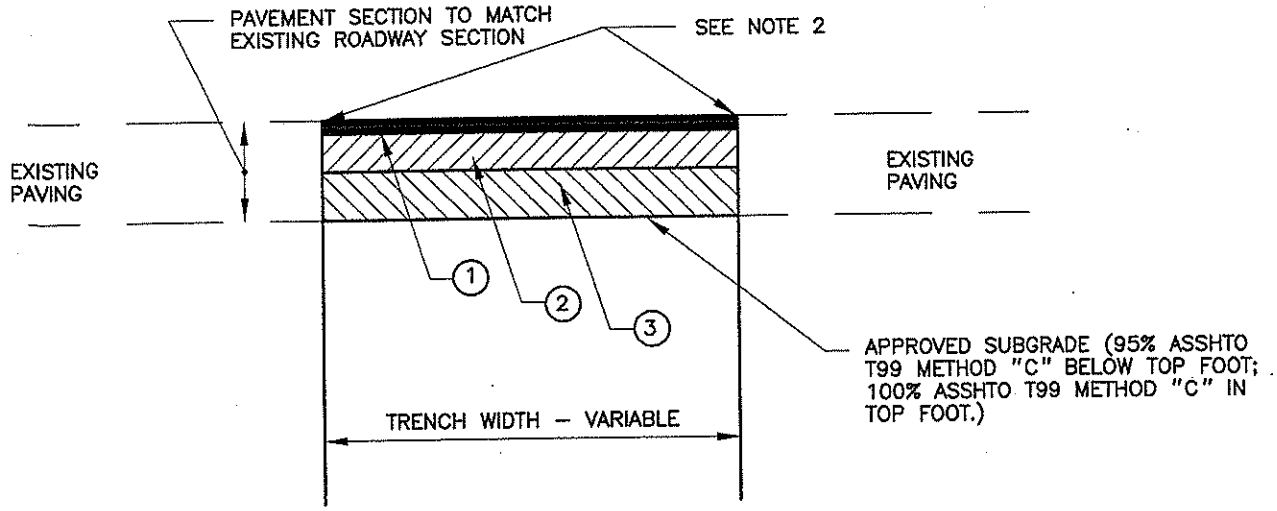
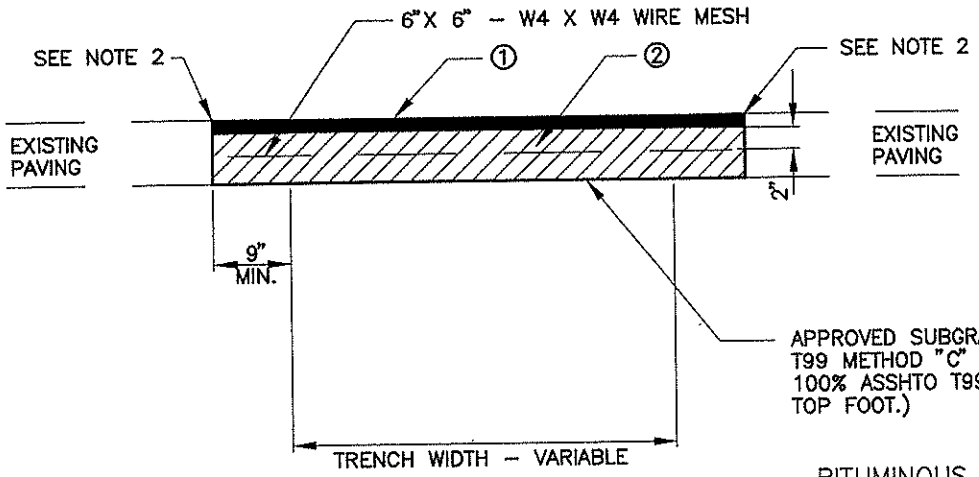


① TWO – 1 1/2" BITUMINOUS CONCRETE SURFACE COURSE

② BITUMINOUS CONCRETE BASE COURSE SEE NOTE 3.

③ SUBBASE MATERIAL SEE NOTE 3

ARTERIAL ROADWAY
(OR HIGHER CLASSIFICATION)



CONCRETE OPTION

① 1 1/2" BITUMINOUS CONCRETE SURFACE COURSE

② 6" MINIMUM CONCRETE PATCH

PRIMARY ROADWAY
(OR LOWER CLASSIFICATION)

BITUMINOUS OPTION

① 1 1/2" BITUMINOUS CONCRETE SURFACE COURSE

② BITUMINOUS CONCRETE BASE COURSE SEE NOTE 3

GENERAL NOTES

1. REFER TO M.C.D.O.T. UTILITY PATCH SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. EXISTING PAVEMENT MUST BE SAW CUT FULL DEPTH PRIOR TO EXCAVATION.
3. BASE COURSE AND SUBBASE MATERIAL SHALL CONFORM TO APPROPRIATE ROADWAY CLASSIFICATION DESIGN STANDARD OR MATCH EXISTING CONDITION, WHICHEVER IS GREATER.

APPROVED JAN 5/96
DATE

DIRECTOR, DEPT. OF TRANS.

CHIEF, DIV. OF ENG. SERVICES

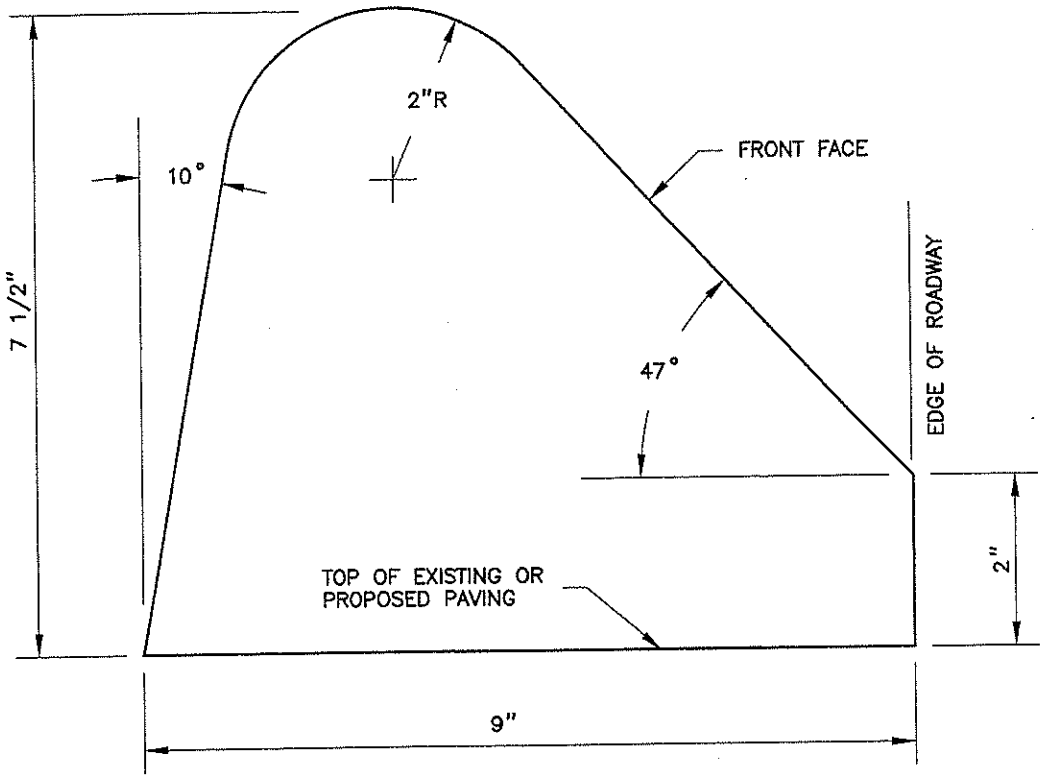
REVISED

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

UTILITY PATCH
IN FLEXIBLE PAVEMENT

STANDARD NO. MC-801.02

P:\DOTSTD\MC80102 6-24-94 111210 am EST



GENERAL NOTES

1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. CURB TO BE MARYLAND STATE HIGHWAY ADMINISTRATION TYPE SN OR BF BITUMINOUS CONCRETE.
3. THIS STANDARD IS INTENDED TO BE USED IN TEMPORARY SITUATIONS ONLY.
4. BACK OF CURB TO BE LOCATED 6 INCHES MINIMUM INSIDE EDGE OF PAVING.
5. APPLY TACK COAT WHEN PLACED ON EXISTING PAVEMENT.

APPROVED JAN 5/96
DATE

DIRECTOR, DEPT. OF TRANS.

CHIEF, DIV. OF ENG. SERVICES

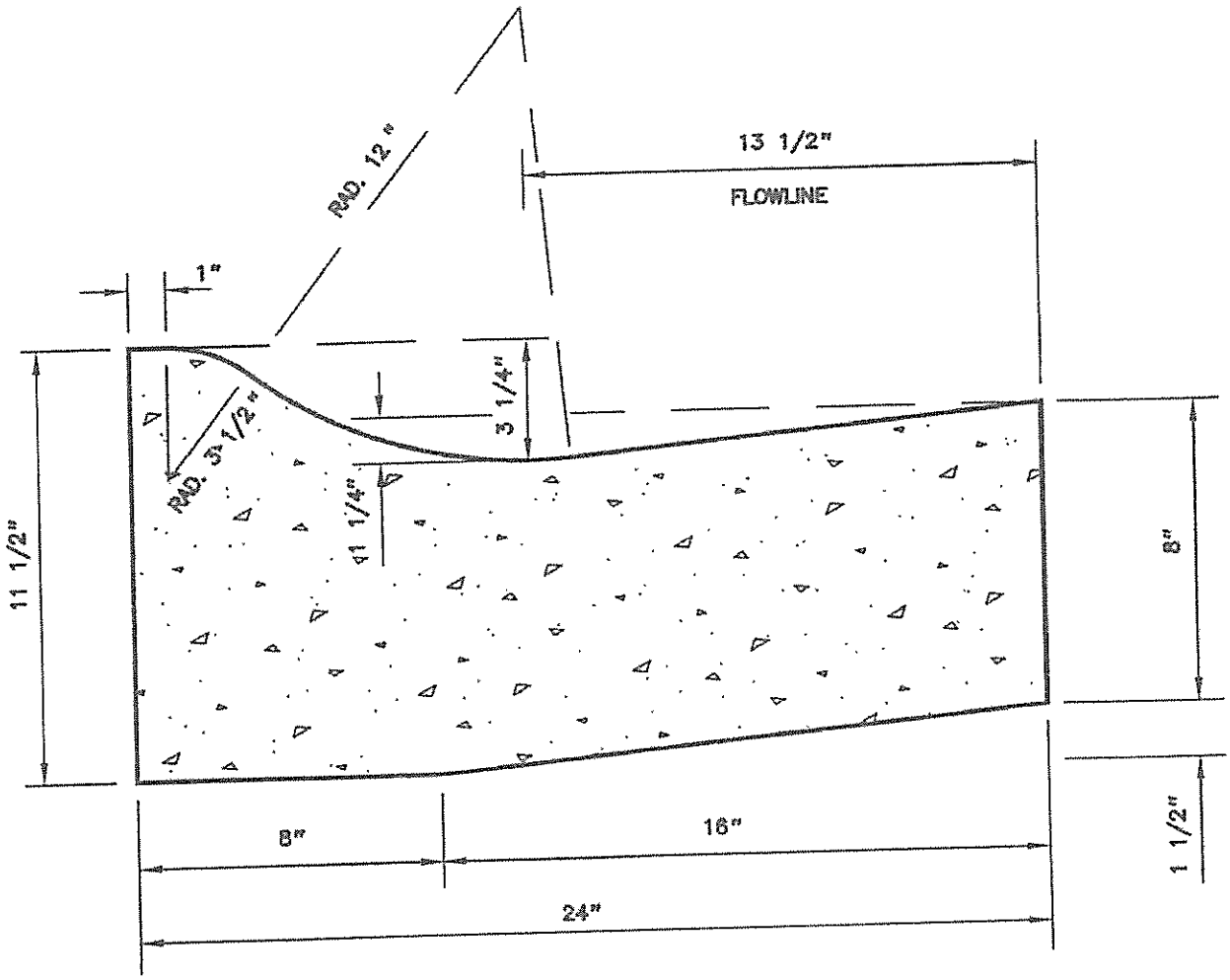
REVISED

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

BITUMINOUS CONCRETE CURB

STANDARD NO. MC-103.01

P:\DOTSTD\MC10301 6-24-94 6:44:54 am EST



GENERAL NOTES

1. REFER TO MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR MATERIALS, METHODS OF CONSTRUCTION, AND EXPANSION JOINT LOCATIONS.

2. MOUNTABLE CURB SHALL ONLY BE USED ON TERTIARY STREETS OR ON SECONDARY RESIDENTIAL CUL-DE-SACS 500 FEET OR LESS IN LENGTH, MEASURED FROM THE LAST INTERSECTING STREET.

3. WHENEVER STANDARD MC-100.01 IS USED IN CONJUNCTION WITH THIS STANDARD, A TEN FOOT TRANSITION SHALL BE PROVIDED FROM STANDARD MC-104.01 TO STANDARD MC-100.01 FOR CURB RETURNS AND CURB SECTIONS WHICH INCLUDE INLETS.

4. TRANSITION BETWEEN STANDARD MC-104.01 AND MC-100.01 OR MC-101.01 SHALL BE ACCOMPLISHED HOLDING THE FLOW LINE SLOPE CONSTANT.

5. THE STANDARD DISTANCE BETWEEN JOINTS SHALL BE TEN FEET (MAXIMUM AND MINIMUM DISTANCES SHALL BE THIRTEEN FEET AND FIVE FEET RESPECTIVELY).

6. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING TWO-COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT COMPLYING COMPLYING WITH ASTM-C920. (1)

APPROVED 14 APR 06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

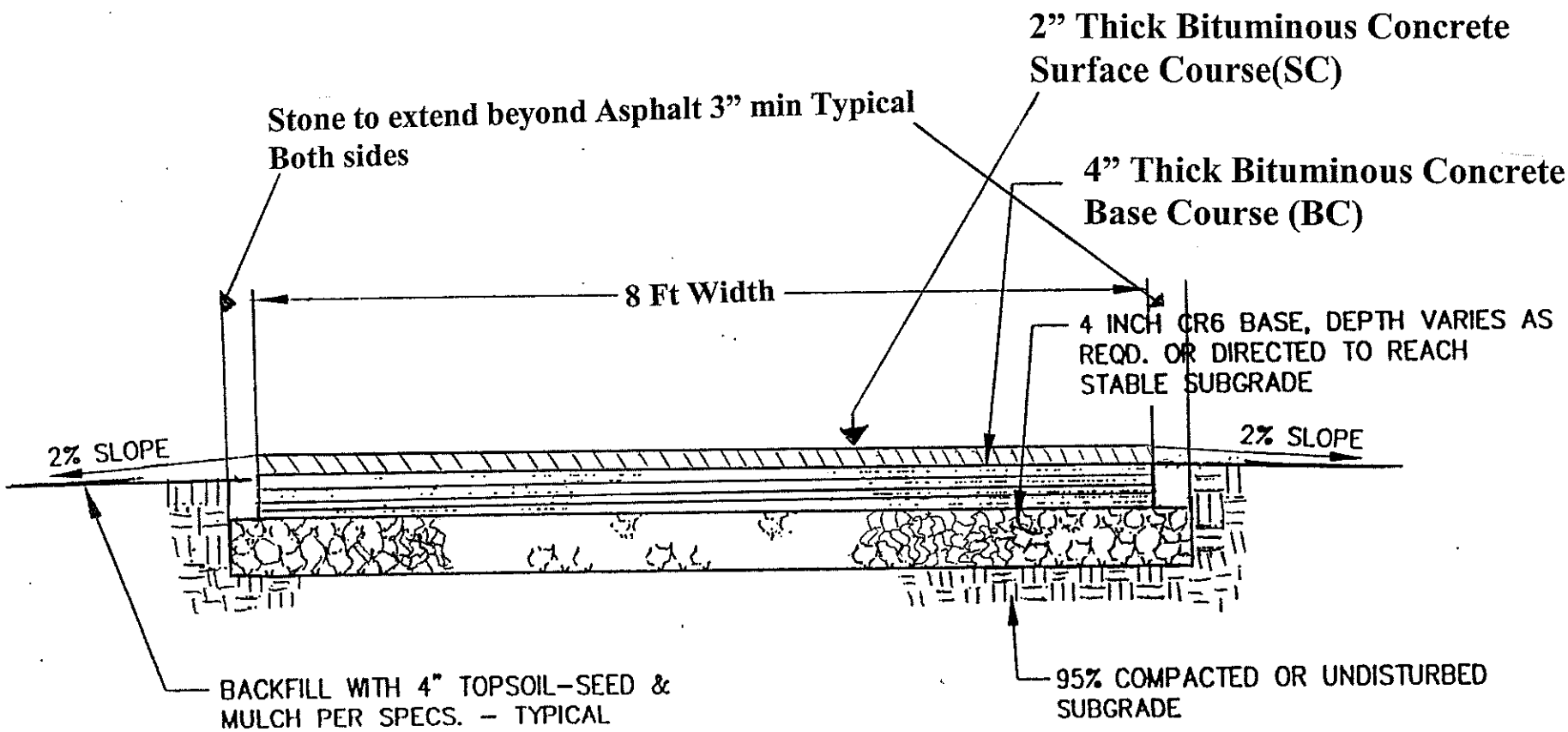
Holger Serrano
for CHIEF, DIV. OF CAP. DEV.

REVISED
(1) ASTM-C920 4/2005

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

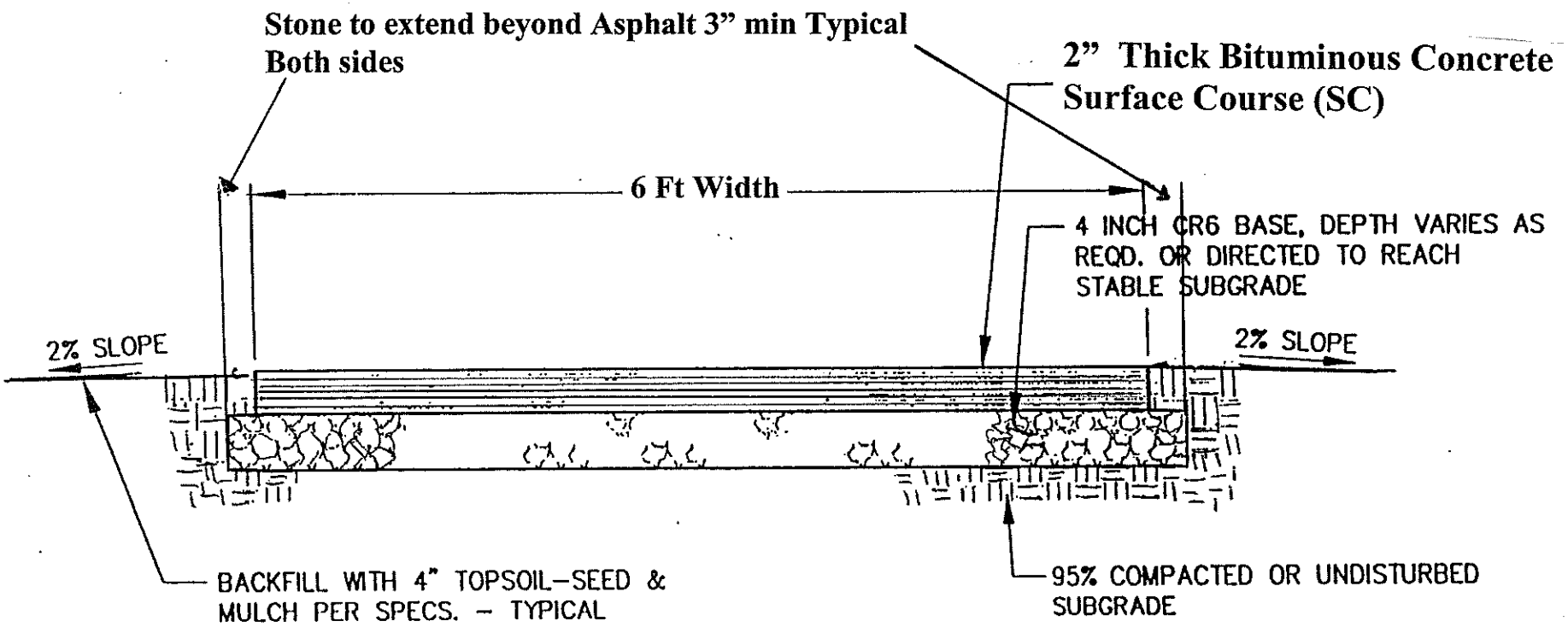
MOUNTABLE CONCRETE CURB AND GUTTER TYPE F

STANDARD NO. MC-104.01



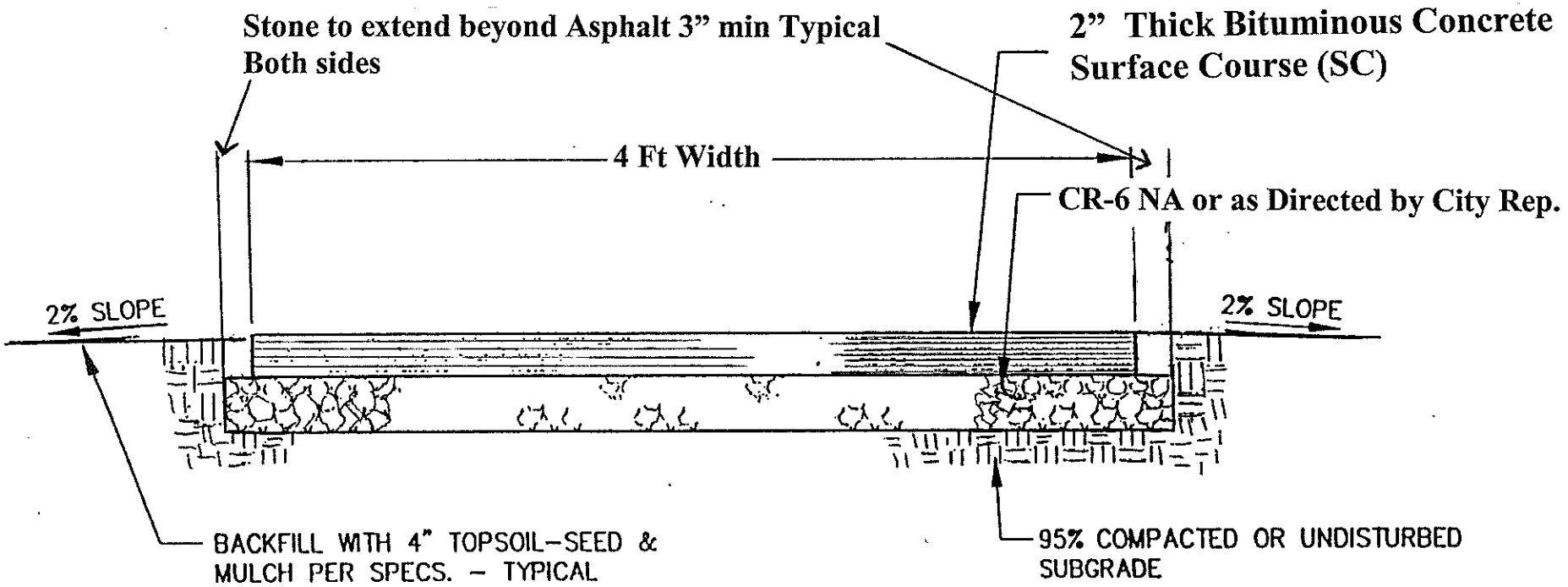
8 Biker Trail Detail

N.T.S.



6 Hiker Trail Detail

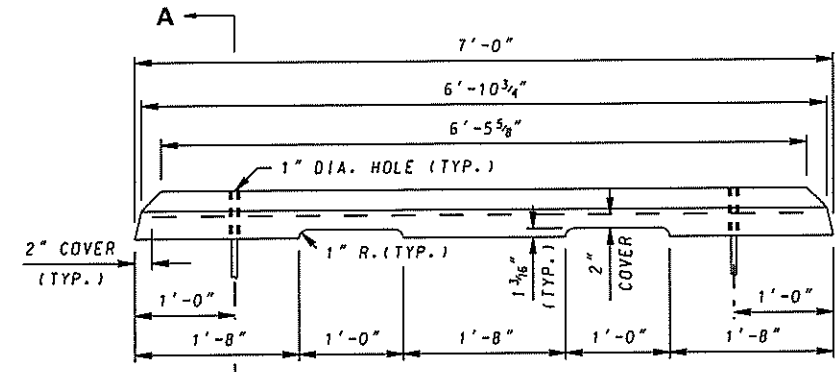
N.T.S.



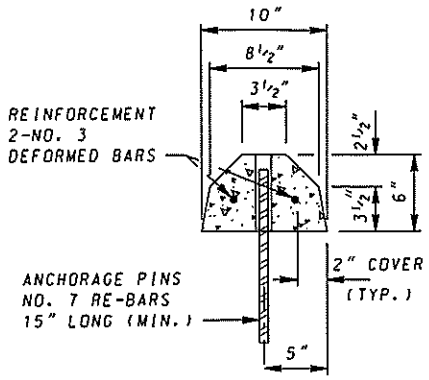
4'

Asphalt Sidewalk Path Detail

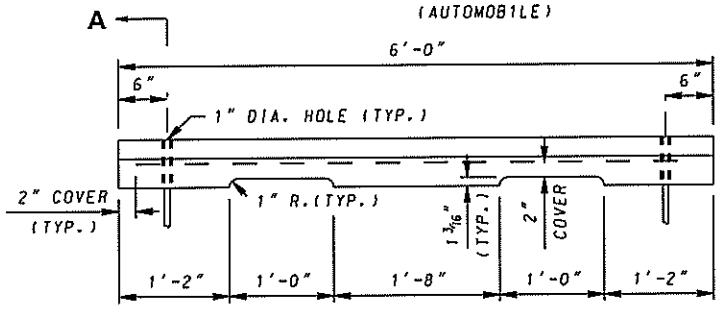
N.T.S.



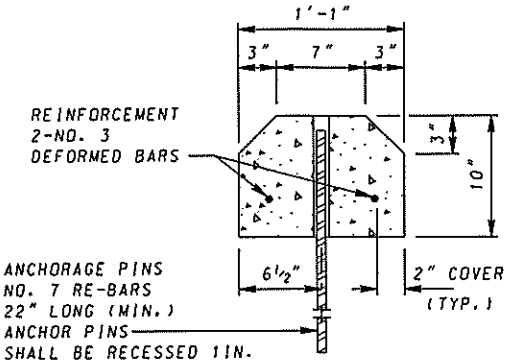
ELEVATION
TYPE I
(AUTOMOBILE)



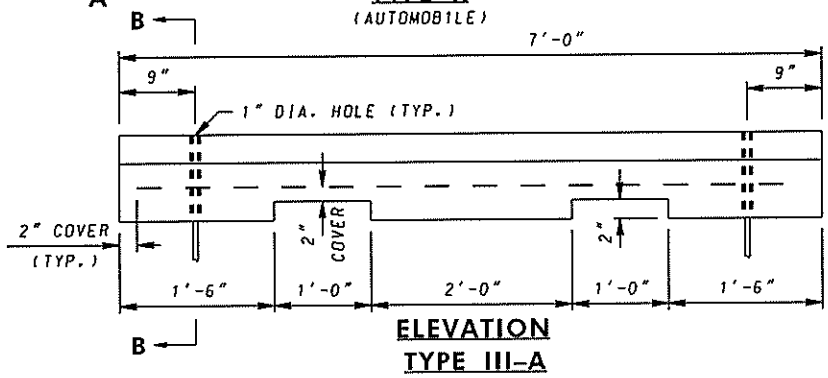
SECTION A-A
(TYPICAL-TYPE I & II)



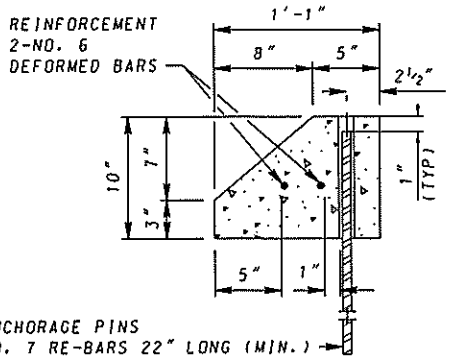
ELEVATION
TYPE II
(AUTOMOBILE)



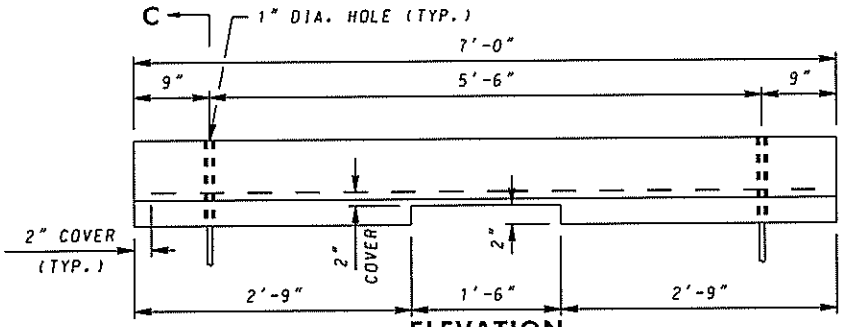
SECTION B-B



ELEVATION
TYPE III-A
(TRUCK)



SECTION C-C



ELEVATION
TYPE III-B
(TRUCK)

NOTE

1. PRECAST CONCRETE WHEEL STOPS SHALL BE LOCATED AS SHOWN ON THE PLANS, THEN SECURED IN PLACE WITH TWO (2) NO. 7 REINFORCEMENT BARS PER WHEEL STOP.
2. COST OF THE REINFORCEMENT BARS WILL BE INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER EACH FOR THE WHEEL STOPS.

SPECIFICATION	CATEGORY CODE ITEMS
608	

APPROVED Kirk G. McCallum
DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

APPROVAL • SHA REVISIONS		APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL	10-26-82	APPROVAL	5-17-83
REVISED	6-20-07	REVISED	8-1-84
REVISED		REVISED	
REVISED		REVISED	

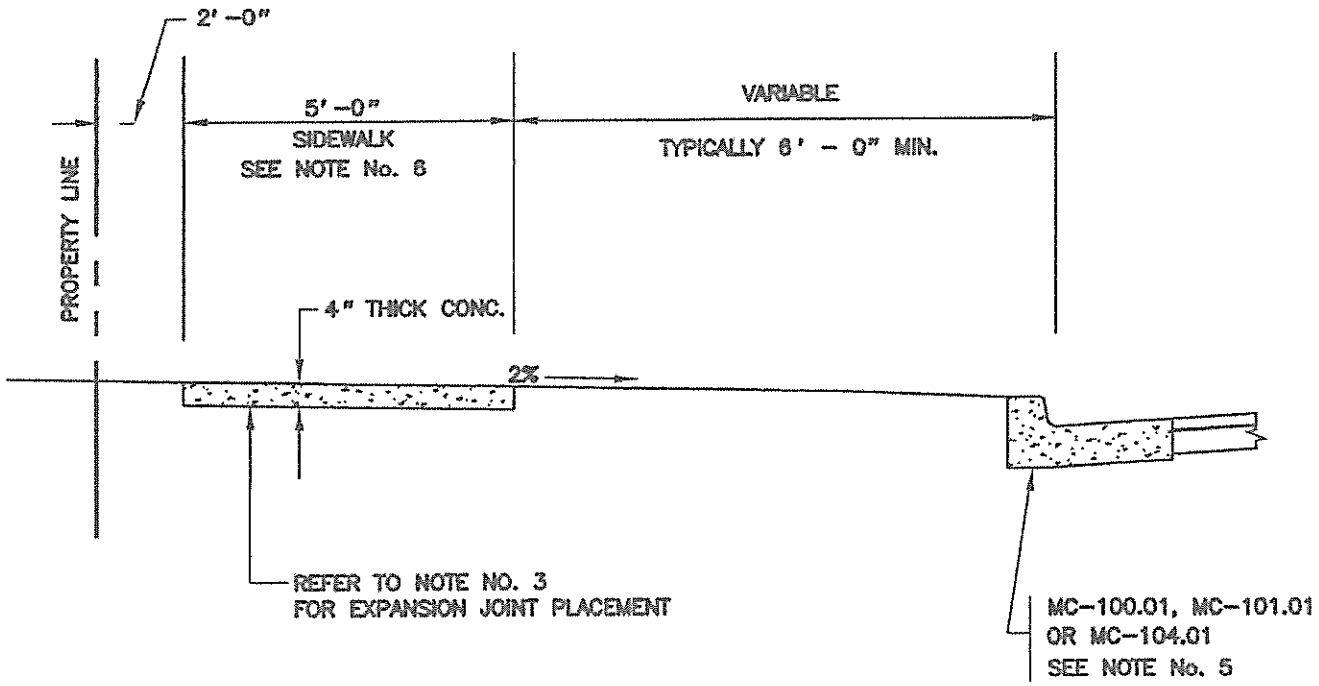
SHA State Highway Administration

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

PRECAST CONCRETE WHEEL STOPS

STANDARD NO. MD 634.04



GENERAL NOTES

1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. REFER TO THE APPLICABLE MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION DESIGN STANDARDS FOR DETAILS AT DRIVEWAYS.
3. EXPANSION JOINTS SHALL HAVE A MAXIMUM SPACING OF 100 FEET AND BE LOCATED AT POINTS OF CURVATURE. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING, TWO-COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT COMPLYING WITH ASTM-C920. (1)
4. SCORE THE CONCRETE TO A DEPTH OF 1/3 THE SLAB THICKNESS TO PROVIDE WEAKENED PLANE TRANSVERSE JOINTS AT 5'-0" INTERVALS.
5. REFER TO THE APPLICABLE ROAD STANDARD AND CURB AND GUTTER STANDARDS FOR OTHER OPTIONS.
6. SIDEWALK WIDTH SHALL BE 4'-0" FOR SECONDARY AND TERTIARY ROADWAYS.

APPROVED 14APR '06
DATE

DIRECTOR, DEPT. OF TRANS.

Holga Serrano
for CHIEF, DIV. OF CAP. DEV.

