

**CITY OF TAKOMA PARK  
DEPARTMENT OF PUBLIC WORKS**

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**REQUEST FOR PROPOSAL  
INDEFINITE QUANTITIES  
FOR STREET, SIDEWALK, AND STORMWATER STRUCTURES  
TAKOMA PARK, MARYLAND**

**RFP Issuance Date:** August 26, 2019

**Proposal Submission Deadline:** Thursday, September 26, 2019 at 4 pm

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## **INFORMATION TO BIDDERS**

### **1.0 General Intentions:**

The City of Takoma Park, Maryland Department of Public Works, is accepting Bids for the following:

- Indefinite Quantities Contract for street, sidewalk, and stormwater system improvements comprised of asphalt, concrete, earthwork, pipes, and storm drain facilities, to be performed within the City of Takoma Park, Maryland. General intent of this bid is to enter into an agreement with two construction firms, the lowest and second lowest qualified bidder. Bidders will be deemed qualified based on their experience on performing similar work, references and the unit-rates submitted by the bidder.

### **2.0 General Description**

The proposed work includes milling and resurfacing of selected streets, installation, removal and replacement of City sidewalks, curb and gutter, concrete driveway apron and accessibility ramps. Additional work will include stormwater structures, detention and retention facilities, infiltration basins, and trenches. Such systems are expected to be constructed according to details and specifications provided by the City.

Under this contract, the City anticipates an annual expenditure of \$1,000,000 to \$3,000,000. Work performed under this contract will be measured and paid at the contract unit price set forth in the schedule of prices. The actual amount of work to be performed and the time of such performance will be determined by the City Engineer, or his authorized representative, who will issue work orders to the contractor. The City makes no representation as to the number of work orders or the actual amount of services which will, in fact, be requested, nor is the City obligated to accept any specified amount of services. However, all services within the scope of this contract, which the City procures during the terms of the contract, will be procured from the Contractor, except work listed below, which the City may exclude from this contract. Work excluded from this contract includes:

- A. Work to be performed by City employees.
- B. Work to be performed as part of a special program which may include Federal/State funded or matching fund programs that require separate bidding. However, the IDIQ contractor is allowed to participate in the bidding process.
- C. In cases where the City has requested services from the contractor and the contractor has not responded by providing an acceptable schedule within two (2) weeks of the request, then the City may explore alternative award of the work to another qualified contractor. Repeated occurrence of such lack of response will be considered grounds for termination of the contract.

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**3.0 Contract Term**

The Contract Term is for a period of three (3) years, with the option to extend the contract for two (2) additional one (1) year terms. The City reserves the right to renegotiate and extend the contract or terminate the contract upon expiration.

Unit price adjustment must be requested sixty (60) days prior to the anniversary of the contract date. Such price adjustments must be presented to the City in written form, with full explanation and substantiation of the requested reason for the change. The unit price adjustment, if approved, will become effective at the extended contract effective date.

Pricing for items not covered in provisions of this contract shall be proposed by the Contractor and reviewed and approved by the City prior to commencement of the work.

**4.0 Bidding Instructions**

The bidder must complete and submit the following documents duly signed:

- Proposal Form
- Unit Price Table for Pavement
- Unit Price Table for Street/Concrete Structures
- Unit Price Table for Drainage Structures
- Unit Price Table for Tree Protection, and Miscellaneous
- Bidders Qualification & Certification Statement
- Non-Nuclear Involvement Affidavit
- Living Wage Form
- COG Rider Clause
- Insurance documents (required prior to contract award)
- References

**5.0 Special Projects Davis Bacon Prevailing Wage Compliance**

U.S. Department of Housing and Urban Development, Community Development Block Grants (CDBG) are used as a funding mechanism for some projects in Takoma Park. The Contractor will be responsible for compliance with Federal Labor Rate Schedules and requirements for these projects. Should the use of the Federal Labor Rate affect the unit prices in the bid response, the contractor shall provide those unit prices by bid item on an attachment to the bid form and note it is the Federal labor Rate pricing. Federal Labor Standard provision attachments are included for information only. General Wage Decision, which is specific to a project, shall be obtained when a project is determined to be a CDBG project.

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**PROPOSAL FORM**

Proposal of \_\_\_\_\_

(Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
City

\_\_\_\_\_  
State

\_\_\_\_\_  
Zip Code

To the City of Takoma Park, Maryland:

In accordance with the advertisement of the City of Takoma Park, Maryland, inviting bids for the work in conformance with the plans and specifications, I/we hereby certify that I/we am/are the only person or persons interested in this bid proposal as principals, that an examination has been made of the bid specifications, including the "special provisions" contained herein, and propose to furnish all necessary machinery, equipment, tools, labor and other means of construction, and furnish all materials specified in the manner and, at the time prescribed, at the following unit prices:

The unit prices provided on the attached bid schedule is to include and cover the means necessary for performing the work, and performing all steps required to complete the work satisfactorily in the manner set forth, and submit for approval by the City Engineer, as described in the specifications and drawings.

Witness: \_\_\_\_\_

\_\_\_\_\_  
Contractor

Witness: \_\_\_\_\_

\_\_\_\_\_  
Contractor

\*Note: Each and every person bidding and named above must sign here. In case of firms, give the first and last name of each party in full.

