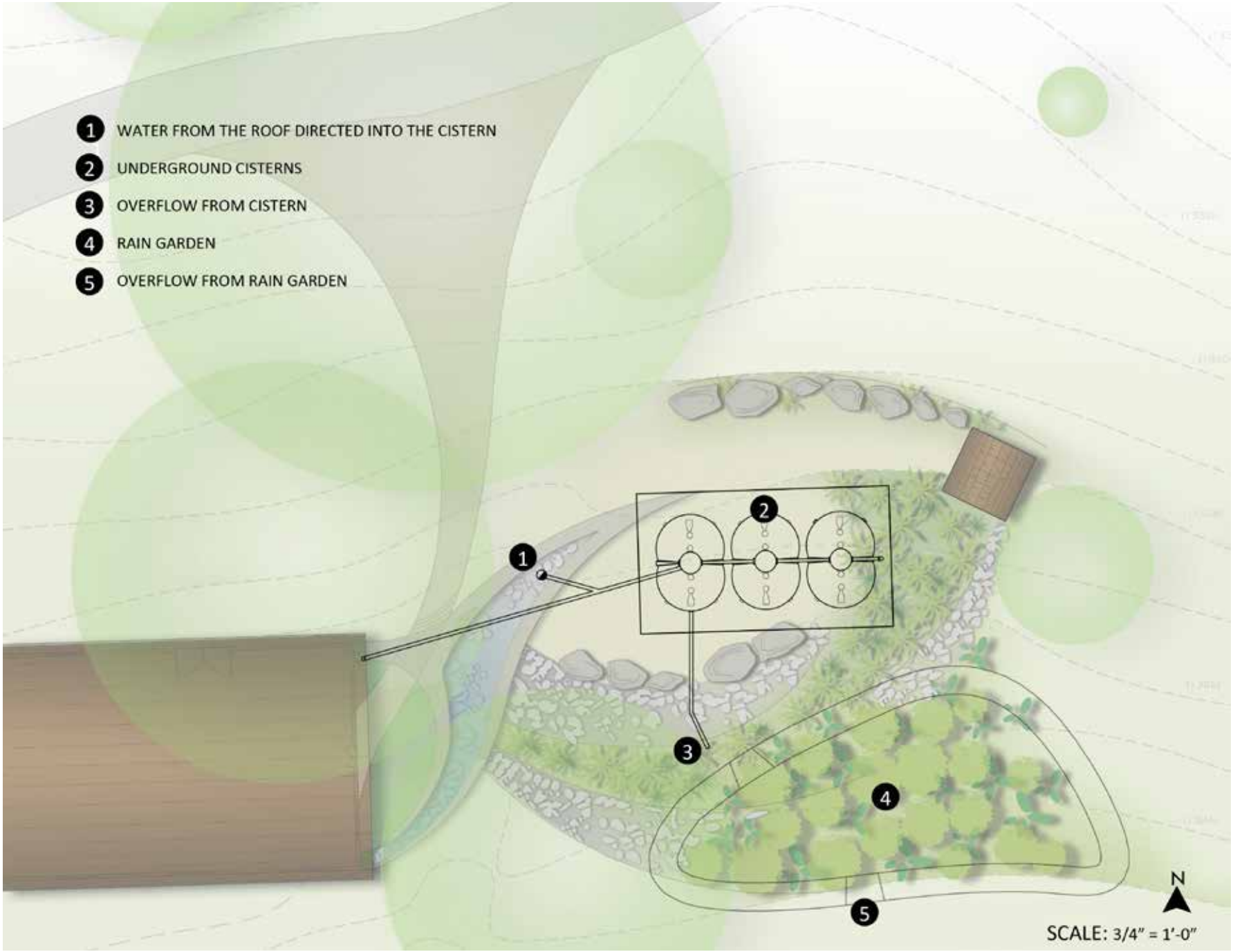