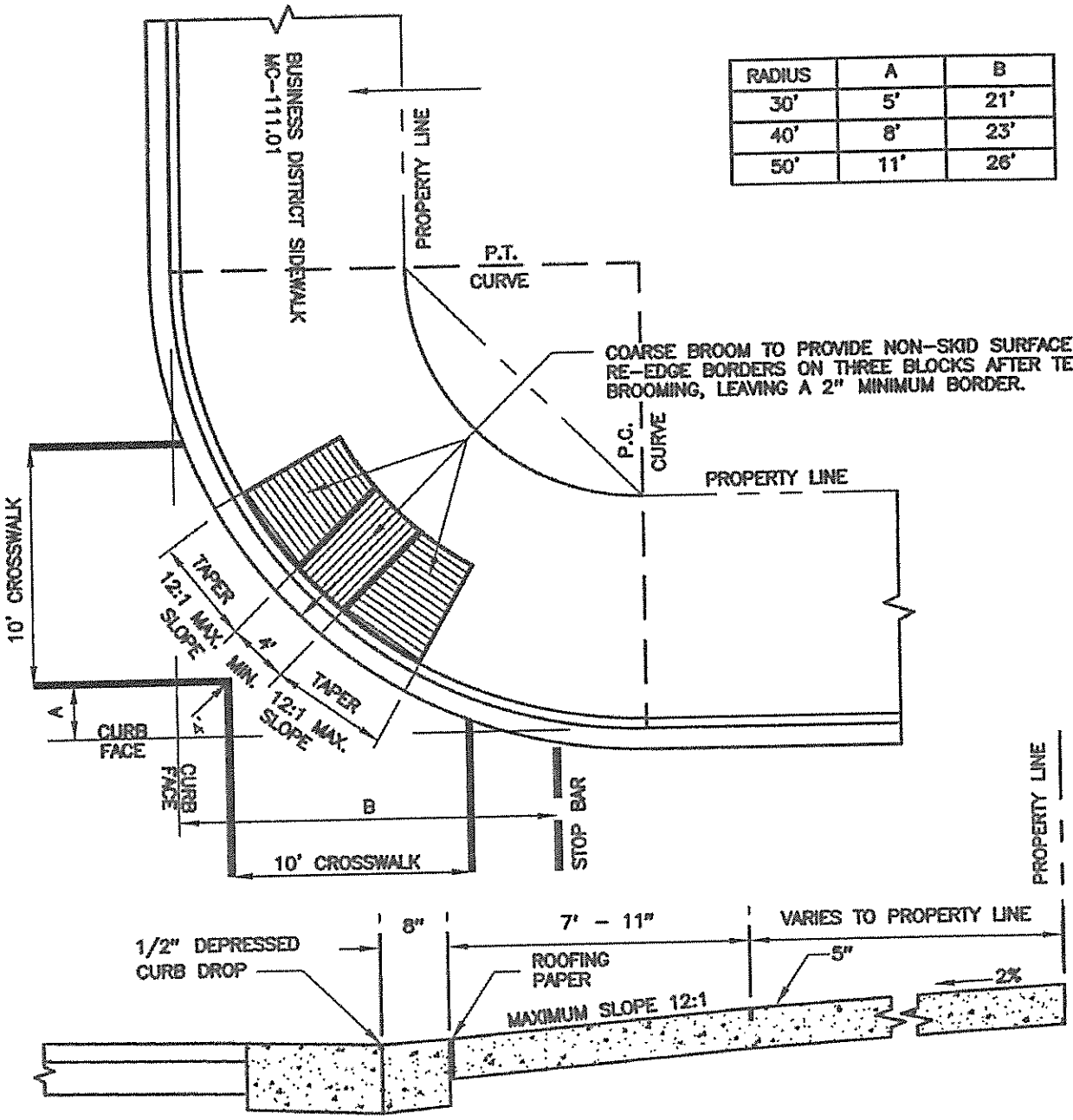
REVISED

(1) ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

RESIDENTIAL SIDEWALK CLOSED SECTION

STANDARD NO. MC-110.01



RADIUS	A	B
30'	5'	21'
40'	8'	23'
50'	11'	26'

GENERAL NOTES

1. THIS STANDARD TO BE USED WITH CURB RADIUS OF 30' OR GREATER.
2. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
3. SIDEWALK RAMPS SHOULD BE LOCATED AS INDICATED, HOWEVER, EXISTING SURFACE UTILITIES MAY AFFECT PLACEMENT.
4. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING, TWO COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT, COMPLYING WITH ASTM-C920. 1

APPROVED 14 APR '06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

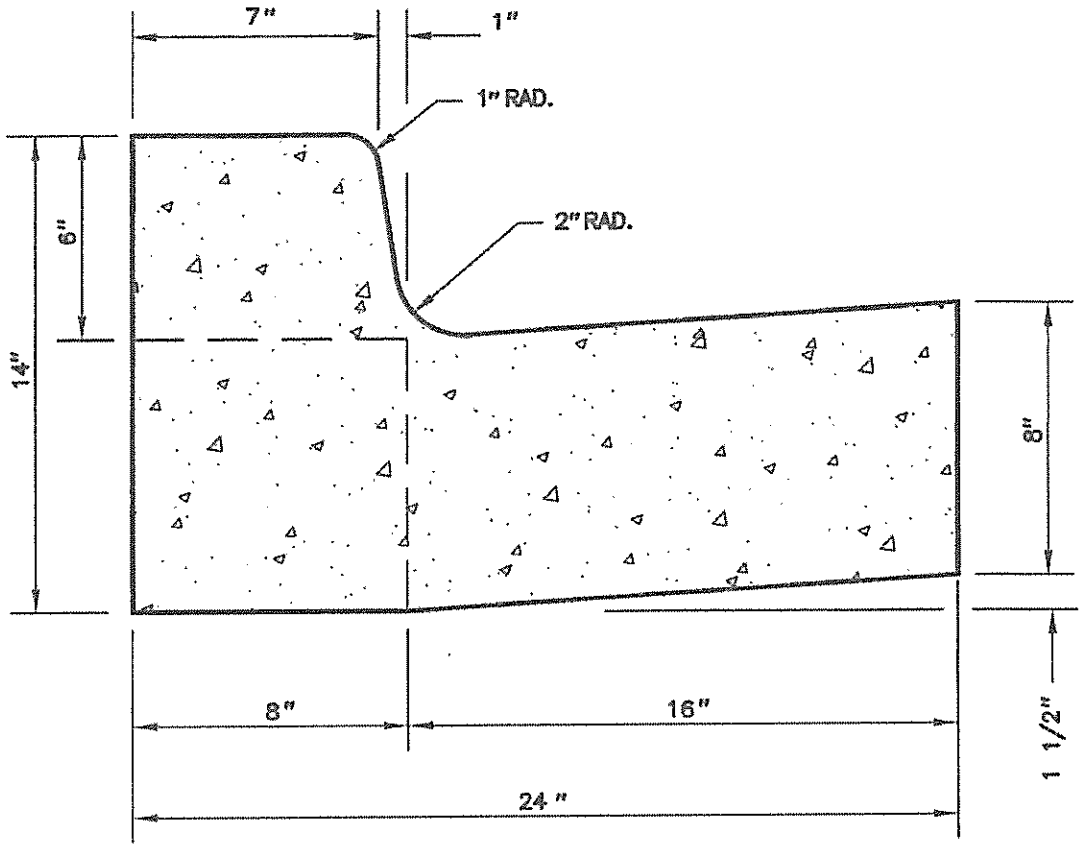
for CHIEF, DIV. OF CAP. DEV.

REVISED
1 ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

BUSINESS DISTRICT SIDEWALK SINGLE RAMP

STANDARD NO. MC-113.01



GENERAL NOTES

1. REFER TO MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR MATERIALS, METHODS OF CONSTRUCTION AND EXPANSION JOINT LOCATIONS.

2. THIS STANDARD SHALL BE USED ON PRIMARY RESIDENTIAL, ARTERIAL AND BUSINESS DISTRICT ROADS AS WELL AS CURB RETURNS AND INLET THROATS.

3. WHENEVER STANDARD MC-101.01 CURB IS USED IN CONJUNCTION WITH THIS STANDARD, A TEN FOOT TRANSITION SHALL BE PROVIDED FROM STANDARD MC-100.01 TO STANDARD MC-101.01 FOR CURB RETURNS AND CURB SECTIONS WHICH INCLUDE INLETS.

4. THE STANDARD DISTANCE BETWEEN JOINTS SHALL BE TEN FEET (MAXIMUM AND MINIMUM DISTANCES SHALL BE THIRTEEN FEET AND FIVE FEET RESPECTIVELY).

5. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING TWO-COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT COMPLYING WITH ASTM-C920. /1\

APPROVED 14 APR '06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

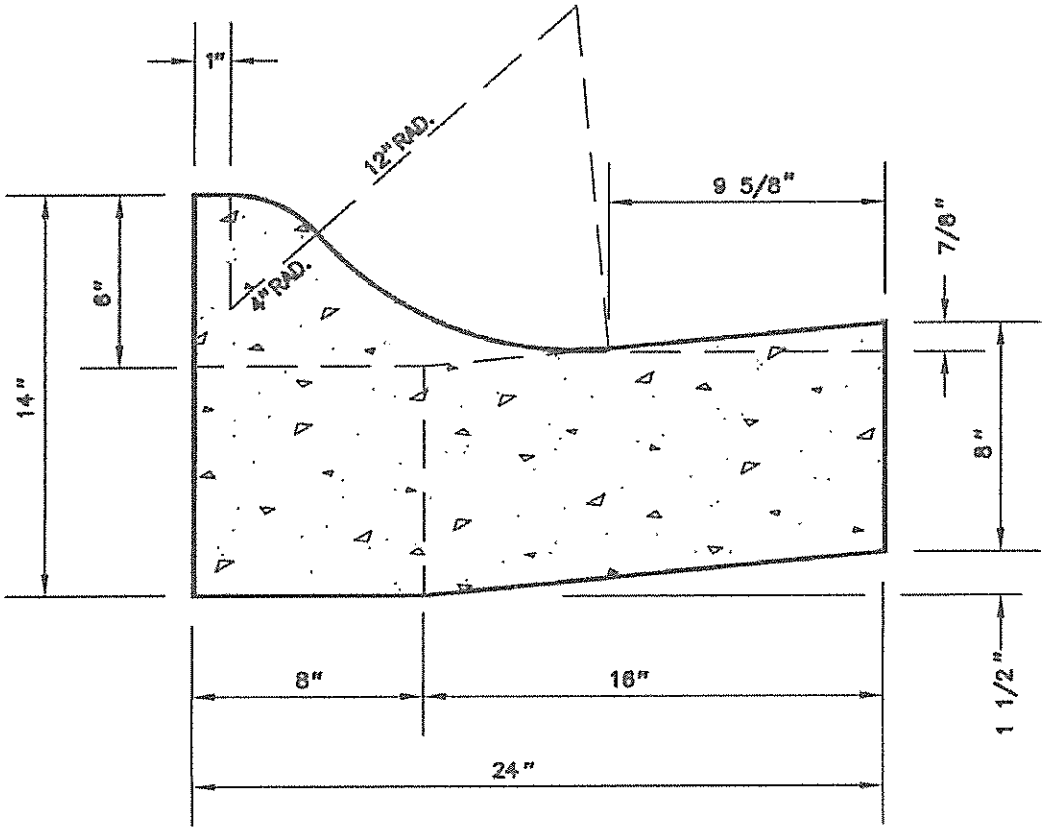
for CHIEF, DIV. OF CAP. DEV.

REVISED
/1\ ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

COMBINATION CONCRETE CURB AND GUTTER TYPE A

STANDARD NO. MC-100.01



GENERAL NOTES

1. REFER TO MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR MATERIALS, METHODS OF CONSTRUCTION AND EXPANSION JOINT LOCATIONS.
2. THIS STANDARD SHALL BE USED ON PRIMARY, SECONDARY AND TERTIARY RESIDENTIAL ROADS EXCEPT AT CURB RETURNS AND INLET THROATS.
3. WHENEVER STANDARD MC-100.01 CURB IS USED IN CONJUNCTION WITH THIS STANDARD, A TEN FOOT TRANSITION SHALL BE PROVIDED FROM STANDARD MC-101.01 TO STANDARD MC-100.01 FOR CURB RETURNS AND CURB SECTIONS WHICH INCLUDE INLETS.
4. THE STANDARD DISTANCE BETWEEN JOINTS SHALL BE TEN FEET (MAXIMUM AND MINIMUM DISTANCES SHALL BE THIRTEEN FEET AND FIVE FEET RESPECTIVELY).
5. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING TWO-COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT COMPLYING WITH ASTM-C920. △1

APPROVED 14 APR '06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

Holger Serrano
for CHIEF, DIV. OF CAP. DEV.

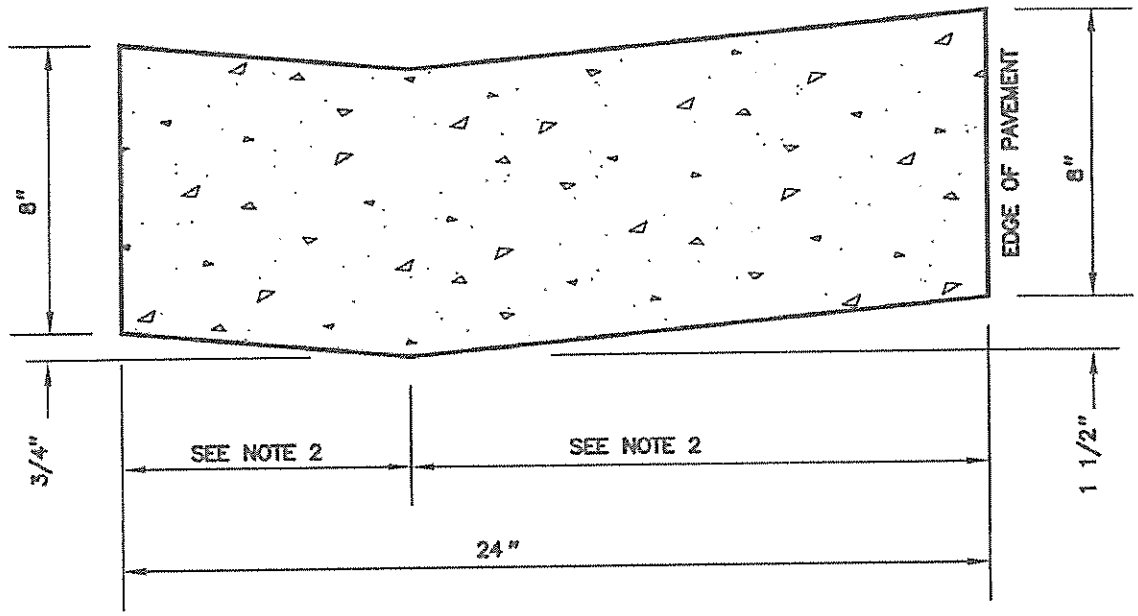
REVISED

△1 ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

COMBINATION CONCRETE CURB AND GUTTER TYPE C

STANDARD NO. MC-101.01



GENERAL NOTES

1. REFER TO MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR MATERIALS, METHODS OF CONSTRUCTION AND EXPANSION JOINT LOCATIONS.
2. THE DISTANCES FROM THE FLOWLINE TO THE FRONT AND BACK EDGE OF CURB SHALL BE ADJUSTED TO MATCH EXISTING CONDITIONS.
3. THE STANDARD DISTANCE BETWEEN JOINTS SHALL BE TEN FEET (MAXIMUM AND MINIMUM DISTANCES SHALL BE THIRTEEN FEET AND FIVE FEET RESPECTIVELY).
4. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING TWO-COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT COMPLYING WITH ASTM-C920. (1)

APPROVED 14 APR '06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

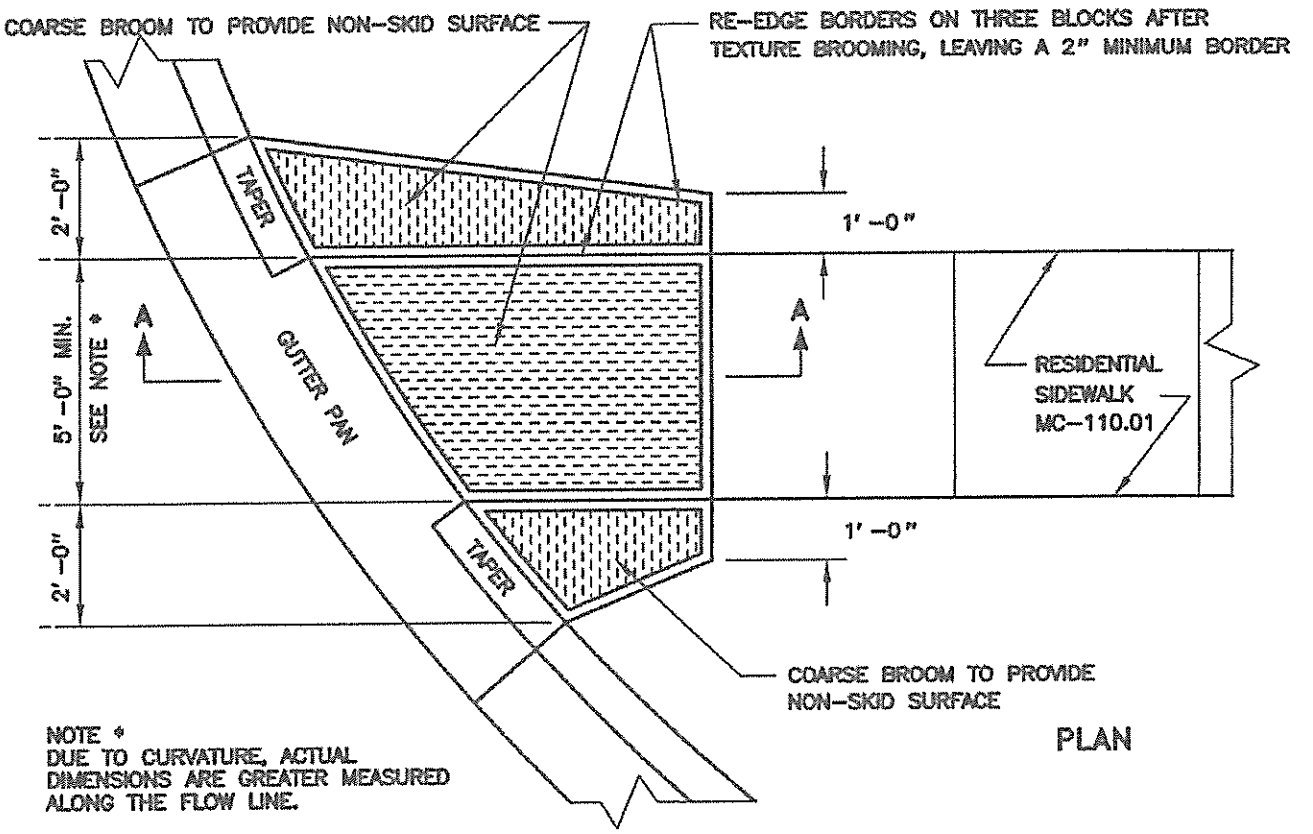
for CHIEF, DIV. OF CAP. DEV.

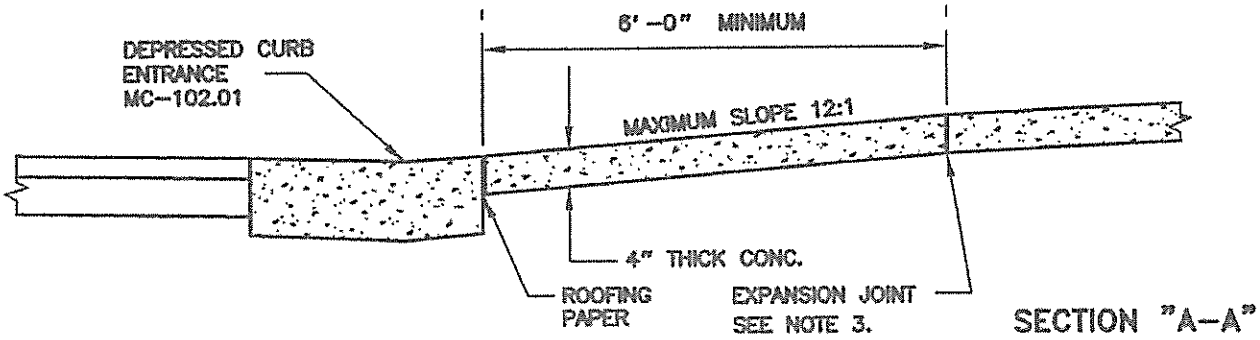
REVISED
(1) ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

DEPRESSED CURB ENTRANCE

STANDARD NO. MC-102.01





GENERAL NOTES

1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIAL AND METHODS OF CONSTRUCTION.
2. SIDEWALK RAMPS SHOULD BE LOCATED AS INDICATED. HOWEVER, EXISTING SURFACE UTILITIES AND EXISTING OR PROPOSED GEOMETRICS MAY AFFECT PLACEMENT.
3. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING, TWO COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT, COMPLYING WITH ASTM-C920. (1)

APPROVED 14 APR 06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

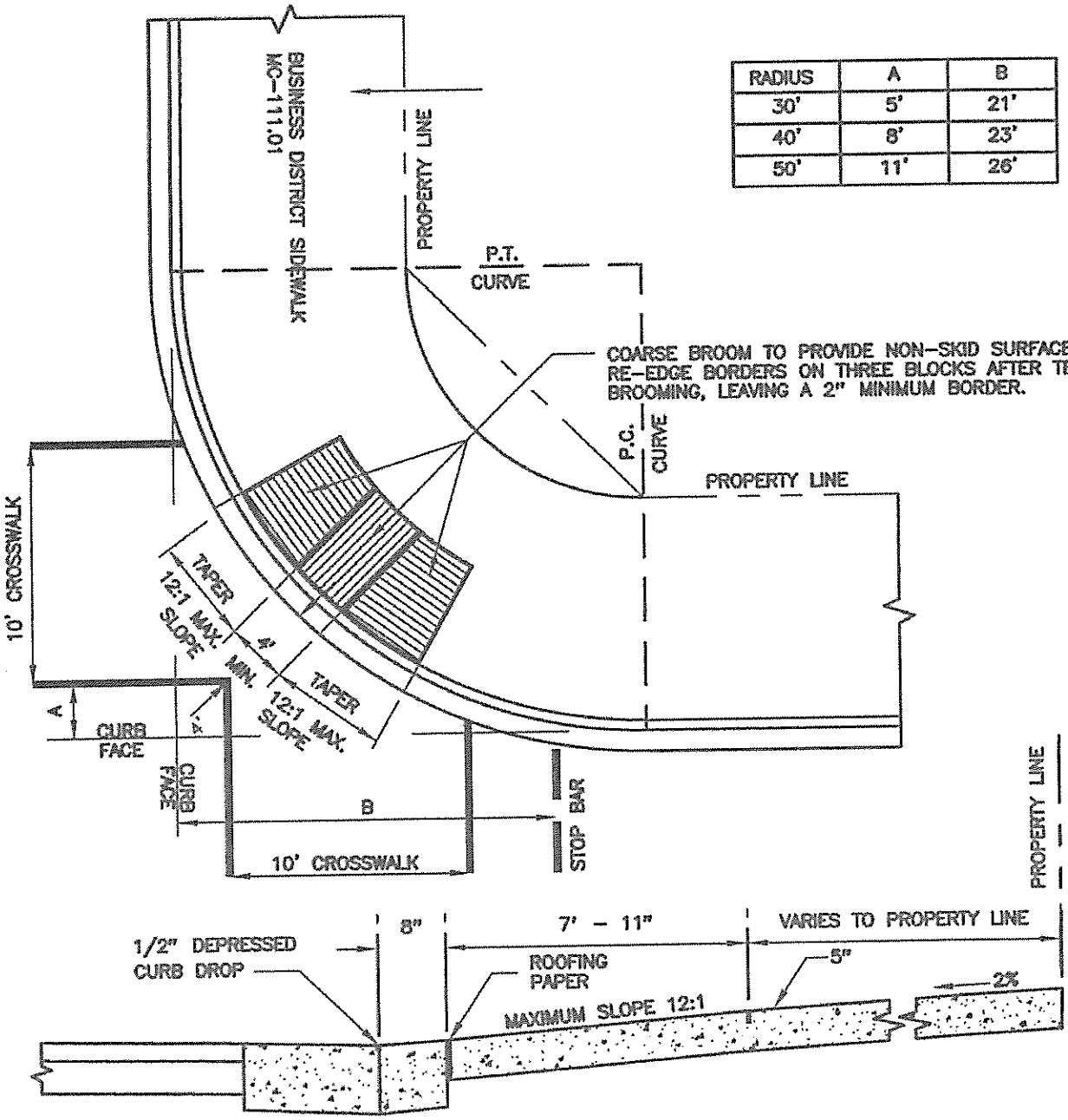
for CHIEF, DIV. OF CAP. DEV.

REVISED
(1) ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

RESIDENTIAL SIDEWALK RAMP

STANDARD NO. MC-112.01



RADIUS	A	B
30'	5'	21'
40'	8'	23'
50'	11'	26'

GENERAL NOTES

1. THIS STANDARD TO BE USED WITH CURB RADIUS OF 30' OR GREATER.
2. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
3. SIDEWALK RAMPS SHOULD BE LOCATED AS INDICATED, HOWEVER, EXISTING SURFACE UTILITIES MAY AFFECT PLACEMENT.
4. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING, TWO COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT, COMPLYING WITH ASTM-C920. △1

APPROVED 14 APR '06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

for CHIEF, DIV. OF CAP. DEV.

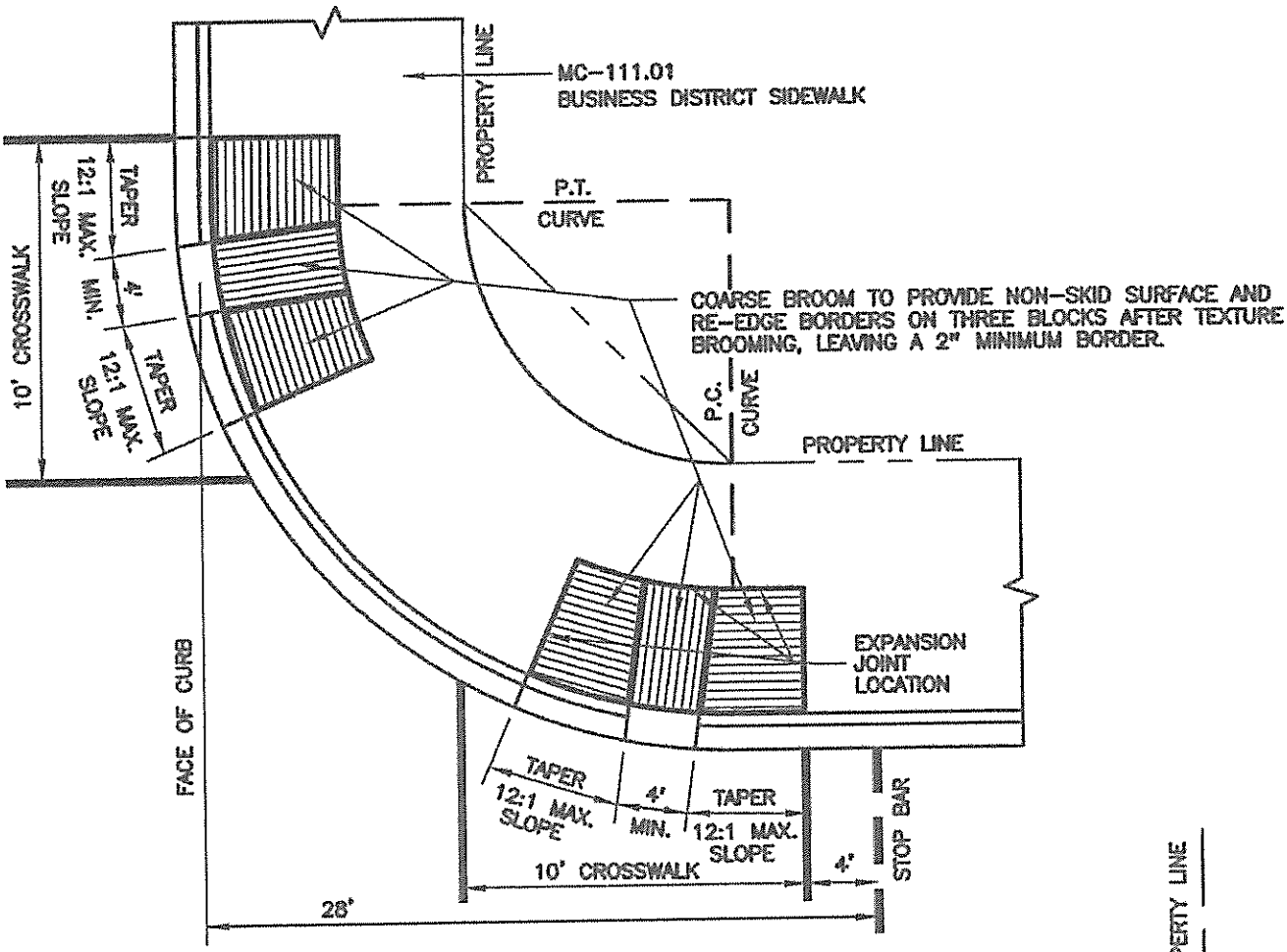
REVISED

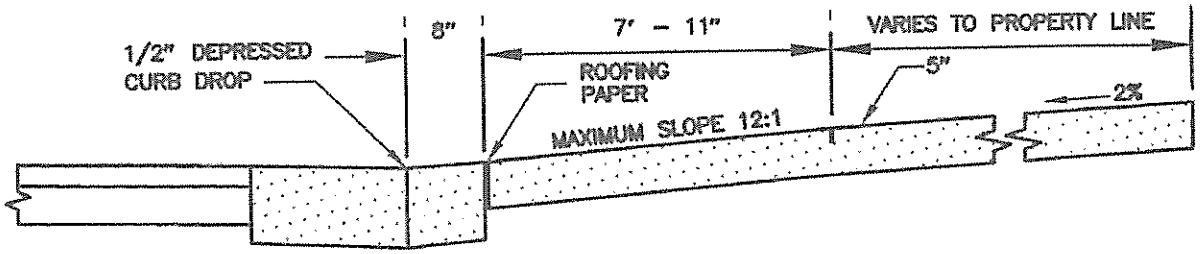
△1 ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

BUSINESS DISTRICT SIDEWALK SINGLE RAMP

STANDARD NO. MC-113.01





GENERAL NOTES

1. THIS STANDARD TO BE USED WITH CURB RADIUS LESS THAN 30'.
2. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIAL AND METHODS OF CONSTRUCTION.
3. SIDEWALK RAMPS SHOULD BE LOCATED AS INDICATED, HOWEVER, EXISTING SURFACE UTILITIES MAY AFFECT PLACEMENT.
4. EXPANSION JOINT MATERIAL SHALL BE 1/2 INCH PREFORMED CORK, TRIMMED AND SEALED WITH NON-STAINING, TWO COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT, COMPLYING WITH ASTM-C920. (1)

APPROVED 14 APR '06
DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION

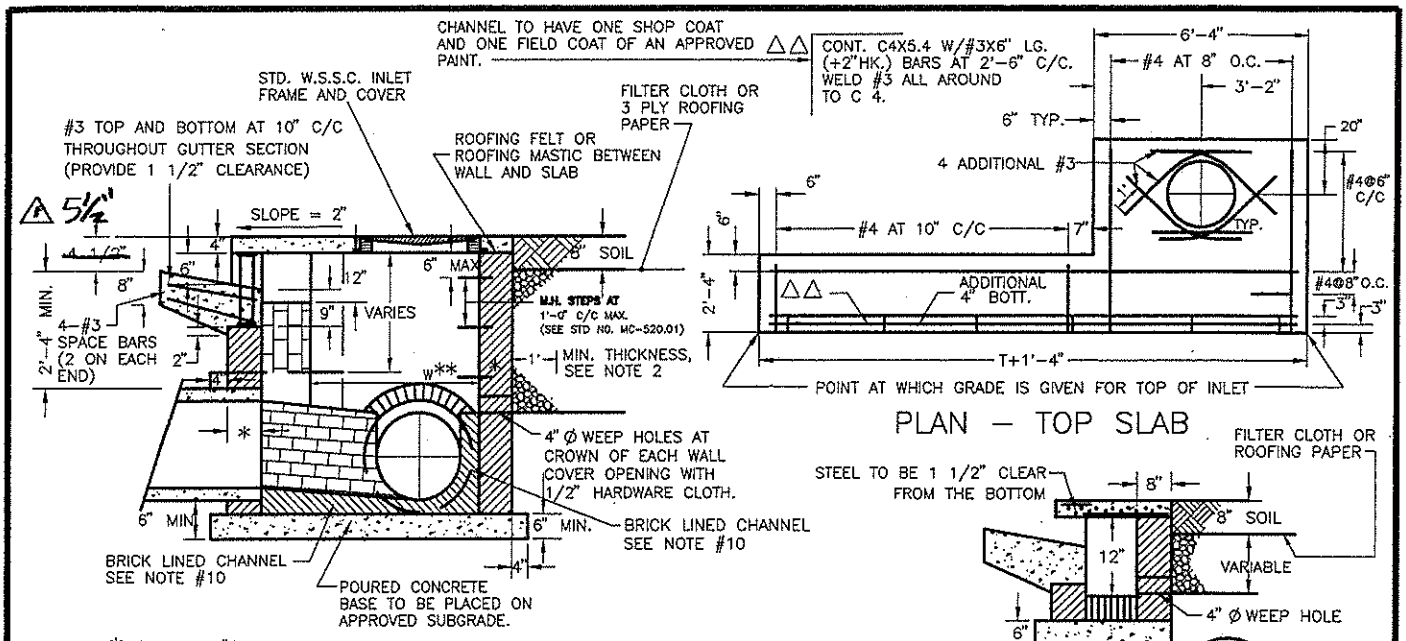
for CHIEF, DIV. OF CAP. DEV.

REVISED
(1) ASTM-C920 4/2006

MONTGOMERY COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

BUSINESS DISTRICT SIDEWALK DUAL RAMP

STANDARD NO. MC-113.02



GENERAL NOTES

1. USED SOLID MASONRY (BRICK OR CONCRETE BLOCK) OR POURED CONCRETE FOR WALLS.
2. INSTALL FOUNDATION DRAINAGE MATERIAL AROUND STRUCTURE FROM BOTTOM OF WEEP HOLES TO WITHIN 8" OF SURFACE.
3. MORTAR SHALL CONFORM TO ASTM SPECIFICATION C270 TYPE M.
4. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION FOR MATERIALS AND METHODS OF CONSTRUCTION.
5. WALL THICKNESS WILL BE THE FOLLOWING: 8" THICK WALLS FOR THE FIRST 8'-0" OF DEPTH, 12" THICK WALL BETWEEN 8'-0" AND 12'-0" OF DEPTH, 16" THICK WALLS FOR DEPTH GREATER THAN 12'-0" DEPTH TO BE MEASURED FROM TOP OF CURB TO CROWN OF OUTGOING PIPE.
6. f'_c =3500 PSI AT 28 DAYS.
7. ALL REINFORCING STEEL TO BE ASTM A615. GR.60.
8. FOR PIPES 30" AND LARGER, PROVIDE STEPS IN CHANNELS OF STRUCTURE. SEE STANDARD MC-520.02
9. ON TERMINAL INLETS, THE INLET BOTTOM SHALL BE SLOPED TO OUTLET PIPE WITH 9" MIN. FALL, SEWER BRICK OR CONCRETE.
10. FOR ACTUAL PIPE LOCATIONS, REFER TO STORM DRAIN PLANS AND CONSTRUCT BRICK CHANNEL TO PIPE CONFIGURATIONS. BRICK CHANNEL SHALL BE SEWER BRICK ON EDGE AND BUILT TO THE CROWN OF THE PIPES.