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**Table A: Asphalt Pavement Unit Prices**

<b>Item No.</b>	<b>Page</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>
A.1	20	<a href="#">Roadway Excavation and Grading</a>	CU	
A.2	20	<a href="#">Gravel Base Construction</a>	TON	
A.3	20	<a href="#">Milling (1-1/2 – 2-1/2 inches)</a>	SY	
A.3.1	20	<a href="#">Milling (4 inches)</a>	SY	
A.3.2	20	<a href="#">Milling (6 inches)</a>	SY	
A.4	21	<a href="#">Preparation of Existing Pavement</a>	SY	
A.5	21	<a href="#">Hot Mix Asphalt Base</a>	TON	
A.6	21	<a href="#">Hot Mix Asphalt Surface</a>	TON	
A.7	22	<a href="#">Pavement Reinforcing (i.e., Petro mat ©)</a>	SY	
A.8	22	<a href="#">Pavement Marking</a>	LF	
A.9	23	<a href="#">Thermoplastic Stripping on Hot Asphalt</a>	LF	
A.10	23	<a href="#">Thermal Stripping by Heat Application</a>	LF	
A.11	23	<a href="#">Preformed Thermoplastic Pavement Markings</a>	LF	
A.12	23	<a href="#">Pavement Seal Coating</a>	SF	
A.13	24	<a href="#">Asphalt Pavement Patching</a>	SF	
A.14	24	<a href="#">Subgrade Improvement (2 ft. Deep)</a>	SF	
A.15	24	<a href="#">Plain, Conventionally Reinforced or Continuously Reinforced Portland Cement Concrete Pavement Base Repair (Any Size)</a>	CY	
A.16	24	<a href="#">Adjust Sewer Manhole to Finished Grade</a>	EA	
A.17	24	<a href="#">Adjust Water Valve Box</a>	EA	
A.18	25	<a href="#">Maintenance of Traffic (Special Provisions)</a>	DAY	
A.19	25	<a href="#">Speed Bump (City Standard)</a>	EA	
A.20	25	<a href="#">Speed Hump (Montgomery County Standard)</a>	EA	
A.21	25	<a href="#">Speed Table (Montgomery County Standard)</a>	EA	
A.22	25	<a href="#">Raised Crosswalk (County Standard)</a>	EA	
A.23	25	<a href="#">FOUR 4" Pipe Bollard Installed</a>	EA	
A.24	25	<a href="#">SIX 6 "Pipe Bollard Installed</a>	EA	

- If unit prices listed above are not inclusive of the prevailing Federal Labor Rates for Montgomery County, please indicate so. Provide unit prices that are inclusive of prevailing federal labor Wage Rate on separate sheet or on additional column.

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**Table B: Street Structure Unit Prices**

<b>Item No.</b>	<b>Page</b>	<b>Description</b>	<b>Unit</b>	<b>Unit Price</b>
B.1	26	<a href="#">Remove/Replace Curb and Gutter</a>	LF	
B.2	26	<a href="#">Remove/Replace Handicap Ramp</a>	SY	
B.3	26	<a href="#">Detectable Warning Mat Installation</a>	SF	
B.4	27	<a href="#">Montgomery County Standard 1 0-A 1 0-C Curb and Gutter</a>	LF	
B.5	27	<a href="#">New Handicap Ramp Installation</a>	SF	
B.6	27	<a href="#">Remove and Replace Concrete Sidewalk</a>	SY	
B.7	27	<a href="#">Install New Sidewalk</a>	SY	
B.8	27	<a href="#">Remove/Replace Residential Driveway Apron</a>	SY	
B.9	27	<a href="#">Remove/Replace Commercial Driveway Apron</a>	SY	
B.10	28	<a href="#">Drain Connection through Curb</a>	EA	
B.11	28	<a href="#">Saw Cut Concrete and Asphalt 4 in. to 8 in.</a>	LF	
B.12	28	<a href="#">Install Brick Pavers on 2-inch Sand</a>	SF	
B.13	28	<a href="#">Install Brick Pavers on 4-inch Concrete</a>	SF	
B.14	28	<a href="#">Install Concrete Block Pavers</a>	SF	
B.15	29	<a href="#">Install Flexible Sidewalk</a>	SF	
B.16	30	<a href="#">RIP RAP Placement</a>	SF	
B.17	30	<a href="#">Imbricated RIP RAP for Channel Protection</a>	TON	
B.17.1	30	<a href="#">Grouted RIP RAP Placement</a>	SF	
B.18	30	<a href="#">Traffic Circle Construction</a>	SF	
B.19	30	<a href="#">Reinforcement Steel</a>	TON	
B.20	30	<a href="#">MSHA TYPE "A" or "C" Curb and Gutter</a>	LF	
B.21	30	<a href="#">Timber Retaining Wall</a>	SF	
B.22	30	<a href="#">Interlocking Concrete Block Retaining Wall</a>	SF	
B.23	31	<a href="#">Reinforced Concrete Retaining Wall</a>	SF	
B.24	31	<a href="#">Remove and relocate fence</a>	LF	

- If unit prices listed above are not inclusive of the prevailing Federal Labor Rates for Montgomery County, please indicate so. Provide unit prices that are inclusive of prevailing Federal Labor Wage Rate on separate sheet or on additional column.

