

Tom and Diane Schmidt
1717A Tanglewood Trail
Long Lake

Runoff Reduction Plan

The Runoff Reduction Plan Set provides an aerial view and cross sections of the rain gardens. A native planting (400ft²) is included to the north of the house. Rain garden locations and planting locations were also flagged during the site visit 9/09/16. Impervious surface draining to rain gardens = 1550 ft². Total functional rain garden size = 210 ft² or 13.5%.

Silt fence must be installed below any areas of excavation or where excavated or construction materials are placed.

All areas disturbed during construction to be seeded with a lawn grass mix.

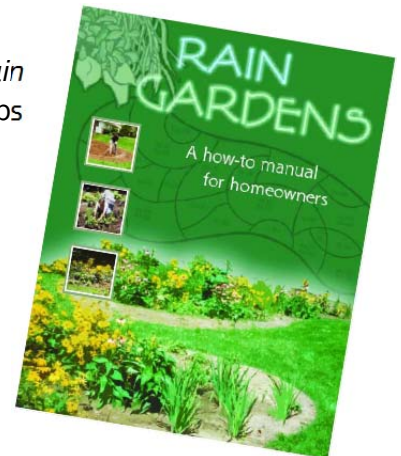
Rain garden location is indicated on the site diagram.

- Confirm utility locations with owner and/or Diggers Hotline prior to beginning construction. Previously checked utilities for planning purposes indicate that utilities are clear of installation locations.
- Be sure to avoid the use of heavy equipment within the proposed rain garden location; it will compact the soil and decrease infiltration.

Installing rain gardens

The process for installing the rain garden is outlined in detail in the *Rain Gardens: A how-to manual for homeowners* publication. The basic steps are as follows:

1. **Dig the rain garden** (page 12) The rain gardens will be approximately 9 inches deep and level at their bases. An extra foot is excavated then filled with a 70/30 sand compost mixture. The edges of the garden will slope from ground level to the garden's base.
2. **Install block wall.** Because of the steep slope, the back edges of the garden are vertical walls formed with block. Filter fabric is placed behind each wall. The blocks are placed in a bed of at least 6 inches of gravel. Excavated soil must be hauled off-site.
3. **Level the rain garden** (page 12). It is essential that the base of the rain garden is flat in order to prevent uneven pooling of water within the garden. To maximize infiltration capacity, the water must soak into the ground evenly throughout the garden's base.



4. **Rock overflow to next wall.** See the cross-section diagram. There is at least 6 inches of native soil behind each wall then a slope to the base on the garden. The slope is overlain with filter fabric and covered with 2-4" rock.
5. **Create rock overflow to carry water from the lowest rain garden.** The rock overflow will be sloped to carry water and underlain with filter fabric which is covered by 2-4 inch rock. The overflow swale will be placed to overflow to the currently well-vegetated area.
6. **Plant the rain garden** (page 16). Plant the garden with transplanted plants from owner's gardens. Native plants are recommended.

Begin by laying down 2-3 inches of shredded bark or wood mulch. To plant, separate the mulch, dig a hole, sprinkle organic soil amendment, and place the plant in the hole. Press the soil gently around the plant roots and replace the mulch, being careful to keep mulch ½ inch from the stem of plants. Mulch should be installed after the rain gardens are created to cover the soil and prevent erosion even if plants are not planted.

7. **Water immediately after planting.** Plan to water daily for the first few weeks or until the plants are well established. If plants wilt or droop, a repeated watering during the day may be necessary. Once plants are established, water only if prolonged dry periods occur.

Information for maintaining your rain garden is also included in the rain gardens publication (page 17). Like all gardens, it will require some weeding and watering. This is especially important during the first year or so after the garden is installed. Since the plants are native, however, they should require minimal care once established.

