

Lexington Heights Bluff Restoration Plan

September, 2011

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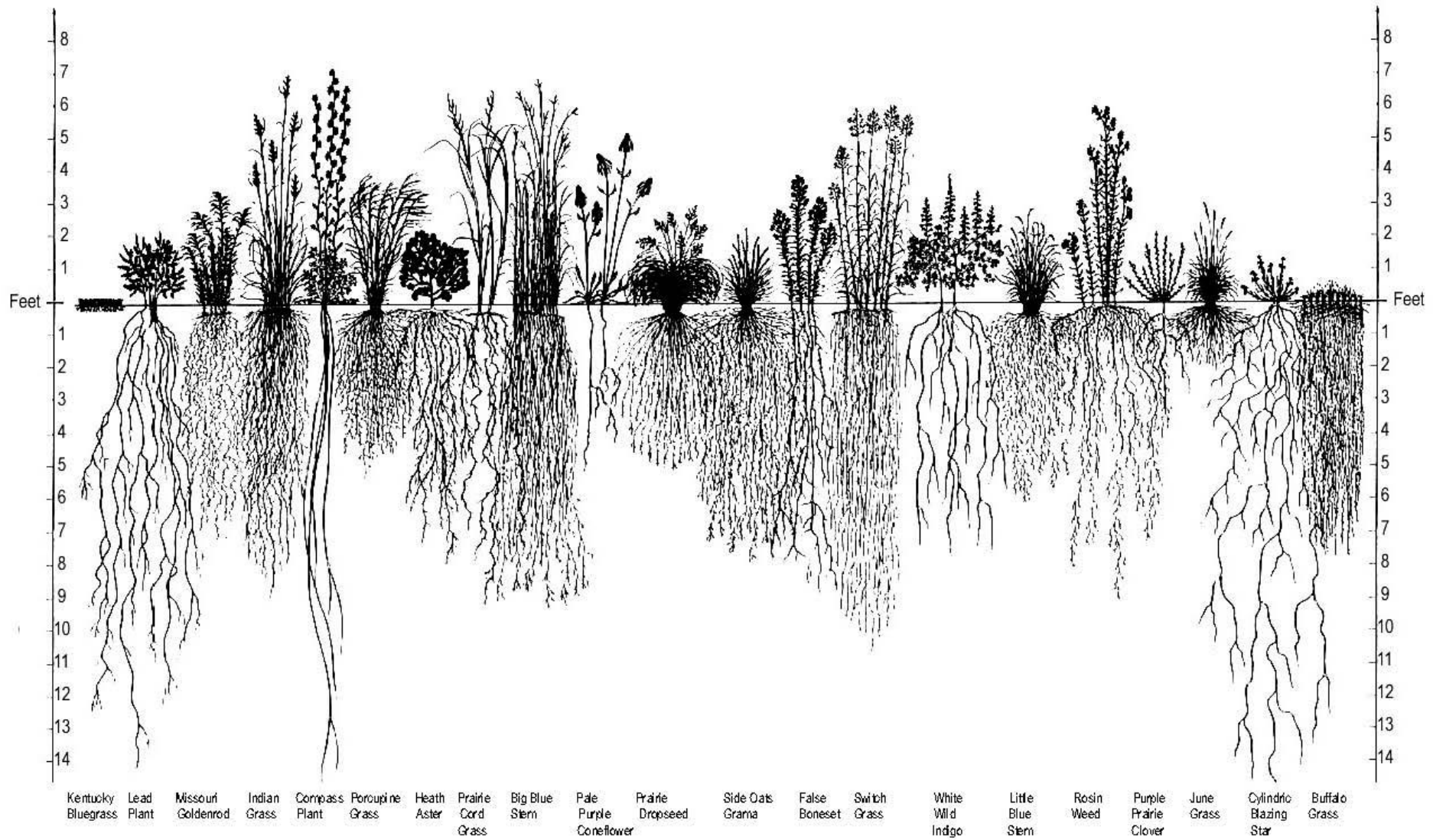