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**Table C: Stormwater Drainage Structure Unit Prices**

Item No.	Page	Description	Unit	Unit Price
C.1	32	<a href="#">Removal of Defective Drain Pipes – All Sizes</a>	LF	
C.2	32	<a href="#">Trench Unclassified Excavation and Backfill</a>	CY	
C.3	33	<a href="#">Drain Pipe Installation 4” – 12” Schedule 40 PVC</a>	LF	
C.3.1	33	<a href="#">Install 15” Diameter: HDPE Drain Pipe</a>	LF	
C.3.2	33	<a href="#">Install 15 Diameter: RCP Drain</a>	LF	
C.3.3	33	<a href="#">Install 24” – 36” Dia. HDPE</a>	LF	
C.3.4	33	<a href="#">Install 24” – 36” Dia. RCP</a>	LF	
C.4	33	<a href="#">Inlet Top Slab Replacement 5-10 ft. Length</a>	EA	
C4.1	33	<a href="#">Inlet Top Slab Replacement 10 – 20 ft. Length</a>	EA	
C.4.2	33	<a href="#">Remove or Replace Drain Inlet Throat</a>	LF	
C.5	33	<a href="#">New Inlet Structure Construction</a>	EA	
C.6	33	<a href="#">Install Sidewalk Trench Drain</a>	LF	
C.7	34	<a href="#">Underdrain (UD) Installation as per Detail</a>	LF	
C.8	34	<a href="#">Under Sidewalk Intake Structure</a>	EA	
C.9	34	<a href="#">Standard Concrete End Section for 15”-30” R.C.P</a>	EA	
C.10	34	<a href="#">End Section for 15” – 30” HDPE</a>	EA	
C.11	34	<a href="#">Standard Manhole and Yard Inlet</a>	EA	
C.12	34	<a href="#">Inlet Brick Work Repair</a>	SF	
C.13	34	<a href="#">Temporary Curb Inlet Projection (any size)</a>	EA	
C.14	35	<a href="#">Field Connections for Pipe 8 Inches In diameter or Larger: Field connections New Pipe to Existing Pipe (Any Size – Any Type)</a>	EA	
C.15	35	<a href="#">Field Connections for Pipe 8 Inches In diameter or Larger: Field connections New Pipe to Existing Structure: (Any Size &amp; Type)</a>	EA	

- If unit prices listed above are not inclusive of the prevailing Federal Labor Rates for Montgomery County, please indicate so. Provide unit prices that are inclusive of prevailing Federal Labor Wage Rate on separate sheet or on additional column.

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**Table D: Tree Protection & Miscellaneous Material Unit Prices**

Item No.	Page	Description	Unit	Unit Price
D.1	36	<a href="#">Hand Removal of Curb and Sidewalk</a>	LF	
D.2	36	<a href="#">Tree Protection Fencing</a>	LF	
D.3	36	<a href="#">Root Zone Pruning</a>	LF	
D.4	36	<a href="#">Installation of Wooden Tree Wraps</a>	EA	
D.5	36	<a href="#">Top Soil Replacement</a>	SY	
D.6	36	<a href="#">Grass Seeding and Mulching</a>	SY	
D.7	37	<a href="#">Sod Placed over 2-inch Topsoil</a>	SY	
D.8	37	<a href="#">Shredded Hardwood Mulch – 3-inch</a>	SY	
D.9	37	<a href="#">Soil Mix Bio Retention</a>	CY	
D.10	37	<a href="#">Soil Stabilization Matting – Type A and B</a>	SY	
D.11	38	<a href="#">Impermeable Liner</a>	SY	
D.12	38	<a href="#">Aggregate No. 57</a>	TON	
D.13	38	<a href="#">Aggregate No. 7 or No. 8</a>	TON	
D.14	38	<a href="#">Aggregate No. 2</a>	TON	
D.15	38	<a href="#">Riprap Replacement for Erosion (Class I and II)</a>	TON	
D.16	38	<a href="#">River Jack Boulders Stone 4” – 7”</a>	TON	
D.17	38	<a href="#">Imbricated Rip Rap (Class IV and V)</a>	TON	
D.18	38	<a href="#">Pea Gravel</a>	TON	
D.19	39	<a href="#">Super Silt Fence</a>	LF	

MISCELLANEOUS				
D.20	39	<a href="#">Minimum Amount of Work Order</a>	EA	
D.21	39	<a href="#">Period of Warranty (Min. 12-Month)</a>	Month	
D.22	39	<a href="#">Timeframe for Repair of Defective Work</a>	Month	

- If unit prices listed above are not inclusive of the prevailing Federal Labor Rates for Montgomery County, please indicate so. Provide unit prices that are inclusive of prevailing Federal Labor Wage Rate on separate sheet or on additional column.

**CITY OF TAKOMA PARK  
GENERAL CONDITIONS**

The General Conditions set out below shall apply to all formal solicitations for the City of Takoma Park, Maryland. Proposers are responsible for informing themselves of these requirements prior to submission of proposals. The term "bid" and "bidder" as used in these General Conditions shall include the term "proposal" and "offeror" or "respondent."

1. Receipt of Proposals

Proposals or amendments received after the date and time specified as the proposal due date will not be considered.

2. Proposal Due Date

- a. Wednesday, September 26, 2019 at 4:00 p.m. EST
- b. Unless otherwise specified by the City, all proposals submitted may not be withdrawn after bid opening and shall be binding for City acceptance for ninety (90) days from the proposal due date.