DESIGNATION	T THROAT OPENING	NUMBER OF PIPE SUPPORTS
B-10	10'-0"	1
B-15	15'-0"	2
B-20	20'-0"	3

PIPE SUPPORTS TO BE SPACED AT 5'-0" C/C

APPROVED JAN 5/96
DATE

DIRECTOR, DEPT. OF TRANS.

CHIEF, DIV. OF ENG. SERVICES

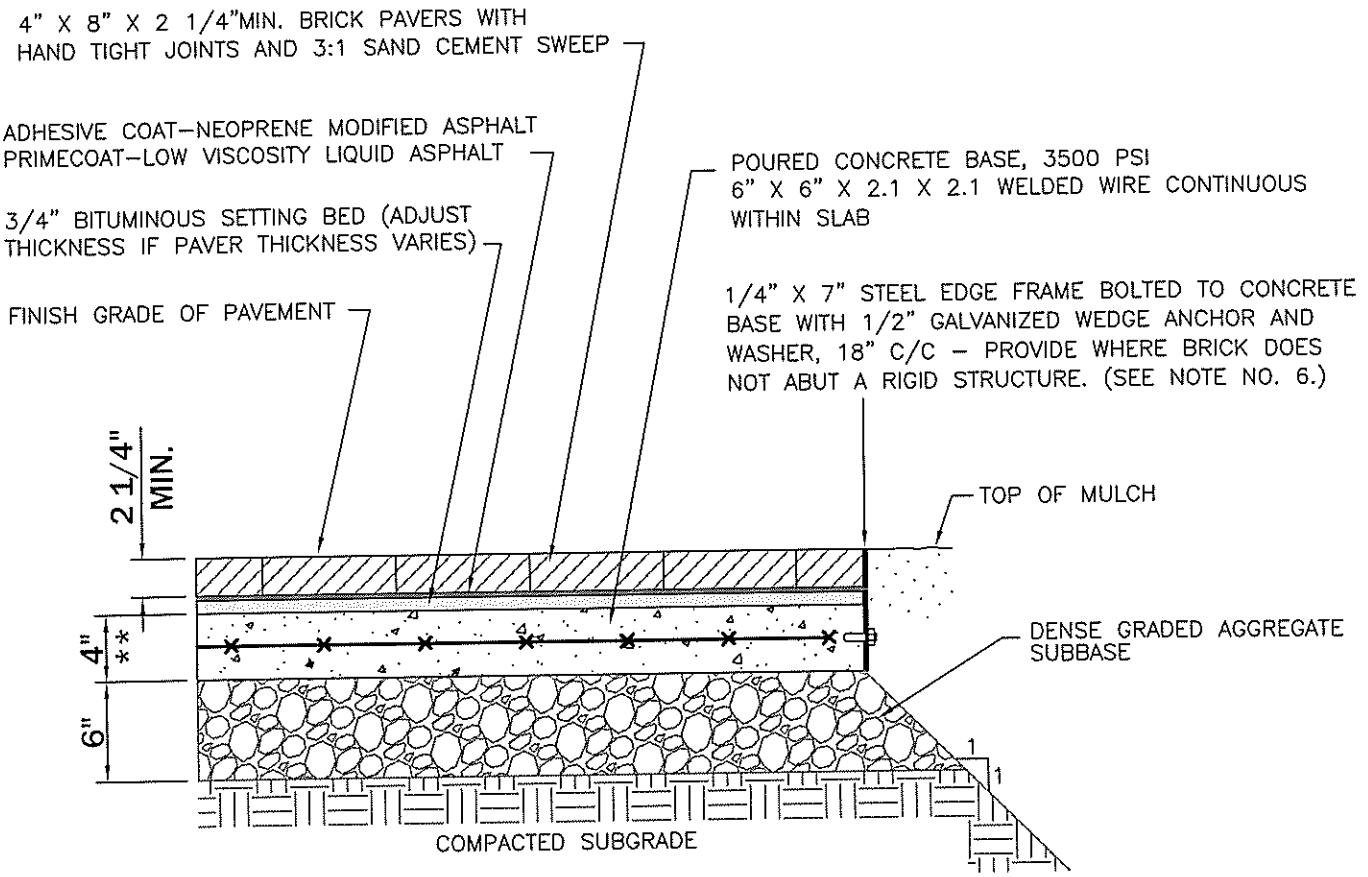
REVISED
⚠ RESTORED 1" DEPRESSION AT GUTTER EDGE 6/25/12

MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION

" B " INLET

STANDARD NO. MC-502.01

P:\DOTSTD\MC50201 10-24-95 12:35:40 pm EST



** 7" THICK CONCRETE SUBBASE AT DRIVEWAY ENTRANCES

GENERAL NOTES

1. Pavers shall be WATSONTOWN "Garden Blend" or approved equal, class SX, type I, have compressive strength of 10,000 psi for any five block tested, shall be capable of withstanding a min. of a 100 freeze–thaw cycles, have an average water absorption rate of 4% or less, and shall conform to ASTM Designation of C–902.
2. The Bituminous setting shall consist of Hot Mix Asphalt Superpave 4.75mm for surface PG58–28 conforming to AASHTO designation M–320.
3. A tack coat of 2% neoprene–modified asphalt adhesive shall be used.
4. Joint filler shall be one part Portland cement mixed with three parts sand.
5. The 28 day compressive strength for the concrete subbase shall be 3500 p.s.i.
6. Provide 1/2" expansion joint where brick abuts a rigid structure.
7. Refer to Maryland State Highway Administration specifications for materials and methods of construction.

APPROVED 22 MAY '09
DATE

DIRECTOR, DEPARTMENT OF TRANSPORTATION

CHIEF, DIVISION OF TRANSPORTATION ENGINEERING

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

STREETSCAPE – PAVERS SIDEWALK

STANDARD NO. MC–111.02

SECTION 32 12 43 – FLEXI-PAVE, POROUS FLEXIBLE PAVEMENT (Rev. 10/17)

PART 1 - GENERAL .

1.1 SUMMARY

A. This specification provides requirements for the construction of Flexi-Pave, porous flexible pavement. Flexi-Pave is highly porous, insulating, flexible paving material that is used as a Tree Preservation and Stormwater Mitigation tool in a variety of applications including sidewalks, trails, tree surrounds, potholes, green roofs, driveways, parking spots, diffusion strip drains, courtyards, wooden bridge overlays, inlet protection, playgrounds, splashparks, pool decks, etc.

B. In case the requirements of this specification conflict with the contract documents, this document shall govern.

1.2 RELATED SECTIONS

1. Subgrade preparation under Section 31 20 00 Earth Moving (02200 – Earthwork).

2. Utilities and subsurface drainage under Section 33 40 00 Storm Drainage Utilities (02700 – Subsurface Drainage and Structures), as needed.

1.3 DEFINITIONS

A. ISA Certified Arborist: An individual certified by the International Society of Arboriculture who has been trained through education and experience to be knowledgeable in tree care, tree preservation and construction around trees.

B. Exposure Condition, Moderate: Exposure to a climate where the paving will not be in a saturated condition when exposed to freezing and will not be exposed to deicing agents or other aggressive chemicals.

C. Exposure Condition, Severe: Exposure to deicing chemicals or other aggressive agents or where the paving can become saturated by continual contact with moisture or free water before freezing.

D. Base Reinforcement: The use of a geosynthetic within the aggregate base course to enhance the performance of a paving

E. Geogrid: Biaxial or triaxial woven polypropylene material for base course reinforcement and confinement, and subgrade stabilization and increased subgrade load capacity

F. Panel: An individual paving slab bordered by joints or slab edges.

G. Porous/Pervious/Permeable Paving: A paving comprising material with sufficient continuous voids to allow water to pass from the surface to the underlying layers.

H. Porous/Pervious/Permeable: The property of a material which permits movement of water through it under ordinary hydrostatic pressure.

I. Porous Flexible Paving: Paving system comprised of 3 principle components: recycled passenger car tire rubber granules, aggregate, and urethane binder that provides a strong, pervious, flexible pavement.

J. Subbase: A layer in a paving system between the subgrade and the base course, or between the subgrade and a porous flexible paving.

K. Subgrade: The soil prepared and compacted to support a structure or paving system.

1.4 PERFORMANCE BASED TEST STANDARDS

A. Porous Flexible Paving used on this project must meet the following minimum standard performance results:

1. Freeze/Thaw Testing
   a. ASTM C 666/C 666M-03, Standard Test Method for Resistance of Concrete to Freezing and Thawing, Procedure A - freezing and Thawing in Water. Samples shall indicate only minimal mass change and no deformation or destruction results after 300 nominal freeze-thaw cycles. Visual examination of the test specimens shall also indicate no cracks or breaks.
   b. D 3385-03 Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer.
   c. D 3665-06 Standard Practice for Random Sampling of Construction Materials
   d. E 329-06a Specifications for Agencies Engaged in Construction Inspection and/or Testing.
2. Initial Scuff / Power Steering Resistance
   a. ISSA TB 100, Wet Track Abrasion @ 25° C. Pavement shall maintain 4.6 g/ft^2 @ 1 hour, 8.6 g/ft^2 @ 6 days.
   b. ISSA TB 139 cohesion measurement @ 25° C. Pavement shall maintain 15 kg-cm $(solid\ spin)^2$.
   c. Accelerated Weathering @ 500 hours with Xenon Arc Cycle A, ISSA TB 100, Wet Track Abrasion @ 25° C. Pavement shall maintain 16.5 g/ft^2 @ 1 hour and 17.7 g/ft^2 @ 6 days.
3. Permeability
   a. FL DOT FM 5-565 @ 25° C. Pavement shall maintain $1.8x10^{-1}$ cm/sec.
   b. FL DOT FM 5-565 @ field sample. Pavement shall maintain 1.1×10^{1} cm/sec.
4. Flexibility
   a. PRI TM 025 @ 4"w X 2"t X 36" beams @ 25° C. Pavement shall maintain 2 mm average maximum deflection at center of beams with not cracks after 16 days and with no permanent deformation
5. Hamburg Loaded Wheel Tester
   a. TX DOT 242-F @ 60° C to 8000 cycles or 0.5" rut depth, whichever occurs first. Pavement shall maintain a 2.3 mm rut depth at 8000 cycles measured at end of test and pavement shall fully recover after 24 hours.
6. Static Creep
   a. TX DOT 231-F @ 60° C. Pavement shall maintain a total strain of +2.703% and permanent strain of 0.514%
7. Resilient Modulus

a. ASTM D 4123 @ 25° C. Pavement shall maintain a value of 68,495.

8. Slip Resistance
   a. ASTM D 2047 @ 25° C, dry. Pavement shall maintain a value of 0.65.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. The technical requirements and short working time of moisture-cured polyurethane based porous flexible pavements dictate higher than normal investment from installers to master the material handling and installation techniques necessary to successfully use and install this material. Therefore, installers must be certified, experienced and show proven competency through the following criteria. Installers must:
   a. Possess Porous Flexible Paving manufacturer's certification.
   b. Employ at least one (1) full time employee who is an ISA Certified Arborist with at least 10 years experience to oversee construction around trees.
   c. Possess a minimum of 5 years continual experience installing Porous Flexible Pavement.
   d. Offer a minimum 5-year warranty.
   e. Offer a minimum of 70 colors of Porous Flexible Pavement.
   f. Exhibit proof that porous flexible pavement is the installer's primary business, and not ancillary to other services.
   g. Maintain no less than two (2) local full-time dedicated Porous Flexible Paving crews with minimum four (4) workers per crew who directly perform each installation of Porous Flexible Paving and it's associated stone base preparation. General contractors, other subcontractors, landscaping crews, concrete & asphalt crews, first-time installers and out-of-town or traveling installation crews are not acceptable. The requirement for dedicated porous flexible paving crews demonstrates a commitment to the special time constraints, material handling techniques, and installation proficiencies needed for this specialty paving material.
   h. Have installed a minimum documented 40,000 square feet of Porous Flexible Paving in the greater Washington DC area within the preceding 12 consecutive months.
   i. Demonstrate quality workmanship and properly installed jobs based on the following criteria. Finished porous flexible pavement must:
      1) Have a smooth, monolithic and consistently uniform paving surface
      2) Be composed of three (3) ingredients with the following weight distribution: 46% ¼" crumb rubber, 46% 3/8" clean crushed aggregate and 8% single component moisture cured elastomeric polyurethane binder.
      3) Be ADA compliant to not exceed 2% side slopes & 5% running slopes
      4) Have consistently formed 45 degree beveled edges
      5) Have properly level, blended and finished cold seams between pours
      6) Be free from visible bull-float and hand trowel finishing marks
      7) Exhibit consistently parallel edges
      8) Interface with adjacent materials in a seamless manner
      9) Not possess significant visible surface variations, rough patches or sloughing

B. Installer Submittals:
   a. Provide manufacturers certification of training.

b. Provide resume and copy of certificate for at least one (1) ISA Certified Arborist on staff
c. Provide proof of having minimum of 5 years of continual experience installing Porous Flexible pavement
d. Provide a copy of minimum 5-year warranty certificate.
e. Provide this project's proposed Mix Design.
f. Provide PDF showing installer's 70 readily available pavement color choices.
g. Provide physical sample board containing at least 70 physical color samples.
h. Provide proof that Porous Flexible Pavement is installer's primary business.
i. Provide names and titles of eight (8) full time dedicated porous flexible paving crew members
j. Provide documentation of having installed at least 40,000 square feet of porous flexible paving in the Greater Washington DC area within the preceding 12 consecutive months.
k. Provide a list of 10 successfully installed Porous Flexible Paving projects of equal or greater size to this project, within the Greater Washington DC area so that quality workmanship can be verified. Include in the list the following information for each project:
    1) Jobsite Name
    2) Jobsite Address
    3) Installation Date
    4) Product used & mix design
    5) Square footage
    6) Color
    7) Owner name, email & phone number
    8) Project Photographs
    9) Project cost
l. Provide a pour stop plan showing planned construction joints and specify expansion joint materials.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for pedestrian traffic around the work area and prevent pedestrian & vehicular access into the paving area for 24 hours after paving completion.

B. Schedule pavement placements to minimize exposure to wind and heat before curing materials are applied.

C. Avoid placing porous paving if rain, snow, or frost is forecast within 24 hours unless measures are taken as described later. Always protect fresh paving from moisture and freezing.

D. Maintain polyurethane binder temperatures above 45 degrees Fahrenheit at all times up to point of installation.

E. Protect under roof all rubber and stone components to ensure that they remain free from all forms of moisture prior to mixing with urethane.

F. Certain equipment is forbidden from operating on Flexi-Pave and will void the warranty. This includes forklifts, backhoes, excavators, bucket trucks, material handlers, skid steers, tracked steers, wheeled loaders, scissor lifts, man lifts, booms, truck outriggers, cranes, dumpsters, roll

or containers, tracked vehicles, zero turn radius equipment, any solid tire machine and any off road tire machine or vehicle.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

Capitol Flexi-Pave, LLC
39024 E Colonial Hwy
Hamilton, VA 20158
Ph: 202.760.1099
Fx: 571.312.9208
Email: sales@capitolflexipave.com
Website: www.capitolflexipave.com

2.2 SITE PREP

A. Existing hard surfaces such as concrete, brick or asphalt in the area to receive Porous Flexible Paving shall be demolished and hauled away to an approved recycling or disposal facility. Demolition shall be done carefully to not damage existing tree trunks or roots. Exposed roots shall be protected and not cut or pruned without authorization of an ISA Certified Arborist or Urban Forestry Administration forestry inspector.

B. Common soil excavation shall be performed as needed to achieve desired pavement elevations and ADA compatibility. Common excavation shall be done carefully so as to not impact, damage or destroy existing tree trunks or roots.

2.3 GEOTEXTILES & GEOGRIDS

A. A non-woven, needle punched geotextile fabric such as Mirafi 140 or equal shall be installed as a soil separator whenever stone base course will be installed over existing exposed soil.

B. A geo-grid such as Tensar TriAx or equal shall be installed on top of the geotextile fabric whenever porous flexible pavement is expected to receive vehicular traffic.

2.4 BASE COURSE

A. Coarse aggregates shall meet the durability requirements of ASTM C 33. #57 stone, recycled concrete RC-57, or ¾" stalite shall be laid under pavement to a minimum depth of 4" for pedestrian use and a minimum of 6" for vehicular use. There is no maximum depth of stone. It shall be as specified per project. Stone shall be tamped with a vibratory plate compactor or vibratory roller compactor to align the stone facets and achieve relative compaction.

2.5 POROUS FLEXIBLE PAVING

A. Bonding: Have the capacity to bind with: wood; steel; concrete; aluminum; compacted aggregate; enamel tile, fiberglass.

B. Resistance to degradation: Resistant to: chlorine; ozone; bromine; muriatic acid; salt water; oil; transmission oil, hydraulic oil.

C. Aggregate:

1. Stone: Triple-washed & kiln dried 1/8" to 3/8" crushed granite per ASTM C 33, bagged, labeled, kept dry and under cover until installation.

2. Rubber: Recycled passenger tires ground to 1/4" nominal crumbs with 99.9% of the wire remnants removed and 90% of the chord removed.

D. Binding agent:

1. Firm, Pedestrian and Light Vehicular Pavement Binder: Single component elastomeric moisture cured aromatic polyurethane liquid prepolymer based upon Diphenylmethane-Diisocyanate designed for permanently binding stone and rubber with a firm and flexible bond. The natural properties of aromatic binders is to produce an 'amber' tint on some lighter colored pavements, however this effect wears off with foot traffic and weathering.
2. Soft, Pedestrian Only Playground Binder: Single component elastomeric moisture cured aromatic or aliphatic polyurethane liquid prepolymer based upon Diphenylmethane-Diisocyanate designed for permanently binding EPDM, TPV & SBR rubber granules while maintaining a minimum 6 foot critical fall height capacity in compliance with ASTM F1292. Aliphatic binders are clear and do not produce an 'amber' effect on the pavement surface, however aliphatic binders are more costly.

E. Air Entraining Agents: Prohibited.

F. Mix Design: Design a tentative mix of materials and colors to prove the consistency intended for use on the specified work, including the following parameters.

1. Flexi-Pave Rubber/Stone Pavement - HD1000, HD1500, HD2000, HDX1000, HDX1500, HDX2000 (Flagship product for sidewalks, trails, tree surrounds, potholes, courtyards, green roofs, diffusion strip drains, etc.)
    a. The volume by weight of aggregate per cu. yd. shall be 46% of the total mix.
    b. The volume by weight of the rubber product per cu. yd. shall be 46% of the total mix.
    c. The volume by weight of the urethane component per cu. yd. shall be 8% of the total mix.
    d. The percentage of each rubber or stone component to match the selected final color.
    e. Permeability: Pervious infiltration rate of minimum 2,500 gallons/square foot/hour.
2. Flexi-Pave All-Stone Pavement - AS1000, AS1500, AS2000, ASX1000, ASX1500, ASX2000 (All stone product for vehicular surfaces, patios, parking spots, driveways, etc.)
    a. The volume by weight of aggregate per cu. yd. shall be 92% of the total mix.
    b. The volume by weight of the urethane component per cu. yd. shall be 8% of the total mix.
    c. The percentage of each stone component to match the selected final color.
    d. Permeability: Pervious infiltration rate of minimum 2,500 gallons/square foot/hour.
3. Flexi-Pave All-Rubber Play Surface - P1000, P1500, P2000, P2500, PX1000, PX1500, PX2000 (All rubber product for safety surfaces, playgrounds, spashparks, pool decks, etc)

a. The volume by weight of the rubber product per cu. yd. shall be 92% of the total mix.
b. The volume by weight of the urethane component per cu. yd. shall be 8% of the total mix.
c. The percentage of each rubber component to match the selected final color.
d. Permeability: Pervious infiltration rate of minimum 2,500 gallons/square foot/hour.

4. The "X" in any pavement mix design denotes a final surface overspray of the urethane binder. This overcoat provides additional strength, durability and longevity to the pavement without compromising the porosity. It is required for all vehicular applications on a annual basis, and it can be applied to any pedestrian surface as needed throughout its lifespan to bring it back to like-new condition.

2.6 FORMS

A. Make forms with steel, wood, or other material that is sufficiently rigid to maintain specified tolerances, and capable of supporting concrete and mechanical concrete placing equipment.

B. Forms shall be clean and free of debris of any kind, rust, and hardened concrete.

C. Form release: Diesel, Bio-diesel or vegetable oil coating.

D. Forms should not have pins, stakes or spikes protruding above the form top, which would preclude smooth screeding.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. Prepare subgrade as specified in the contract documents.

B. Construct subgrade to ensure that the required paving thickness is obtained in all locations.

C. Keep all traffic off of the subgrade during construction to the maximum extent practical. Regrade subgrade disturbed by delivery vehicles or other construction traffic, as needed.

D. Compact the material added to obtain final subgrade elevation.

E. If requested, determine subgrade permeability in accordance with ASTM D3385 before porous paving placement. Confirm that subgrade permeability meets requirements of Contract Documents.

3.2 SUBBASE

A. Prepare subbase in accordance with contract documents.

3.3 SETTING FORMWORK

A. Set, align, and brace forms so that the hardened paving meets the tolerances specified herein.

B. Apply form release agent to the form face which will be in contact with porous paving, immediately before placing paving.

C. The vertical face of previously placed concrete may be used as a form.

1. Protect previously placed paving from damage using masking.
2. Do not apply form release agent to previously placed concrete.
3. Apply liquid urethane bonding agent to face of surfaces when adhesion is desired

D. Placement width shall be as specified in Contract Documents.

3.4 BATCHING, MIXING, AND DELIVERY

A. Batch and mix materials in a volumetric mixer on site in compliance with mix design. Discharge shall be completed within 1-2 minutes of the introduction of urethane to the dry products. Do not leave material in mixer more than 4 minutes or batch integrity will be compromised. Discard any material that has mixed for more than 5 minutes.

3.5 PLACING AND FINISHING PAVING

A. Do not place porous flexible paving on frozen or wet subgrade or subbase.

B. Deposit porous flexible paving directly onto the stone base by either mixer chute, wheelbarrow or by material handler, unless otherwise specified.

C. Paving shall be a continuous operation with fresh batches being screeded into previously paid sections.

D. Deposit porous flexible paving between the forms to the specified depth, whether 1", 1.5", 2" or 2.5" nominal depth. (Example: AS1000 = 1" nominal depth, HD2000 = 2" nominal depth, P2500 = 2.5" nominal depth).

E. Spread the porous flexible paving using a come-along, square-ended shovel or asphalt rake.

F. Utilize a screed to level to strike off material to a uniform finish.

G. Fill imperfections and divots with material from the same batch and smooth with magnesium hand trowels.

H. Use aluminum bull floats to compact and smoothly finish the pavement to elevations and thickness specified in mix design.

I. Finish all troweling and bull floating within 10 minutes of screeding material.

J. Finish edging with 45° chamfered edge using magnesium trowels.

K. Do not touch or tool pavement after it has been out of mixer for 15 minutes.

L. Pour stops or construction joints should be consistent with the approved joint plan.

3.6 FINAL SURFACE TEXTURE

A. Final surface of porous flexible paving shall be smoothed with aluminum bull float and magnesium trowels to a uniform smooth finish.

3.7 EDGING

A. When permanent forms are not used, bevel the edge of the side surface to a 45° chamfer.

3.8 CURING

A. Begin curing within 20 minutes of paving discharge. Do not handle, smooth, or otherwise touch pavement after 15 minutes or pavement integrity will be compromised and potholing will result.

B. Completely cover the paving surface with a minimum 4 mil thick polyethylene sheet only if rain or sprinklers are imminent within 20 minutes. Cut sheeting to a minimum of a full placement width.

1. Cover all exposed edges of paving with polyethylene sheet.
2. Secure curing cover material without using dirt or placing heavy items over sheet.

C. Cure paving for a minimum of 24 uninterrupted hours until it is fully cured, which can be observed if it is hard to the touch and dry. If surface is still tacky after 24 hours, leave protected for another 24 hours before opening for use. Maintain a protective fence around the pavement until fully cured.

3.9 SURFACE OVERSPRAY

A. After curing for 24 hours, a urethane overspray can be applied if specified by the "X" in the mix design.

B. Protective fencing shall be maintained until overspray dries.

C. Overspray shall not be performed if precipitation has occurred in the previous 48 hours before application of if precipitation is expected within 48 hours after application.

D. Sprinklers around overspray area shall be turned off for 48 hours prior and 48 hours after application.

E. Care should be taken to protect adjacent surfaces, buildings, vehicles and windows from overspray drift.

3.10 HOT- AND COLD-WEATHER CONSTRUCTION

A. When hot weather is anticipated up to 95 degrees Fahrenheit, no special procedures are necessary. When temperatures are over 95 degrees, pavement cure rate increases by approximately 50% and material can become unworkable.

B. In cold weather it is imperative that the polyurethane binder be kept above 45 degrees Fahrenheit until mixed with dry ingredients and placed. This requires the binder to kept in enclosed heated containers protected from the elements. Binder that falls below 45 degrees becomes compromised and shall be discarded.

C. When precipitation is imminent and temperatures will fall below freezing after installation, cover with polyethylene sheet and utilize a fan or torpedo heater to maintain airflow over the paving during the curing process.

3.11 OPENING TO TRAFFIC

A. Do not open the paving to pedestrian or light vehicular traffic until the porous flexible paving has cured for at least 24 hours during warm weather, and 48-72 hours during cold temperatures and not until the porous flexible paving is accepted by the Owner for opening to traffic. Paving should be checked and verified to be sufficiently hardened after the curing period as relative humidity can alter the curing time in some regions.

3.12 FINAL CLEANUP

A. Once pavement is cured and the protective fence is removed, the adjacent areas shall be dressed with soil, seed and straw or soil and sod as the contract requirements dictate.

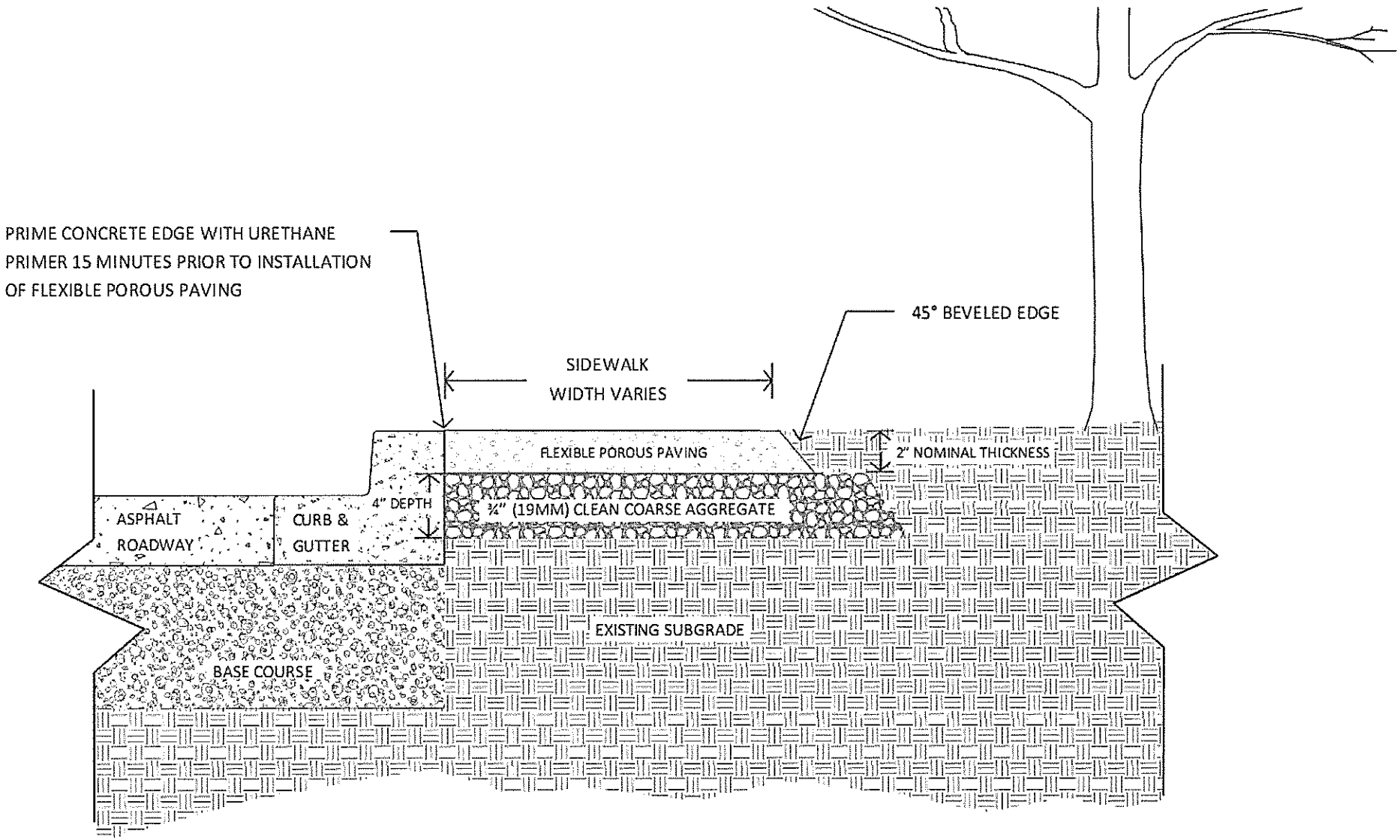
B. Mulch shall be installed around tree pits to cover exposed aggregate base that extend beyond the pavement.

C. Up to 4 subsequent waterings shall be applied as needed to aid establishment of new sod.

3.13 COMPENSATION

A. The amount of Flexi-Pave to be compensated shall be measured in square yards of pavement. This quantity shall be measured by the Flexi-Pave foreman and verified by the inspector. Daily reports containing the square yards of pavement shall be submitted for payment. The Flexi-Pave pay item shall be understood to incorporate all the necessary conditions in the aforementioned specifications that are required to install the Flexi-Pave. These items include and are limited to mobilization, no-parking signs, maintenance of traffic, demolition of hard surfaces, common excavation, masking and forming, geotextile, geogrid, stone base, Flexi-Pave, protective fencing, soil, seed/sod, straw and mulch.

END OF SECTION 32 12 43



CAPITOL FLEXI-PAVE

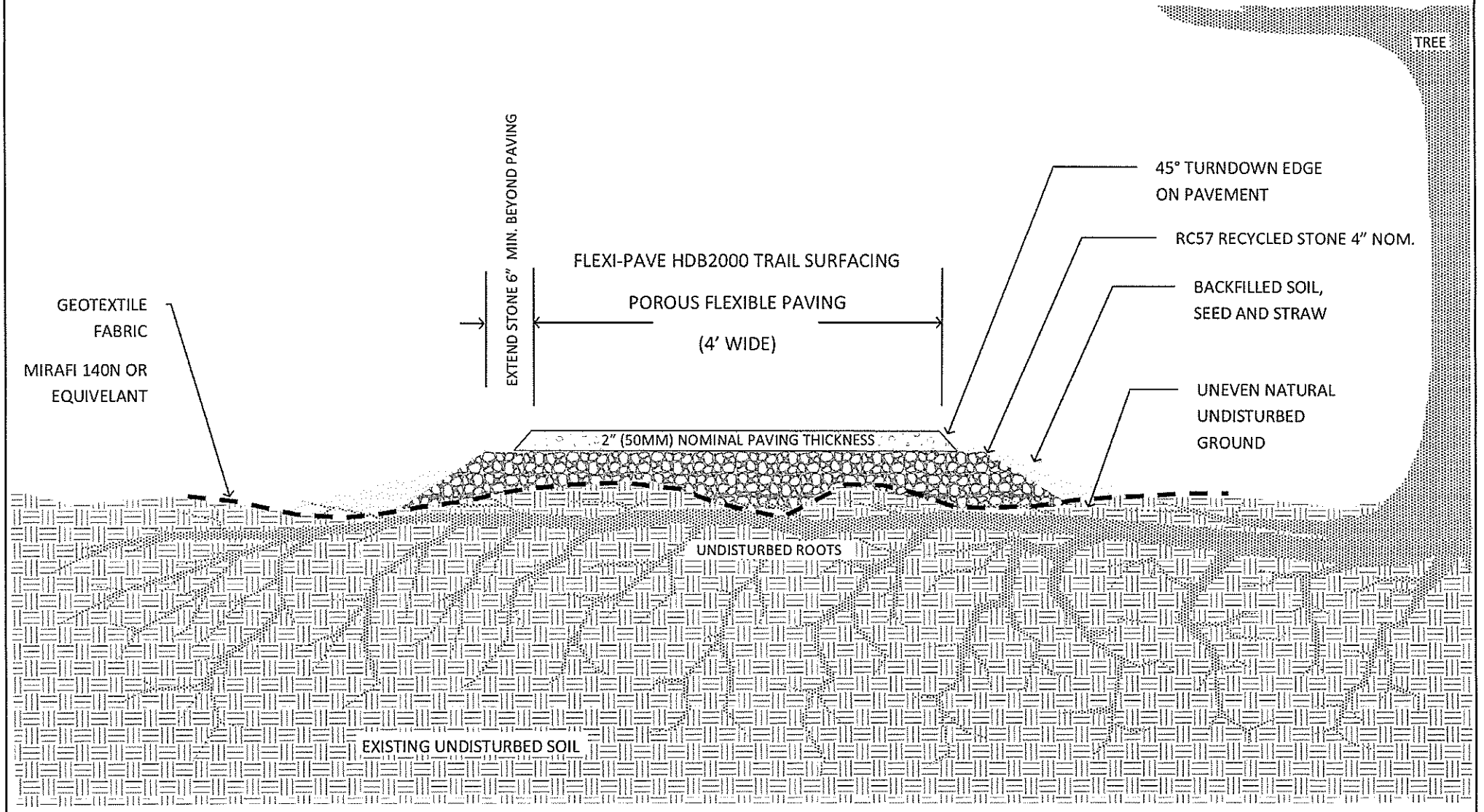
NOTE:
ALL INFORMATION SHOWN IS SUGGESTED. DUE TO APPLICATION VARIANCES, IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO PROVIDE ALL INFORMATION REQUIRED TO SUIT LOCAL BUILDING CODES AND REGULATIONS. THIS DETAIL IS FOR REPRESENTATIVE PURPOSES ONLY AND SHOULD NOT BE SOLELY USED FOR CONSTRUCTION PURPOSES UNLESS IT HAS BEEN CERTIFIED AND SEALED BY A QUALIFIED ENGINEER.