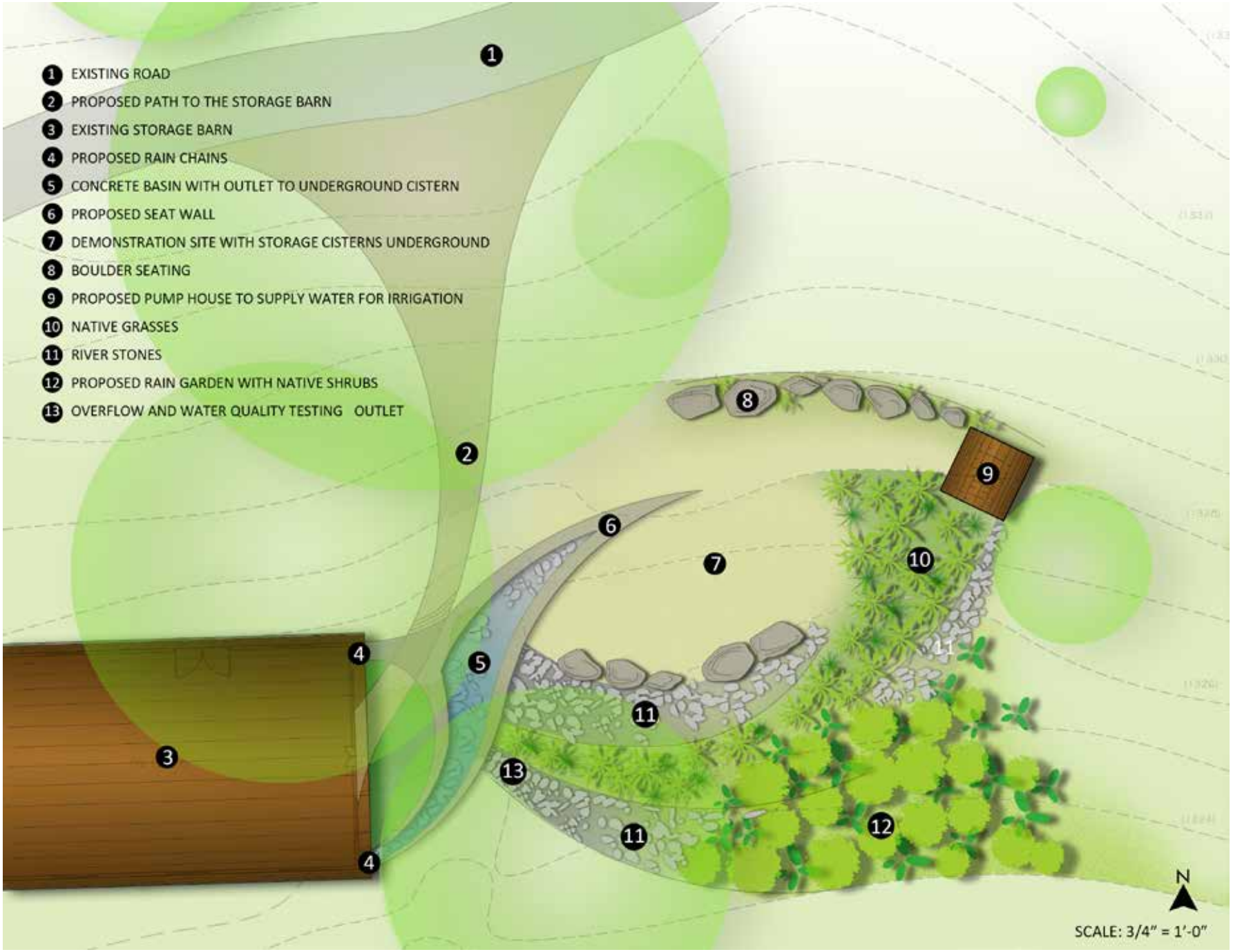