Native planting

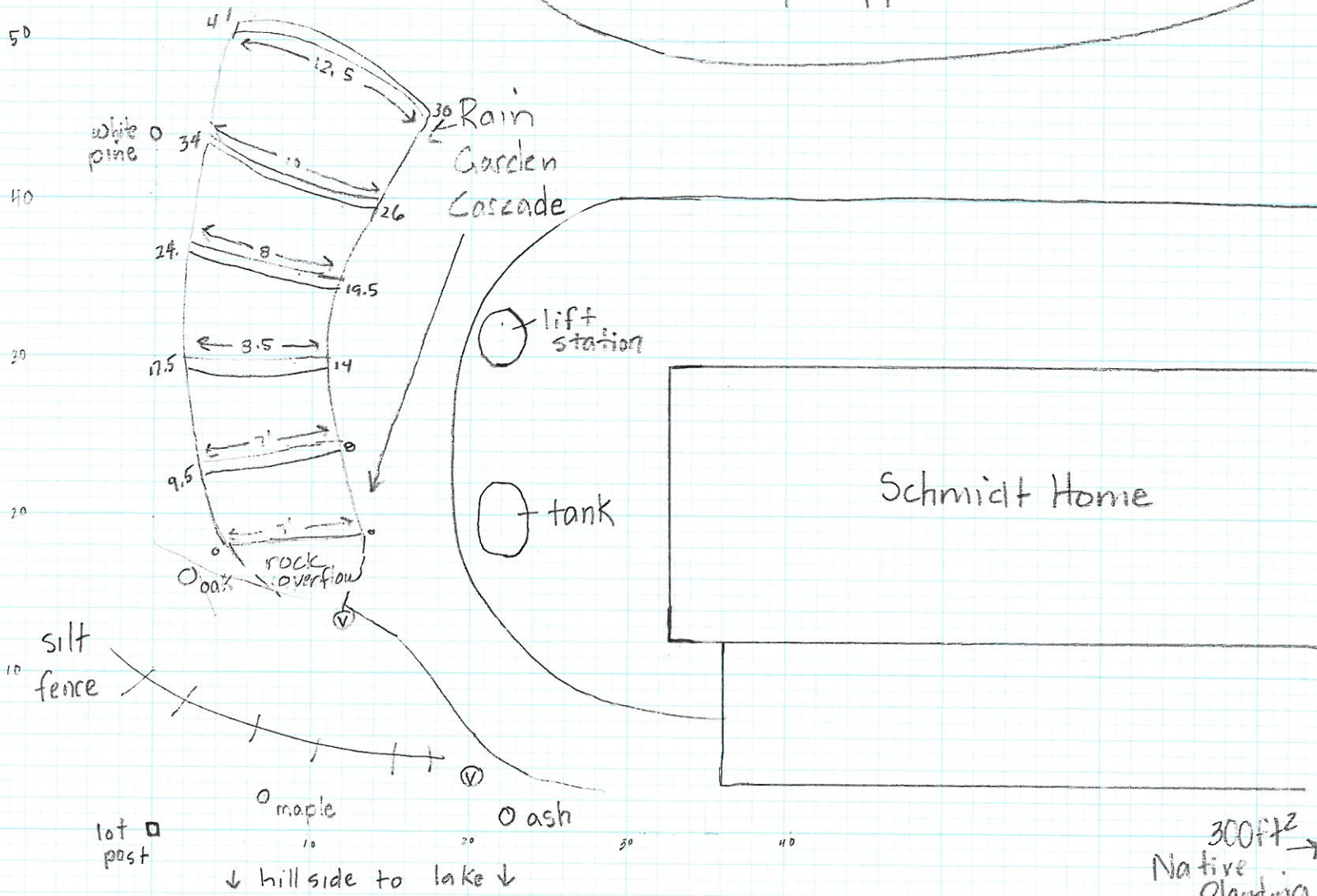
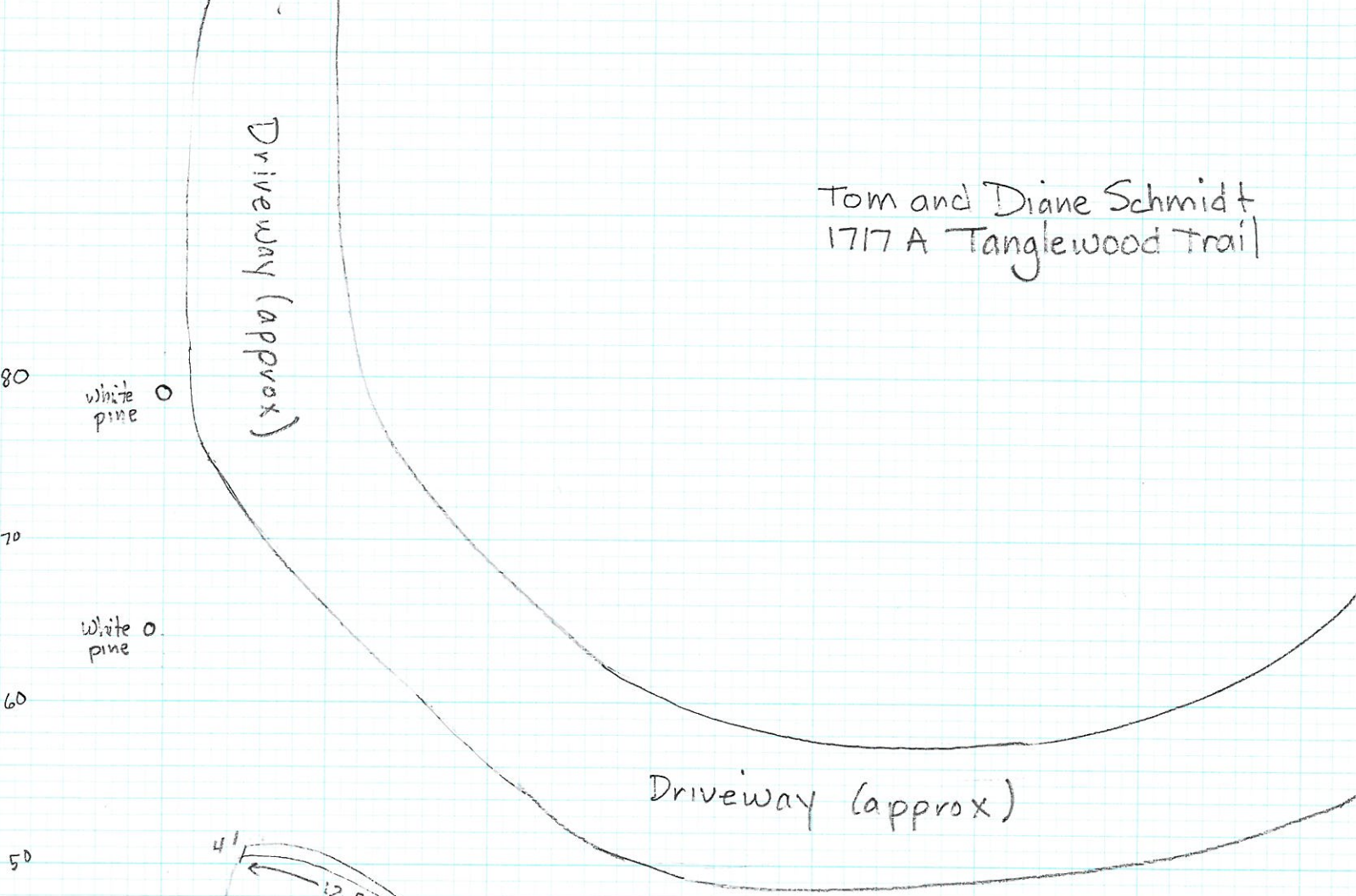
Plant the area flagged and discussed at the site visit on the northeast side of the house (approximately 400 ft²). The planting will serve to slow the flow of runoff in this area where there isn't adequate room for rain gardens.