AREA REQUIRING EARTH FILL

AREA REQUIRING DILIGENT STEWARDSHIP

EXISTING TREES TO REMAIN

- BASSWOOD
- SERVICEBERRY
- BLACK CHERRY
- BIRCH

NEW NATIVE SHRUBS

- SNOWBERRY

NEW GRASSES AND FORBS
SEED MIXES SHOULD INCLUDE ALL OF THE NOTED PLANT TYPES WITH A HIGH CONTRACTION OF ONE KIND IN EACH MIXTURE. INTENT IS TO CREATE A PATTERN OF "DRIFTS" (AREAS WHERE ONE SPECIES IS DOMINANT – SEE NOTATIONS ON PLAN IDENTIFYING DRIFTS OF DOMINANT PLANT TYPES.)

GRASSES:

- CANADA WILD RYE
- SIDEOTS GRAMA
- COASTAL PANICGRASS
- SWITCHGRASS

PLAN SYMBOL

- CR
- SO
- CP
- SG

FORBS:

- CONEFLOWER
- BLUEBELLS
- NATIVE COLUMBINE
- STARRY FALSE SOLOMAN'S SEAL
- BLACK EYED SUSAN

PLAN SYMBOL

- BB

CRITICAL MAINTENCE TASKS IN STEWARDSHIP AREA

- REMOVE INVASIVE SPECIES (GRAPE VINE, HONEYSUCKE BUCKTHORN, AUTUMN OLIVE, ETC.)
- CUT AT BASE AND PAINT STEM W/ FULL STENGTH GLYPHOSATE CONTAINING HERBICIDE (ROUNDUP).
- FILL DEPRESSIONS WITH SANDY LOAM TOPSOIL AND SOW W/ NATIVE GRASS/FORB SEED MIX. COVER W/ EROSION CONTROL BLANKET.

LAKEVIEW ROAD

BOAT LAUNCH

SECTION

EX. STL. GROIN, TYP.