SITE PLAN | Plan with below-grade elements



CONCEPTUAL PLAN

Photo | View of site facing southwest (Phase I construction)

PHOTO | View of site facing west (Phase I construction)

ILLUSTRATIVE PERSPECTIVE | View of site design facing southwest (proposed)

Native Plant List

Perennials

Asclepias tuberosa	Butterfly Milkweed
Lobelia cardinalis	Cardinal flower
Mertensia virginica	Virginia Bluebells
Tiarella cordifolia	Foam Flower

Grasses

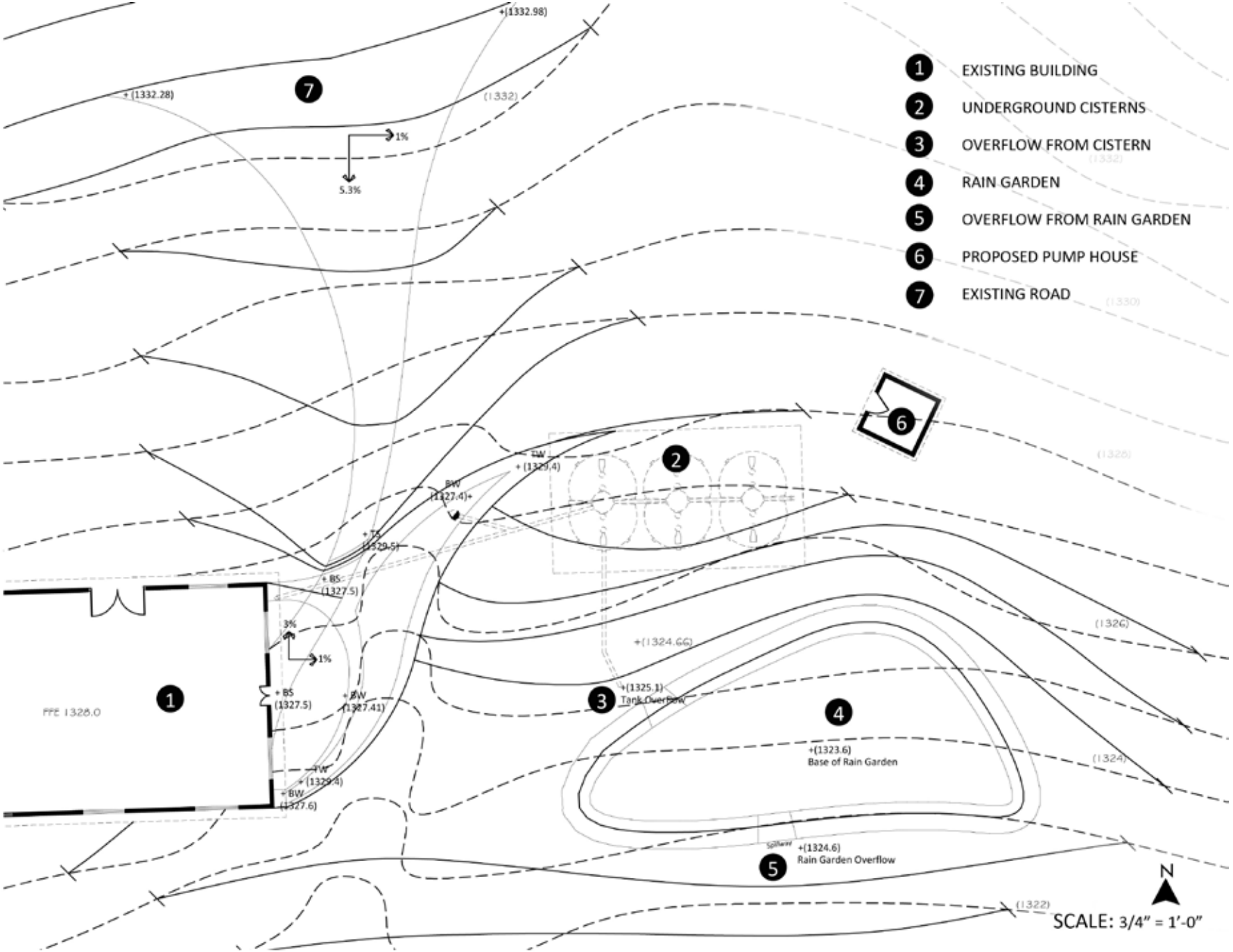
Hystrix patula	Bottlebrush Grass
Sorghastrum nutans	Indian Grass

Shrubs

Cornus amomum	Silky Dogwood
Hydrangea arborescens	Wild Hydrangea
Rhododendron maximum	Rosebay
Sambucus canadenis	Common Elderberry
Spiraea alba	Meadowsweet
Viburnum dentatum	Arrowwood Viburnum

