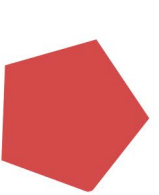


BIORETENTION #1 - PLANT LIST: NATIVE SHRUBS & TREES



Red Osier Dogwood, *Cornus sericea*  
 height 6-9' / spread 7-10', medium-wet soils, full sun-part shade



Winterberry, *Ilex verticillata*  
 height 3-12' / spread 3-12', medium-wet soils, full sun-part shade



Summersweet, *Clethra alnifolia*  
 height 3-8' / spread 4-6', medium-wet soils, full sun-part shade



Highbush Blueberry, *Vaccinium corymbosum*  
 height 6-12' / spread 8-12', medium soils, full sun-part shade



Sweetfern, *Comptonia peregrina*  
 height 2-5' / spread 4-8', medium soils, full sun-part shade



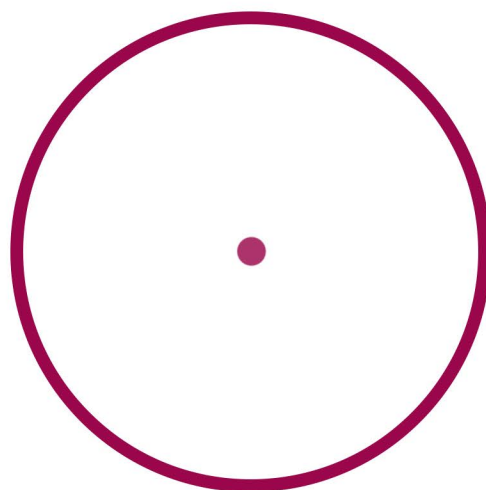
Ninebark, *Physocarpus opulifolius* 'Diabolo' (or similar maroon cultivar)  
 height 5-8' / spread 4-6', medium soils, full sun-part shade



Cinquefoil, *Potentilla fruticosa*  
 height 2-4' / spread 3-5', medium soils, full sun-part shade



Red Chokeberry, *Aronia arbutifolia*  
 height 6-10' / spread 3-5', medium soils, full sun-part shade



Serviceberry, *Amelanchier canadensis*  
 height 25-30' / spread 15-20', medium soils, full sun-part shade

OR

Speckled Alder, *Alnus incana* subs. *rugosa*  
 height 15-25' / spread 15-25', medium-wet soils, full sun-part shade



Red Maple, *Acer rubrum*  
 height 40-70' / spread 30-50', medium-wet, full sun-part shade

OR

Pin Oak, *Quercus palustris*  
 height 50-70' / spread 40-60', medium-wet, full sun

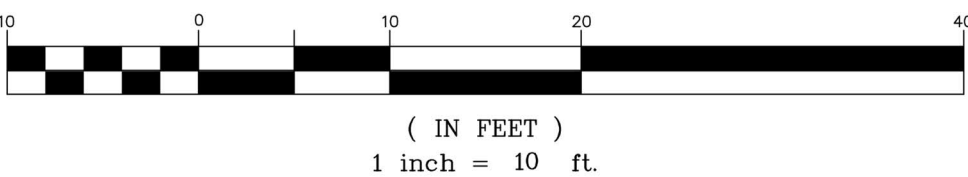


PLANT LIST

LEGEND

|  |                           |
|--|---------------------------|
|  | APPROXIMATE PROPERTY LINE |
|  | APPROXIMATE SETBACK LINE  |
|  | EXISTING CONTOUR          |
|  | EXISTING FENCE            |
|  | EXISTING GRAVEL           |
|  | EXISTING PAVEMENT         |
|  | EXISTING ELECTRIC         |
|  | EXISTING GAS              |
|  | EXISTING STORM            |
|  | EXISTING CATCH BASIN      |
|  | EXISTING UTILITY POLE     |
|  | EXISTING LIGHT POLE       |
|  | EXISTING DECIDUOUS TREE   |
|  | EDGE OF BRUSH/WOODS       |
|  | WETLANDS                  |
|  | WETLANDS BUFFER           |
|  | PROPOSED CONTOUR          |
|  | PROPOSED CURB             |
|  | PROPOSED PAVEMENT         |
|  | PROPOSED STORM            |
|  | PROPOSED SWALE            |
|  | PROPOSED STORM MANHOLE    |
|  | PROPOSED CATCH BASIN      |