Capitol Flexi-Pave
39024 E Colonial Hwy
Hamilton, VA 20158
202.760.1099 DC & MD
571.383.7000 VA
www.capitolflexipave.com

TITLE:
FLEXI-PAVE SIDEWALK

DRAWN BY:	REVISION DATE:
NJA	10/21/13
DATE:	**SCALE:**
4/2/13	NTS

DETAIL NO. 118.00.01



CAPITOL FLEXI-PAVE
the pervious paving company

NOTE:
ALL INFORMATION SHOWN IS COPYRIGHTED BY CAPITOL FLEXI-PAVE. THIS DETAIL HAS BEEN DEVELOPED BY A DEGREED URBAN FORESTER, ASCA CONSULTING ARBORIST, MD LICENSED TREE EXPERT, ISA CERTIFIED ARBORIST AND PERVIOUS PAVING EXPERT. ANY CHANGES TO THIS DETAIL CAN ONLY BE APPROVED BY CAPITOL FLEXI-PAVE.

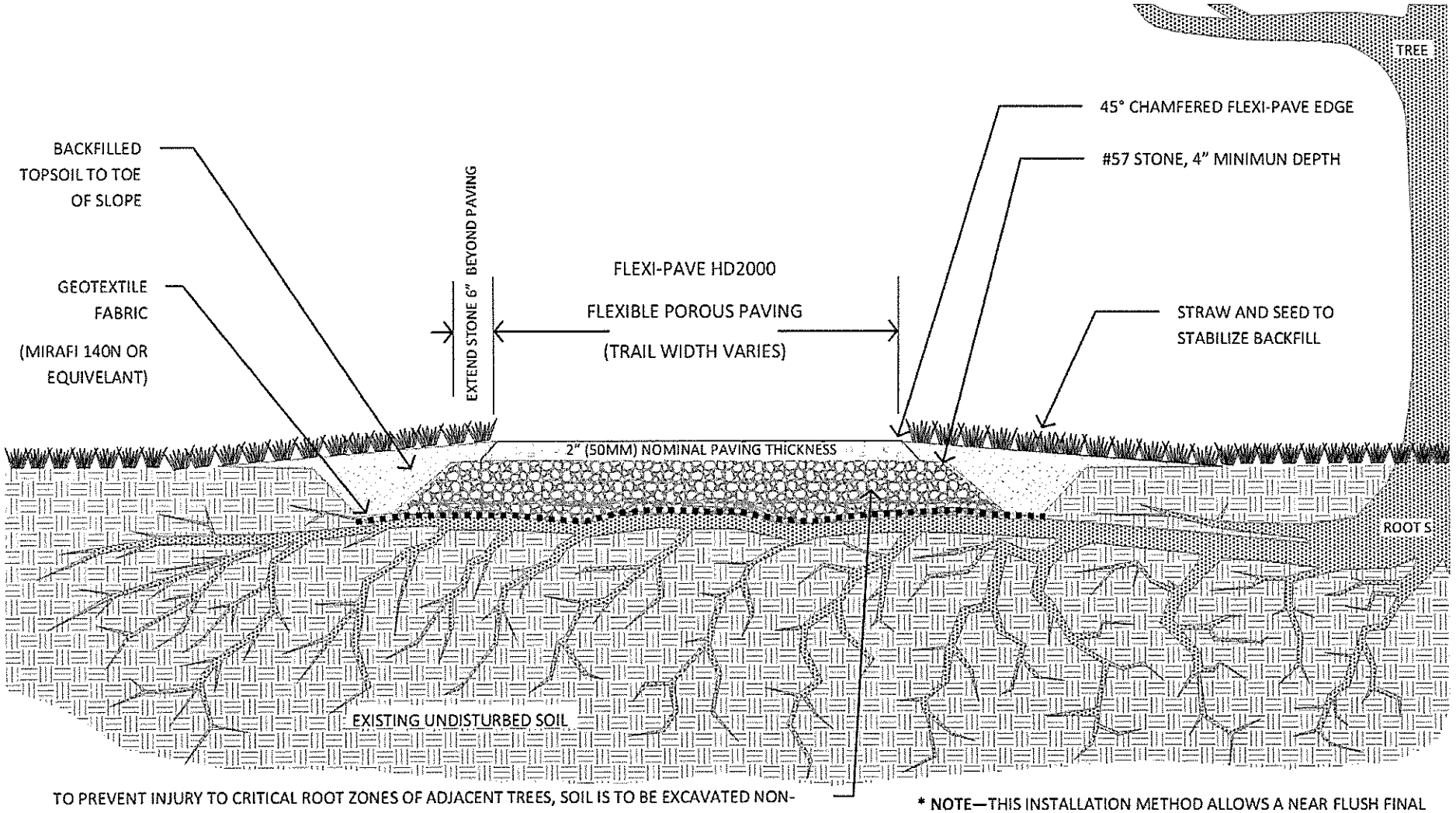
Capitol Flexi-Pave
39024 E Colonial Hwy
Hamilton, VA 20158
571.383.7000 PH
571.312.9208 FX
www.capitolflexipave.com
www.capitolsolutionsgroup.com

TITLE:
ABOVE GRADE FLEXI-PAVE TRAIL OVER TREE ROOTS

DRAWN BY:	REVISION DATE:
NJA	8/11/22
DATE:	SCALE:
10/8/15	NTS

DUE TO THE SPECIALIZED CONSTRUCTION TECHNIQUES SHOWN ABOVE, AND SINCE THE LIVING TREES ASSOCIATED WITH THIS CONSTRUCTION DETAIL MAY BE INJURED OR KILLED IF THIS DETAIL IS NOT FOLLOWED TO THE LETTER, ONLY A LICENSED TREE EXPERT & ISA CERTIFIED ARBORIST SHALL PERFORM THIS WORK. CAPITOL FLEXI-PAVE,LLC RESERVES THE RIGHT TO CHANGE THE SPECIFICATIONS SHOWN WITHOUT NOTICE.

DETAIL NO. 137.01.00



TO PREVENT INJURY TO CRITICAL ROOT ZONES OF ADJACENT TREES, SOIL IS TO BE EXCAVATED NON-INVASIVELY TO ROOT DENIAL DEPTH USING SUPERSONIC AIR KNIFE . THEN FABRIC AND STONE ARE TO BE INSTALLED OVER AND AROUND ROOTS. ROOT PRUNING MAY BE PERFORMED BY ARBORIST AS NEEDED ON SELECTED ROOTS <2" IN DIAMETER PROVIDED NO MORE THATN 15% OF CRITICAL ROOT ZONE IS REMOVED.

* NOTE—THIS INSTALLATION METHOD ALLOWS A NEAR FLUSH FINAL PAVING ELEVATION, BUT REQUIRES ADDITIONAL NON-INVASIVE EXCAVATION TECHNIQUES PERFORMED BY CERTIFIED ARBORIST WITH DOCUMENTED EXPERIENCE IN SPECIAL EXCAVATION TECHNIQUES AROUND ROOTS.

CAPITOL FLEXI-PAVE

NOTE:
THIS DETAIL IS MEANT TO ILLUSTRATE THE INTERFACE OF FLEXI-PAVE WITH THE SURROUNDING INFRASTRUCTURE AND IS NOT MEANT TO BE SOLELY USED FOR CONSTRUCTION OF ANYTHING OTHER THAN FLEXI-PAVE. THEREFORE IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO PROVIDE ALL INFORMATION, DETAILS AND SPECIFICATIONS REQUIRED TO SUIT LOCAL BUILDING CODES AND REGULATIONS FOR THE ITEMS OTHER THAN THE FLEXI-PAVE.

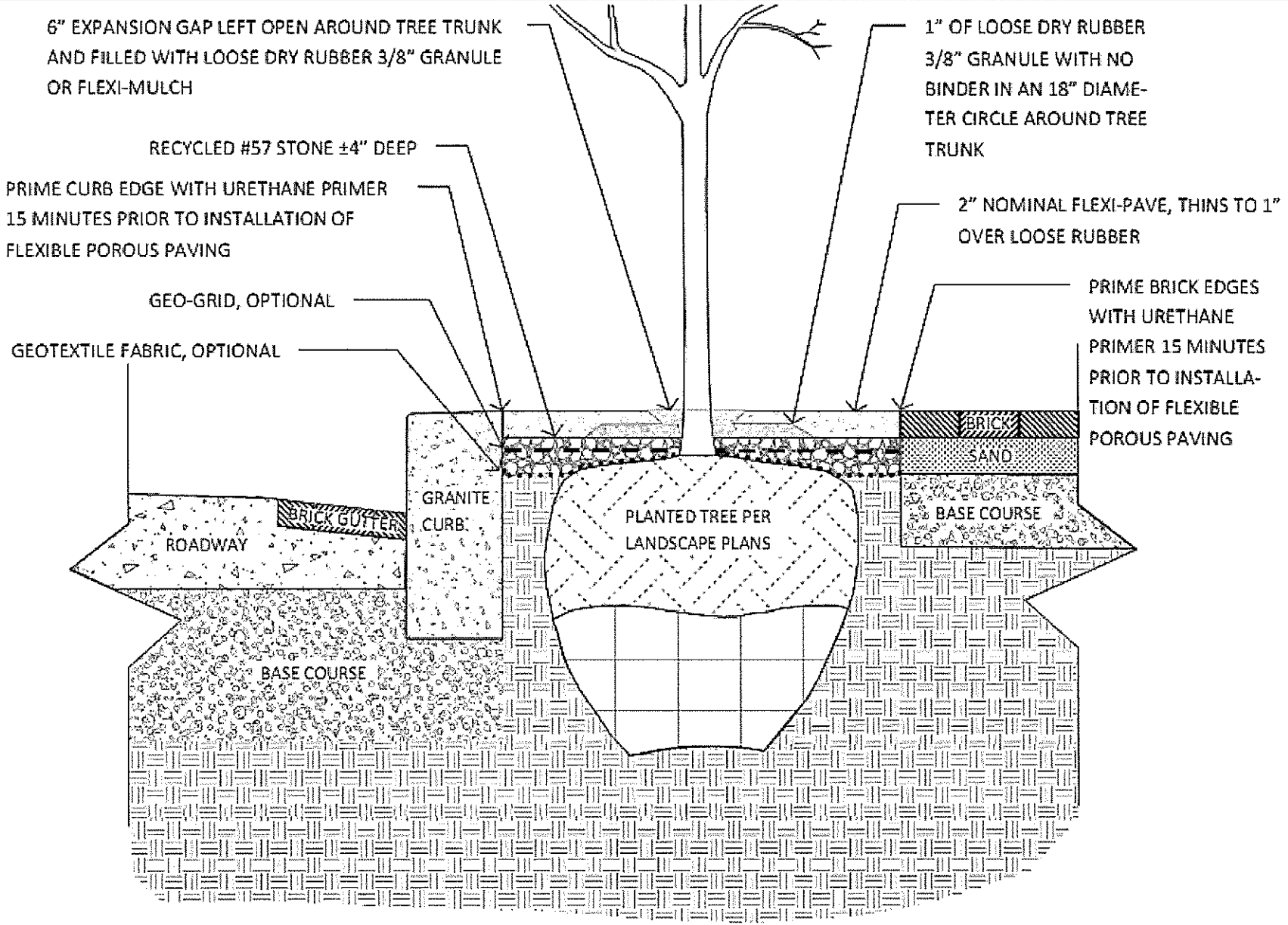
Capitol Flexi-Pave, LLC
18323 Woodburn Rd.
Leesburg, VA 20175
202.760.1099 PH
571.312.9208 FX
www.capitolflexipave.com

TITLE: FLEXI-PAVE TRAIL FLUSH WITH GRADE

DRAWN BY:	REVISION DATE:
NJA	
DATE: 7/2/15	SCALE: NTS

DUE TO VARIANCES IN LOCAL CODES, CONSTRUCTION PRACTICES AND REQUIREMENTS, ALL DETAILS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SUCH LOCAL CODES, CONSTRUCTION PRACTICES AND REQUIREMENTS REGARDLESS OF DETAIL CONSTRUCTION SHOWN IN DRAWING. CAPITOL FLEXI-PAVE,LLC RESERVES THE RIGHT TO CHANGE SPECIFICATIONS SHOWN WITHOUT NOTICE. ALL CHANGES TO SPECIFICATIONS CAN ONLY BE APPROVED BY CAPITOL FLEXI-PAVE, LLC

DETAIL NO. 135.00.00



CAPITOL FLEXI-PAVE

NOTE:
THIS DETAIL IS MEANT TO ILLUSTRATE THE INTERFACE OF FLEXI-PAVE WITH THE SURROUNDING INFRASTRUCTURE AND IS NOT MEANT TO BE SOLELY USED FOR CONSTRUCTION OF ANYTHING OTHER THAN FLEXI-PAVE. THEREFORE IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO PROVIDE ALL INFORMATION, DETAILS AND SPECIFICATIONS REQUIRED TO SUIT LOCAL BUILDING CODES AND REGULATIONS FOR THE ITEMS OTHER THAN THE FLEXI-PAVE.

Capitol Flexi-Pave, LLC
18323 Woodburn Rd.
Leesburg, VA 20175
202.760.1099 PH
571.312.9208 FX
www.capitolflexipave.com

TITLE: FLEXI-PAVE TREE SURROUND FOR NEWLY PLANTED TREES

DRAWN BY:	REVISION DATE:
NJA	
DATE: 6/12/15	SCALE: NTS

DUE TO VARIANCES IN LOCAL CODES, CONSTRUCTION PRACTICES AND REQUIREMENTS, ALL DETAILS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SUCH LOCAL CODES, CONSTRUCTION PRACTICES AND REQUIREMENTS REGARDLESS OF DETAIL CONSTRUCTION SHOWN IN DRAWING. CAPITOL FLEXI-PAVE,LLC RESERVES THE RIGHT TO CHANGE SPECIFICATIONS SHOWN WITHOUT NOTICE. ALL CHANGES TO SPECIFICATIONS CAN ONLY BE APPROVED BY CAPITOL FLEXI-PAVE, LLC

DETAIL NO. 134.00.00

Signage

Parking Stall Sign

Installation Notes: Install signs in the center of each stall. Signs to be 12" wide, Engineer grade prismatic .080 aluminum reflective signs.

Accessible Isle Sign

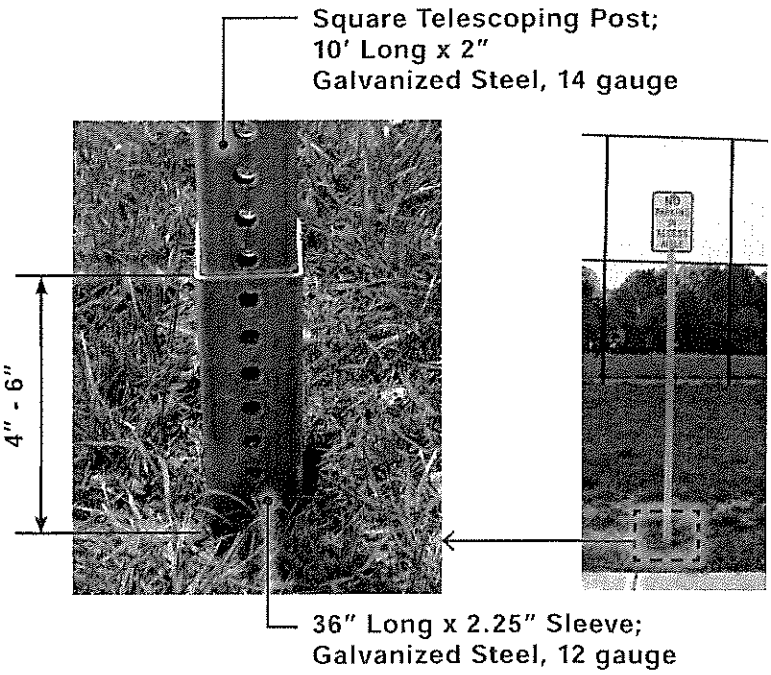
Installation Notes: Install signs in the center of each 8' wide van accessible isle when possible. Signs to be 12" wide, Engineer grade prismatic .080 aluminum reflective signs.

Recommended vendors:
http://www.shannonbaum.com/
http://www.usa-traffic-signs.com
http://eberliron.com/home.html
http://www.compliancesigns.com

Signage (cont.)

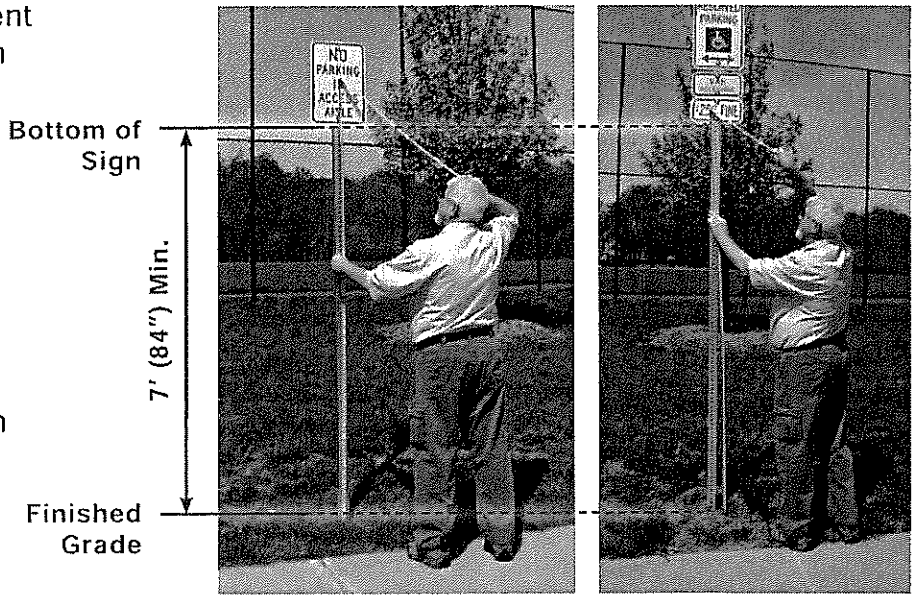
Installation

Installation Notes: Push a 36" sleeve 30"-32" into the ground as shown in the picture. Use a level to make sure it is vertical. Insert the post into the sleeve and adjust the height per the requirements. Use a screw to fasten the post to the sleeve. No concrete footing is necessary for this method.



Height

Installation Notes: Measurement from grade to bottom of the sign must be at least 84".



Recommended vendors:
http://www.usa-traffic-signs.com
http://eberliron.com/home.html

Handrail Extension on Slopes

2010 ADA Standards
505.10.1 Top and Bottom Extension at Ramps. Ramp handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent ramp run.

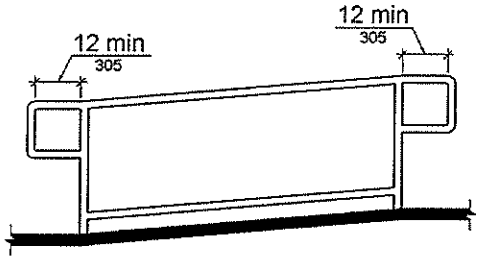
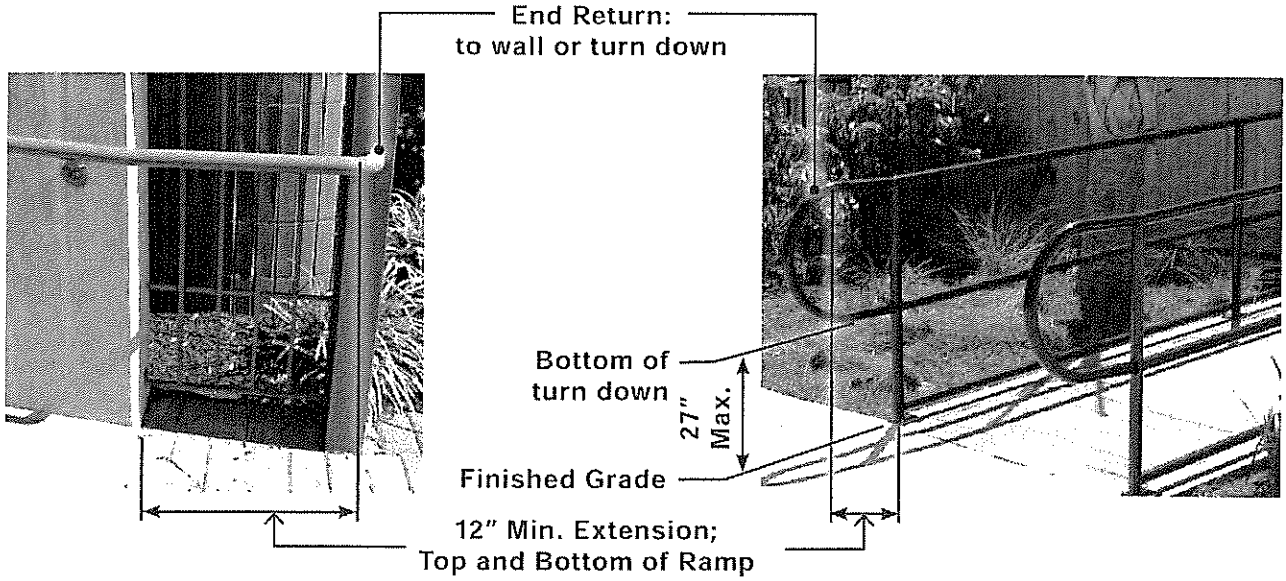


Figure 505.10.1
Top and Bottom Handrail Extension at Ramps

Installation Notes: Measurement from start of landing to the end of the railing's straight portion must be 12" minimum.



Handrail Extension on Steps

2010 ADA Standards
505.10.2 Top Extension at Stairs. At the top of a stair flight, handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

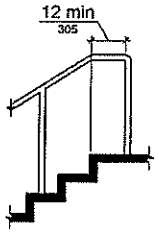
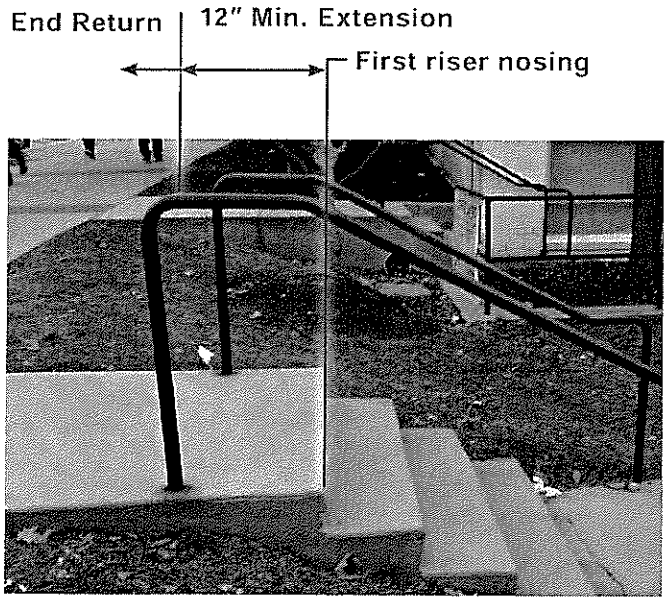


Figure 505.10.2
Top Handrail Extension at Stairs

Top of Stairs

Installation Notes: Measurement from the first riser nosing to the end of the railing's straight portion must be 12" minimum.



Edge Protection

2010 ADA Standards
405.9 Edge Protection. Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.
405.9.1 Extended Floor or Ground Surface. The floor or ground surface of the ramp run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505*.
405.9.2 Curb or Barrier. A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface.

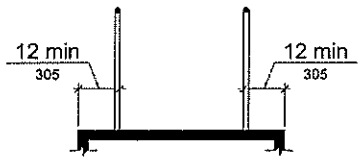


Figure 405.9.1
Extended Floor or Ground Surface Edge Protection

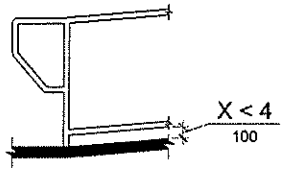
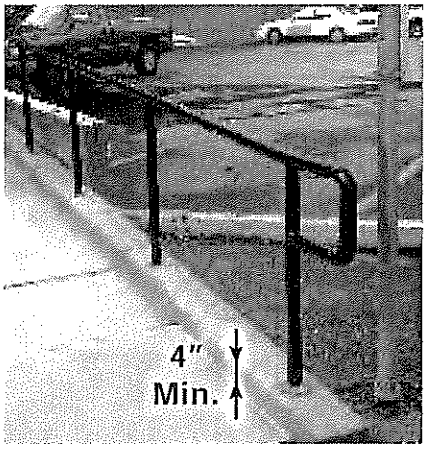


Figure 405.9.2
Curb or Barrier Edge Protection

* Refer to **2.3 Handrails.**

Extended Floor Edge

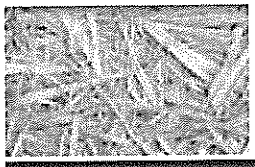
Curb Edge

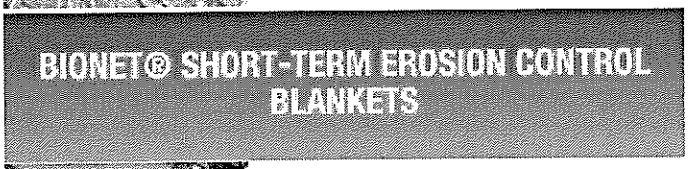


Handrail* & Wall Barrier Edges

* Refer to **2.3 Handrails.**

North American Green





BioNet
Natural Solutions for Natural Problems.

BioNet® Short-Term Biodegradable Erosion Control Blankets

The short-term biodegradable erosion control blankets in North American Green's BioNet Series consist of an evenly distributed layer of 100% agricultural straw stitched with biodegradable thread to a single- or double-netting structure composed of 100% biodegradable jute fiber.

They are designed to provide all-natural erosion protection and assist with vegetation establishment for up to 12 months in applications such as moderately sloping areas and low-flow channels where bare-ground seeding and loose mulches often fail. After the blankets biodegrade, soil erosion is controlled by the root, stem, and leaf structures of the mature vegetation.

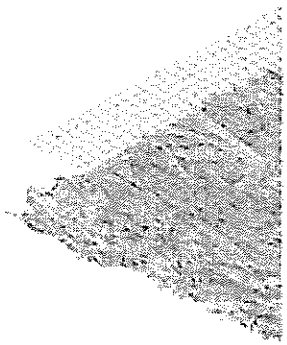
Product	Longevity	Typical Applications	Permissable Sheer Stress[1] Bare Soil	Max. Flow Velocity[2]	FHWA FP-03 Category	ECTC Category	Typical Projects
S75BN	12 Months	4:1-3:1 Slopes / Low-flow Channels	1.60 (76)	5.00 (1.52)	Type 2.C	Type 2.C	Wetland Mitigation, Bioengineering
S150BN	12 Months	3:1-2:1 Slopes / Moderate-flow Channels	1.85 (88)	6.0 (1.83)	Type 2.D	Type 2.D	

[1] lbs/ft^2 (Pascal) [2] ft/s (m/s)

BioNet® S75BN™

Single Net Straw Blanket

S75BN™ features a layer of 100% straw fiber stitched with biodegradable thread to a biodegradable, natural-fiber top net. S75BN provides better erosion protection and mulching action than conventional jute nettings alone and is typically effective for up to 12 months.



Top Net
Leno woven, 100% biodegradable jute fiber
9.30 lbs/1,000 ft^2
(4.53 kg/100 m^2) approx. wt.

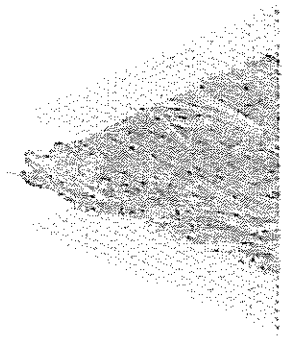
Straw Fiber
0.50 lbs/yd^2
(0.27 kg/m^2)

Thread
Biodegradable

BioNet® S150BN™

Double Net Straw Blanket

S150BN™ features a layer of 100% straw fiber stitched with biodegradable thread between biodegradable, natural-fiber top and bottom nets. S150BN is designed to provide up to 12 months of erosion protection and mulching in applications where the added durability of a double-net structure is required.

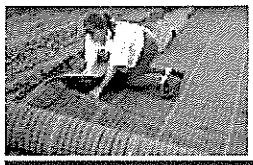


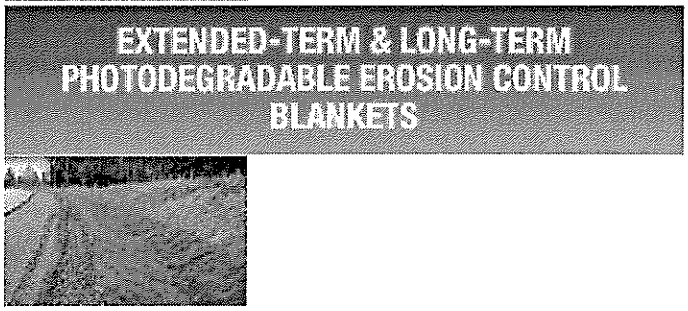
Top Net
Leno woven, 100% biodegradable jute fiber
9.30 lbs/1,000 ft^2
(4.53 kg/100 m^2) approx. wt.

Straw Fiber
0.50 lbs/yd^2
(0.27 kg/m^2)

Bottom Net
Woven, 100% biodegradable jute fiber
7.70 lbs/1,000 ft^2
(3.76 kg/100 m^2) approx. wt.

North American Green





Extended-Term and Long-Term Photodegradable Erosion Control Blankets

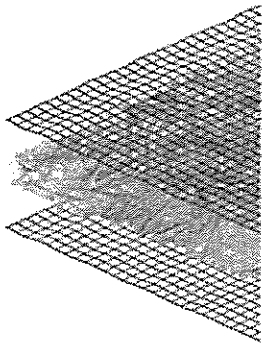
Our extended-term and long-term photodegradable erosion control blankets utilize a double-netting structure and a long-lasting, coconut-fiber component to provide erosion protection and assist vegetation establishment for 18 to 36 months, depending on the product.

These blankets are designed for immediate- to long-term erosion protection and vegetation establishment on steep slopes, medium- to high-flow channels, and shorelines. After the blankets degrade, soil erosion is controlled by the mature vegetation's root, stem, and leaf structures.

SC150®

Double-Net, Straw-Coconut Blanket

SC150® is constructed with a layer of 70% straw and 30% coconut fiber stitched with degradable thread between a heavyweight UV stabilized polypropylene top net and a lightweight photodegradable polypropylene bottom net. The addition of coconut fiber and a UV stabilized top net increases the SC150's durability, erosion control capabilities, and longevity for use on steeper slopes, medium-flow channels, and other areas where vegetation will take up to 24 months to grow.



Top Net
Heavyweight, UV stabilized polypropylene
3.0 lbs/1,000 ft^2
(1.47 kg/100 m^2) approx. wt.

Straw/Coconut Matrix
70% straw at

0.35 lbs/yd^2
(0.19 kg/m^2)
30% coconut at
0.15 lbs/yd^2
(0.08 kg/m^2)

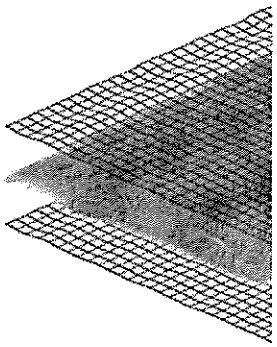
Bottom Net
Lightweight, photodegradable polypropylene
1.50 lbs/1,000 ft^2
(0.73 kg/100 m^2) approx. wt.

Stitching
Degradable thread

C125®

Double-Net, Coconut Blanket

C125® is constructed of 100% coconut fiber stitched with UV stabilized polypropylene thread between heavyweight UV stabilized polypropylene top and bottom nets. The 100% coconut fiber and UV stabilized nets provide the highest level of durability, erosion control, and longevity for protection of severe slopes, steep embankments, high-flow channels, and other areas where vegetation will take up to 36 months to grow.



Top Net
Heavyweight, UV stabilized polypropylene
3.0 lbs/1,000 ft^2
(1.47 kg/100 m^2) approx. wt.

Coconut Fiber
0.50 lbs/yd^2
(0.27 kg/m^2)

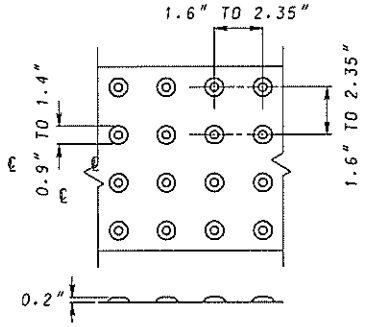
Bottom Net
Heavyweight, UV stabilized polypropylene
3.0 lbs/1,000 ft^2
(1.47 kg/100 m^2) approx. wt.

