAVE THE RAIN WATER METAL DIVERTER	\$24-\$35	1	\$24-\$35
WOOD (RECOMMEND USING PRESSURE TREATED, COMPOSITE, OR CEDAR FOR WEATHER RESISTANCE)	(6) 1" x 6" x 8' BOARDS (4) 2" x 2" x 8' BOARDS	\$4/BOARD \$3/BOARD	6 4	\$36
POND LINER	NEED: 7' x 6' (AVAILABLE ITEM: SMART POND 7' x 10' PVC POND LINER)	\$50	1	\$50
PLUMBING (BULK HEAD ASSEMBLY)	PVC MALE AND FEMALE ELECTRICAL CONDUIT ADAPTERS, A BUNA-N RUBBER DRAIN GASKET, AND A SHORT PIECE OF PVC PIPE	\$15-\$20	1	\$15-\$20
SANDY SOIL MIX	TOPSOIL (0.6 CUBIC FT.) CLEAN COARSE SAND (3.6 CUBIC FT.) COMPOST (1.8 CUBIC FT.)	\$8/3 CUBIC FT. \$8/3 CUBIC FT. \$8/3 CUBIC FT.	1 2 1	\$32
PEA GRAVEL	EVERGREEN PEA GRAVEL	\$4/0.5 CUBIC FT.	4	\$16
SPLASH ROCK	KOLORSCAPE RIVER PEBBLES	\$5/0.5 CUBIC FT.	1	\$5
PLANT MATERIALS	ASSUME PERENNIALS SPACED 12" TO 18" ON-CENTER	\$12	3-6	\$36-\$72
HARDWOOD MULCH	EVERGREEN HARDWOOD MULCH	\$4/3 CUBIC FT.	1	\$4
CONCRETE BLOCKS (CONCRETE MASONARY UNITS)	NA	\$1.30/BLOCK	10	\$13
<b>TOTAL BUDGETARY COST ESTIMATE (ROUNDED UP TO NEAREST FIVE DOLLARS) ==&gt;</b>				<b>\$235 - \$285</b>

**NOTES:**

- BUDGETARY COST ESTIMATE DOES NOT INCLUDE TAXES AND SHIPPING/HANDLING COSTS.
- SPECIFIC MAKES/MODELS HAVE BEEN PRESENTED FOR ESTIMATING PURPOSES ONLY. ALTERNATE OR EQUIVALENT MATERIALS MAY BE USED, WHICH MAY IMPACT QUANTITIES AND OVERALL COST FOR RAIN GARDEN IMPLEMENTATION.
- MATERIALS LIST DOES NOT INCLUDE HARDWARE SUCH AS SCREWS. RECOMMEND USING GALVANIZED STEEL METAL PARTS FOR WEATHER RESISTANCE.

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