3. Award or Rejection of Proposals

- a. A contract shall be awarded to a responsive and responsible qualified bidder. The City reserves the right, in its sole discretion, to: 1) accept a proposal in part or as a whole; 2) reject any or all proposals; 3) re-advertise the Request for Proposals; 4) waive any required information set forth in the Request for Proposals; 5) select a proposal and make a contract award which best serves the most effective and efficient performance of the contract services and the interests of the City; and/or 6) reject any and all proposals that comply with the Request for Proposals specifications, or to accept a higher proposal that complies, provided that, in the judgment of the City, the services or items offered under the higher proposal have additional values or functions justifying the difference in price.
- b. The City reserves the right to personally interview bidders and to inspect the bidder's place of business, inventory, supplies, and equipment prior to making a contract award.
- e. The City reserves the right to award the contract to two bidders that are deemed qualified based on their unit rate, previous work experience and references.
- c. The City also reserves the right, in its sole discretion, to reject the proposal of a bidder who has previously failed to satisfactorily perform or to timely complete a contract of

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a similar nature (whether for the City or for a different jurisdiction or entity) or a proposal of a bidder who, upon investigation, is not in a position to perform the contract.

- d. A written notice of the contract award (or acceptance of the bid) will be provided to the successful bidder within the specified acceptance period. The successful bidder will be expected to sign a City contract.

4. Payment

Invoices for payment for contract services must be submitted electronically. Payment will be made upon the City's acceptance of the services or items represented by the invoice. Payment terms are net 30 unless special arrangements have been established.

5. Subcontractors

Bidders may not assign or sublet the contract services or any part thereof without the prior written consent of the City Engineer. Bidders must request approval in writing for any such assignment or subcontracting, including the name of such assignee or subcontractor(s) he or she intends to use the specific services or materials to be furnished by such assignee or subcontractor, the assignee or subcontractor's place of business, and other information as the City Engineer may require.

Bidders shall not legally or equitably assign any of the monies payable under the contract, or its claim thereto, unless by and with the prior written consent of the City Engineer.

6. Compliance with Specifications

Bidders shall abide by and comply with the true intent of the specifications of this Request for Proposals and not take advantage of any unintentional error or omission.

7. Bidder's Certification of Noninvolvement in the Nuclear Weapons Industry

In order to comply with the provisions of Takoma Park Code Chapter 14.04, Nuclear-Free Zone, section 14.04.060.C, bidders must certify, by a notarized statement, that the bidder is not knowingly or intentionally a nuclear weapons producer. The certification form is included in this RFP.

8. Living Wage Requirement

This Request for Proposals is subject to the City of Takoma Park's living wage requirement for service contracts. The "Living Wage Requirements Certification" must be completed and submitted with the proposal. If the required Living Wage Requirements Certification is not completed and submitted with the proposal, then the proposal is unacceptable and will be rejected.

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The current mandatory living wage rate, payable by a contractor to employees under the City's living wage law, is \$15.05 per hour through June 30, 2020. The living wage rate is adjusted as of July 1 of each year to reflect the most current Montgomery County living wage rate and shall be applicable to any contract awarded thereafter until the date of the next adjustment. Notice of adjustments to the living wage rate can be found on the City's website ([www.takomaparkmd.gov](http://www.takomaparkmd.gov)). The City's living wage law—Takoma Park Code § 7.08.180 et. seq. is available at the same website.

9. Conflict of Interest

No employee or officer of the City, or his or her immediate family member, shall be permitted to any share or part of this contract or to any benefit that may arise from this contract.

10. Indemnification and Insurance

- a. The bidder is responsible for any loss, personal injury, death, property damages, and any other damages of every name and description that may be done or suffered by reason of bidder's negligence or failure to perform any contractual obligations. The bidder shall indemnify and save harmless the City of Takoma Park, its employees, officials, and agents, from and against all losses, liabilities, claims, demands, damages, suits, costs and expenses of any kind, including attorney's fees, and litigation expenses, suffered or incurred due to the bidder's negligence, tortuous act or omission, or failure to perform any of its contractual obligations.
- b. The bidder must obtain at its own cost and expense, and keep in force and effect during the term of the contract with the City for the contract work, including all extensions and renewals, the insurance specified below, with an insurance company licensed or qualified to do business in the state of Maryland. A certificate of insurance must be submitted to the City prior to the commencement of any work under the contract and prior to any contract modification extending the term of the contract, as evidence of compliance with this provision. The City of Takoma Park must be named as an additional insured on all liability policies. A minimum of thirty (30) days written notice to the City of cancellation or material change in any of the policies is required. In no event may the insurance coverage be less than that shown below, unless the requirements of this section are waived, in whole or in part, in writing by the City Manager.

<u>Coverage</u>	<u>Amount or Limits</u>
Workers Compensation (for bidders with employees)	
Bodily injury by	
Accident (each)	\$100,000
Disease (policy limits)	\$500,000
Disease (each employee)	\$100,000

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Commercial General Liability	\$1,000,000
(Minimum combined single limit for bodily injury and property damage per occurrence, including contractual liability, premises and operations, and independent contractors.)	

Minimum Automobile Liability	
(Including owned hired and non-owned automobiles.)	
Bodily injury, each person	\$500,000
Bodily injury, each occurrence	\$1,000,000
Property damage, each occurrence	\$300,000

11. Bidder's List

In an attempt to keep the prospective bidders' list current, bidders are asked to respond to all bid solicitations. If the response is a "No Bid," the bidder is requested to explain his reasons for not bidding. Failure to respond to three consecutive invitations may result in deletion from the City's bidder's list.