Stitching
UV stable polypropylene thread

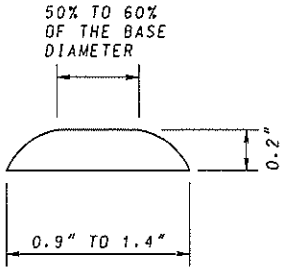
Product	Longevity	Typical Applications		Permissable Sheer Stress[1] Bare Soil	Max. Flow Velocity[2]	FHWA FP-03 Category	ECTC Category	Typical Projects
SC150	24 Months	2:1-1:1 Slopes	Medium-flow Channels	2.00 (96)	8.00 (2.44)	Type 3.B	Type 3.B	Steeper Slopes, Landfills

MAT DETAILS

SEE PLACEMENT GUIDELINES BELOW

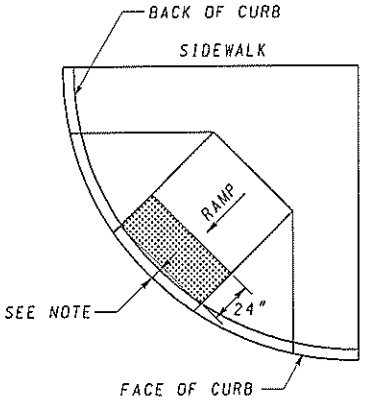


DOME SPACING

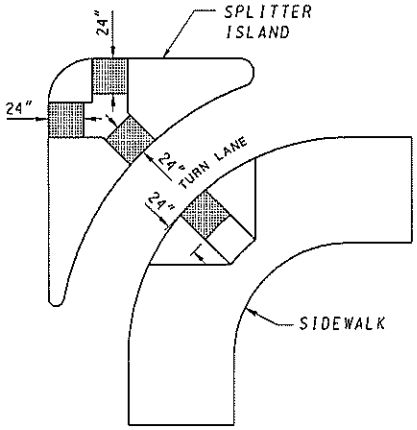


DOME SECTION

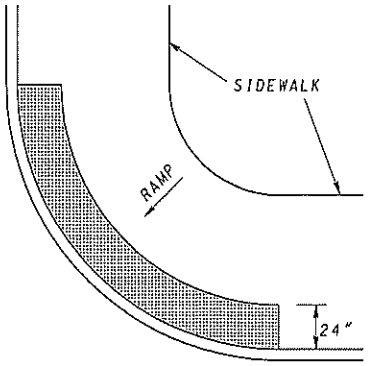
PLACEMENT GUIDELINES



SHARED CURB RAMP



REFUGE ISLAND



BLENDED CURB

WHERE ISLANDS OR MEDIANS ARE LESS THAN 6 FEET WIDE, THE DETECTABLE WARNING SHOULD EXTEND ACROSS THE FULL LENGTH OF THE CUT THROUGH THE ISLAND OR MEDIAN

NOTES

1. THE DETECTABLE WARNING SURFACE SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 6 TO 8 INCHES FROM THE FACE OF CURB.
2. FOR SKEWED APPLICATIONS DETECTABLE WARNING SHALL BE PLACED SUCH THAT THE DOMES CLOSEST TO THE BACK OF CURB ARE NO LESS THAN 0.5" AND NO MORE THAN 3.0" FROM THE BACK OF CURB. TRUNCATED DOME SURFACES SHALL BE FABRICATED TO PROVIDE FULL DOMES ONLY.
3. DETECTABLE WARNING SURFACE SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 611 OF THE SPECIFICATIONS.
4. DETECTABLE WARNING SURFACES ARE REQUIRED AT STREET CROSSING & SIGNALIZED INTERSECTIONS.

SPECIFICATION 611	CATEGORY CODE ITEMS
APPROVED	Kirk G. McCallum DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

APPROVAL • SHA REVISIONS		APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL	2-10-04	APPROVAL	3-31-04
REVISED	3-15-06	REVISED	4-5-06
REVISED		REVISED	
REVISED		REVISED	

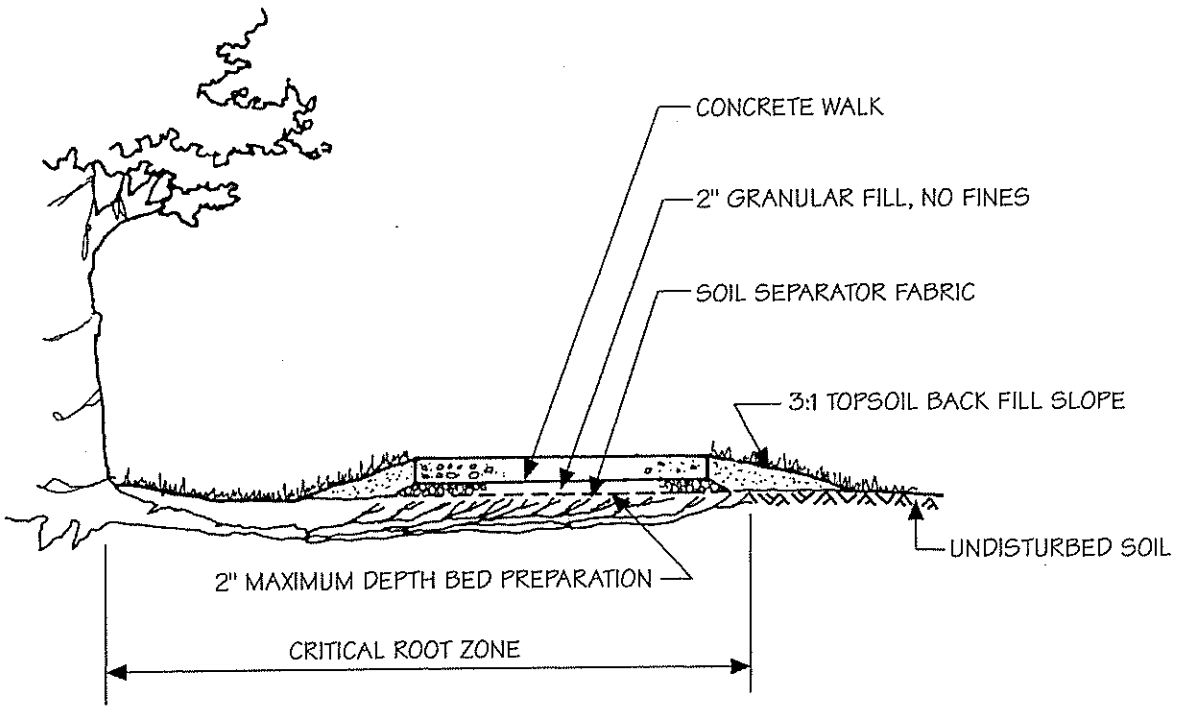
SHA State Highway Administration

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

DETECTABLE WARNING SURFACES

STANDARD NO. MD 655.40

Figure E-13:
Sidewalk above Critical Root Zone

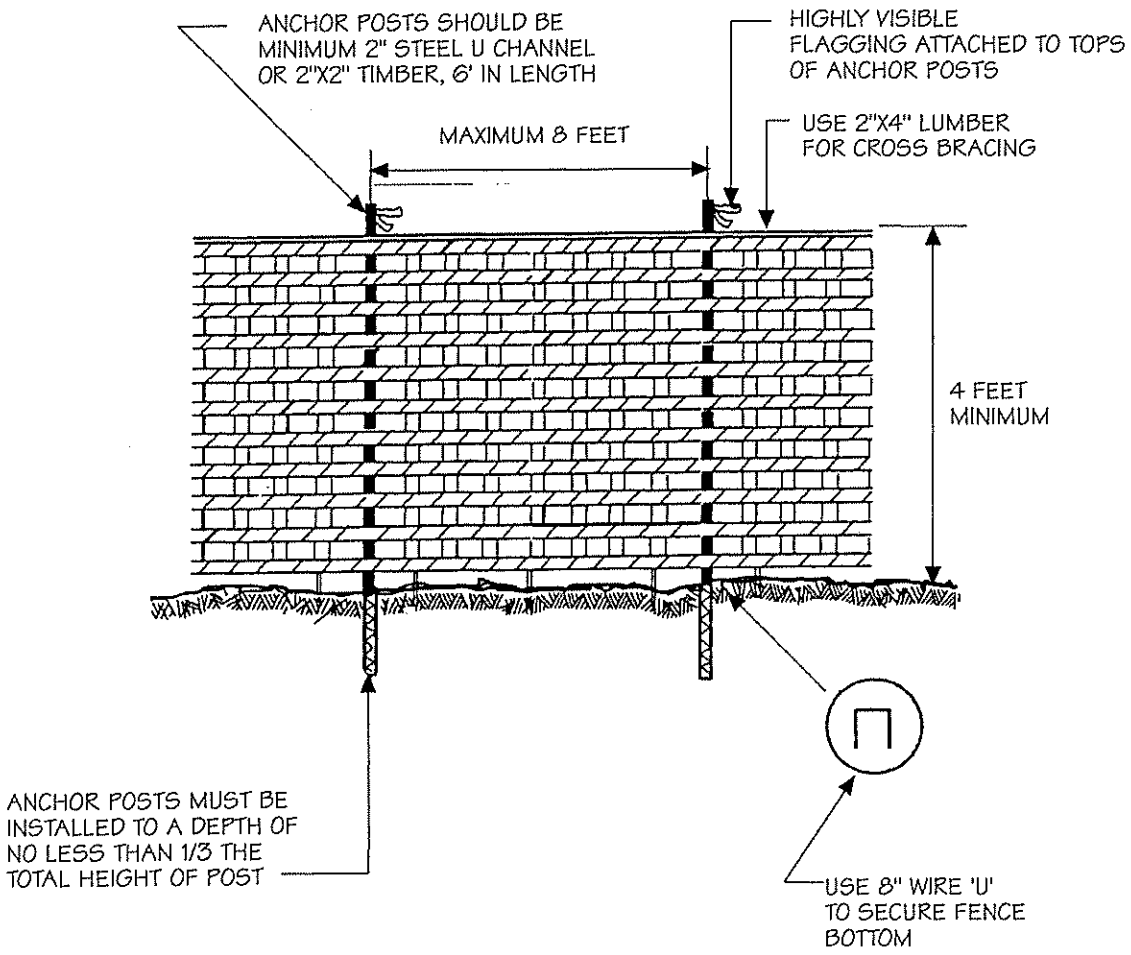


Notes:

1. Do not exceed a depth of 2 inches for bed preparation.
2. Granular fill should contain no fines.
3. Minimize width of sidewalk as allowed by code.
4. Take extreme care of existing trees' Critical Root Zone during construction.

Source: Adapted from Steve Clark & Associates/ACRT, Inc.

Figure E-3:
Plastic Mesh Tree Protection Fence

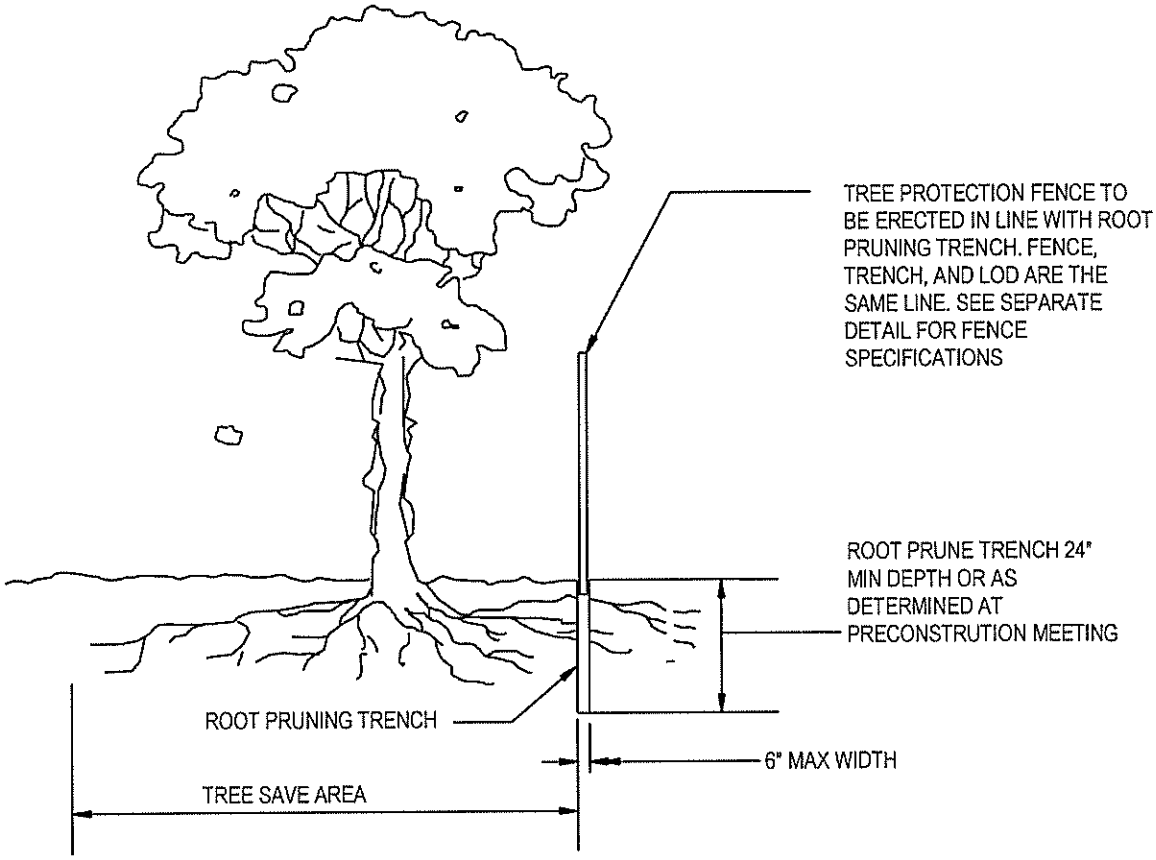


Notes:

1. Blaze orange or blue plastic mesh fence for forest protection device, only.
2. Boundaries of Retention Area will be established as part of the Forest Conservation Plan review process.
3. Stake and flag boundaries of Retention Area prior to installing device.
4. Avoid damage to critical root zone. Do not damage or sever large roots when installing posts.
5. Protection signs are required, see Figures E-1 and E-2.
6. Maintain device throughout construction.

Source: Adapted from Prince George's County, Maryland: Woodland Conservation Manual and State Forest Conservation Technical Manual, 1991

Figure E-9:
Root Pruning



Notes:

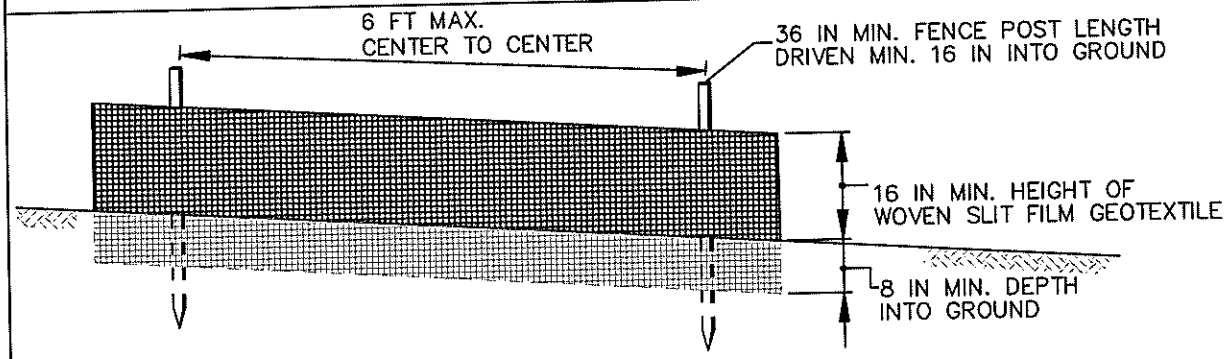
1. Retention areas to be established as part of the Forest Conservation Plan review process.
2. Stake, flag and/or fence boundaries of Retention Areas prior to trenching.
3. Exact location of trench to be identified on site.
4. Immediately backfill trench with excavated soil or replace with organic soil.
5. Cut roots cleanly using vibratory knife or other acceptable equipment.

Source: Adapted from Steve Clark & Associates/ACRT, Inc. and State Forest Conservation Technical Manual 1991

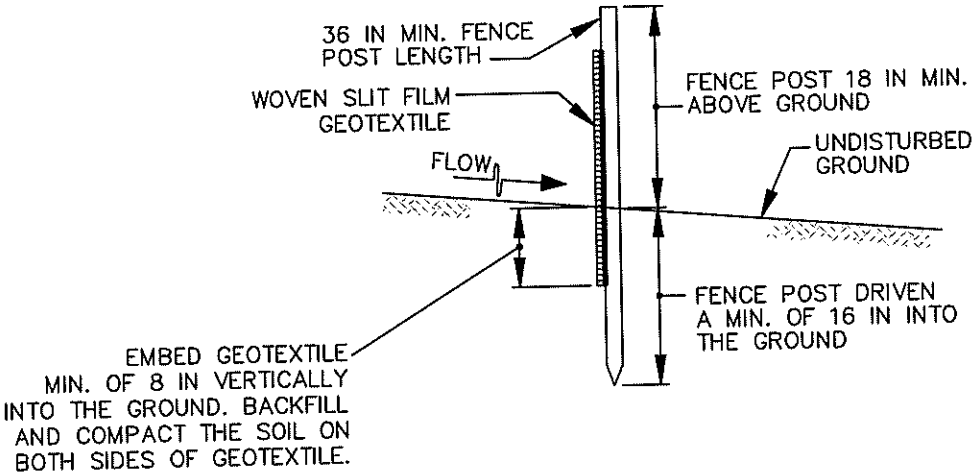
DETAIL E-1 SILT FENCE

STANDARD SYMBOL

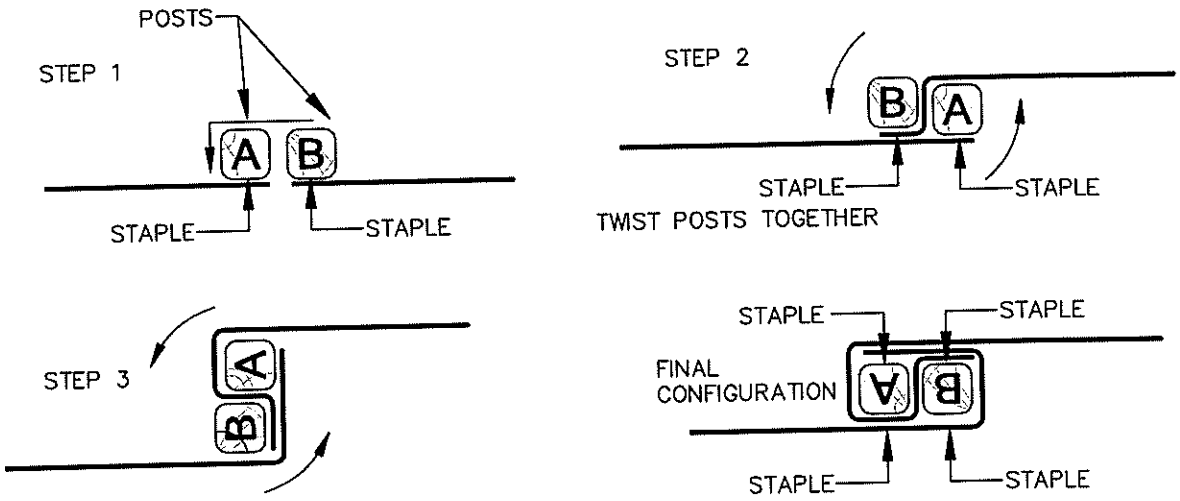
SF



ELEVATION



CROSS SECTION



JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

1 OF 2

DETAIL E-1 SILT FENCE

STANDARD SYMBOL

SF

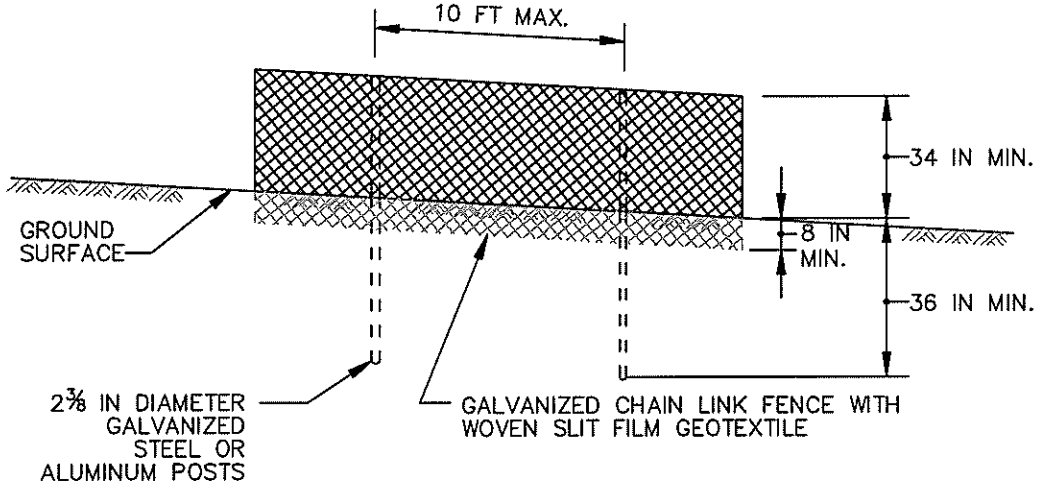
CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± 1/16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID–SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

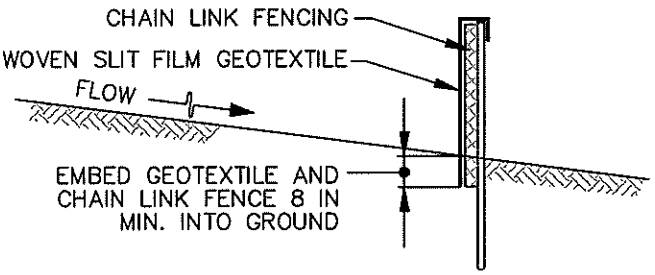
DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL

SSF



ELEVATION



CROSS SECTION

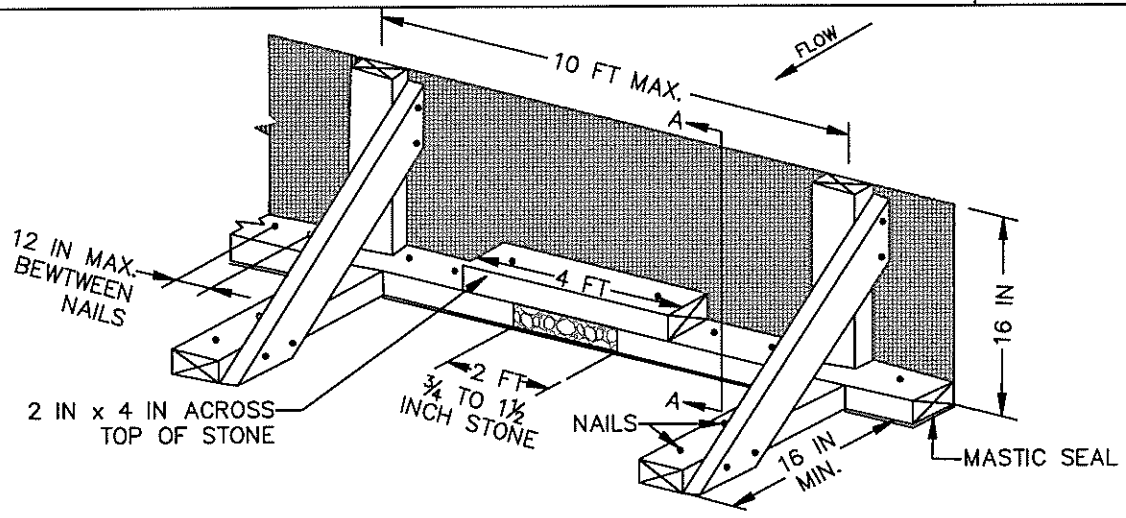
CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

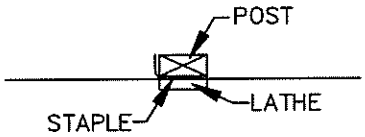
DETAIL E-2 SILT FENCE ON PAVEMENT

STANDARD SYMBOL

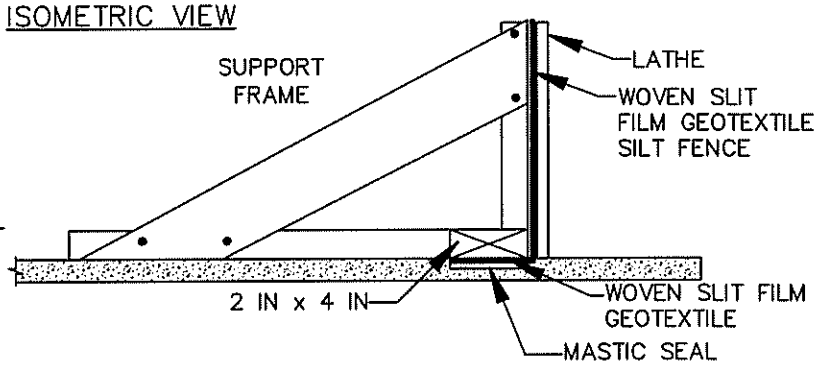
SFOP



ISOMETRIC VIEW



JOINING ADJACENT SECTIONS OF GEOTEXTILE



SECTION A–A

CONSTRUCTION SPECIFICATIONS

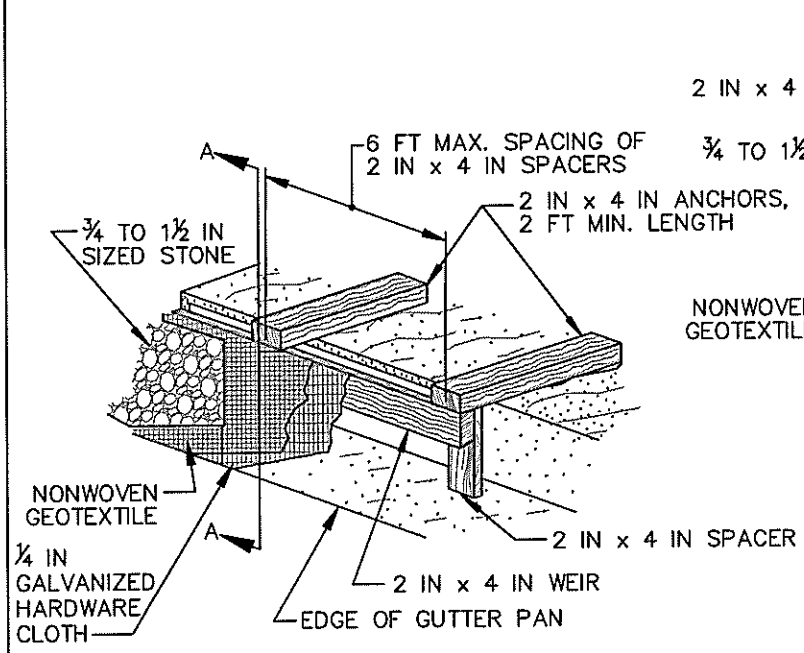
1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. USE WOVEN SLIT FILM GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS.
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
4. SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPSLOPE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT–LADEN WATER FROM ESCAPING BENEATH SILT FENCE INSTALLATION.
9. SECURE BOARDS TO PAVEMENT WITH 40D 5 INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.

DETAIL E-9-3 CURB INLET PROTECTION

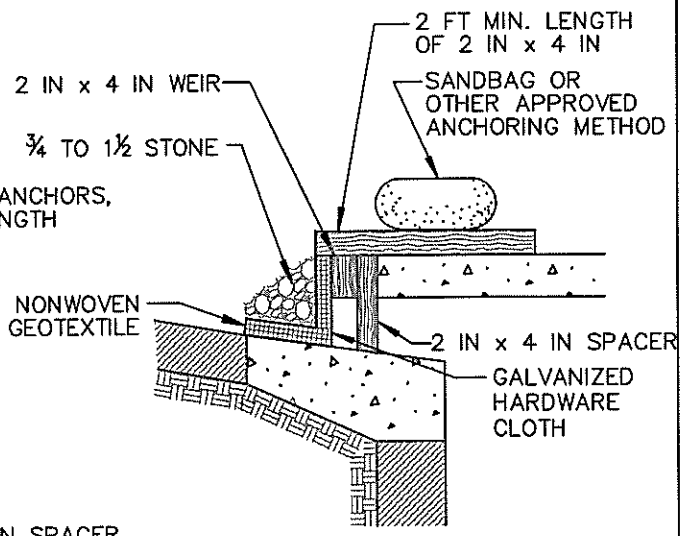
STANDARD SYMBOL

CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



ISOMETRIC



SECTION A—A

CONSTRUCTION SPECIFICATIONS

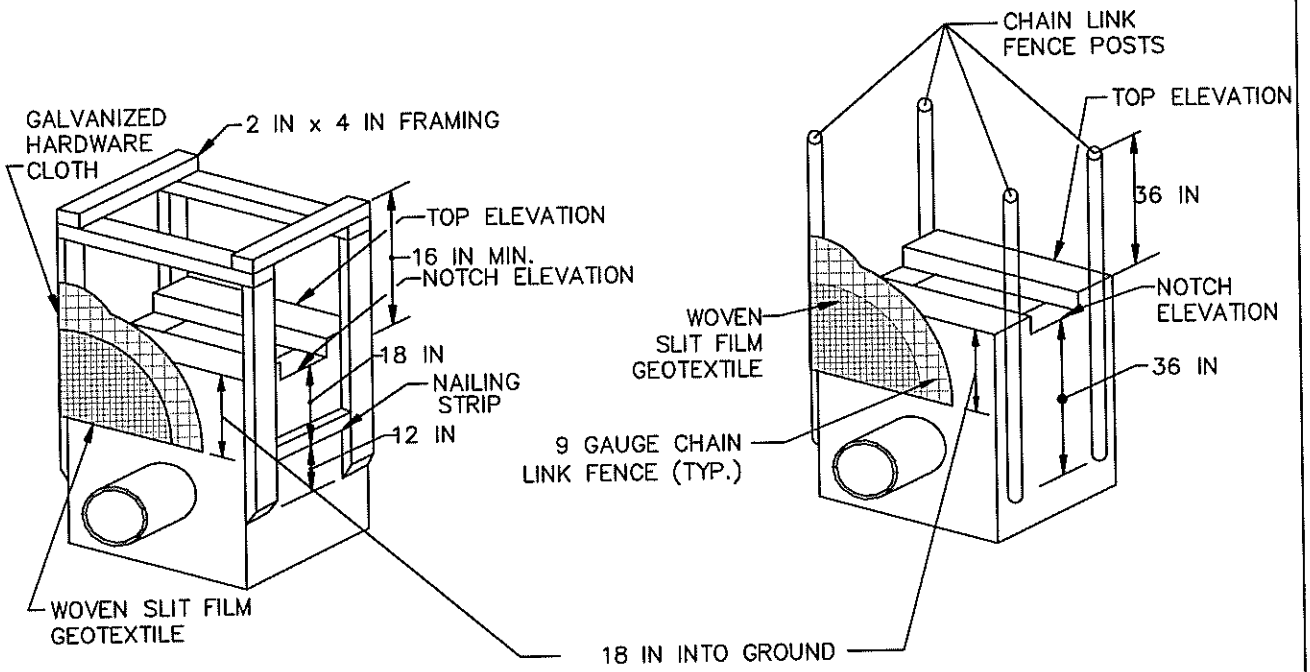
1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H—1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON—SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL

SIP

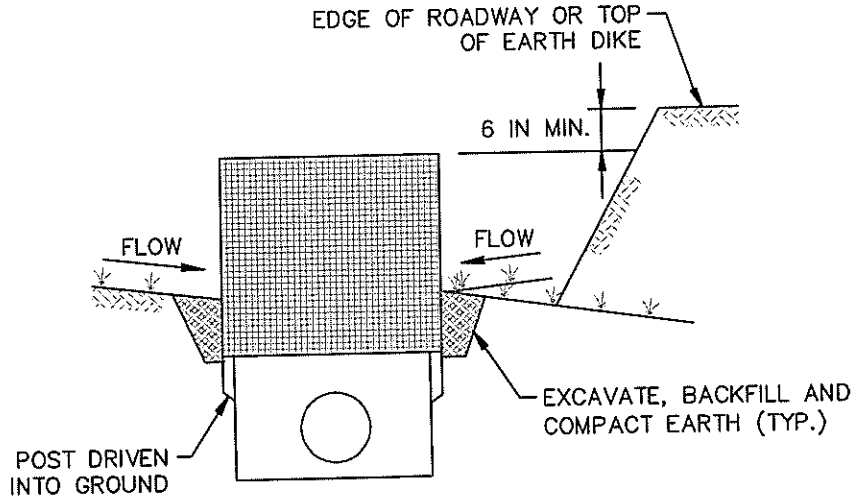
TYPE A MAXIMUM DRAINAGE AREA = ¼ ACRE
TYPE B MAXIMUM DRAINAGE AREA = 1 ACRE



TYPE A

TYPE B

ISOMETRIC VIEW



SECTION FOR TYPE A AND B

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL

SIP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.

2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.

3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.

4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.