GRAPHIC SCALE



SITE ENGINEER:



CIVIL ENGINEERING ASSOCIATES, INC.  
 10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403  
 P: 802-864-2323 FAX: 802-864-2271 web: www.cca-vt.com  
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STORMWATER CONSULTANT



208 FLYNN AVE SUITE 2H BURLINGTON, VT 05401  
 P: 802-497-2367 web: www.watershedca.com

ECOLOGICAL LANDSCAPE DESIGNER



CLIENT:

CENTRAL VERMONT  
 REGIONAL  
 PLANNING  
 COMMISSION

PROJECT:

BERLIN  
 FIRE DEPARTMENT

WASHINGTON CENTRAL UNIFIED  
 UNION SCHOOL DISTRICT  
 372 PAINE TURNPIKE N  
 BERLIN, VT, 05602



LOCATION MAP

1" = 2000'

| DATE | CHECKED | REVISION |
|------|---------|----------|
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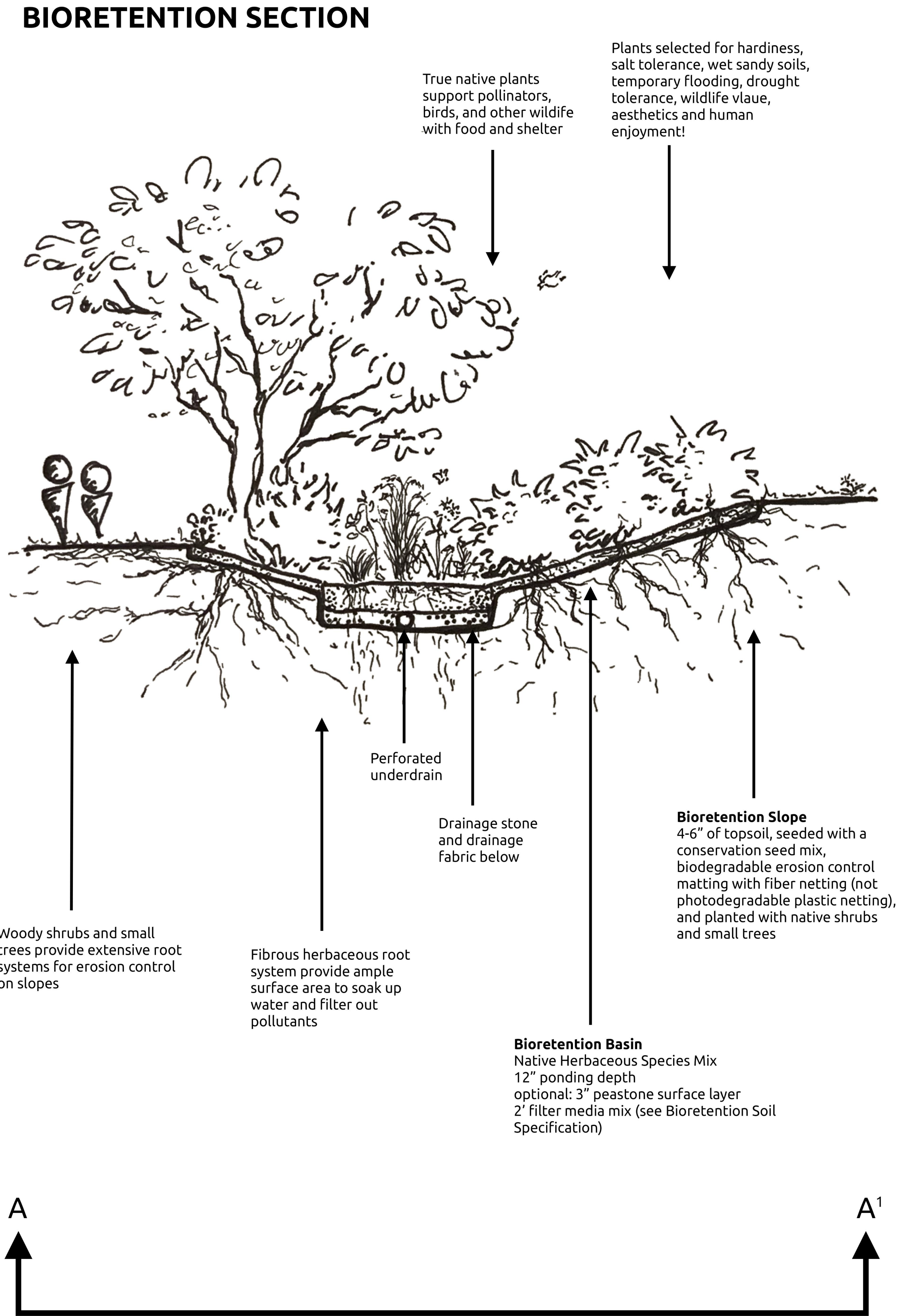
PROPOSED  
 CONDITIONS  
 PLAN