12. Changes

The City may, at any time, by written order, make changes to the Scope of Services as set forth in this RFP. If such changes cause an increase or decrease in the bidder's cost or time required for performance of any project service, an equitable adjustment, if applicable, may be made and the parties' contract modified in writing accordingly.

Any claim of the bidder for adjustment under this clause must be asserted in writing within fourteen (14) days from the date of receipt, by the bidder, of the notification of the change order, unless the City grants a further period of time.

No service for which additional compensation will be charged by the bidder shall be furnished without the written authorization of the City.

13. Covenant against Contingency Fees

The bidder warrants that no member of the bidder's firm has employed or retained any representative, individual, or firm other than a bona fide employee working solely for the bidder firm to solicit or secure any contracts hereunder and further warrants that there has not been any payment or promise or agreement to pay anyone a fee, commission, percentage, gift or any other consideration contingent upon or resulting from the award of a contract under this proposal.

## SPECIAL PROVISIONS

### 1.0 General Intentions

- 1.1 All work performed under this Contract shall be in accordance with the [Maryland Department of Transportation State Highway Administration \(MDTSHA\), Standard Specifications for Construction and Materials \(SSCM\)](#), dated July 2018, and that said specifications are hereby made part of this contract.
- 1.2 These special provisions are hereby made part of this contract. In case any conflict arises with any part of these specifications, the City Engineer will be the sole authority for determination of the proper procedure to follow. The various items under this contract shall be paid for as set forth in the bid or proposal.
- 1.3 The Contractor shall, if necessary, in the opinion of the City Engineer, provide a representative to appear and address questions and concerns from citizens residing on the street where repairs are to take place, currently under construction, or final punch-out has occurred.

### 2.0 Maintenance of Traffic

- 2.1 All work under this Contract shall be done in a manner that minimizes interruption to pedestrian and vehicular traffic through areas of the proposed work in accordance with sections GP-7.07, GP-7.08, GP-7.09, and GP-7.10 of [Maryland Department of Transportation, State Highway Administration, and Standard Specifications for Construction and Materials](#). Maintenance of traffic routes will be a subsidiary obligation of this Contract.
- 2.2 The Contractor shall maintain warning markers or a barricade at each location of work as necessary and until such time as the area is safe and ready to be used. If these safety features are not adhered to, a “stop work order” will be issued. Any damages caused by such delays will be the responsibility of the Contractor.
- 2.3 If movement of traffic must be inhibited in order to perform the work, all emergency services, school transportation office and local buses, police as well as the public must be notified by the contractor no later than 72 hours in advance of such temporary re-routing. The alternative route must be approved in advance and clearly marked.
- 2.4 Where traffic conditions make it impossible or undesirable to close the road to traffic, the Contractor shall provide at least two (2) competent, courteous and safely attired flag workers to direct the traffic at all times during the work hours. These persons shall be trained and certified in traffic control and equipped with safety vests, appropriate signage, and hand-held radios or communication devices. Additional flag workers shall be provided by the Contractor at intersections and other points where traffic condition dictates. Traffic control plans shall be approved by the City Engineer in advance.

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- 2.5 The Contractor shall provide and erect all necessary barricades, lights, and warning signs.
- 2.6 The cost of maintaining traffic, as noted above, shall be paid only if the conditions described above are met. No traffic control payment will be made when ordinary crew members act as flaggers. Although such setup may be sufficient, it is considered a subsidiary obligation of the Contractor for which no additional payment will be made.

**3.0 Utilities**

- 3.1 Attention of the Contractor is directed to the presence of water, sewer, gas mains, electrical wires and conduit, communication cables (both overhead and underground), poles and house services connections in the areas in which the construction project is to be performed. The Contractor shall exercise special care and extreme caution in order to protect and avoid damage to utility company facilities. The Contractor shall take into consideration the adjustments and installations by public utilities in areas within the limits of this contract. Existing utilities will be generally located and shown on project plans, if provided, as they are believed to exist; however, the City of Takoma Park assumes no responsibility for the accuracy of said locations. It is solely the Contractor's responsibility to locate and protect the locations of such utilities.
- 3.2 It is the sole responsibility of the contractor to obtain utility clearance and/or marking of all utilities on the site prior to commencement of work. The Contractor must call "Miss Utility" at least 72 hours in advance of construction, between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday. No work shall be permitted until Miss Utility has marked the utilities. The Contractor shall furnish the ticket number to the City prior to commencing. Rectifying any utility damage that occurs as a result of construction activities is the sole responsibility of the contractor and such damages shall be rectified to meet the requirements of the affected utility.
- 3.2 The Contractor shall be responsible for locating all existing utilities. Should any existing utilities be damaged or destroyed due to the operations of the contractor, the damaged or destroyed components shall be immediately replaced or repaired, as necessary, to restore utility to satisfactory operating condition. The cost of such repair or replacement shall be borne entirely by the Contractor.
- 3.3 No direct payment will be made to the Contractor for working around or protecting the utilities within the project limits. This will include the removal of temporary materials from the adjusted utilities prior to conducting the proposed work. The Contractor shall cooperate with the owners of the utilities and/or other Contractors. All costs incurred shall be included and considered incidental to the items identified in the Bid Proposal.