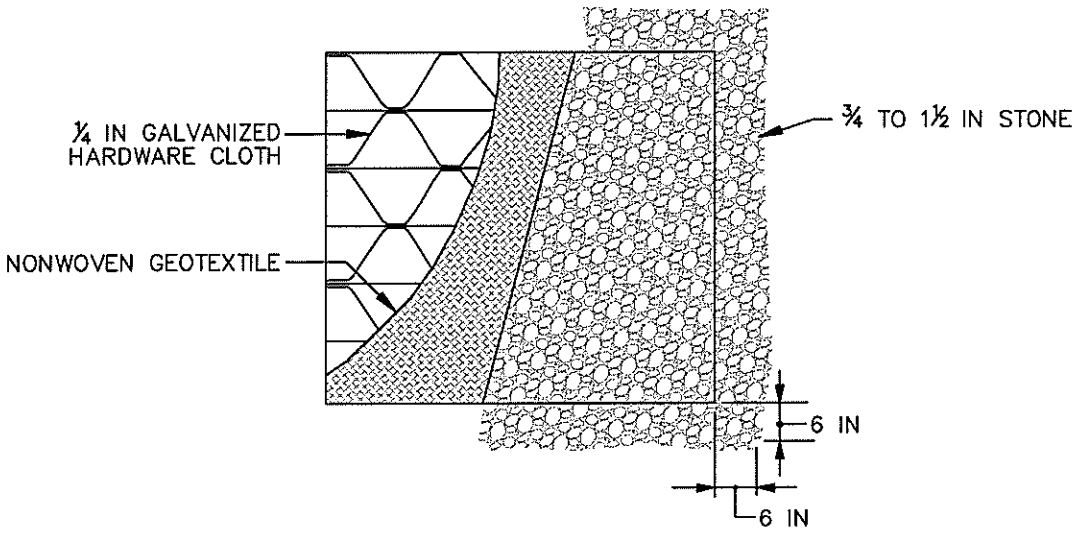
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

DETAIL E-9-2 AT-GRADE INLET PROTECTION

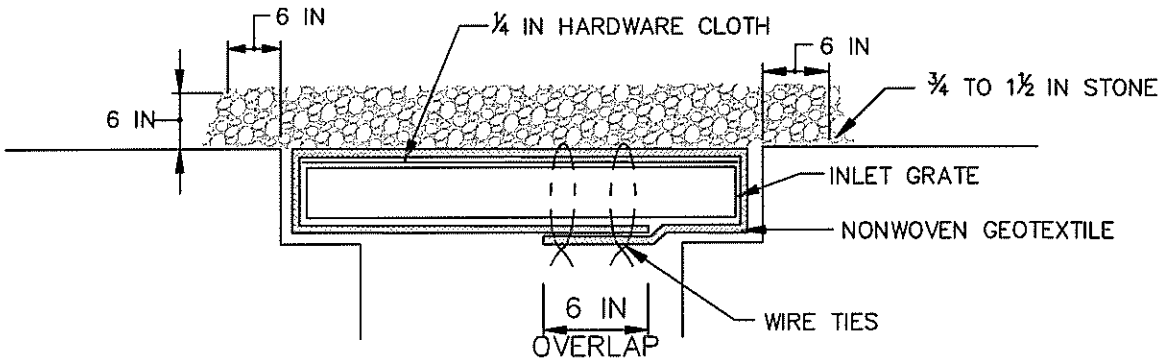
STANDARD SYMBOL

AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



PLAN / CUT AWAY VIEW



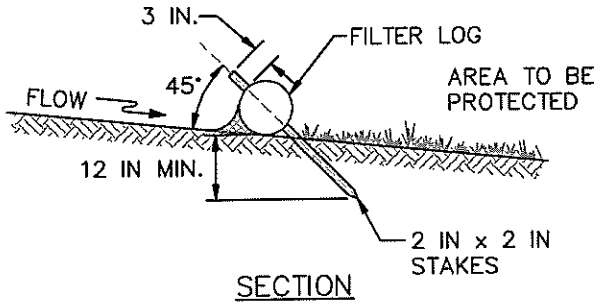
CROSS SECTION

CONSTRUCTION SPECIFICATIONS

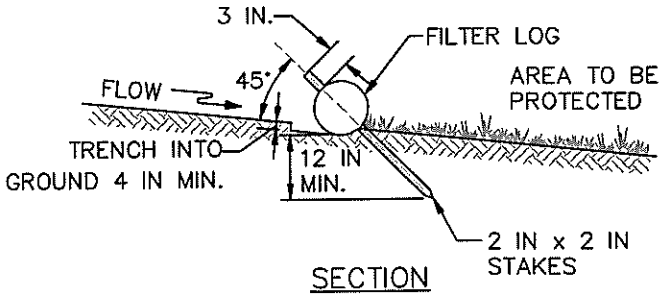
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

DETAIL E-6 FILTER LOG

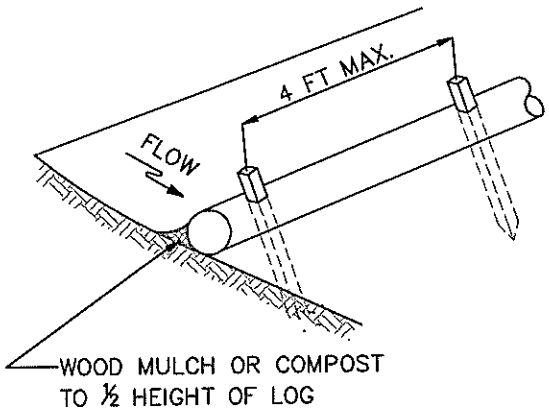
STANDARD SYMBOL
FL-18
DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.



SECTION

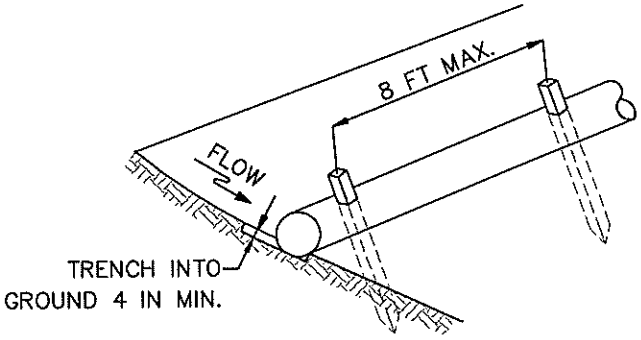


SECTION



UNTRENCHED INSTALLATION

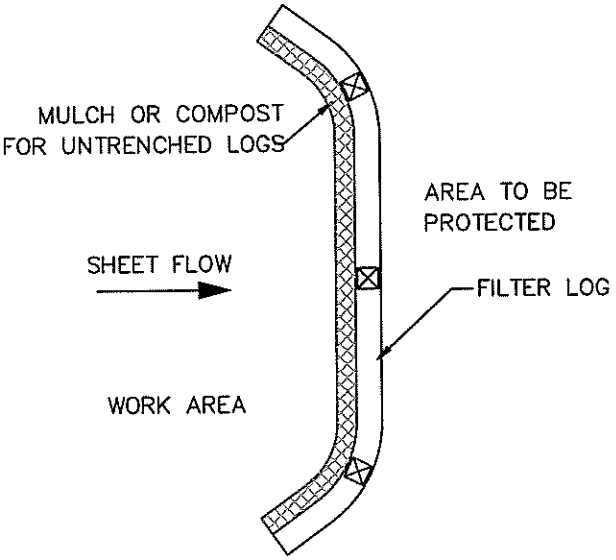
OR



ENTRENCHED INSTALLATION*

*THIS APPLICATION MAY NOT BE USED WITH LOGS SMALLER THAN 12 IN.

ISOMETRIC VIEW



PLAN

DETAIL E-6 FILTER LOG

STANDARD SYMBOL

FL-18

DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.

CONSTRUCTION SPECIFICATIONS

1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG NETTING UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF ½ THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

NOTES:

1. PRACTICE MAY BE COMBINED WITH SEDIMENT CONTROL FENCING, PER DIRECTION OF FORESTRY STAFF.

2. LOCATION AND LIMITS OF FENCING SHALL BE COORDINATED IN THE FIELD WITH FORESTRY STAFF.

3. BOUNDARIES OF PROTECTION AREA MUST BE STAKED PRIOR TO INSTALLING PROTECTIVE DEVICE.

4. ROOT DAMAGE SHOULD BE AVOIDED. ROOT PRUNING TO OCCUR PRIOR TO OR IN CONJUNCTION WITH INSTALLATION, AS SHOWN ON FCP PLAN OR PER DIRECTION OF FORESTRY STAFF.

5. PROTECTIVE SIGNAGE IS REQUIRED.

6. FENCING SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. REMOVAL WITH APPROVAL BY CITY FORESTRY STAFF.

STANDARD SYMBOL

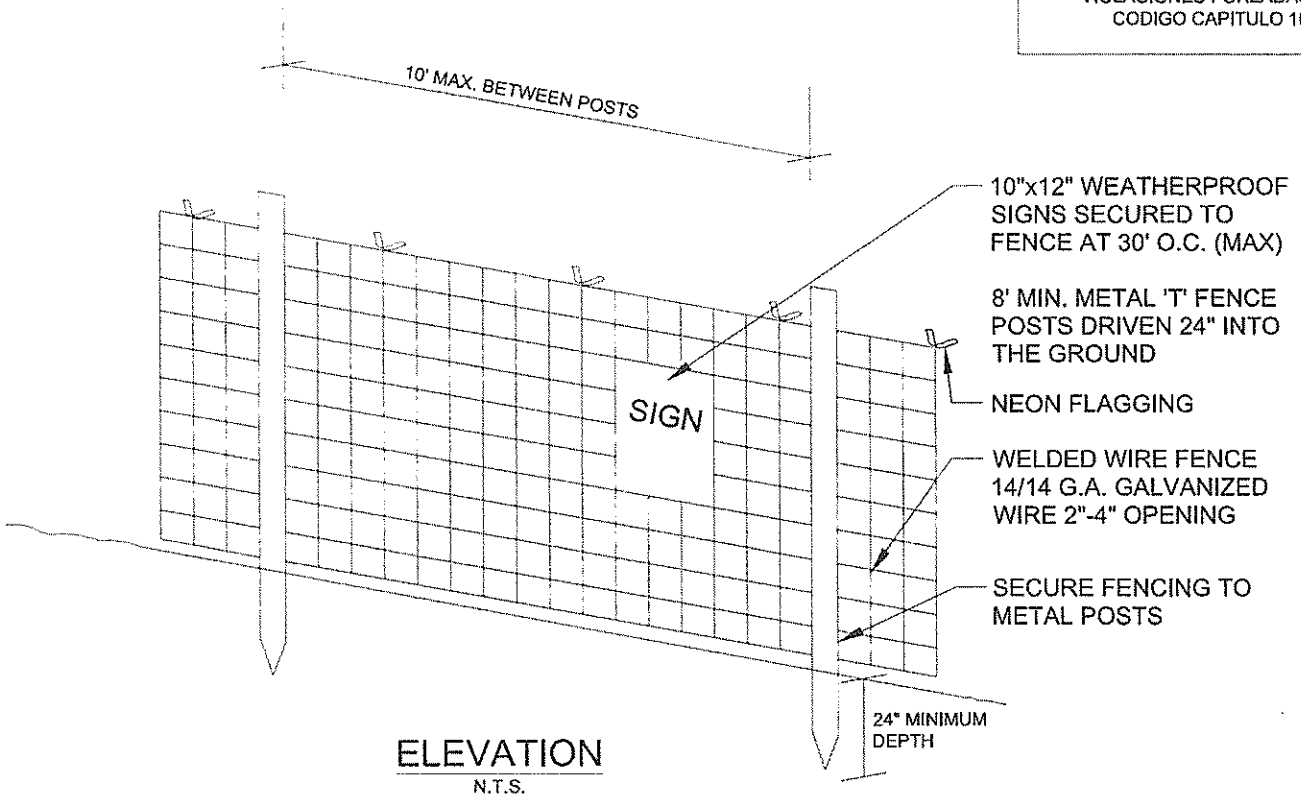
——TPF —— TPF ——

TREE PROTECTION AREA

NO DISTURBANCE OR ACCESS PERMITTED BEYOND THIS POINT
VIOLATIONS ENFORCED PER CITY CODE CHAPTER 10.5

AREA DE PROTECCION DE ARBOLES

NINGUN DISTURBIO O ACCESO PERMITIDO MAS ALLA DE ESTA PUNTO
VIOLACIONES FORZADAS POR CODIGO CAPITULO 10.5



ELEVATION
N.T.S.

ROCKVILLE · MARYLAND

APPROVED BY: W C Wolf
CITY FORESTER

DATE: 3/30/17

TREE PROTECTION FENCE DETAIL

DETAIL
A-6

NOTES:

1. RETENTION AREAS WILL BE SET AS PART OF THE REVIEW PROCESS AND PRECONSTRUCTION MEETING.

2. BOUNDARIES OF RETENTION AREAS MUST BE STAKED AT THE PRECONSTRUCTION MEETING AND FLAGGED PRIOR TO ROOT PRUNING.

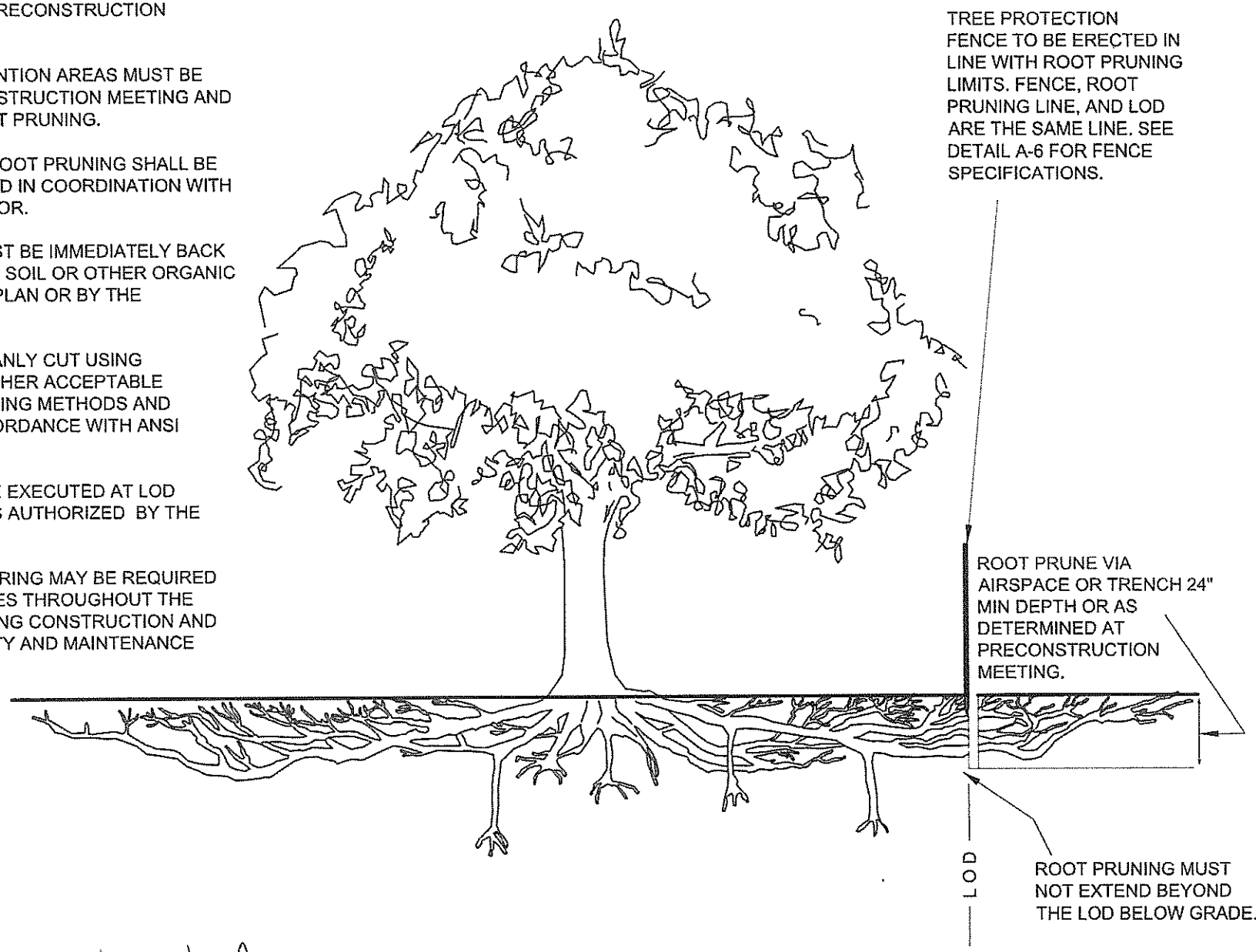
3. EXACT LOCATION OF ROOT PRUNING SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FORESTRY INSPECTOR.

4. EXCAVATED AREA MUST BE IMMEDIATELY BACK FILLED WITH EXCAVATED SOIL OR OTHER ORGANIC SOIL AS SPECIFIED PER PLAN OR BY THE FORESTRY INSPECTOR.

5. ROOTS SHALL BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT. ROOT PRUNING METHODS AND MEANS MUST BE IN ACCORDANCE WITH ANSI STANDARD A3000.

6. ALL PRUNING MUST BE EXECUTED AT LOD SHOWN ON PLANS OR AS AUTHORIZED BY THE FORESTRY INSPECTOR.

7. SUPPLEMENTAL WATERING MAY BE REQUIRED FOR ROOT PRUNED TREES THROUGHOUT THE GROWING SEASON DURING CONSTRUCTION AND SUBSEQUENT WARRANTY AND MAINTENANCE PERIOD.



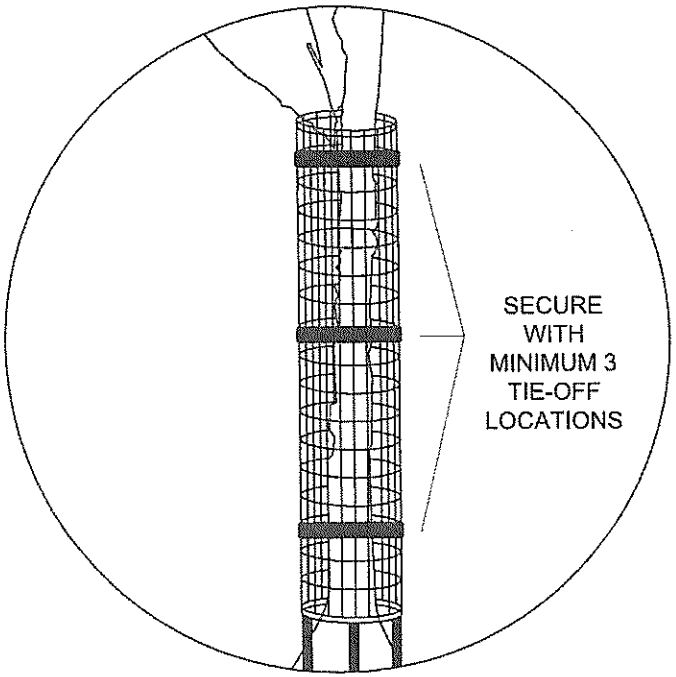
ROCKVILLE · MARYLAND

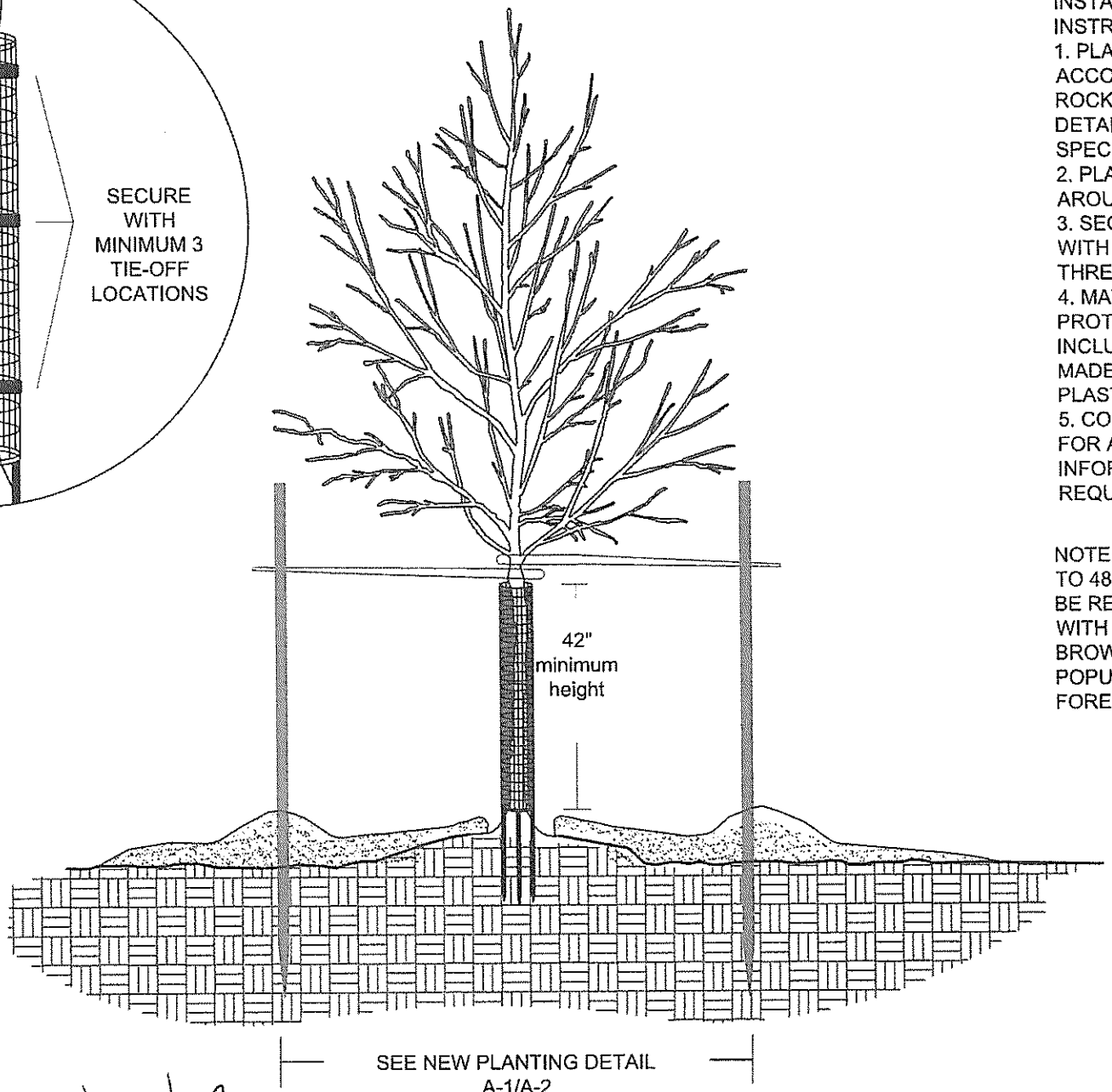
APPROVED BY: W G Wall
CITY FORESTER

DATE: 3/30/17

ROOT PRUNING DETAIL

DETAIL
A-3





INSTALLATION INSTRUCTIONS:
1. PLANT TREE ACCORDING TO CITY OF ROCKVILLE STANDARD DETAIL A-1/A-2 SPECIFICATION.
2. PLACE THE SHELTER AROUND THE TREE.
3. SECURE PROTECTION WITH A MINIMUM OF THREE TIES
4. MATERIALS FOR PROTECTION MAY INCLUDE: MESH CAGE MADE FROM WIRE, PLASTIC OR WOOD.
5. CONSULT FORESTRY FOR ADDITIONAL INFORMATION IF REQUIRED.

NOTE; WIRE CAGES UP TO 48" IN DIAMETER MAY BE REQUIRED IN AREAS WITH HEAVY DEER BROWSE OR BEAVER POPULATIONS, PER FORESTRY STAFF.

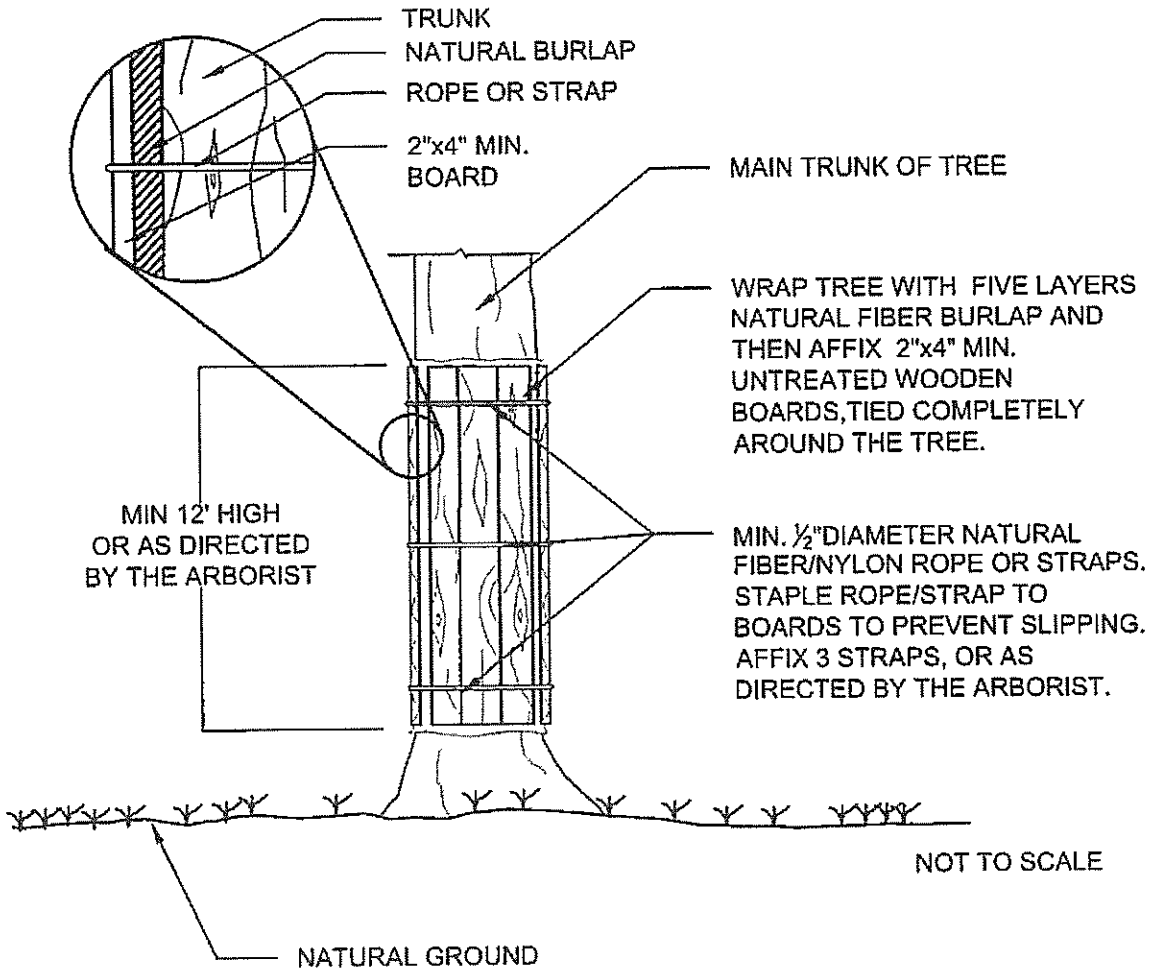
ROCKVILLE · MARYLAND

APPROVED BY: W C Wall
CITY FORESTER

DATE: 3/30/17

DEER RUB PROTECTION DETAIL

DETAIL
A-5



NOTES:

1. COMPLETE ALL INSTALLATION UNDER THE DIRECTION OF A CERTIFIED ARBORIST.
2. DO NOT DIRECTLY FASTEN PLANKS TO TREES.
3. DO NOT PIN OR STAKE PLANKS INTO THE GROUND.
4. INSTALL PLANKING COMPLETELY AROUND THE TREE. DO NOT PLACE PLANKING BOARDS ON ROOT FLARE OF TREE.
5. TIE BOARDS WITH 1/2" DIAMETER ROPE OR STRAPS SUFFICIENT TO PROTECT THE TREE DURING CONSTRUCTION.
6. WHERE SIGNIFICANT TREE BRANCHES EXIST WHICH PREVENT PLANK INSTALLATION, PLANKING SHALL EXTEND TO THE ELEVATION OF THE LOWEST BRANCH.

APPROVED BY: W C Wall

DATE: 1/11/18

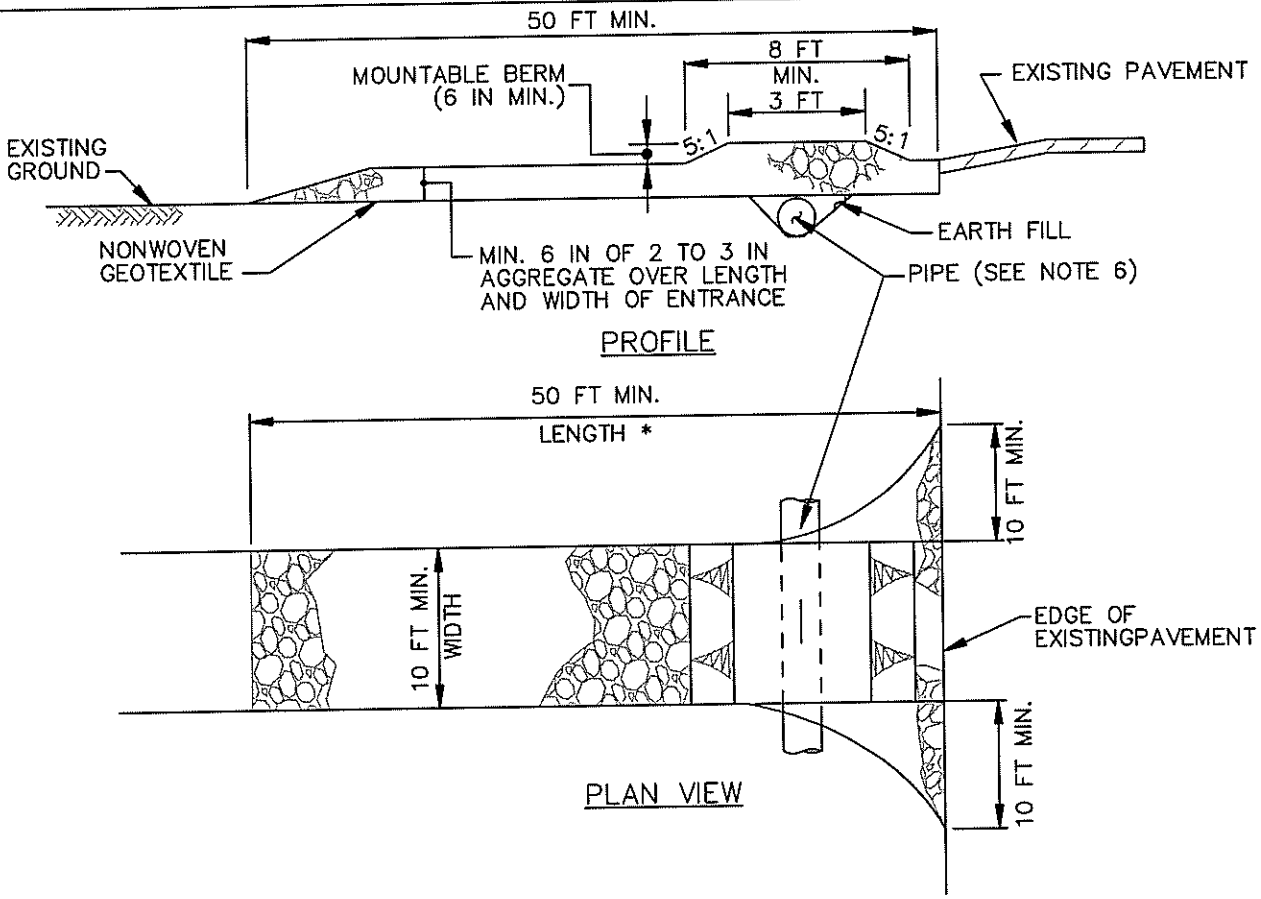
TRUNK PROTECTION DETAIL

DETAIL
A-10

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL

SCE



CONSTRUCTION SPECIFICATIONS

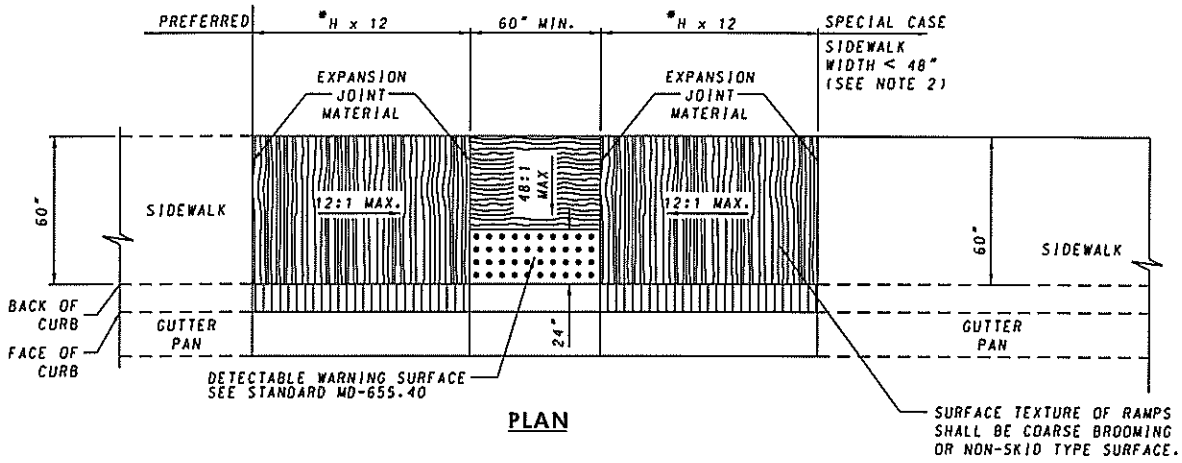
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.

2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.

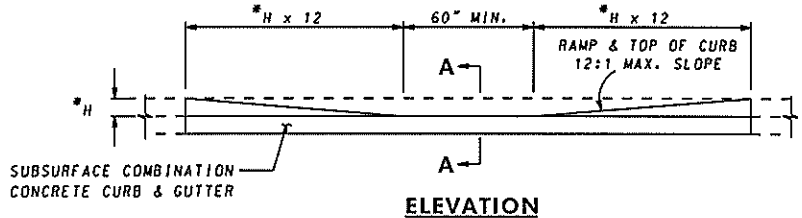
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS.

4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.

5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

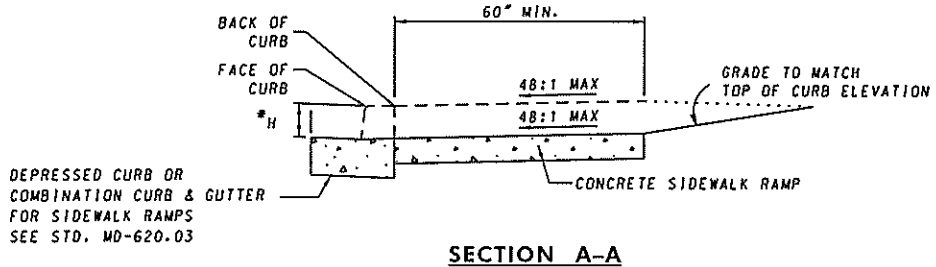


PLAN



ELEVATION

* - H = HEIGHT OF CURB
ALL MEASUREMENTS IN INCHES



SECTION A–A

NOTES

1. TO BE USED WHERE SIDEWALK IS ADJACENT TO THE CURB. THIS STANDARD MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION.
2. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, A DESIGN WAIVER MUST BE REQUESTED.
3. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
4. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
5. SIDEWALK RAMP SHALL BE INCLUDED IN PRICE BID FOR CONCRETE SIDEWALK. DEPRESSED CURB AND CURB TRANSITION SHALL BE INCLUDED IN PRICE BID FOR CURB OR CURB & GUTTER ADJACENT TO SIDEWALK RAMP. DETECTABLE WARNING SURFACE SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 611 OF THE SPECIFICATIONS.
6. SIDEWALK RAMPS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED RAMP VARIES FROM STANDARD CASES.