| DATE      | DRAWING NUMBER |
|-----------|----------------|
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| SCALE     |                |
| 1" = 10'  |                |
| PROJ. NO. |                |
| 19170     |                |

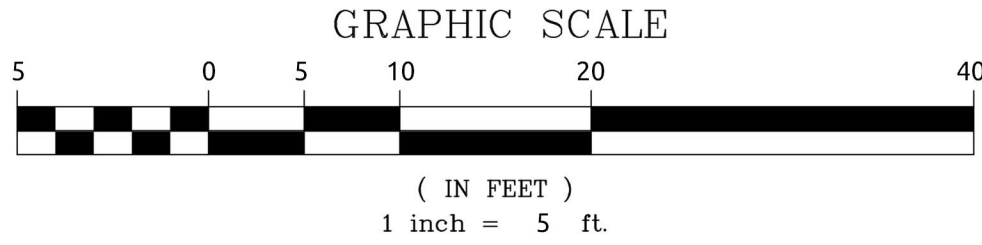
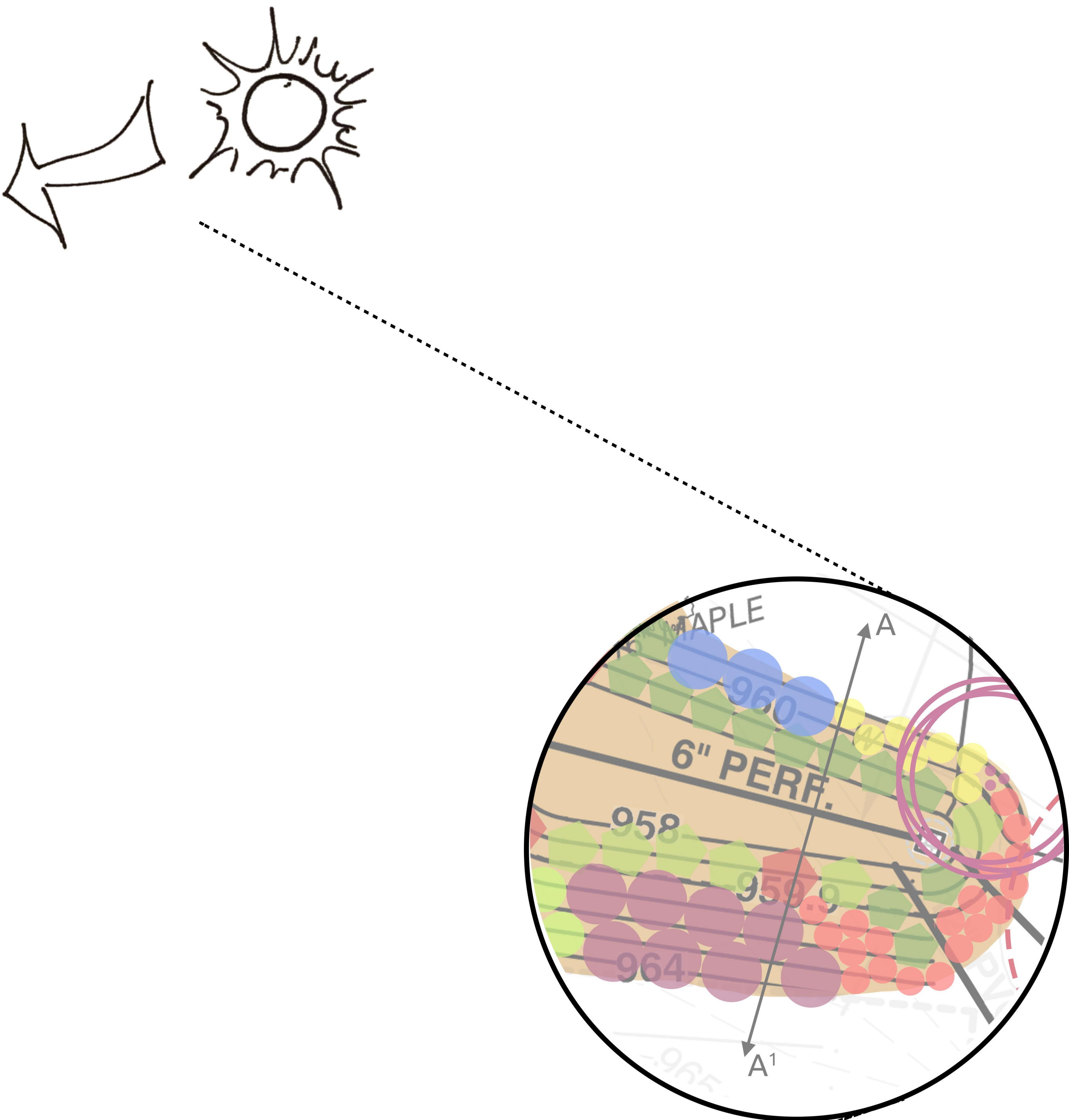
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BIORETENTION SECTION