Trees

Aesculus glabra	Horse Chestnut
Betula nigra	River Birch



GRADING PLAN

DRAINAGE AREA NO.1a/ROOF RUNOFF

Longest Hydraulic Route for 1a:
a= 17' over asphalt shingle (0.95 C Value) @30% slope = 0.5 mins
b= 97' thru gutter (0.95 C Value) @ 0.05% slope= 4.5 mins
c = 45' through gravel (0.6 C Value) @ 0.2% slope =6.25 mins
d= 60' through pipe (0.95 C Value) @ 0.5% slope = 1.5 mins
TC= a+b+c+d = 12.75 minutes --> longest hydraulic route

DRAINAGE AREA NO.1b/ GARDEN AREA RUNOFF

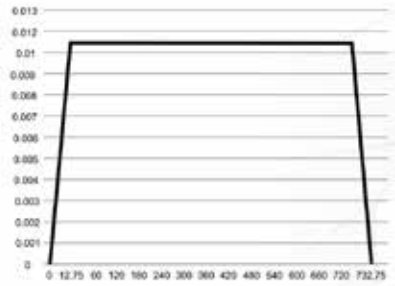
Longest Hydraulic Route for 1b: 140' over rolling pasture (0.36 C Value) @ 7.8% slope
TC= 11.5 minutes

NOTE : GUTTER CHANGE IN ELEVATION
Run x Slope = Rise
97' x 0.5% = 0.485' = 5.82"
Rise = 5.82" over length of roofline 97'

DRAINAGE AREA No.1b/GARDEN AREA RUNOFF

C = 0.36 coefficient for rolling pasture
CA =1.0
I = 0.167 in/hr per NOAA's
NWS precipitation frequency data for 2-yr storm of 12-hr duration
A = l*w = 8,700ft2/43,560 convert to acres = 0.2ac
q = CCAIA = 0.36*1.0*0.167*0.2 = 0.012 ft3/sec
0.012ft3/sec *60 = 0.72 ft3/min * 60 =43.2 ft3/hr*12=518ft3/12hrs
518 ft3/12hrs * 7.48 convert to gallons = 3,874.64

HYDROGRAPH



RUNOFF CALCULATIONS
using Modified Rational Method

Note: The PA-BMP manual recommends sizing to capture the first 2" of precipitationa 2-yr storm event over 12 hours accounts for 2.03" in the Pittsburgh, PA area.