SPECIFICATION	CATEGORY CODE ITEMS
603 & 611	

APPROVED: Kirk G. McCall
DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	2-10-04	3-31-04
REVISED	3-25-08	4-5-06
REVISED		
REVISED		

SHA State Highway Administration

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION

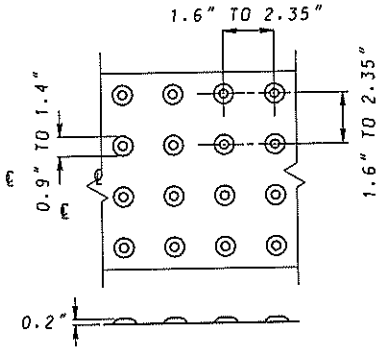
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

SIDEWALK RAMPS PARALLEL

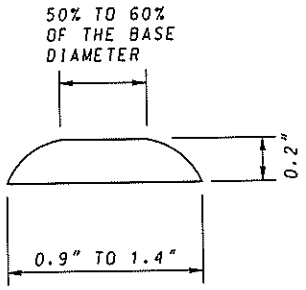
STANDARD NO. *MD 655.12*

MAT DETAILS

SEE PLACEMENT GUIDELINES BELOW

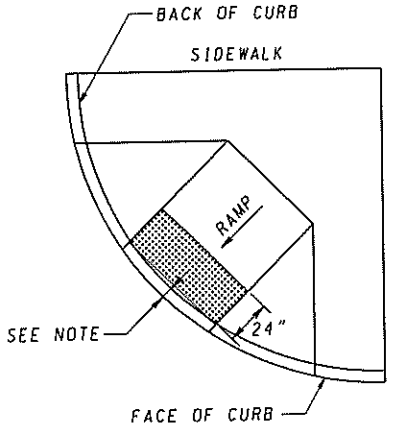


DOME SPACING

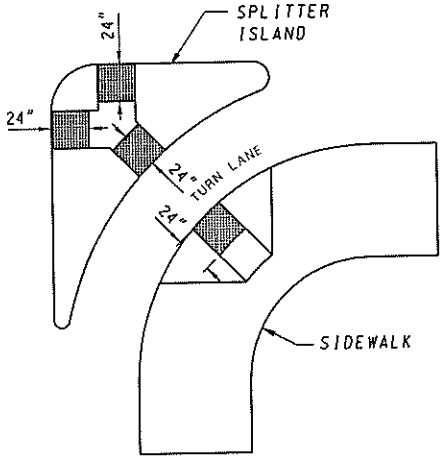


DOME SECTION

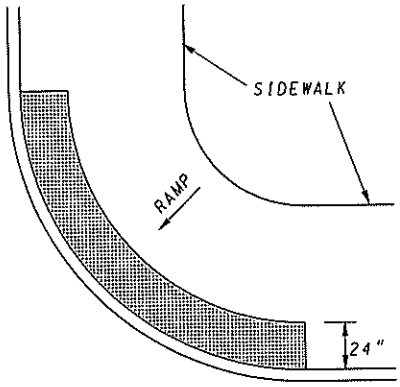
PLACEMENT GUIDELINES



SHARED CURB RAMP



REFUGE ISLAND



BLENDED CURB

WHERE ISLANDS OR MEDIANS ARE LESS THAN 6 FEET WIDE, THE DETECTABLE WARNING SHOULD EXTEND ACROSS THE FULL LENGTH OF THE CUT THROUGH THE ISLAND OR MEDIAN

NOTES

1. THE DETECTABLE WARNING SURFACE SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 6 TO 8 INCHES FROM THE FACE OF CURB.
2. FOR SKEWED APPLICATIONS DETECTABLE WARNING SHALL BE PLACED SUCH THAT THE DOMES CLOSEST TO THE BACK OF CURB ARE NO LESS THAN 0.5" AND NO MORE THAN 3.0" FROM THE BACK OF CURB. TRUNCATED DOME SURFACES SHALL BE FABRICATED TO PROVIDE FULL DOMES ONLY.
3. DETECTABLE WARNING SURFACE SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 611 OF THE SPECIFICATIONS.
4. DETECTABLE WARNING SURFACES ARE REQUIRED AT STREET CROSSING & SIGNALIZED INTERSECTIONS.

SPECIFICATION 611	CATEGORY CODE ITEMS
APPROVED	DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

APPROVAL • SHA REVISIONS		APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL	2-10-04	APPROVAL	3-31-04
REVISED	4-17-06	REVISED	4-5-06
REVISED		REVISED	
REVISED		REVISED	

SHA State Highway Administration

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

DETECTABLE WARNING SURFACES

STANDARD NO. MD 655.40

Gravelpave^2

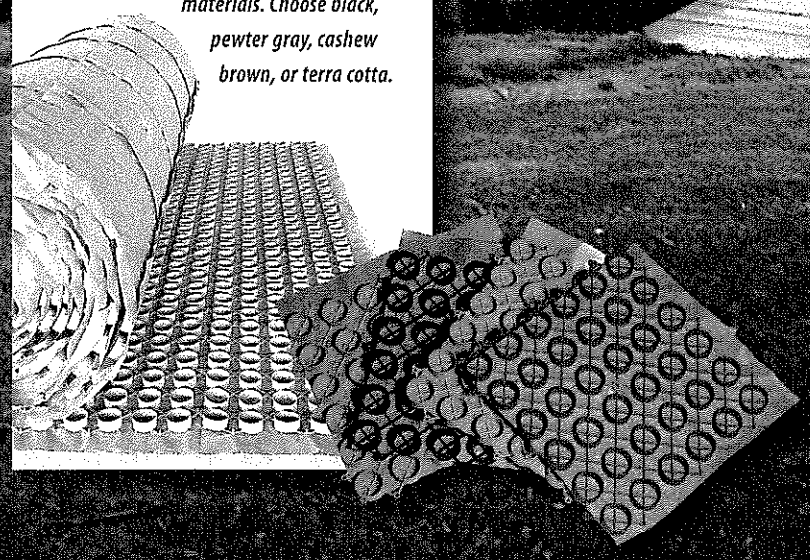
Gravelpave^2 has been used for high traffic porous parking areas since 1993 — banks, fast food restaurants, colleges, and residential driveways. 100% recycled plastic rings are molded onto non-woven geotextile filter fabric. The rings become invisible or camouflaged by the decorative gravel which is "contained" for a smooth, well-dressed finish. Large rolls of Gravelpave^2 make installation of trails or parking lots quick and easy.

Gravel base course, depth specified by a soils engineer, is laid underneath to bear vehicle loading. Gravelpave^2 is unrolled and fastened together with washers included, then filled with decorative gravel of minus 5mm (3/16") using a front end loader and rakes. Settling of fill gravel can be done by either compacting with a roller or irrigating with water.

U.S. Patent No. 5,123,778

Porous Paving for High Use Areas

Colorful Gravelpave^2 selections blend well with a variety of stones and other granular materials. Choose black, pewter gray, cashew brown, or terra cotta.

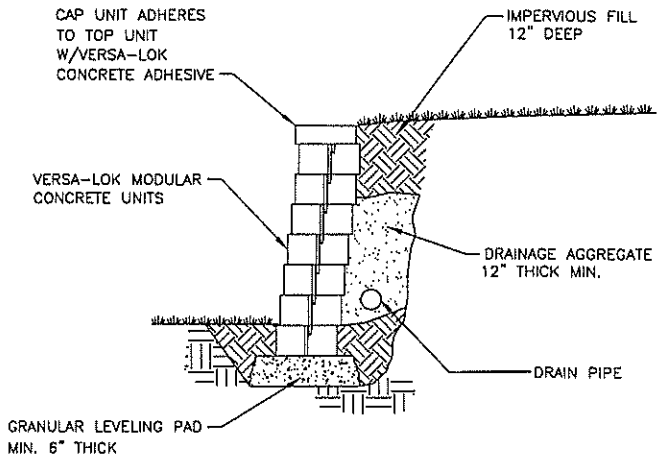


Gravelpave^2 parking lot used daily at Frostburg State College in Maryland. This 15,000-square-foot parking lot is permeable to water, thus allowing all the water that falls on site to percolate back into the soil. Water tables are naturally replenished and age-old trees are preserved while the function of parking is served.

VERSA-LOK®
Retaining Wall Systems
Solid Solutions.™

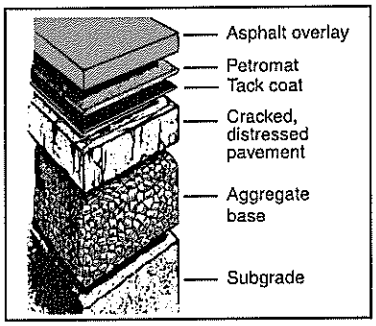
GRAVITY WALLS (UNREINFORCED)

This typical cross-section illustrates components of a gravity wall. The maximum unreinforced height of VERSA-LOK® walls varies with soil and loading conditions. Generally, with level backfill, good soils and no extra loads, gravity walls are stable to heights of four feet.

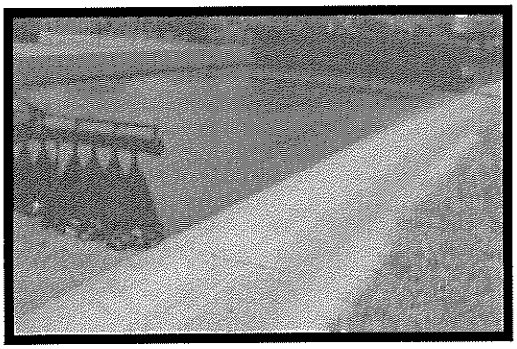


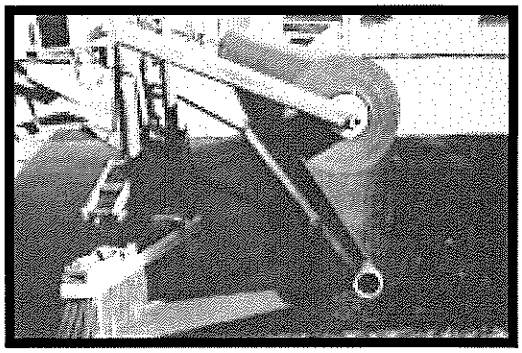
Petromat®

Introduction



The Amoco Petromat® System extends the life of new asphalt concrete (AC) pavements and AC overlays. The Petromat System consists of Amoco's Petromat non-woven polypropylene fabric which is field saturated with an asphalt cement tack coat. When placed between pavement layers, the Petromat system becomes an integral part of the roadway section, forming a barrier to water infiltration and absorbing stresses to reduce reflective and fatigue cracking of the new AC surface layer. Since 1965, the economical Petromat System has had an outstanding record of improving pavement performance while reducing maintenance and roadway life-cycle costs. Paving fabric systems are currently being used at a rate of over 15,000 equivalent lane miles per year in North America alone.





Benefits

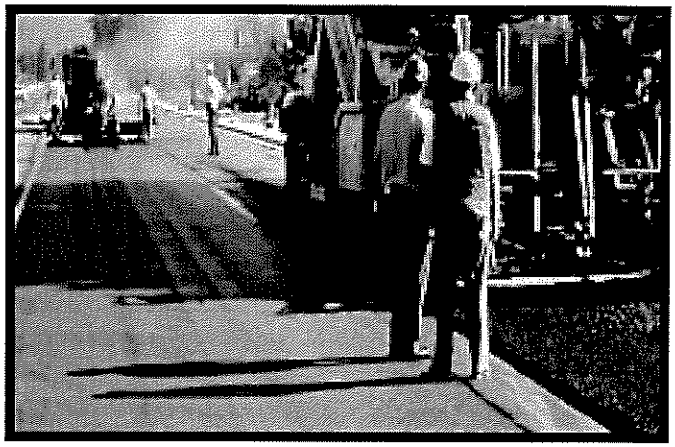
➢ Moisture Barrier

Function: The greatest source of damaging water in road structural sections is precipitation infiltration through pavements. Most pavements do not have adequate drainage systems to quickly remove infiltrated water. If a pavement base is saturated as little as 10% of the time, the useful life of that pavement will be reduced by 50 %. The Petromat fabric, when saturated with the asphalt cement tack coat, becomes a moisture barrier in the pavement, minimizing surface water infiltration. The American Association of Highway and Transportation Officials (AASHTO) 1993 flexible pavement design methodology gives a substantial structural credit to unbound roadbase materials when they are well drained and not allowed to become saturated. By minimizing water infiltration, the Petromat System moisture barrier will keep the road base more well drained and will therefore maximize the structural strength of unbound roadbase materials.

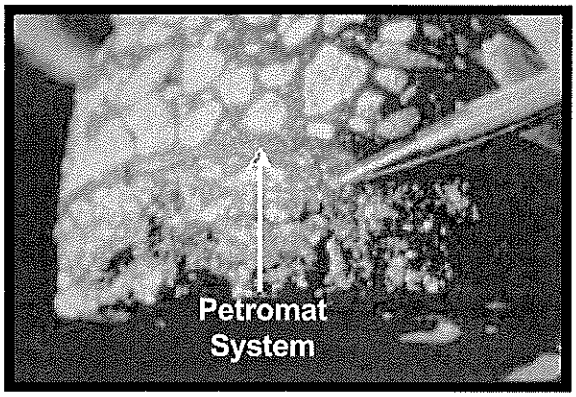
AMOCO GEOTEXTILES

Amoco Fabrics and Fibers Company

In rehabilitation of an existing pavement, capping the surface with the Petromat System can be a much more efficient and cost effective way to control moisture problems than retrofitting edge drain systems to typically poor draining road bases.



Performance: Both laboratory and field testing have shown pavements to be 10 to 1000 times less permeable when the Petromat System is incorporated as an interlayer. A complete treatise on the need for pavement moisture control and the effectiveness of paving fabric systems as moisture barriers may be found as a Transportation Research Board (TRB) Circular and is summarized as Tech Note 4 by Amoco Fabrics and Fibers Company. The circular, EC006, may be found on the TRB web site as an online publication at "http://www.nas.edu/trb/publications/ec006.html". Also shown in the referenced paper is the need for a uniform application of the proper amount of asphalt cement tack coat for the Petromat System to achieve the desired very low permeabilities.

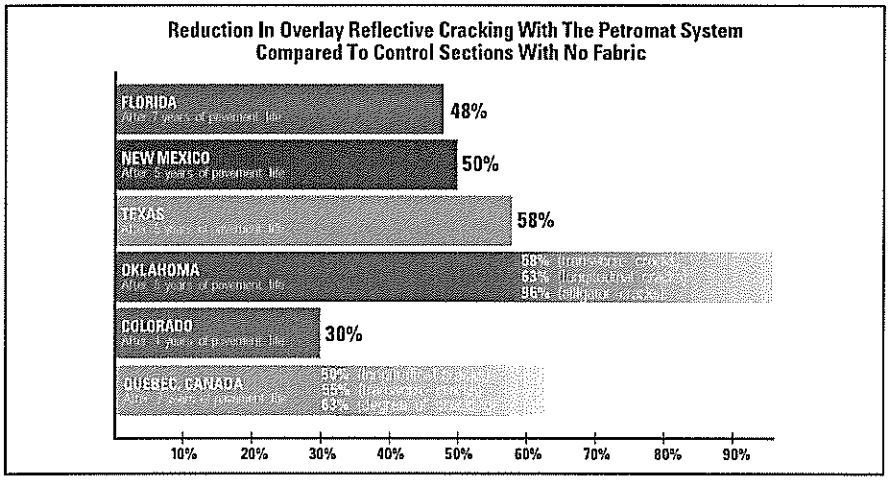


➢Stress Absorbing Interlayer

Function: Petromat paving fabric, saturated with asphalt cement, forms a substantial interlayer media within which stresses can be absorbed. Stresses associated with limited movement along cracks and joints in existing AC or Portland cement concrete (PCC) pavements are absorbed within the paving fabric system and therefore, are not translated, or reflected, up into the asphalt concrete layer over the system. If there is excessive movement of existing cracks or joints, there are more robust membrane interlayer products available, such as, Petrotac®, Pro-Guard®, or PetroGrid™, for pavement treatment.

Asphalt concrete flexible pavements will eventually develop fatigue cracking due to tensile stresses while flexing. The inclusion of the Petromat System interlayer results in a layered pavement with greatly reduced tensile stresses compared to monolithic pavements with no interlayer. The result is a dramatic increase in the fatigue life of new pavements or overlays.

Performance: Laboratory simulation of comparable pavements both with and without the Petromat System interlayer indicated a 100 to 300% increase in the number of pavement load applications before fatigue or reflective cracking appeared over the Petromat System. Field performance indicates a 50 to 150% increase in overlay life before fatigue or reflective cracking occurs in overlays over the Petromat System versus control sections with no fabric. A comprehensive study, Maxim Technologies (1997), which examined available paving fabric research and empirical evidence, concluded that properly applied paving fabric systems, such as the Petromat System, equate to an additional 0.1 to 0.15 foot (3 to 4.4 cm) thickness of AC overlay for the retardation of reflective cracking. The study, which can be viewed at "http://www.gmanow.com/techdoc/doc1.html/docindex.html", cited both the moisture barrier environmental benefits and the stress absorbing interlayer functions as the reasons for the success of paving fabric systems. Widespread field evaluations have verified the effectiveness of the Petromat System as shown below:



Petromat, Number One In The Business

Petromat, the original paving fabric, is the most widely used paving fabric in the world for the following reasons:

➢Fabrics Designed Specifically For Pavement Application:

- a heat set side on top to minimize asphalt cement tack coat bleed-through and to protect against damage from construction traffic,
- a special blend of fiber sizes to promote rapid, uniform tack coat saturation and to give the interlayer stability while holding the asphalt cement in place indefinitely, and
- an engineered amount of stretch to ease installation while maintaining stability.

- **Choice of Styles:** Petromat styles 4598 and 4599 are the most widely recommended and used paving fabrics. Style 4598 meets the requirements of AASHTO guideline specification M-288-96.
- **Cost-effective**: The installed cost of the Petromat System(fabric and asphalt cement tack coat) is typically less than half the cost of 0.1 foot (3cm) of AC. For extending pavement life, the installation of the Petromat System is therefore much less expensive than placing additional asphalt concrete or increasing roadway maintenance. Use of paving fabrics generally yields a savings in pavement rehabilitation system costs of more than $7,000 per lane mile.
- **Versatile**: The Petromat System is effective within new AC pavements, below AC overlays over rigid and flexible pavements, and below surface treatment(chip-seal) pavements. It can improve the performance of highways, city streets, parking areas, airport pavements, bridge decks and other pavement surfaces.
- **Made by Amoco:** A pioneer in the paving fabrics and geotextiles, Amoco provides customers with quality products, a wealth of technical information and assistance, and the nation's most extensive and knowledgeable distributor network. If you have any questions or need technical assistance, please call us at 800-445-SPEC (7732).

Installation

Detailed information on installation of Petromat paving fabrics can be found in the Amoco Petromat Installation Guide.

Published Reports

Majidzadeh, K., *A Laboratory Investigation of Use of Petromat for Optimization of Pavement Performance*, Ohio State University, Nov 1976.

State of California, *Evaluation of Paving Fabric Test Installations in California*, Report No. FHWA/CA-90/02, CALTRANS, Deptartment of Transportation, Feb. 1990.

State of Florida, *Reduction of Reflective Cracking in Bituminous Overlays, Payne's Prairie Experimental Project*, Florida Department of Transportation, Office of Materials & Research, Research Report 176-A, State Project No. 26260-8426, June 1977.

State of New Mexico, *New Mexico Study of Interlayers Used in Reflective Crack Control*, New Mexico State Highway Department, Research Report MB-RR-84/1, Sept. 1984.

State of Oklahoma, The Evolution of Non-Woven Fabrics, Oklahoma Department of Transportation, Research & Development Divison, Report No. FHWA/OK 82(6), May 1982.

State of South Carolina, *Evaluation of Petromat When Used With Bituminous Surface Treatment*, South Carolina Department of Highways & Public Transportation, Research & Materials laboratory, In-House Study 82-5, Dec. 1990.

State of Texas, *Overlay Construction and Performance Using Geotextiles*, Texas Transportation Institute, Texas A&M University System, Paper No. 880424, Jan. 1989.

State of Virginia, *Control of Reflection Cracking in a Fabric-Reinforced Overlay on Jointed Portland Cement Concrete Pavement*, Virginia Highway & Transportation Research Council, VHTRC 83-R8, Aug. 1982.

City of Verdun, Quebec Canada, *Paving Fabric Repairs Road in Severe Canadian Climate*, Oct. 1995.

Maxim Technologies, Inc., *"Nonwoven Paving Fabrics Study"* for Industrial Fabrics Association International, Oct. 1997.
http://www.gmanow.com/techdoc/doc1.htm/docindex.html

Marienfeld, M.L. and Baker, T.L., *Paving Fabric Interlayer System as a Pavement Moisture Barrier*, Transportation Research Board Paper # 9881112, 1998.
http://www.nas.edu/trb/publications/ec006.html

Amoco Fabrics and Fibers Company
260 The Bluffs
Austell, GA 30168
770-944-4569 800-445-7732
770-944-4584 - fax
email address: geotextiles@bp.com
http://www.geotextile.com
Part of the BP Amoco Group

PAVING FABRIC GUIDE SPECIFICATION

DESCRIPTION This work shall consist of furnishing and placing an asphalt overlay geotextile (paving fabric) beneath a pavement overlay or between pavement layers to provide a moisture barrier membrane and a stress absorbing interlayer.

MATERIAL REQUIREMENTS

Paving Fabric: will be a staple fiber, needle-punched, nonwoven material consisting of at least 85 percent by weight polyolefins, polyesters or polyamides. The paving fabric shall be resistant to chemical attack, rot and mildew and shall have no tears or defects that will adversely alter its physical properties. The fabric shall be specifically designed for pavement applications and be heat-set on one side to reduce tack coat bleed-through and to minimize fabric pick-up by construction equipment during installation. The fabric shall meet the physical requirements specified in Table 1.

Tack Coat: The tack coat used to impregnate the fabric and bond the fabric to the pavement is typically the same grade asphalt cement as used in the hot mix asphalt. A cationic or anionic emulsion may be used as approved by the Engineer. The Contractor shall follow the recommendations of the paving fabric manufacturer when an asphalt emulsion is used. The use of cutbacks or emulsions that contain solvents shall not be permitted.

CONSTRUCTION AND INSTALLATION REQUIREMENTS*

Shipping and Storage: The paving fabric shall be kept dry and wrapped such that it is protected from the elements during shipping and storage. If stored outdoors, the fabric shall be elevated and protected with a waterproof cover. The paving fabric shall be labeled in accordance with ASTM D 4873-88, "Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls."

Weather Limitations: The air and pavement temperatures shall be at least 50°F(10 °C) and rising for placement of asphalt cement and shall be at least 60°F(16 °C) and rising for placement of asphalt emulsion. Neither asphalt tack coat nor paving fabric shall be placed when weather conditions are not suitable, in the opinion of the Engineer.

Surface Preparation: The pavement surface shall be dry and thoroughly cleaned of all dirt and oil to the satisfaction of the Engineer. Cracks 1/8" (3mm) wide or greater shall be cleaned and filled with suitable bituminous material or by a method approved by the Engineer. Crack-filling material shall be allowed to cure prior to placement of paving fabric. Potholes and other pavement distress shall be repaired. Repairs shall be performed as directed by the Engineer.

Tack Coat Application: The tack coat shall be applied using a calibrated distributor spray bar. Hand spraying, squeegee and brush application may be used in locations where the distributor truck cannot reach. Every effort shall be made to keep hand application to a minimum. The tack coat shall be applied uniformly to the prepared, clean, dry pavement surface. The asphalt cement tack coat application rate must be sufficient to saturate the fabric and to bond the fabric to the existing pavement surface. The tack coat application rate shall be 0.22 to 0.28 gallons per square yard (1.0 to 1.3 liters per square meter) as required by the roadway surface and environmental conditions. When using emulsions, the application rate must be increased as directed by the Engineer to offset the water content of the emulsion. Within street intersections, on steep grades or in other zones where vehicle braking is common, the normal application rate shall be reduced by about 20 percent as directed by the Engineer, but to not less than 0.20 gallons per square yard (0.9 liters per square meter).

The temperature of the tack coat shall be sufficiently high to permit a uniform spray pattern. For asphalt cements, the minimum temperature shall be 290°F(143 °C). To avoid damage to fabric, distributor tank temperatures shall not exceed 325°F(163 °C). For asphalt emulsions, the distributor tank temperatures shall be maintained between 130°F(55 °C) and 160°F(71 °C).

The target width of the tack coat application shall be equal to the paving fabric width plus 6"(15.2cm). Tack coat application shall be wide enough to cover the entire width of fabric overlaps. The tack coat shall be applied only as far in advance of paving fabric installation as is appropriate to ensure a tacky surface at the time of paving fabric placement. Traffic shall not be allowed on the tack coat. Excess tack coat shall be cleaned from the pavement.

Paving Fabric Placement: The paving fabric shall be placed onto the tack coat using mechanical or manual laydown equipment capable of providing a smooth installation with a minimum amount of wrinkling or folding. The paving fabric shall be placed before the asphalt cement tack coat cools and loses its tackiness. Paving fabric shall not be installed in areas where the overlay asphalt tapers to a minimum compacted thickness of less than 1.5"(3.8cm).

*Note:
Additional instructions on paving fabric installation are available from Amoco Fabrics and Fibers Company in their Petromat® Installation Manual, which may be found at **http://www.geotextile.com.**

When asphalt emulsions are used, the emulsion shall be allowed to cure properly such that essentially no water moisture remains prior to placing the paving fabric. Wrinkles severe enough to cause folds shall be slit and laid flat. Brooming and/or rubber-tire rolling will be required to maximize paving fabric contact with the pavement surface.

Turning of the paver and other vehicles shall be done gradually and kept to a minimum to avoid movement and damage to the paving fabric. Abrupt starts and stops shall also be avoided. Damaged fabric shall be removed and replaced with same type of fabric and a tack coat.

Joints and Overlaps: At joints, fabric rolls shall overlap by 1" to 6"(2.5 to 15.2cm). End joints and joints from repair of wrinkles should be made to overlap or "shingle" in the direction that the pavement overlay will be placed. Overlaps of adjacent rolls may be as great as 6" to accommodate variations between the width of the roadway and paving fabric. Excess fabric shall be cut and removed to ensure that overlaps of adjacent rolls do not exceed 6"(15.2cm). Additional tack coat shall be applied between all fabric overlaps and repairs. Any locations that do not have additional tack for the overlaps shall be corrected by manual placement of tack coat prior to overlay construction. **Unless otherwise approved by the Engineer, no traffic except necessary construction traffic will be allowed to drive on the paving fabric.**

Overlay Placement: Asphalt overlay construction shall closely follow fabric placement. All areas in which paving fabric has been placed will be paved during the same day. Excess tack coat that bleeds through the paving fabric shall be removed by broadcasting sand on the paving fabric . Excess sand should be removed before beginning the paving operation. In the event of rainfall on the paving fabric prior to the placement of the asphalt overlay, the paving fabric must be allowed to dry before asphalt concrete is placed. Overlay asphalt thickness shall meet the requirements for the contract drawings and documents. The minimum compacted thickness of overlay asphalt shall not be less than 1.5"(3.8cm) in areas of paving fabric installation.

METHOD OF MEASUREMENT

Paving Fabric: The paving fabric will be measured by the square yard (square meters).
Tack Coat: Tack coat will be measured by the gallon (liter).

BASIS OF PAYMENT

Paving Fabric: The accepted quantities of paving fabric will be paid for at the contract unit price per square yard (square meter) in place.
Tack Coat: The accepted quantities of tack coat for the paving fabric will be paid for at the contract unit price per gallon (liter) complete in place.

TABLE 1 PHYSICAL REQUIREMENTS OF PAVING FABRICS [1,2,3]

(Note to Specifier: Choose one fabric specification, delete the other)

		(Petromat® Style 4599)		or	(Petromat® Style 4598)	
Properties	**Test Method**	**American Standard**	**Metric Units**		**American Standard**	**Metric Units**
Mass per unit Area	ASTM D 3776	na	na		4.1 oz/yd²	140 g/m²
Tensile Strength	ASTM D-4632-91	90 lbs	0.400 kN		101 lb	0.450 kN
Tensile Elongation	ASTM D-4632-90	50%			50%	
Asphalt Retention	ASTM D 6140	0.20 gal/yd²	0.90 l/m²		0.20 gal/yd²	0.90 l/m²
Melting Point	ASTM D 276-87	300 °F	149 °C		300 °F	149 °C
Surface Texture	VISUAL INSPECTION	Heat-Set On One Side			Heat-Set On One Side	

NOTES

[1] Certification of conformance from paving fabric manufacturer may be required

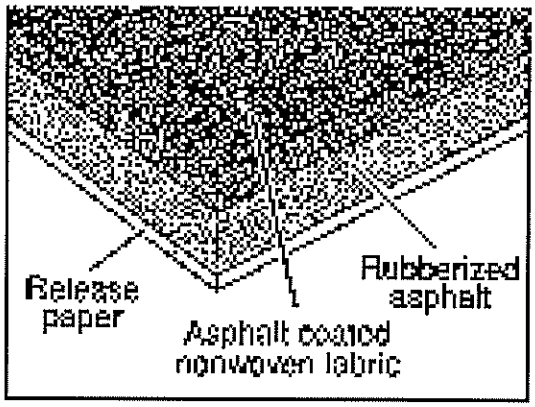
[2] All numerical values represent minimum average roll values (average of test results from any sampled roll in a lot shall meet or exceed the minimum values) in the weaker principal direction. Lot shall be sampled according to ASTM D 4354-89, "Practice for Sampling of Geosynthetics for Testing."

[3] Comformance of paving fabrics to specification property requirements shall be determined in accordance with ASTM D 4759-88, "Practice for Determining the Specification Conformance of Geosynthetics."

Petrotac®

Introduction

Petrotac is an unique peel and stick paving fabric/ rubberized asphalt composite membrane. Petrotac acts as a moisture barrier as well as a stress absorbing membrane interlayer. It is used in pavement maintenance to treat joints and cracks before overlay placement. Petrotac is also used as a bridge deck membrane system.



BENEFITS

- **Minimizes water infiltration:** Moisture can enter a pavement through cracks and pores, ultimately causing a loss in pavement strength. Petrotac membranes seal cracks and joints, reducing the damaging effects of moisture penetration.
- **Reduces reflective cracking:** Petrotac used as a stress absorbing membrane interlayer, absorbs stresses from underlying cracks or joints helping to insulate the overlay from relective cracking. Monitored field intallations on high volume roadways deomonstrate that pavements with the Petrotac interlayer show considerabley less recurrence of cracking.
- **Easy to install:** Petrotac peel and stick membrane can be installed quickly by a two-person crew. No special equipment is necessary.
- **Excellent bonding to overlay:** The top surface of Petrotac is precoated with an asphalt cement tack coat, which ensures an excellent bond with the pavement overlay.
- **Multipurpose:** Petrotac adhesive will stick readily to asphalt, concrete, and wood surfaces. Petrotac membranes have been proven effective in sealing and treating pavement cracks, potholes, and other localized distress areas, and are used as bridge deck membranes.

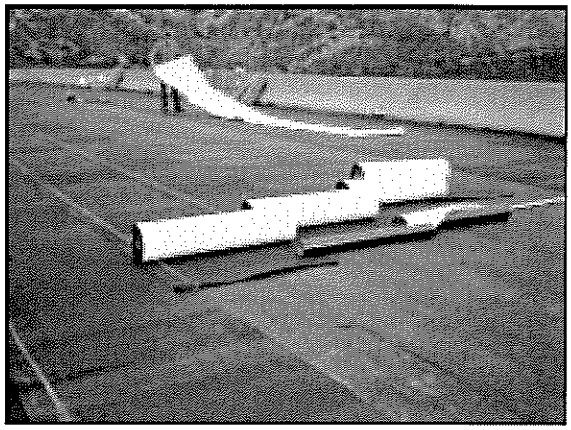
AMOCO GEOTEXTILES

Amoco Fabrics and Fibers Company

MATERIAL PROPERITIES

Petrotac consists of Amoco's Petromat®, a needle-punched nonwoven polypropylene fabric, coated with asphalt cement and a rubberized asphalt adhesive. A release sheet, which is removed prior to placement, covers the adhesive.

Petrotac is available in a variety of widths, as shown below. The rolls are individually packaged in corrugated boxes. Petrotac should be stored in a dry location at temperatures not exceeding 125°F.



Available Dimensions					
Width	**ft**	**1**	**1.5**	**2**	**3**
	m	.30	.45	.60	.91
Length	**ft**	**108**	**108**	**108**	**45**
	m	32.9	32.9	32.9	13.7
Gross Weight	**lb**	**45**	**65**	**90**	**55**
	kg	20	30	41	25

Roll weights are approximate values only

Installation

A detailed Petrotac Installation Guide is available upon request from Amoco or your local distributor.

The attached sheet contains full guide specifications for pavement repair and bridge deck membranes.

Petrotac Specifications[1]			
Property	**Test Method**	**US Standard**	**Metric**
Strip Tensile	ASTM D 882[2]	50 lb/in	8.7 kN/m
Puncture Resistance	ASTM E 154	200 lb	890 N
Permeance	ASTM E 96 Method B	.10 perms (max)	
Pliability	ASTM D 146[3]	No cracks in fabric or rubberized aspalt	

Notes
[1] Minimum average roll values unless otherwise noted
[2] Using 12 in/min test speed and 1" initial distance between grips
[3] Using 180° bend on 1/4" mandrel at -25°F

REFERENCES

Barnhart, V.T., Field Evaluation of Experimental Fabrics to Prevent Reflective Cracking in Bituminousn Resurfacing, Michigan Department of Transportation, Research Report No. R-1300, July 1989.

Goodner, G.S., Evaluation of Heavy Duty Membranes, Oklahoma Department of Transportation, May 1991.

Knight, N.E. and Hoffman, G.L., Heavy Duty Membranes for Reduction of Reflective Cracking in Bitmuinous Concrete Overlays, Commonwealth of Pennsylvania, Department of Transportation, Office of Research and Speacial Studies, Reasearch Project 79-6, Dec. 1983.

Amoco Fabrics and Fibers Company
260 The Bluffs
Austell, GA 30168
770-944-4569 800-445-7732
770-944-4584 - fax
email address: geotextiles@bp.com
http://www.geotextile.com
Part of the BP Amoco Group

PETROTAC®
STRIP MEMBRANE INTERLAYER
GUIDE SPECIFICATION

DESCRIPTION - This work shall consist of furnishing and placing an asphalt-coated paving fabric reinforced membrane over pavement cracks, joints and other pavement distress areas prior to placement of a pavement overlay. The membrane shall be installed as indicated on the plans and contract documents.

MATERIAL REQUIREMENTS - The strip membrane interlayer shall be a nonwoven, needle-punched, polypropylene fabric coated with rubberized asphalt adhesive on the bottom, and top-coated with an asphalt tack coat. A release sheet, which is removed just prior to placement, shall cover the adhesive. The membrane shall meet the physical requirements specified in Table 1.

Table 1 Physical Requirements of the Strip Membrane Interlayer

Property	Test Method	American Standard[1]	Metric[1]
Strip Tensile	ASTM D 882[2]	50 lb/in	8.7 kN/m
Puncture Resistance	ASTM E 154	200 lb	890 N
Permeance	ASTM E 96 Method B	.10 perms (max)	
Pliability	ASTM D 146[3]	No cracks in fabric or rubberized asphalt	

Notes
1 - Minimum average roll values unless otherwise noted
2 - Using 12 in/min test speed and 1" initial distance between grips
3 - Using 180° bend on ¼" mandrel at -25°F

Materials shall be stored and handled in accordance with the manufacturer's recommendations.
Incidental materials recommended by the manufacturer for proper membrane installation, such as primer and tack coat shall be furnished and used in accordance with the manufacturer's recommendations. More detailed installation procedures are available from the membrane manufacturer.