**4.0 Adjustment of Utilities**

- 4.1 The contractor shall notify all the utilities involved at least one (1) week prior to starting work in which there are water, electric, gas, and communication services that need to be adjusted so that these organizations may have their representatives present. The

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Contractor shall assist the utility companies, as necessary, by providing line and grade for structure adjustments.

- 4.2 As the street structures are raised to match the proposed surface, the Contractor will protect them with hand-tamped bituminous concrete, except where the utilities concerned have protected their own structures. The work will be a subsidiary obligation of the Contract and no extra payment will be made. The Contractor shall not be entitled to extra compensation for claim of damages because of possible delays in relocating utilities.
- 4.3 At the option of the City, Washington Suburban Sanitary Commission (WSSC) surface structure adjustments consisting of various water and sewer surface structures, including minor main adjustments, will be negotiated with the Contractor in accordance with Section GP-9.02, "Force Account Work" of the [Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#).
- 4.4 Any damage to utilities that may result from the Contractor's operations shall be made good by the Contractor. The Contractor shall have no claims for any delay that may occur in changing or relocating any of the services. If the City is charged any expense by the impacted utility as a result of actions taken by the Contractor, it will pass along that charge to the contractor or deduct the same from any monies due or to become due to the contractor.

**5.0 Fill**

- 5.1 If any areas adjacent to the proposed work covered by this Contract are lower than the approved grades due to the Contractor's work operations, these areas shall be re-graded prior to seeding as necessary, to provide positive drainage and conformity with typical grading sections. The exact limits and locations of this work shall be as directed by the City Engineer in the field.
- 5.2 A suitable sub-grade material, approved by the City Engineer, shall be used below the proposed construction as required in order to maintain approved grades.
- 5.3 All cost involved for furnishing, placing, and compacting the fill materials shall be included in the unit price bid for the various items of this contract.

**6.0 Mix Designs**

The Contractor shall submit mix designs for all concrete and bituminous concrete to be used on this Contract annually to the City Engineer for approval. Failure to do so may result in unnecessary delays.

**7.0 Erosion and Sediment Control**

Installation and maintenance of erosion and sediment control devices are required anywhere grading and excavation is done on this project. This work shall be performed in accordance with

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Section 101 – “Clearing and Grading of the [Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#),” and as directed by the City Engineer. There is no pay item in this contract for erosion and sediment control and it will not be paid for directly, but will be considered a subsidiary obligation of the various items of this contract. Inlet protection at some locations may be required and shall be provided as a subsidiary obligation.

**8.0 Site Restoration**

Upon completion of specific work items, all surface facilities and planting shall be restored to their original conditions. Driveways, lead walks, sidewalks, lawns, and shrubbery shall be restored to the satisfaction of the City Engineer. Restoration of utilities shall be done in accordance with specifications of applicable agent or utility company. There is no pay item in this contract for Site Restoration and it will not be measured and paid for directly, but will be considered a subsidiary obligation of the various pay items of this contract.

## **CONSTRUCTION STANDARDS**

Bidders are advised to read these Construction Standards completely below developing bid prices. The information contained herein sets the design requirements and construction standards the City expects for each of the items listed in the Bid Form.

### **PART A - ASPHALT PAVEMENT DEFINITIONS**

#### **A.1. ROADWAY EXCAVATION AND GRADING**

This item shall consist of excavating and grading the roadway, including approaches for intersecting streets and private driveways, curb and gutter, construction of embankments, compaction of the subgrade, fine grading, rolling and all other work necessary for the compaction of the subgrade, shoulders, slopes, ditches, change of channel of streams, unless provided otherwise, and disposal of surplus, all in accordance with Section 202 of the [“Maryland Department of Transportation,” State Highway Administration, Standard Specifications](#) for Construction and Materials, and as directed by the City Engineer.

#### **A.2. GRAVEL BASE CONSTRUCTION**

This item shall consist of construction of a roadway foundation course composed of bank run gravel or crusher run gravel compacted on the prepared Subgrade in accordance with Section 500 of the [“Maryland Department of Transportation,” State Highway Administration, Standard Specifications](#), and as directed by the City Engineer.

Gravel Base construction shall be paid by the number of tons of approved material furnished, placed, compacted, and accepted in accordance with these specifications.

#### **A.3. – A.3.2 MILLING – VARIOUS DEPTHS**

In areas directed by the City Engineer, the existing asphalt surface shall be removed down to the specified depth (i.e., 2-inch for resurfacing, 6-inch for total reconstruction) by use of a combination milling-planning machine and hauled away from the job site. Such machine shall be capable of producing a true uniform grade throughout, regardless of the type of material encountered. Any curb, gutter, header, or manhole damaged by the milling-planning machine shall be repaired by the Contractor at no additional cost to the City. Section 508 of the [“Standard Specification for Construction and Materials” Maryland Department of Transportation State Highway Administration](#) should be referenced as guidelines.

The Contractor will be required to protect persons and property from flying chips by the use of shields or other suitable means. Any damage to personal property of the residents and/or City right of way shall be repaired by the contractor at no cost to the City.

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The unit measure will be by the square yard and will be determined from the actual area of milling-planning. Payment for milling-planning will be made at the contract unit price per square yard. Payment will include removal and disposal of all materials, safeguards, and all labor materials, tools, equipment, and incidentals needed to complete the work specified.