BIORETENTION #1 - SECTION A-A<sup>1</sup>



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CIVIL ENGINEERING ASSOCIATES, INC.  
10 MANSFIELD VIEW LANE, SOUTH BURLINGTON, VT 05403  
P: 802-864-2323 FAX: 802-864-2271 web: www.cea-vt.com  
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STORMWATER CONSULTANT



208 FLYNN AVE SUITE 2H BURLINGTON, VT 05401  
P: 802-497-2367 web: www.watershedca.com

ECOLOGICAL LANDSCAPE DESIGNER:



Burlington, Vermont hollygreenleaf.com  
greenleafholly@gmail.com (802) 535-8737

CLIENT:

CENTRAL VERMONT  
REGIONAL  
PLANNING  
COMMISSION

PROJECT:

BERLIN  
FIRE DEPARTMENT

WASHINGTON CENTRAL UNIFIED  
UNION SCHOOL DISTRICT  
372 PAINE TURNPIKE N  
BERLIN, VT, 05602



LOCATION MAP  
1" = 200'

1

| DATE | CHECKED | REVISION |
|------|---------|----------|
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PROPOSED  
CONDITIONS  
PLAN

|                    |                |
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| DATE<br>--         | DRAWING NUMBER |
| SCALE<br>1" = 5'   |                |
| PROJ. NO.<br>19170 |                |



## OPTION 1 - SEEDING SPECIFICATIONS

Seed bottom of retention basins with *Ernst Conservation Seeds* ‘Rain Garden Mix’, or similar mix:

33.4% Schizachyrium scoparium, ‘Itasca’, MN Ecotype (Little Bluestem, ‘Itasca’, MN Ecotype)  
20.0% Elymus virginicus, PA Ecotype (Virginia Wildrye, PA Ecotype)  
7.0% Carex vulpinoidea, PA Ecotype (Fox Sedge, PA Ecotype)  
5.6% Chasmanthium latifolium, WV Ecotype (River Oats, WV Ecotype)  
5.5% Echinacea purpurea (Purple Coneflower)  
3.0% Chamaecrista fasciculata, PA Ecotype (Partridge Pea, PA Ecotype)  
3.0% Coreopsis lanceolata (Lanceleaf Coreopsis)  
3.0% Panicum clandestinum, Tioga (Deertongue, Tioga)  
3.0% Panicum rigidulum, PA Ecotype (Redtop Panicgrass, PA Ecotype)  
3.0% Rudbeckia hirta, Coastal Plain NC Ecotype (Blackeyed Susan, Coastal Plain NC Ecotype)  
3.0% Verbena hastata, PA Ecotype (Blue Vervain, PA Ecotype)  
2.0% Heliopsis helianthoides, PA Ecotype (Oxeye Sunflower, PA Ecotype)  
1.8% Asclepias incarnata, PA Ecotype (Swamp Milkweed, PA Ecotype)  
1.0% Carex scoparia, PA Ecotype (Blunt Broom Sedge, PA Ecotype)  
1.0% Senna hebecarpa, VA & WV Ecotype (Wild Senna, VA & WV Ecotype)  
0.5% Aster novae-angliae, PA Ecotype (New England Aster, PA Ecotype)  
0.5% Aster prenanthoides, PA Ecotype (Zigzag Aster, PA Ecotype)  
0.5% Baptisia australis, Southern WV Ecotype (Blue False Indigo, Southern WV Ecotype)  
0.5% Pycnanthemum tenuifolium (Narrowleaf Mountainmint)  
0.5% Zizia aurea (Golden Alexanders)  
0.4% Monarda fistulosa, Fort Indiantown Gap-PA Ecotype (Wild Bergamot, Fort Indiantown Gap-PA Ecotype)  
0.3% Eupatorium coelestinum, VA Ecotype (Mistflower, VA Ecotype)  
0.3% Eupatorium perfoliatum, PA Ecotype (Boneset, PA Ecotype)  
0.3% Helenium autumnale, PA Ecotype (Common Sneezeweed, PA Ecotype)  
0.3% Juncus tenuis, PA Ecotype (Path Rush, PA Ecotype)  
0.2% Juncus effusus (Soft Rush)  
0.2% Solidago nemoralis, PA Ecotype (Gray Goldenrod, PA Ecotype)  
0.2% Solidago rugosa, PA Ecotype (Wrinkleleaf Goldenrod, PA Ecotype)

20 lbs per acres

Bioretention #1 Basin Area: 790 square feet (0.36 lbs seed)  
Bioretention #2 Basin Area: 2,460 square feet (1.13 lbs seed)

Seed swales with *Ernst Conservation Seeds* ‘Rain Garden Grass Mix’, or similar mix:

31.0% Schizachyrium scoparium, ‘Camper’ (Little Bluestem, ‘Camper’)  
20.4% Panicum clandestinum, Tioga (Deertongue, Tioga)  
20.0% Carex vulpinoidea, PA Ecotype (Fox Sedge, PA Ecotype)  
20.0% Elymus virginicus, PA Ecotype (Virginia Wildrye, PA Ecotype)  
5.0% Chasmanthium latifolium, WV Ecotype (River Oats, WV Ecotype)  
2.5% Panicum rigidulum, PA Ecotype (Redtop Panicgrass, PA Ecotype)  
0.5% Carex scoparia, PA Ecotype (Blunt Broom Sedge, PA Ecotype)  
0.3% Juncus effusus (Soft Rush)  
0.3% Juncus tenuis, PA Ecotype (Path Rush, PA Ecotype)