BEACH

EX. STAIRS

- NEW NATIVE SHRUBS**
- RED OSIER DOGWOOD
 - FRAGRANT SUMAC
 - SNOWBERRY

- NEW NATIVE SHADE TREE**
- BASSWOOD

- NEW NATIVE FLOWERING TREES**
- SERVICEBERRY
 - DUNE WILLOW

EXISTING TREES TO REMAIN

- POPLAR
- BIRCH
- WILLOW

LAKE HURON

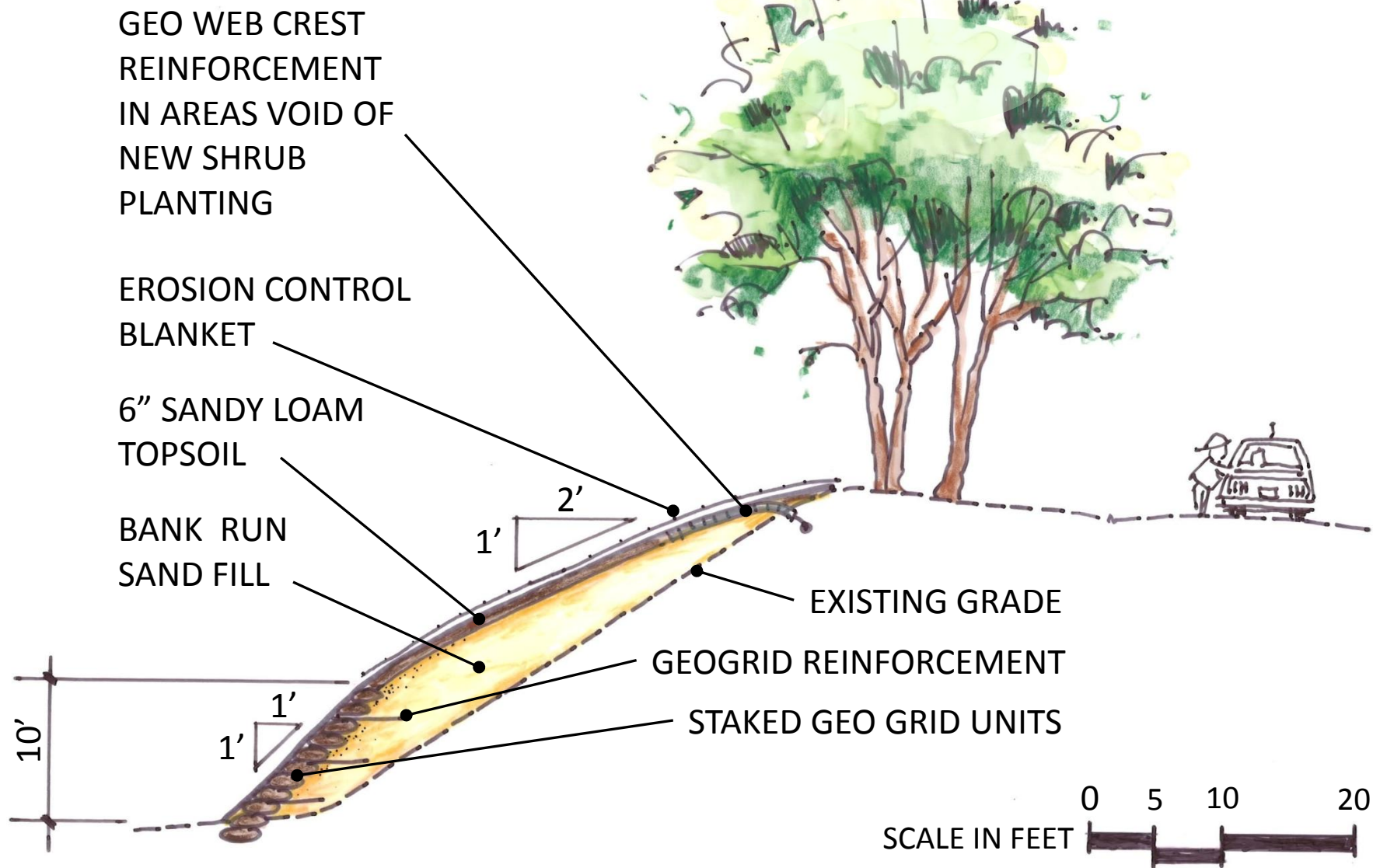
- REMOVE INVASIVE SPECIES BEFORE PLACING FILL (GRAPE VINE, HONEYSUCKE BUCKTHORN, AUTUMN OLIVE, ETC.)
- CUT AT BASE AND PAINT STEM W/ FULL STENGTH GLYPHOSATE CONTAINING HERBICIDE (ROUNDUP).