USE - Strip membrane interlayer is used as a moisture barrier and stress absorbing membrane for treatment of pavement cracks, joints, and other pavement distress areas. It is applied in strips over cracks and joints in Portland cement or bituminous concrete pavements. The membrane adheres to the existing surface and is then overlaid with bituminous concrete using standard paving procedures.

CONSTRUCTION METHODS - The strip membrane interlayer shall be installed in accordance with the manufacturer's recommendations and the following requirements.

Preparation of existing surface: The pavement surface shall be cleaned of dirt and other foreign materials. The surface shall be completely dry, with no lingering moisture around pavement cracks. Cracks greater than 3/8" in width shall be filled with a suitable crack filler. Areas of severe alligator cracking or pavement subsidence shall be excavated and replaced prior to membrane application. If necessary, Portland cement concrete slabs shall be stabilized.
Primer placement: When required, a primer shall be furnished and placed on the prepared pavement as specified by the membrane manufacturer. Use of a primer is recommended if the pavement temperature is below 70°F. No prime coat is needed when the pavement is clean, dry and at a temperature of 70°F or above.
Membrane placement: The strip membrane interlayer shall be centered over joints and cracks to be treated and shall be rolled after placement. Transverse joints and cracks shall be treated before longitudinal joints. Should a crack require more than one strip, the strips shall be overlapped at least 4" in the direction of paving. Any wrinkles or bubbles in the membrane shall be repaired as specified by the manufacturer. Membrane which is damaged due to the Contractor's operations shall be removed and replaced at the Contractor's expense. The installed membrane shall be approved by the Engineer prior to paving operations.
Overlay placement: A standard pre-paving tack coat shall be applied over the pavement and pavement repair membrane. Paving mix should be applied as specified in the plans and contract documents; however, a compacted overlay thickness of less than 1½ inches is not recommended.
Vehicle traffic: If necessary, traffic can be permitted on the membrane before the overlay is placed. However, as a safety precaution, such traffic should be only temporary and must be approved by the Engineer. Harsh traffic conditions, such as high speeds, turning, and braking, should be avoided. Warning signs shall be posted to alert drivers that the surface may be slippery. Signs shall also post a safe speed.
Temperature: The pavement temperature shall be at least 45°F and rising for membrane installation.

MEASUREMENT AND PAYMENT - The strip membrane interlayer will be measured in place by the square yard, without credit for overlaps. The accepted quantities of strip membrane interlayer will be paid for at the contract unit price per square yard in place.

PETROTAC®
BRIDGE DECK MEMBRANE
GUIDE SPECIFICATION

DESCRIPTION - This work shall consist of furnishing and placing an asphalt-coated paving fabric reinforced membrane on a repaired, widened, or new bridge deck prior to placement of a bituminous concrete overlay. The membrane shall be installed as indicated on the plans and contract documents.

MATERIAL REQUIREMENTS - The bridge deck membrane shall be a nonwoven, needle-punched, polypropylene fabric coated with rubberized asphalt adhesive on the bottom and top-coated with an asphalt tack coat. A release sheet, which is removed just prior to placement, shall cover the adhesive. The membrane shall meet the physical requirements specified in Table 1.

Table 1 Physical Requirements of Bridge Deck Membrane

Property	Test Method	American Standard[1]	Metric[1]
Strip Tensile	ASTM D 882[2]	50 lb/in	8.7 kN/m
Puncture Resistance	ASTM E 154	200 lb	890 N
Permeance	ASTM E 96 Method B	.10 perms (max)	
Pliability	ASTM D 146[3]	No cracks in fabric or rubberized asphalt	

Notes
1 - Minimum average roll values unless otherwise noted
2 - Using 12 in/min test speed and 1" initial distance between grips
3 - Using 180° bend on ¼" mandrel at -25°F

Materials shall be stored and handled in accordance with the manufacturer's recommendations.
Incidental materials recommended by the manufacturer for proper membrane installation, such as primer, tack coat, and mastic, shall be furnished and used in accordance with the manufacturer's recommendations. More detailed installation procedures are available from the membrane manufacturer.

USE - The bridge deck membrane is used to provide a continuous moisture barrier on bridge decks of Portland cement concrete, bituminous concrete, wood, or steel. It is applied in strips and overlapped to form a continuous membrane sheet. The membrane adheres to the deck surface and is then overlaid with a bituminous concrete overlay using standard paving procedures.

CONSTRUCTION METHODS - The bridge deck membrane shall be installed in accordance with the manufacturer's recommendations and the following requirements.

Preparation of existing surface: The bridge deck surface shall be cleaned of dirt and other foreign materials and shall be completely dry. Cracks greater than 3/8" in width shall be filled with a suitable crack filler. Areas of pavement distress shall be repaired prior to membrane application. Excess preservative on wooden bridge decks must be removed.
Primer placement: A primer shall be furnished and placed on the prepared deck surface as specified by the membrane manufacturer. The primer must cure completely before the bridge deck membrane is placed.
Membrane placement: The bridge deck membrane shall be placed parallel to the bridge, starting at the low or downslope side of the deck. Adjacent membrane strips shall be overlapped at least 4" in the direction of water runoff. The membrane shall be rolled after placement. Additional mastic shall be applied at the membrane edges as recommended by the manufacturer. Any wrinkles or bubbles in the membrane shall be repaired as specified by the manufacturer. Membrane which is damaged due to the Contractor's operations shall be removed and replaced at the Contractor's expense. The installed membrane shall be approved by the Engineer prior to paving operations.
Overlay placement: A standard pre-paving tack coat shall be applied over the deck surface and bridge deck membrane. Paving mix should be applied as specified in the plans and contract documents; however, a compacted overlay thickness of less than 1½ inches is not recommended.
Vehicle traffic: If necessary, traffic can be permitted on the membrane before the overlay is placed. However, as a safety precaution, such traffic should be only temporary and must be approved by the Engineer. Harsh traffic conditions, such as high speeds and braking, should be avoided. Warning signs shall be posted to alert drivers that the surface may be slippery. Signs shall also post a safe speed.
Temperature: The pavement temperature shall be at least 45°F and rising for membrane installation.

MEASUREMENT AND PAYMENT - The bridge deck membrane will be measured in place by the square yard, without credit for overlaps. The accepted quantities of bridge deck membrane will be paid for at the contract unit price per square yard in place.

DEERY® BRAND PAVEMENT PRESERVATION PRODUCTS

SUPER STRETCH.1

PRODUCT DATA SHEET
DECEMBER 2022

HOT APPLIED SEALANT, Part No. 80432

DESCRIPTION DEERY Super Stretch is a fast curing, premium quality, hot applied single component crack & joint sealant. Our best all-around sealant. Only the most appropriate high quality synthetic elastomers, polymers, and antioxidants meeting exacting standards are used in combination with select asphalt plasticizers and naturally occurring reinforcing materials. The sealant contains no solvent, is highly waterproof and resistant to a wide range of salts, bases, and organic materials. Super Stretch is tested for low temperature flexibility at -20 °F (-29 °C). VOC = 0 g/l.

USE DEERY Super Stretch is an excellent sealant for road, airport, and parking area applications for sealing longitudinal and traverse joints and random cracks in Asphalt or Concrete pavements where a fast-curing sealant is desirable. The material's superior combination of fast melting, low viscosity and above average high and low temperature properties result in a sealant preferred by many experienced applicators and end users alike. DEERY Super Stretch is Minimum for use in extreme high temperature conditions.

HEATING Sealant shall be heated in an approved direct fire or hot-oil jacketed Melter capable of constant mechanical agitation and equipped with a calibrated thermometer to monitor sealant temperature. Material shall be heated to and maintained at the Minimum Application Temperature during use. Material can be cooled and then reheated, but only if prolonged heating is avoided. Prolonged heating at or above Minimum Application Temperature may severely damage the product. If overheating damage occurs, immediately drain the machine completely and refill with new material.

APPLICATION DEERY Super Stretch is pre-reacted and can be applied immediately after heating to Minimum Application Temperature. With pavement temperature at 40 °F (4 °C) or higher, place material into clean, dry crack or prepared reservoir by means of a hand-held pour pot, wheeled push bander or wand applicator. Squeegee any excess sealant tight to pavement surface. Excessive over-banding should be avoided. Pavement may be warmed to 40 °F (4 °C) or higher with a hot air lance.

PROPERTIES OF DEERY SUPER STRETCH.1

When sampled and heated to maximum heating temperature in accordance with ASTM D5167

TEST	METHOD	SPECIFICATION
Cone Pen @ 77 °F (25 °C)	ASTM D5329	75 dmm maximum
Cone Pen @ 122 °F (50 °C)	ASTM D5329	120 dmm maximum
Flow @ 140 °F (60 °C)	ASTM D5329	1 mm maximum
Elongation @ 77 °F (25 °C)	ASTM D412	1000% minimum
Low Temperature Flexibility	ASTM D3111 modified	Pass @ -20 °F (-29 °C)
Softening Point	ASTM D36	200 °F (93 °C) minimum
Resilience	ASTM D5329	40% minimum
Asphalt Compatibility	ASTM D5329	Complete
Curing Time	Non-tracking to moving traffic	30 minutes maximum
Minimum Application Temperature		380 °F (193 °C) *
Maximum Heating Temperature		400 °F (204 °C)

*Temperature of product measured at pavement surface. Use the highest Minimum Application Temperature in cool weather.
*Prolonged heating at or above Maximum Heating Temperature may severely damage the product.

PACKAGING Product is supplied in either cardboard boxes, or in meltable boxless packaging. Both package types are labeled in accordance with OSHA, GHS, and specification requirements; are sold by net weight; are interlock stacked on 48 x 40 in. (122 x 102 cm) 4-way pallets; can be stored outside; and are covered with a weather resistant pallet cover and 2 layers of UV protected stretch wrap.

- **BOX** packaging consists of cardboard boxes containing 30 lbs. (13.6 kg) of product with 75 boxes per pallet, weighing approximately 2250 lb. (1020 kg). Boxes contain a quick melting release film for easy removal and are taped closed, without any staples.
- **Meltable** packaging consists of approximately 30 lb. (13.6 kg) completely meltable packages that are interlocked stacked on pallets. To use, the pallet wrap is removed, and individual blocks are placed in the Melter. There are no individual cardboard boxes to open, empty, handle, or dispose of. Meltable packaging quickly melts into the product without affecting specification conformance. Meltable packaged sealant products are sold by the pallet only and individual packages are not intended for sale. For more details on meltable packaging go to https://crafco.com/materials-documentation/

PERFORMANCE Temperature fluctuations, site conditions, surface preparation, traffic, installation technique, material selection, shape factor and surface treatment compatibility influence the effectiveness and useful life of Pavement Preservation treatments. Consider and monitor each element for optimum results. Purchaser and end user should determine applicability for use in their specific conditions.

WARRANTY Manufacturer warrants that these products meet applicable ASTM, AASHTO, Federal or State specifications at time of shipment. Techniques used for the preparation of the cracks and joints prior to sealing or filling are beyond our control as are the use and application of the products; therefore, manufacturer shall not be responsible for improperly applied or misused products. Remedies against manufacturer, as agreed to by manufacturer, are limited to replacing nonconforming product or refund (full or partial) of purchase price from manufacturer. All claims for breach of this warranty must be made within three (3) months of the date of use or twelve (12) months from the date of delivery by manufacturer, whichever is earlier. There shall be no other warranties expressed or implied. **For optimum performance, follow manufacturer recommendations for product installation.**

FOR ADDITIONAL INFORMATION
Call:1-800-227-4059 toll free
Email:info@deeryamerican.com
Web: www.deeryamerican.com

CRAFCO® INC
PRESERVATION PRODUCTS PAVEMENT
Delivering Confidence Through Innovation, Quality and Value Since 1978

6165 W. Detroit St. • Chandler AZ 85226
1-800-528-8242 • (602) 276-0406 • FAX (480) 961-0513
http://www.crafco.com

DEERY BRAND®
PAVEMENT PRESERVATION PRODUCTS
6165 W Detroit St. • Chandler AZ 85226
+1 (602) 276-0406 • +1 (800) 528-8242 • FAX +1 (480) 961-0513
www.deeryamerican.com

INSTALLATION INSTRUCTIONS HOT APPLIED SEALANTS

APRIL 2011

READ BEFORE USING THIS PRODUCT

OVERVIEW: DEERY Hot-Applied Sealants are single component, virgin polymer and /or recycled rubber modified asphalts or resins supplied in solid block form. These products are used to seal or fill cracks or joints in asphalt concrete or portland cement concrete highway, street, aviation and parking lot pavements. To use, product is removed from the package, heated in a melter and applied to the pavement. These products are manufactured for different specifications, climates and uses as listed on DEERY Product Data Sheets. Suitability of the sealant used should be determined by the user prior to application.

MELTING and HEATING: DEERY Hot-Applied Sealants are heated in a hot-oil jacketed melter with constant mechanical agitation and a calibrated thermometer to monitor temperature. Melters should meet requirements of Appendix X1.1 of ASTM D6690. Heat transfer oil should not exceed 525°F (274°C). The melter must be able to safely heat product to 400°F (204°C). **Note:** SuperStretch, Stretch Pro PL, and Asphalt Type 3 Sealants may also be melted in approved direct fired melters. Start melting by carefully adding small quantities (up to 25% of capacity) to the melter with the agitator off to avoid splashing. Heat and agitate sealant until it begins to melt to a liquid. Then additional sealant is added, with the agitator off. Continue heating and agitating until sealant reaches the Recommended Application Temperature of 380-400 F (193-204C). Additional sealant may be added during installation as quantity in the melter decreases. DEERY Hot-Applied Sealants are pre-reacted and can be applied immediately after heating to the Recommended Application Temperature. Best results are obtained when sealant is applied as soon as application temperature is reached. Sealant application life at application temperature exceeds 6 hours and may be extended by adding fresh product as quantity in the melter decreases during use. During application, sealant temperature is to be maintained in the Recommended Application Temperature range. If during use, especially when adding sealant to the melter, sealant temperature drops below the Recommended Application Temperature, installation should stop and not resume until sealant has been heated back to the Application Temperature range. Sealant shall be agitated during installation to assure uniformity. Do not heat sealant above the Maximum Heating Temperature of 400F (204 C). Prolonged heating at or above the Recommended Application Temperature may cause sealant to deteriorate and lose properties. If this happens, sealant should be immediately removed from the melter and discarded. If all heated sealant will not be used that day, reduce quantity in the melter to approximately 25% or less of melter capacity prior to shut down. Product may be reheated once to application temperature after initial heat up. When reheating, add additional blocks of sealant equal to the amount being reheated in the melter and proceed with heating and installation.

PAVEMENT TEMPERATURES: DEERY Hot-Applied Sealants should only be applied when pavement temperature exceeds 40°F (4°C). Sealant installation at lower pavement temperatures may reduce adhesion. If pavement temperature is lower than 40°F (4°C), it may be warmed using a hot air lance. If installing at lower pavement temperature than 40°F (4°C), insure that cracks or joints are dry and product temperature should be maintained at the maximum heating temperature. Do not heat product higher than the maximum heating temperature to try to make up for cold or damp conditions. If installing product at night, assure that dew is not forming on the pavement surface. Applied product should be checked by qualified personnel to assure that adhesion is adequate.

TRAFFIC CONTROLS: Place traffic controls in accordance with Part 6, Temporary Controls, of the FHWA Manual on Uniform Traffic Control Devices (MUTCD) to protect the work site for the duration of the repairs.

CRACK and JOINT PREPARATION: Proper surface preparation is critical for adequate sealant adhesion. Sealants work best if applied to clean dry surfaces. Cracks and joints must be free of moisture, dirt, dust, loose aggregate, or other contaminants to prevent premature adhesion loss. For best results, clean surfaces immediately before sealant application. Various options are used for crack or joint preparation. One or more of the following methods may be utilized:

1. Oil Free Compressed air at a minimum 90 psi (620kpa)
2. Hot Air Lance (Note-Hot Air Lances work best on dry or slightly damp pavement)
3. Routers (make sure all dust has been thoroughly removed from crack after routing)
4. Sawing Equipment (assure all residue is removed)
5. Power Wire Brushing (for cracks in asphalt concrete only, do not use in Portland cement concrete joints or cracks)
6. Sand or Abrasive Blasting

After crack or joint widening and debris removal, and just prior to product installation, final cleaning shall use high pressure 90 psi (620kpa) minimum, dry, oil free compressed air to remove any remaining dust. Both sides of the crack or joint shall be cleaned. Surfaces should be inspected to assure that adequate cleanliness and dryness have been achieved.

CRACK and JOINT CONFIGURATION: In most applications, ideal crack and joint configuration is 1:1 depth to width ratio. Cracks or joints can be routed to provide reservoirs with a 1:1 ratio. Commonly used reservoir dimensions are ½ x ½ inch (12 x 12 mm) or ¾ x ¾ inch (19 x 19 mm). In some applications, mainly in very cold climates, shallower configurations with a 1 to 4 depth to width ratio, typically 1-1/2 inch wide by 3/8 inch deep (40 x 10 mm) are used for high amounts of thermal crack opening. Rout or saw cut the pavement to create a reservoir sufficient in size to accommodate thermal movement. Maximum crack or joint width should not exceed 1 ½ inches (40mm). To control depth and sealant usage, a compatible heat resistant backer rod meeting ASTM D5249 Type I can be used. For random, longitudinal and other non-working type cracks, surface overbands are commonly used. Overbands should not exceed 4 inches (10cm) wide and should not be over 1/16inch (1.6 mm) thick.

SEALANT APPLICATION METHOD: DEERY sealants can be applied by hose, hand held pour pots, or wheeled pour pots (banders). Sealant is applied to the cleaned crack or joint, with slight overfilling and then leveled using a narrow squeegee to fill the crack or joint and minimize sealant on the surface. Maximum sealant thickness on the surface should not exceed 1/16 inch (1.6mm) and bands should not exceed 4 inches (10 cm) wide. Some specifications require recessed installations. For these, apply sealant to the crack or joint from the bottom up leaving the cured sealant 1/8 to ¼ inch (3 -6 mm) below the pavement surface. Concrete joints should be filled to 1/8-1/4 inch (3-6mm) below the pavement surface. This method reduces pick up and tracking by traffic. If desired, DEERY No Stick (Part No 89100) can be used to reduce surface tack.

INSTALLATION PRECAUTIONS: In some cases, additional consideration needs to be given to product selection and installation.

Parking Lots and Other Areas Subjected to Slow Moving Traffic and Pedestrians: Product used must be stiff enough at hot summer temperatures to resist pick up and should not be applied on top of the pavement surface. DEERY No Stick (Part No 89100) can be used to reduce surface tack.

Pavement to Receive Hot Mix Asphalt Concrete Overlay: Sealant will be subjected to high heat from the overlay and stresses during compaction that may produce bumps in the overlay surface. If the pavement is to be overlayed the same year, sealant should be installed recessed 1/4 inch (6mm) below the pavement surface with no sealant on the surface. For additional information contact your DEERY representative.

Pavement to Receive a Surface Treatment or Seal Coat: Solvents or carriers in some surface treatments may soften sealant. Prior to placing a surface treatment or seal coat, a test strip should be placed to verify compatibility of sealant and the surface treatment to assure there are no detrimental effects.

High Severity Cracked Areas: Highly cracked areas (fatigue cracks in wheel paths) should not be treated by covering cracks with sealant because pavement friction may be affected. These cracks can be filled if followed by a surface treatment or overlay to restore friction.

Fuel or Oil Spill Areas: DEERY Hot-Applied Sealants are not fuel resistant and should not be used in fuel or oil spill areas due to possible softening which may occur. Sealant will not adhere to pavement surfaces that are contaminated with fuel or oil spills.

Crack Sealing in Pavements with Surface Treatments: When crack sealing pavements with chip seals, slurry seals, or open graded friction courses, routing should extend through the surface treatment layer into the underlying asphalt concrete. This anchors sealant into solid pavement for better bonding.

Pavements Treated With Anti-Icing Agents: Presence of anti-icing agents on pavements may reduce sealant adhesion. For pavements recently treated with anti-icing agent, apply a small amount of sealant to test adhesion. Allow sealant to cool to the pavement surface temperature and then attempt to dislodge it by prying the edges. If sealant is easily dislodged, the anti-icing agent is not permitting full adhesion. If sealant remains bonded after attempting to dislodge, sealing may proceed. If sealant is easily dislodged, additional cleaning is required prior to continuing. Air blowing, wire brushing, routing or use of a heat lance to clean crack surfaces can be helpful for improving adhesion. After additional cleaning, adhesion should be rechecked. If sealant is still not adhering, the project should be delayed until natural environmental processes rid the pavement surface of the anti-icing agent. It is generally recommended to seal pavements that receive heavy anti-icing treatments in the fall before deicing treatment application begins.

Sealing in Hot Weather: Hot weather does not adversely affect sealant quality or properties but does increase set up times, and potential for pick up or tracking. In hot weather, stiffer low penetration sealants are more resistant to tracking than softer high penetration sealants. Users should determine suitability of the sealant used for conditions during installation. Recommendations for sealing in hot weather follow:

1. Use recessed reservoir installation configurations and leave sealant flush to ¼ inch (6mm) below the pavement surface.
2. When using surface overbands, stop work when pavement temperature exceeds 122F (50C). (Does not apply to recessed reservoirs)
3. Avoid overband installations on longitudinal cracks and joints in wheelpaths. Tires operate at high temperatures and continuous contact with sealant can increase tracking and pick up.
4. When using surface overbands, use a narrow squeegee to minimize amount of sealant left on the surface.
5. Use sealant products designed for hot climate installations.
6. Allow more cooling time and maintain traffic control until sealant has cooled. DEERY No Stick (Part No. 89100) is very effective in hot weather to reduce time to opening to traffic.

MELTER CLEAN OUT: If melters used require clean out, follow manufacturer's instructions. If solvent is used, insure it does not contaminate product because dilution and flash problems may occur.

PRODUCT STORAGE: Pallets of DEERY Hot-Applied Sealant are protected with a weather resistant covering. During storage, this covering must be intact to prevent boxes from getting wet. If wet, boxes may lose strength and crush. Rips in the pallet covering should be repaired to maintain packaging integrity. Pallets should be stored on a dry, level surface with good drainage. Pallets should not be stacked because crushing of bottom boxes may occur. Product properties are not affected by packaging deterioration.

SAFETY PRECAUTIONS: Since these products are heated to elevated temperatures, it is essential that operations be conducted safely. All personnel need to be aware of hazards of using hot- applied materials and safety precautions. Before use, the crew should read and understand product use and safety information on the box and the product MSDS which is included with each pallet. All workers should use required Personal Protective Equipment (PPE) when working on the sealing project. User should check D.O.T. requirements for transportation of product at elevated temperatures above 212°F (100°C).

HAZARDS WITH HOT-APPLIED MATERIALS: Skin contact with hot materials causes burns. Over exposure to fumes may cause respiratory tract irritation, nausea, or headaches. Precautions are to be taken to prevent contact with hot material and to avoid inhalation of fumes for everyone in the vicinity. Safety precautions should include:

1. Protective clothing and PPE to prevent skin contact with hot material.
2. Care when adding product to melters to reduce splashing.
3. Careful operation of wands or pour pots that apply product.
4. Traffic and pedestrian controls which meet or exceed MUTCD requirements to prevent access to work areas while product is in a molten state.
5. Avoidance of material fumes.
6. Proper application configurations with a minimum amount of material excess.
7. Appropriate clean up of excessive applications or product spills.

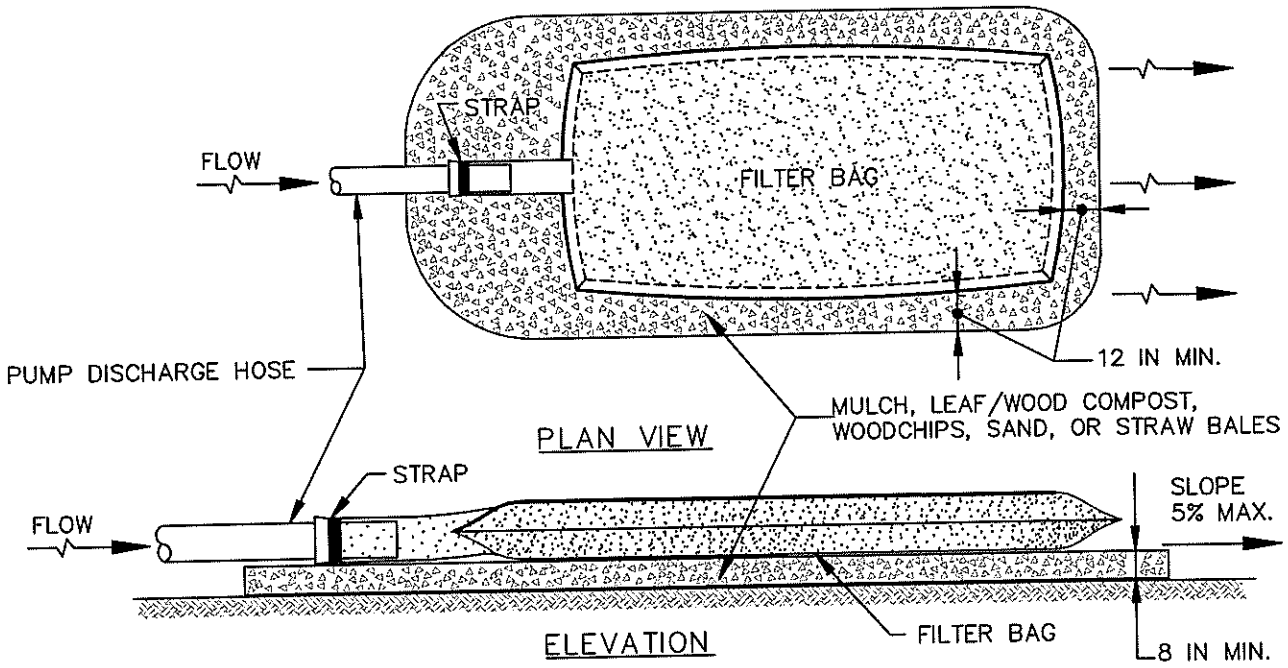
ADDITIONAL INFORMATION: Additional information on use and application of these products is available on the DEERY Products Website at www.deeryamerican.com or by contacting your DEERY sales representative. This information includes:

1. Product Data Sheets
2. Material Safety Data Sheet (MSDS)
3. DEERY Pavement Preservation Products Guide

DETAIL F-4 FILTER BAG

STANDARD SYMBOL

☒FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.

2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.

3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.

4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.

5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

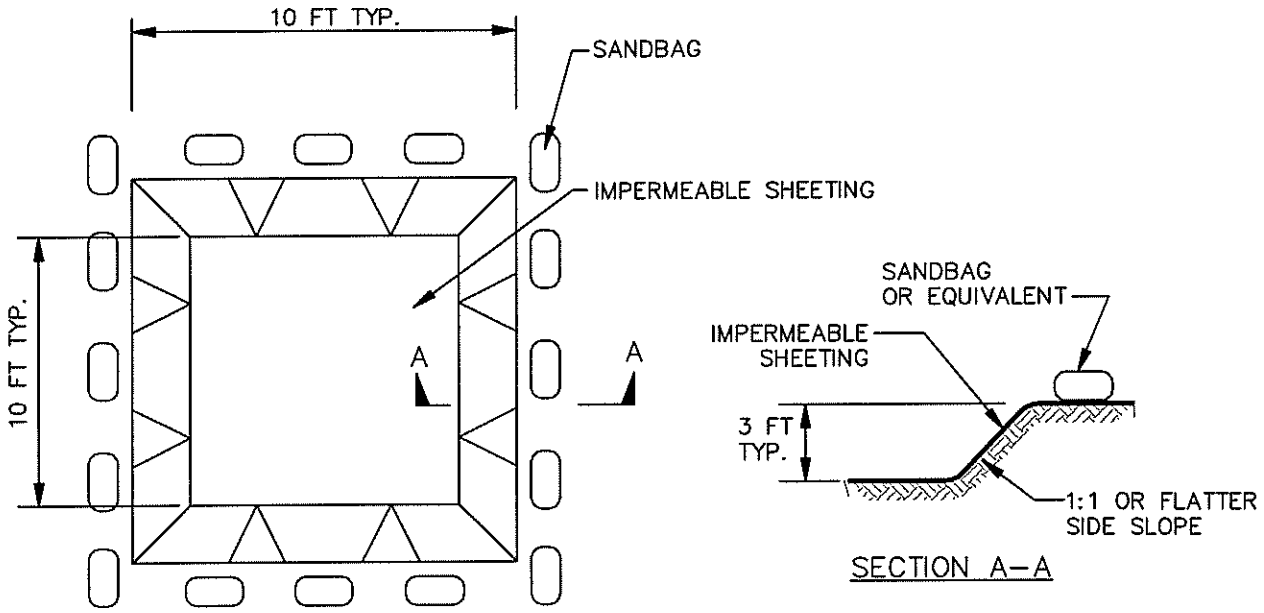
GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT^2	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL

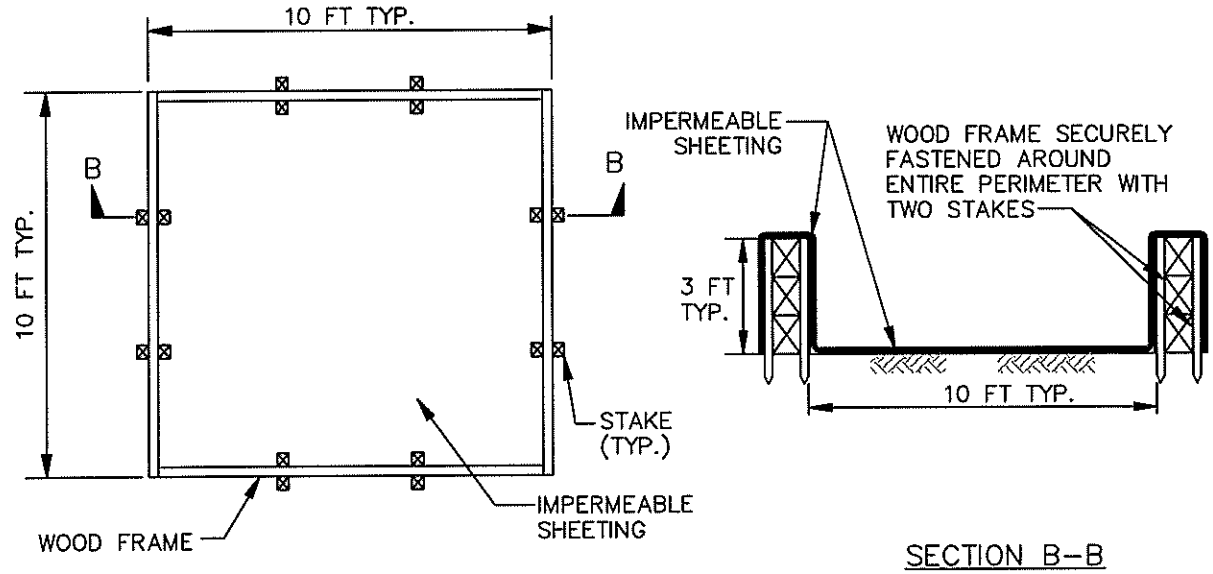
CWS



PLAN

SECTION A–A

EXCAVATED WASHOUT STRUCTURE



PLAN

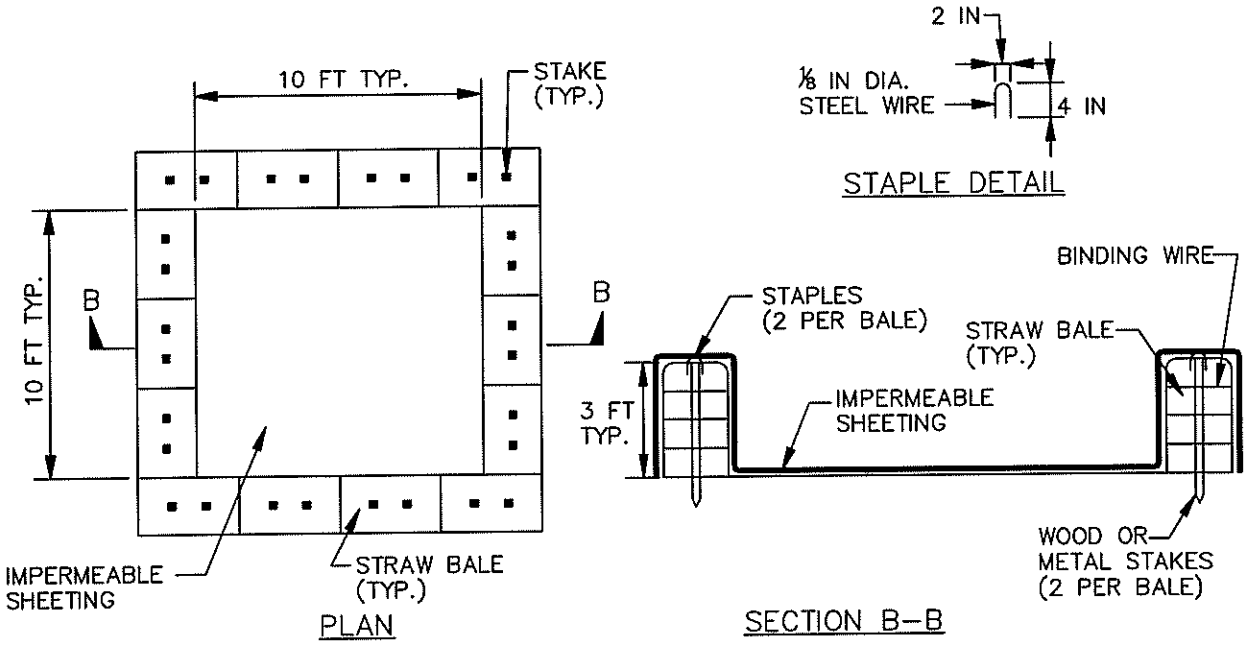
SECTION B–B

WASHOUT STRUCTURE WITH WOOD PLANKS

DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL

CWS



NOTE: CAN BE TWO STACKED BALES OR PARTIALLY EXCAVATED TO REACH 3 FT DEPTH

WASHOUT STRUCTURE WITH STRAW BALES

CONSTRUCTION SPECIFICATIONS

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET–VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.