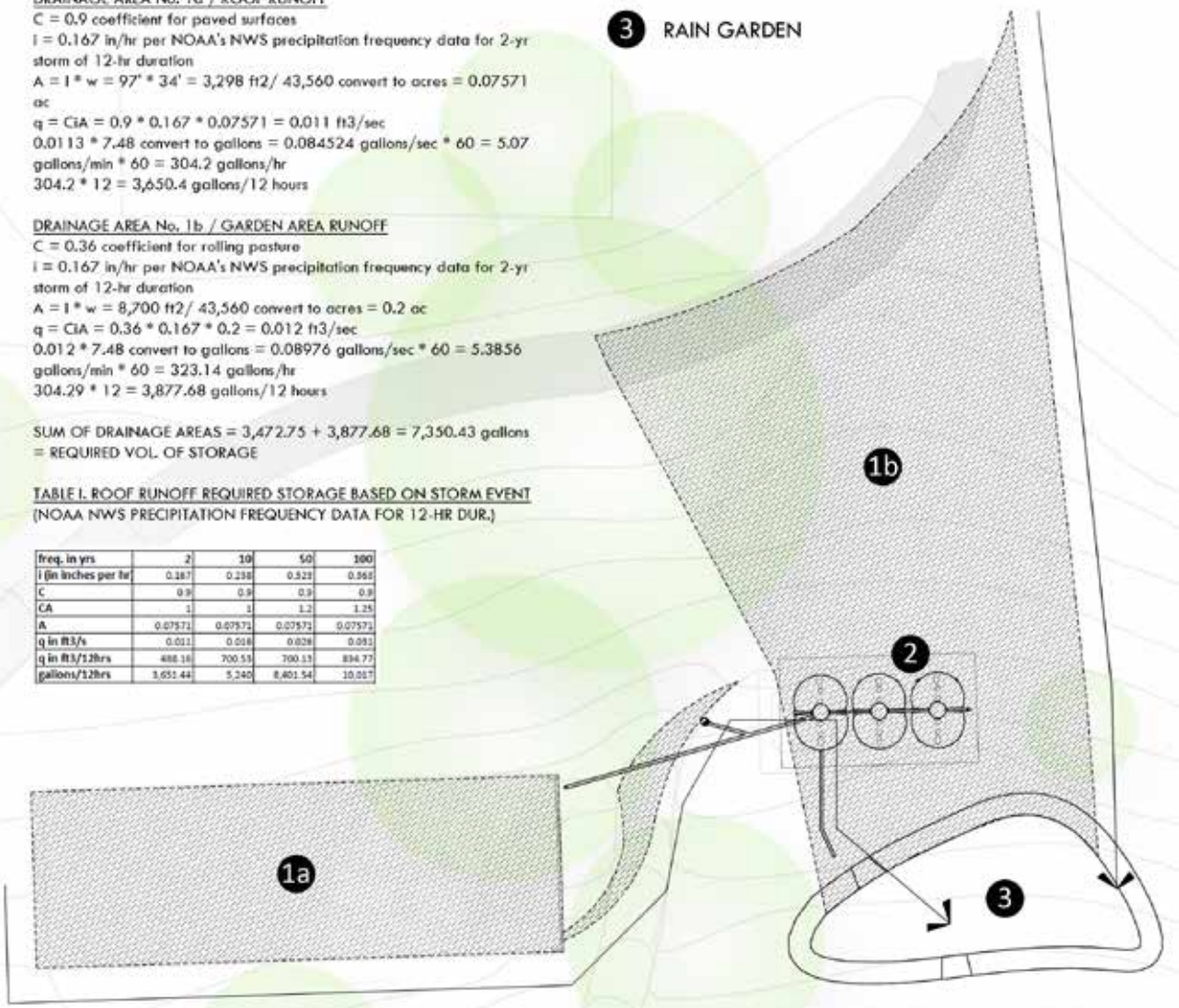
DRAINAGE AREA No. 1a / ROOF RUNOFF
C = 0.9 coefficient for paved surfaces
I = 0.167 in/hr per NOAA's NWS precipitation frequency data for 2-yr storm of 12-hr duration
A = l * w = 97' * 34' = 3,298 ft2/ 43,560 convert to acres = 0.07571 ac
q = CiA = 0.9 * 0.167 * 0.07571 = 0.011 ft3/sec
0.0113 * 7.48 convert to gallons = 0.084524 gallons/sec * 60 = 5.07 gallons/min * 60 = 304.2 gallons/hr
304.2 * 12 = 3,650.4 gallons/12 hours

DRAINAGE AREA No. 1b / GARDEN AREA RUNOFF
C = 0.36 coefficient for rolling pasture
I = 0.167 in/hr per NOAA's NWS precipitation frequency data for 2-yr storm of 12-hr duration
A = l * w = 8,700 ft2/ 43,560 convert to acres = 0.2 ac
q = CiA = 0.36 * 0.167 * 0.2 = 0.012 ft3/sec
0.012 * 7.48 convert to gallons = 0.08976 gallons/sec * 60 = 5.3856 gallons/min * 60 = 323.14 gallons/hr
304.29 * 12 = 3,877.68 gallons/12 hours