SCALE

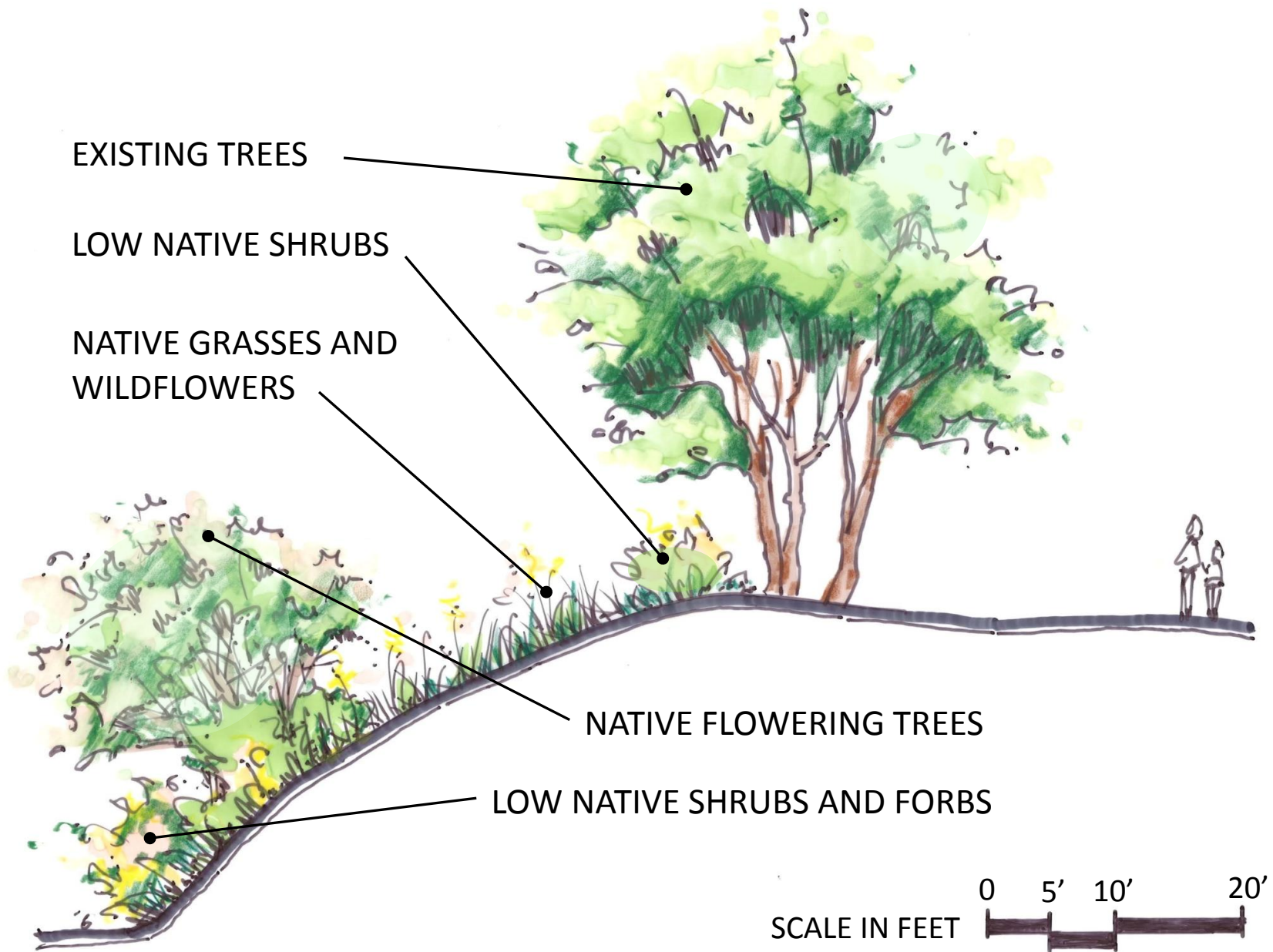
0 10' 20' 40'



RESTORATION CONCEPT PLAN



EARTH FILL SECTION



EXISTING TREES

LOW NATIVE SHRUBS

NATIVE GRASSES AND
WILDFLOWERS

NATIVE FLOWERING TREES

LOW NATIVE SHRUBS AND FORBS

SCALE IN FEET 0 5' 10' 20'