**A.4. PREPARATION OF EXISTING PAVEMENT FULL DEPTH BASE**

Prior to milling and resurfacing, all apparent failure in the existing paving structure shall be identified by the City Engineer or his qualified representative, marked, and repaired by the Contractor. Severely distressed areas of pattern cracking, edge cracks, subsided surfaces, and other defects shall be removed, Subgrade modified, if necessary, and patched with at least 6-inches of base course asphalt. Payment shall be at the contract unit price bid per square yard for the type of material used, as directed by the City Engineer.

**A.5. HOT MIX ASPHALT BASE**

The bituminous base course shall be variable in depth, as directed by the City Engineer and the contract unit price bid shall include furnishing, placing, and compacting all material complete and accepted, as specified in Section 504 "HOT MIX ASPHALT" of [Maryland DOT, State Highway Administration, Standard Specification for Construction and Materials](#). Bituminous Tack Coat will be required on all streets to be resurfaced and shall be as specified in Section 504.03.04 of "[Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#)," except this item will not be paid for directly, but will be considered a subsidiary obligation of the various items of this contract. The tonnage of Hot Mix Base Course to be paid for shall be the number of tons of approved material furnished, placed, compacted, and accepted in accordance with these specifications.

**A.6. HOT MIX ASPHALT SURFACE**

The bituminous concrete surface course shall be as specified in Section 504 – "HOT MIX ASPHALT" of [Maryland Department of Transportation, State Highway Administration, and Standard Specifications for Construction Materials](#).

All intersections formed by streets being resurfaced shall be paved to the points of curvature of the intersecting streets, thereby resurfacing the entire intersection. Maintaining positive drainage in the intersections is of prime importance requiring attention on the part of the paving crew leader.

Bituminous Tack Coat will be required on all streets to be resurfaced and shall be as specified in Section 504.03.04 of "[Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#)", except this item will not be paid for directly, but will be considered a subsidiary obligation of the various items of this contract. The amount and rate of application of Tack Coat shall be approved by the inspector.

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This item shall be paid based on the number of tons of approved hot mix asphalt surface material furnished, placed, compacted, and accepted in accordance with these specifications.

**A.7. PAVEMENT REINFORCEMENT**

The provisions of 921.09 GEOTEXTILES are applicable to pavement reinforcing and Subgrade stabilizing fabrics that are used under this item. All geotextiles shall be listed in the National Transportation Product Evaluation Program (NTPEP) for geotextiles.

This work includes installing high strength pavement reinforcement fabric over cracks, joints, and patches in existing pavement. The fabric may be installed in strips or full width as directed by the City Engineer. Prior to milling, the Contractor will mark the location of joints and cracks with an offset reference so that they can be located after milling has been completed. Before placing the fabric, repair potholes, spalls, or cracks greater than 3/16 inches (5mm) wide, using asphaltic concrete.

Immediately before applying the asphalt binder, the pavement surface must be clean of rocks, dirt, debris, and other materials that may prevent a clean bonding surface. The fabric is to be rolled with a static drum or pneumatic roller to ensure adequate adhesion to the pavement surface.

The reinforcement fabric and asphalt cement binder, complete, in place, and accepted is measured by the square yard for full-width fabric, or by the linear foot for fabric strips. Overlaps shall be done as specified by the fabric manufacturer. The payment shall be based on SY of Pavement reinforced with no allowance for overlap.

**A.8.-A.8.7 PAVEMENT MARKING PAINTING**

This task shall include all materials and labor required for machine stripping of the stop bars, crosswalks, roadway marking (lane edge and center lines) that were removed or covered during construction or as deemed necessary by the City Engineer. The paint shall conform to AASHTO M28 Ready Mixed White and Yellow Traffic Paint, Type F.

**Preparation and application:**

Contractor shall loosen and remove dirt and other materials prior to paint application. Paint shall not be applied when air or surface temperatures are below 50 degrees F. or when pavement is moist. Paint shall be applied in appropriate widths for the application. Paint application shall produce an average, wet film thickness of 0.015 inches. Rate of application shall be 0.0031 gal. per ft. for striping. Location and configuration of permanent markings will match the existing pavement markings, unless otherwise directed by the City Engineer. Survey and layout of markings shall be the responsibility of the Contractor.

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**Stop Bars**

Shall be white paint 12" wide and extend one-half (1/2) the width of the roadway.

**Speed Hump**

Shall be white paint 12" wide stripes and a pattern specified by the City Engineer.

**Lane Edge**

Shall be white paint 4" wide stripe at lengths directed by the City Engineer

**Center Lines**

Shall be double, 4" wide at lengths directed by the City Engineer.

**Cross Walks**

Shall be two (2), 6" wide lines and extend the full width of the roadway or 18-inch wide cross hatches, 4 feet long, as directed by the City Engineer.

**A.9. THERMOPLAST STRIPING ON HOT ASPHALT**

Such striping shall be installed in strict adherence to manufacturer's standards, a copy of which shall be provided to the City Engineer accompanied by product certifications. The width of striping shall be as given above for each marking.

**A.10. THERMAL STRIPING BY HEAT APPLICATION**

This item covers the unit cost for Thermal Striping on cold pavement using heat application standard equipment. The unit fee shall include application of thermal pavement striping according to the same specification as described in items A.8 and A.9.

**A.11 PREFORMED THERMOPLASTIC PAVEMENT MARKINGS**

Furnish and install preformed thermoplastic pavement marking symbols, legends, and lines in adherence to general guidelines provided in Section 556 of the [Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#), as directed by the City Engineer.