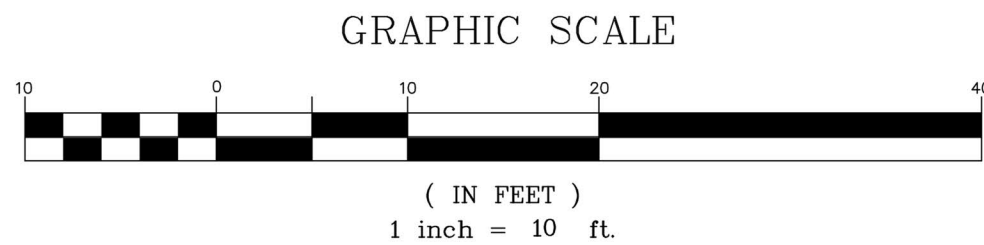
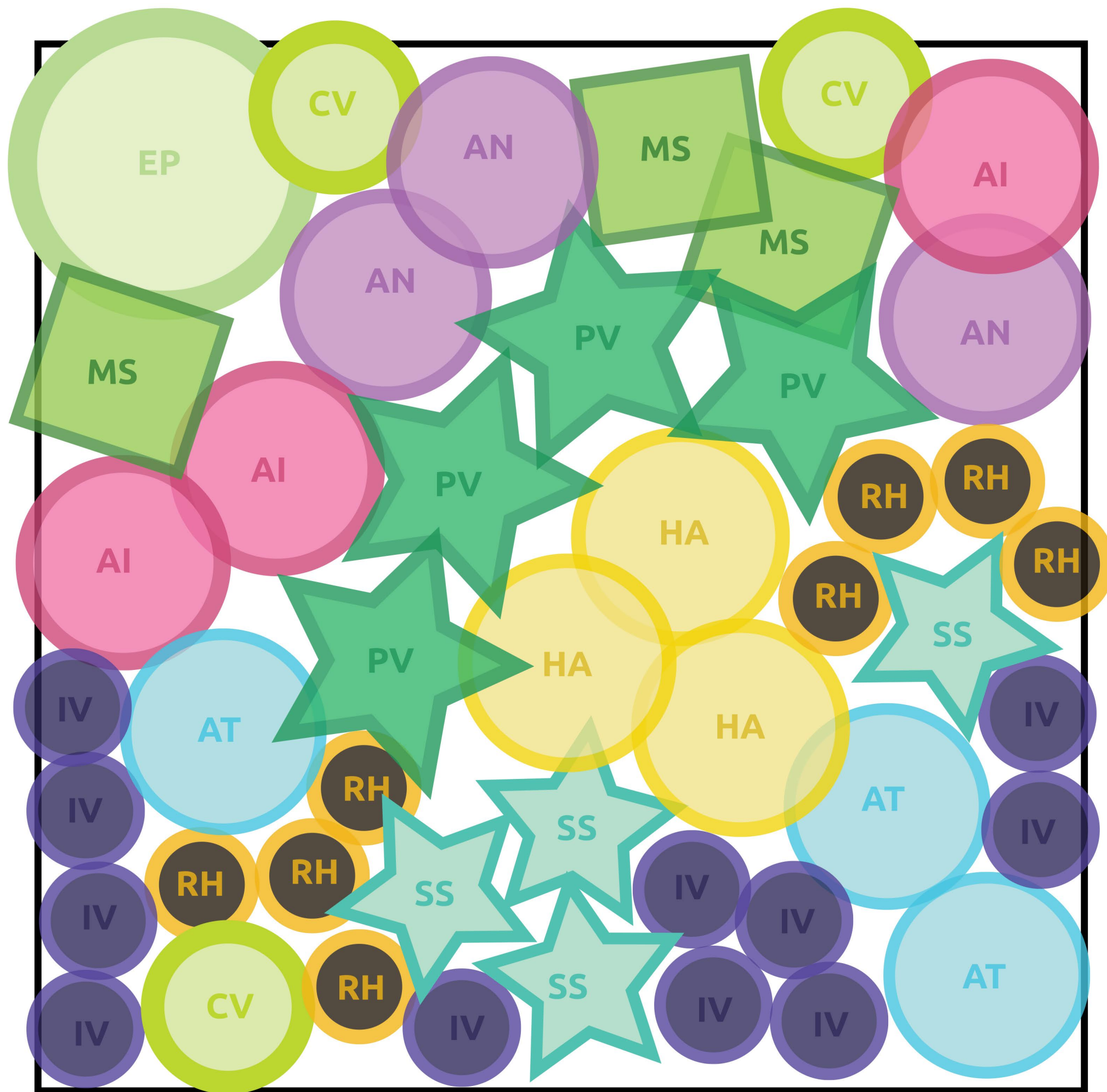
15 lbs per acre

Bioretention #1 Swale Area: 2,000 square feet (0.69 lbs seed)  
Bioretention #2 Swale Area: 1,050 square feet (0.36 lbs seed)

Seed with grain rye cover crop at 30 lbs per acre (4.34 lbs seed)

Broadcast seed evenly on level soil in fall or spring (seed cover crop in spring). An annual cover crop of oats or rye establishes quickly to protect seeds and prevent further weedy invasives. In first growing season, whenever vegetation reaches 18”-24” in height, use a string trimmer to cut vegetation to 8” tall (but no less!). It is important to maintain 8” in the first growing season to reduce competition from weeds. Cease mowing by mid-September. In spring of second growing season, cut all dead plant material back to 3” when growth first starts to emerge. Spot weed invasives and problem weeds if necessary. Native plantings by seed can take 3 to 4 years to fully establish.