Choose plants from the Oak or Pine Forest Polk County native plant list where there is more shade and the Prairie/Upland Meadow list where there is some sun. Leaf compost is recommended as a soil amendment. Recommended shade plants include Pennsylvania sedge as a base, large leaf aster, and bush honeysuckle.

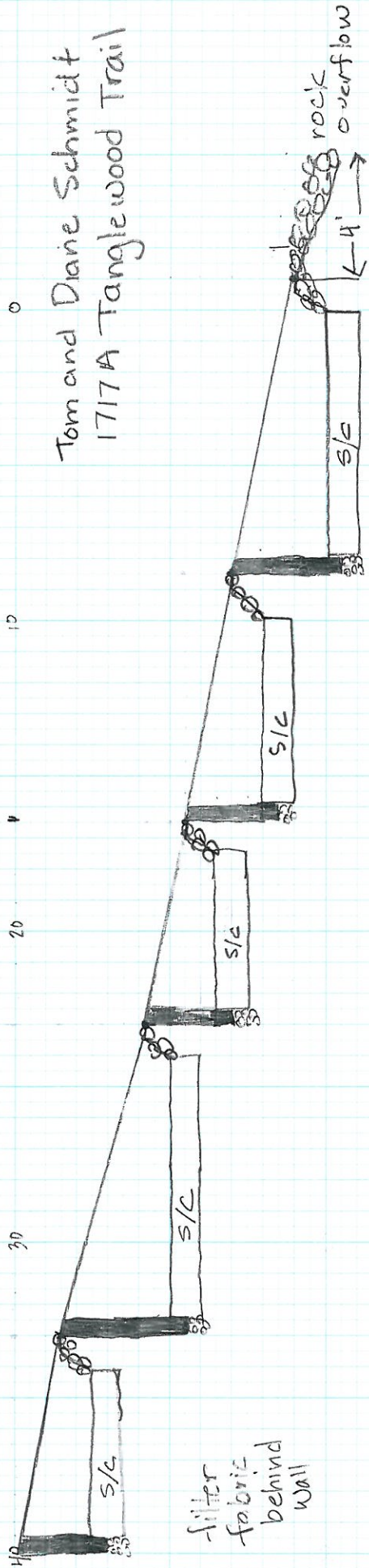
The only site preparation needed is to remove recently placed sod in one area.

Cost estimate = 400 plants @ \$1.25 =	\$500	
Landowner labor = 10 hours @ \$12 =	\$120	Total = \$620