SUM OF DRAINAGE AREAS = 3,472.75 + 3,877.68 = 7,350.43 gallons = REQUIRED VOL. OF STORAGE

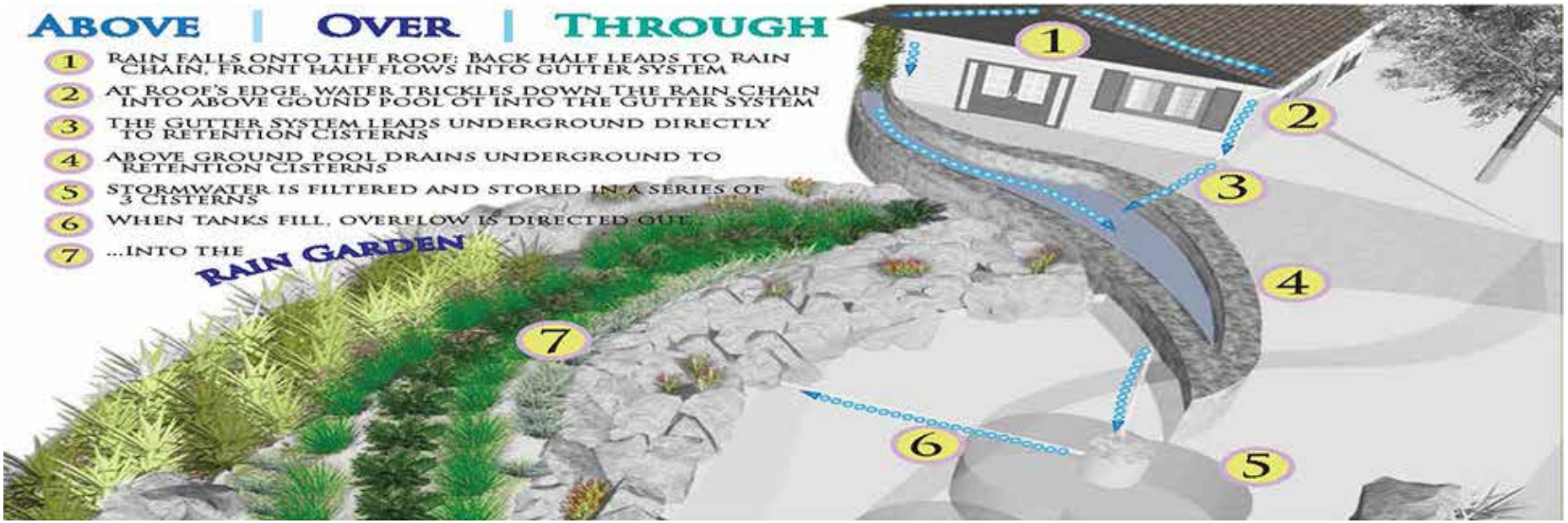
TABLE I. ROOF RUNOFF REQUIRED STORAGE BASED ON STORM EVENT
(NOAA NWS PRECIPITATION FREQUENCY DATA FOR 12-HR DUR.)

freq. in yrs	2	10	50	100
i (in inches per hr	0.167	0.238	0.329	0.369
C	0.9	0.9	0.9	0.9
CA	1	1	1.2	1.25
A	0.07571	0.07571	0.07571	0.07571
q in ft3/s	0.011	0.016	0.028	0.031
q in ft3/12hrs	488.16	700.53	700.13	834.77
gallons/12hrs	3,651.44	5,240	8,401.54	10,017



DRAINAGE AREA AND RUNOFF CALCULATIONS | Drainage area 1a impacts the cistern collection as well as the rain garden via any overflow; drainage area 1b impacts the rain garden directly

ILLUSTRATIVE PERSPECTIVE | Bird's eye view of site design looking south (proposed)


ABOVE | OVER | THROUGH
1 RAIN FALLS ONTO THE ROOF: BACK HALF LEADS TO RAIN CHAIN, FRONT HALF FLOWS INTO GUTTER SYSTEM
2 AT ROOF'S EDGE, WATER TRICKLES DOWN THE RAIN CHAIN INTO ABOVE GOUND POOL OT INTO THE GUTTER SYSTEM
3 THE GUTTER SYSTEM LEADS UNDERGROUND DIRECTLY TO RETENTION CISTERNS
4 ABOVE GROUND POOL DRAINS UNDERGROUND TO RETENTION CISTERNS
5 STORMWATER IS FILTERED AND STORED IN A SERIES OF 3 CISTERNS
6 WHEN TANKS FILL, OVERFLOW IS DIRECTED OUT
7 ...INTO THE RAIN GARDEN
1
2
3
4
5
6
7