SLOPE PLANTING SECTION



Amelanchier arborea
Serviceberry



Tilia americana
Basswood



Cornus stolonifera
Red Osier Dogwood

Rhus aromatica
Fragrant Sumac



WOODY PLANT PALETTE

Symphoricarpos albus
Common Snowberry



Salix cordata
Dune Willow





Elymus canadensis
Canada Wild Rye Grass



Panicum amarum
Coastal Panicgrass

NATIVE GRASS PALETTE



Bouteloua curtipendula
Sideoats grama



Panicum virgatum
Switchgrass



Echinacea purpurea
Purple Coneflower



Smilacina stellata
Starry False Solomon's Seal



Campanula rotundifolia
Bluebell Bellflower



Rudbeckia hirta
Black Eyed Susan

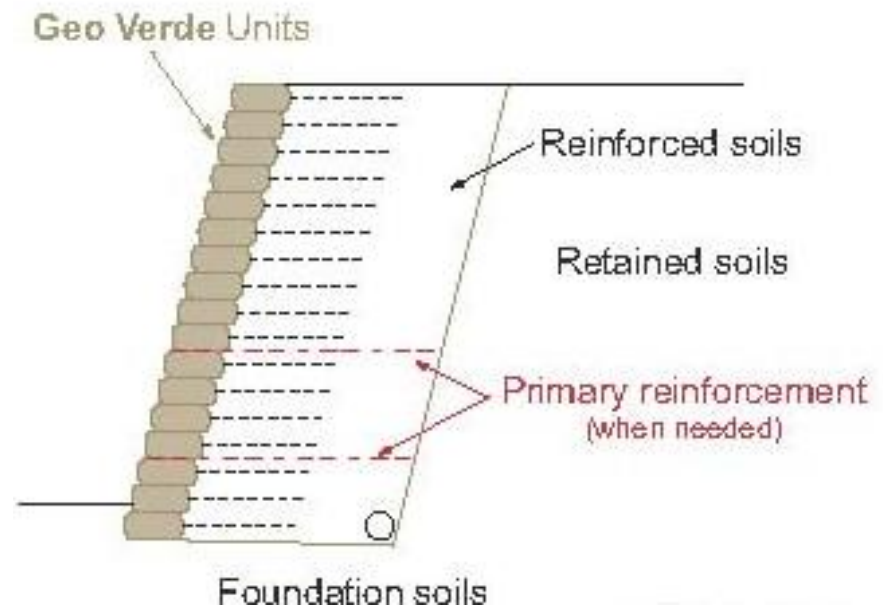
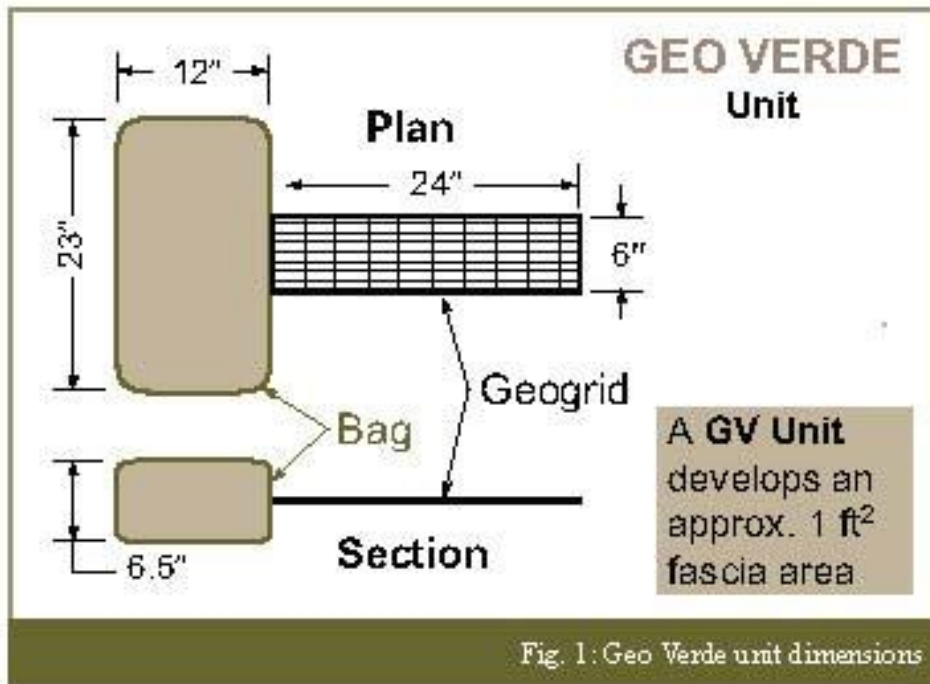
NATIVE FORB PALETTE