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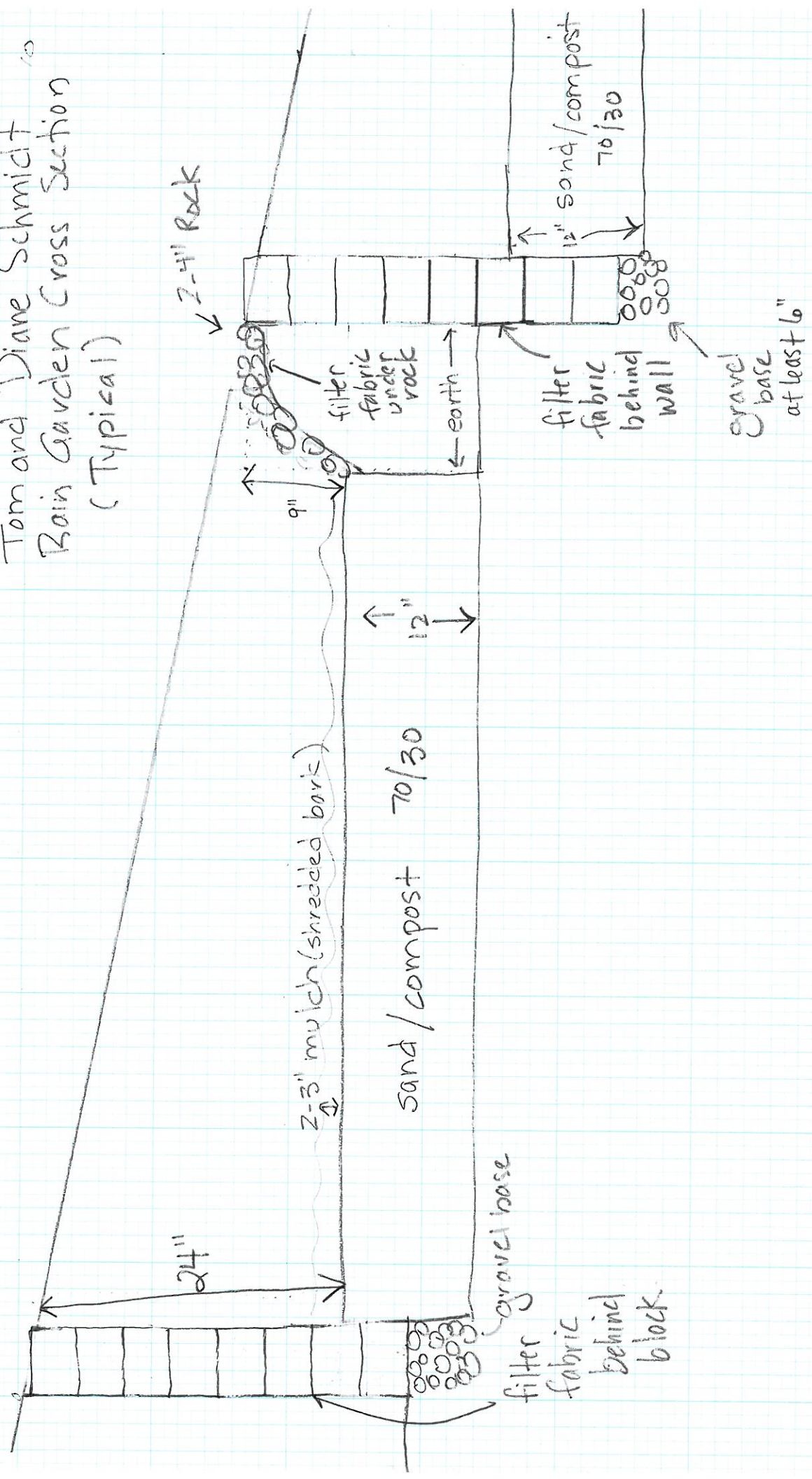
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Rain Garden Cascade
Cross Section

sides slope to base
(mulched and planted)

Tom and Diane Schmidt
Rain Garden Cross Section
(Typical)



Project Quantities

Schmidt
1717A Tanglewood Trail

Materials	Quantity	Cost per unit	Total Cost
Rain Garden Cascade			
Blocks (4"X 6" X 8")	400	\$ 1.50	\$ 600.00
Base gravel (yard)	1	\$ 32.00	\$ 32.00
2-4" Rock (cubic yards)	2	\$50	\$ 100.00
Filter fabric (15 ft)	27	\$4.00	\$ 108.00
Wood mulch (3") (yards)	2.25	\$ 30.00	\$ 67.50
70/30 sand/compost (yards)	8	\$40	\$ 320.00
Skid Steer Rental (days)	1	\$ 250.00	\$ 250.00
Landowner labor (hours)	30	\$ 12.00	\$ 360.00
Grass seed	1	\$ 20.00	\$ 20.00
Silt fence (ft.)	20		\$ 32.00
delivery charges	2	\$75	\$ 150.00
Soil amendment			
plants			\$ -
			\$ 2,039.50
contingency (10%)			\$ 203.95
subtotal			\$ 2,243.45
Cost share lake district 70% (est)			\$ 1,570.42
Homeowner 30% (est)			\$ 673.03
Homeowner portion includes landowner labor up to 30% of the project costs			