CONCEPTUAL RESIDENTIAL FLOW-THROUGH PLANTER BOX DESIGN

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

Philadelphia Water Department

URS
CONCEPTUAL PLANTER BOX LAYOUT
(NOT TO SCALE)

EXISTING DOWNSPOUT
(3" OR 4")

3" OR 4" PVC OVERFLOW PIPE (SIZE OF PIPE SHOULD BE EQUAL TO OR GREATER THAN EXISTING DOWNSPOUT SIZE) REQUIRES A BULKHEAD ASSEMBLY SEE NOTES FOR DETAILS

3" OR 4" PVC WYE OR TEE JOINT SEE NOTES FOR DETAILS

SPASH ROCK SCREEN WRAP

5/8" OR 1" UNDERRAIN WITH FLEXIBLE HOSE OR GARDEN HOSE TO EXISTING STORM SEWER RISER REQUIRES A BULKHEAD ASSEMBLY SEE NOTES FOR DETAILS

EXISTING STORM SEWER RISER

CONCEPTUAL PLANTER BOX SIDE VIEW
(NOT TO SCALE)

SAVE THE RAIN WATER METAL DIVERTER OR EQUIVALENT

DECORATIVE TRIM (OPTIONAL)

LEGEND:

→ ACTIVE PLANTER BOX FLOW
→ CLOSED DIVERTER FLOW (E.G., WINTER/MAINTENANCE)

NOTE:
ALTERNATE DESIGNS MAY WANT TO CONSIDER ADDING PERFORATED UNDERRAIN THROUGHOUT (OR OVER A PORTION OF) THE GRAVEL BED FOR DRAINAGE.

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

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

FIGURE 1A
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 this 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)
    - INLINE AND OFFSET DOWNSPOUT DIVERTER (www.rainbarrel.net/diverter.html)
    - www.aquabarrel.com
  - **OPTION 2: LARGER ROOFTOP DRAINAGE AREA APPLICATION (GREATER THAN 100 SQUARE FEET).** INSTALL AN INLINE DOWNSPOUT DIVERTER: THE GARDEN WATER SAVES (AVAILABLE AT: 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 BASE**
  - A FOUR INCH GRAVEL LAYER IS INCLUDED AT THE BOTTOM OF THE PLANTER BOX TO ALLOW 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)**

**PLANTER BOX PLANT RECOMMENDATIONS**

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

**SOURCES:**
1. STORMWATER PLANTER DESIGN SHOWCASE (PHILADELPHIA WATER DEPARTMENT POWERPOINT PRESENTATION “GREEN CIIES, CLEAN WATERS PROMOTING A GREEN INFRASTRUCTURE VISION FOR THE CITY OF PHILADELPHIA”;

**SIMPLIFIED STANDARDS 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 MEDIUM OVER TOP 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 IN LINE. THIS WILL ALLOW 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 MEDIUM 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 REFERENCES:**
- PLANTER (NUMBER SW–130, SIMPLIFIED/PRESUMPTIVE DESIGN APPROACH) STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS, PORTLAND, OREGON BUREAU OF ENVIRONMENTAL SERVICES (www.portlandoregon.gov/bes/index.cfm? contentid=47953&)

**CONCEPTUAL PLANTER BOX DESIGN**

MODEL NEIGHBORHOOD PROJECT

TYPICAL HOME APPLICATION

DETAILS AND NOTES

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

TOTAL BUDGETARY COST ESTIMATE (ROUNDED UP TO NEAREST FIVE DOLLARS) = $235 - $285

NOTES:
1. BUDGETARY COST ESTIMATE DOES NOT INCLUDE TAXES AND SHIPPING/HANDLING COSTS.
2. 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.
3. MATERIALS LIST DOES NOT INCLUDE HARDWARE SUCH AS SCREWS. RECOMMEND USING GALVANIZED STEEL METAL PARTS FOR WEATHER RESISTANCE.