Aquilegia canadensis
Native Columbine



GEO VERDE UNITS

Geo Verde units use a geotextile bag to permanently confine select growth mediums, giving the mediums shape and support during installation, allowing rain or irrigation waters to penetrate into the medium and enabling excessive water to escape through the fascia without corresponding erosion. The geogrid extension locks the bag and medium



to the adjacent soil, ensuring fascia stability and long-term wall 'shape' maintenance. These extensions allow taller structures or greater overburdens without subsequent primary reinforcement - resulting in cost savings on many projects



GEO VERDE SLOPE W/ MATURE PLANTS

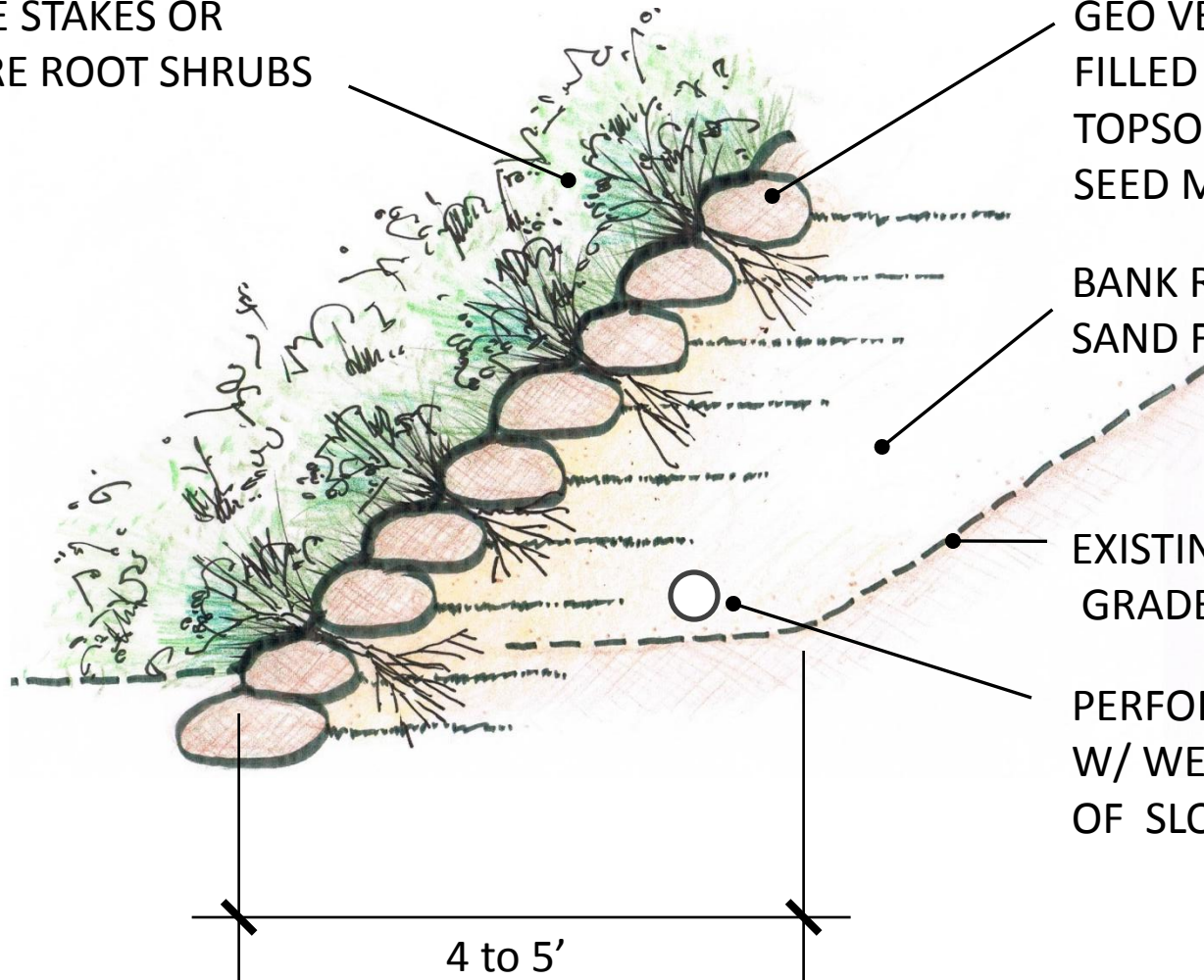
LIVE STAKES OR
BARE ROOT SHRUBS

GEO VERDE UNITS
FILLED W/ SANDY
TOPSOIL AND
SEED MIX

BANK RUN
SAND FILL

EXISTING
GRADE

PERFORATED DRAIN
W/ WEEPS TO FACE
OF SLOPE



SLOPE PLANTING DETAIL



PERFORMANCE SPECIFICATION

SC150BN



The North American Green SC150BN erosion control blanket is constructed of 100% biodegradable materials with a 70% agricultural straw and 30% coconut fiber blend matrix and has a functional longevity of approximately 18 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographic location, and elevation). The straw and coconut fibers shall be evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom with 100% biodegradable natural organic fiber netting woven into an approximate 0.50 inch x 1 inch (1.27 x 2.54 cm) mesh. The blanket shall be sewn together with biodegradable thread on 1.50 inch (3.81 cm) centers. The following list contains further physical properties of the SC150BN erosion control blanket.