## 10’ x 10’ SAMPLE BASIN PLANTING PLAN



## OPTION 2 - PLANTING SPECIFICATIONS

Source containers or plugs from a native/conservation/wetland nursery, e.g., Vermont Wetland Plant Supply or New England Wetland Plants, and plant in spring (April - June) or fall (September-October).

Lay out plants according to mature growth spread or slightly closer for faster vegetative cover (approximately 2'-3' on center). Plant from one end to the other to reduce compaction and protect small plants (boards can be used to walk on to prevent compaction).

Move peastone (or existing surface treatment) aside and dig down to depth of potted plant. Option for quicker plant establishment: place one handful of low-phosphorus compost in hole (sourced from stock made up of 25:1 or more carbon to nitrogen ratio, compost comprising maximum 3-5% of total bioretention soil media).

Plant base of stem level with top of soil media and tamp down (remove all oxygen pockets in soil).

Water thoroughly to soak entire root system. Keep soils moist for minimum 4 weeks to allow establishment. Water once a week in the first growing season and during dry spells in second and third growing seasons to ensure plant establishment.

Spot weed invasives and problem weeds if necessary. Cut down dead plant material 3”-6” above ground and remove in late winter/early spring, before new growth begins.

Bioretention #1 Basin Area: 790 square feet (approx. 144 herbaceous perennials)  
Bioretention #2 Basin Area: 2,460 square feet (approx. 445 herbaceous perennials)

## PLANT LIST - NATIVE HERBACEOUS PERENNIALS

EP - Boneset, *Eupatorium perfoliatum*  
height 4-6’ / spread 2-4’, medium-wet soils, full sun-part shade, white blooms July-Sept



AN - New England Aster, *Symphyotrichum novae-angliae*  
height 3-6’ / spread 2-3’, medium soils, full sun, purple blooms Aug-Sept



AI - Swamp Milkweed, *Asclepias incarnata*  
height 4-5’ / spread 2-3’, medium-wet soils, full sun, mauve blooms July-Aug



HA - Sneezeweed, *Helenium autumnale*  
height 3-5’ / spread 2-3’, medium-wet soils, full sun, yellow blooms Aug-Oct



AT - Eastern Blue Star, *Amsonia tabernaemontana*  
height 2-3’ / spread 2-3’, medium soils, full sun-part shade, blue blooms May



RH - Black-eyed Susan, *Rudbeckia hirta*  
height 2-3’ / spread 1-2’, medium soils, full sun, yellow-brown blooms June-Sept



IV - Blue Flag, *Iris versicolor*  
height 2-2.5’ / spread 2-2.5’, medium-wet soils, full sun-part shade, violet blooms May-June



PV - Switchgrass, *Panicum virgatum*  
height 3-6’ / spread 2-3’, medium-wet soils, full sun-part shade, pink-tinged blooms July-Oct



SS - Little Bluestem, *Schizachyrium scoparium*  
height 2-4’ / spread 1.5-2’, dry-medium soils, full sun, purplish bronze blooms Aug-Oct



CV- Fox Sedge, *Carex vulpinoidea*  
height 1-3’ / spread 0.5-2’, wet soils, full sun, green blooms May-July



MS - Ostrich Fern, *Matteuccia struthiopteris*  
height 3-6’ / spread 5-8’, wet soils, part-shade-shade



### PLANT SUBSTITUTES

WETTER CONDITIONS:  
Joe Pye Weed, *Eupatorium maculatum*  
Blue Vervain, *Verbena hastata*

DRIER CONDITIONS:  
Coreopsis, *Coreopsis lanceolata*  
Slender Mountain Mint, *Pycnanthemum tenuifolium*