<u>Property</u>	<u>Test Method</u>	<u>Typical</u>
Thickness	ASTM D5199/ECTC	0.29 in (7.47 mm)
Resiliency	ECTC Guidelines	86 %
Mass per Unit Area	ASTM D6475	9.66 oz./yd ² (328 g/m ²)
Water Absorption	ASTM D1117/ECTC	158 %
Swell	ECTC Guidelines	46 %
Stiffness/Flexibility	ASTM D1388/ECTC	0.42 oz-in (4,737 mg-cm)
Light Penetration	ECTC Guidelines	11.70 %
Smolder Resistance	ECTC Guidelines	Yes**
MD Tensile Strength	ASTM D5035	280.80 lbs/ft (4.10 kN/m)
MD Elongation	ASTM D5035	9.50%
TD Tensile Strength	ASTM D5035	205.20 lbs/ft (2.99 kN/m)
TD Elongation	ASTM D5035	13.20 %

**Material is smolder resistant according to specified test

MD - Machine direction

TD - Transverse direction

EROSION CONTROL BLANKET

Slope Design Data

Cover Factors (C)				Channel Roughness Coefficients	
Slope Gradient (S)		Flow Depth		Manning's 'n'	
Slope Length (L)	≤ 3:1	3:1 - 2:1	≥ 2:1	≤ 0.50 ft (0.15 m)	0.050
≤ 20 ft (6 m)	0.00009	0.029	0.063	0.50-2.00 ft	0.050-0.018
20 - 50	0.005	0.055	0.092	≥ 2.00 ft (0.60 m)	0.018
≥ 50 ft (15.2 m)	0.010	0.080	0.120	Max. Permissible Shear Stress 2.10 lbs/ft ² (100.0 Pa)	

Bench Scale Testing[†]

Unvegetated Channel	3.9 lbs/ft ²
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Approximate Max Flow Velocity
8.00 ft/s (2.44 m/s)

For most accurate design data consult ECMDSTM
Manning's 'n' expressed in English units

[†]Bench Scale Testing

Bench scale tests are index property tests. These tests are not indicative of field performance and therefore should not be used in design to establish performance levels for rolled erosion control products. Bench scale tests are performed according to methods developed by the Erosion Control Technology Council (ECTC).