**A.12. PAVEMENT SEAL COAT**

Work included in this section shall in general consist of furnishing all labor, materials, and equipment required for pavement seal coats in adherence to general guidelines provided in Section 503 of the [Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#), as directed by the City Engineer.

Areas that have been subject to fuel and oil spillage, but not permanently damaged or softened, shall be wire-brushed or scraped to remove excess dirt and grease accumulations. Solvents shall not be used for cleaning. The area shall be primed with acrylic copolymer latex to provide proper handling of the seal coat.

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Old lines shall be blackened with Gilsonite asphalt, black epoxy, or black acrylic coating. Excessive building up of lines should be abraded before tar emulsion coats are applied. Immediately before application of sealer, clean surface of all loose dirt, dust, leaves, and other foreign materials by sweeping, blowing, or flushing with water, or any other combination of the three.

**A.13. ASPHALT PAVEMENT PATCHING**

Pavement sections that require patching include additional paving adjacent to the curb and gutter and/or valley gutter shall be replaced to limits directed. The unit price bid per square yard for "Asphalt Patching" shall include removing and disposing of the existing pavement, placing and compacting additional gravel sub-base course, as required, and placing and compacting the bituminous patch with material that shall conform to MSHA standard specification section 505 HHOT MIX ASPHALT PATCHES. It should be noted that in some locations a leveling course will be required. The City Engineer shall direct the areas and type of material to be used for this work. Payment shall be at the contract unit price bid for the type of material used and shall match the existing paving in depth. It will be required that existing pavement be trimmed with a neat straight edge to allow for a smooth connection. Measurement for payment of "Asphalt Patching" shall be on square yard basis, surface measurement, from a point one (1) foot from the gutter edge to the limit of the patch.

**A.14.-A14.1 SUBGRADE IMPROVEMENTS**

This item consists of removal of subgrade material and replacement with compacted and controlled select fill in areas of repairs directed by the Engineer. The depth of improvements may vary, but will generally be limited to two (2) feet below subgrade elevation. If Geotextile fabric or reinforcing material such as Geogrid are specified for subgrade improvements, they shall be installed as per manufacturer recommendation as directed by City engineer. The cost shall be computed based on area of improved subgrade excluding overlaps.

**A.15. PLAIN, CONVENTIONALLY REINFORCED OR CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT BASE REPAIRS (ANY SIZE)**

Repair of plain, conventionally reinforced, or continuously reinforced Portland cement concrete pavement must adhere to the guidelines in Section 522 of [Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#), as directed by the City Engineer. All concrete base repairs will be measured in place and paid for at the contract unit price per cubic yard.

**A.16. ADJUST SEWER MANHOLE TO FINISHED GRADE 2 IN. TO 4 IN.**

Utility Manholes, Water, Sanitary, and Stormwater Manholes and access points shall be adjusted using extension collars compatible with the said utility and in accordance with standards of the same. Any permit or coordination with the respective utility entity is the responsibility of the contractor as is the responsibility of compliance with respective standards. All necessary work and

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equipment to make any and all manhole covers flush with the resurfaced pavement level is included in this item for payment.

**A.17. ADJUST WATER VALVE BOX**

All necessary work and equipment to make any and all water valves flush with the resurfaced pavement level is included in this item for payment.

**A.18. MAINTENANCE OF TRAFFIC**

Please refer to Special Provisions Items 2 on page 16 for description for detailed description of this item and condition of payment.

**A.19 – A.22 SPEED BUMP, SPEED HUMP, SPEED TABLE, RAISED CROSSWALK**

These items consist of providing labor and materials and incidentals necessary for construction of speed bumps, speed humps, speed tables, and raised crosswalks using Hot Mix surface quality asphaltic concrete. The details of the standards used in the City are attached. Prior to installation of the structures, the contractor shall saw cut the existing pavement to create two (2) six-inch wide, 2-inch deep trenches in the existing pavement perpendicular to the gutter at the outer edges of the planned structure.

The contractor is expected to create a wooden form to match the dimensions of the speed bump and speed hump. The wooden form will be made to the exact profile for the structures. When the structures are being made, these forms will be placed on the existing road surface and the new asphalt will be placed and compacted to match the form.

**A.23. FOUR 4" PIPE BOLLARD INSTALLATION**

Mountable or embedded bendable elastomer 4-inch Bollards with end cap, loop cap, and post guard cover, color finishes of gray or yellow with reflective stripes shall be installed per specifications by the City. The unit cost includes all incidentals to such item. Embedment depth, if applicable, shall be specified by the City Engineer.

**A.24. SIX 6" PIPE BOLLARD INSTALLATION**

Mountable or embedded bendable elastomer 6-inch bollards with end cap, loop cap, and post guard cover, color finishes of gray or yellow with reflective stripes shall be installed per specification by the City. The unit cost includes all incidentals to such item. Embedment depth, if applicable, shall be specified by the City Engineer.

**PART B - CONCRETE STRUCTURES DEFINITIONS**

Unless otherwise indicated by the City Engineer, all concrete structures, including sidewalks and sidewalk ramps, shall conform to “Montgomery County Department of Transportation or Department of Permitting Services” design and construction standards. Two separate unit prices are required for construction of sidewalk and ramps as new construction and as replacement of an existing structure. Also, a bid item is included for installation of detectable warning mat according to manufacturer recommended procedures and as directed by the City Engineer.

**B.1. REMOVE AND REPLACE CONCRETE CURB AND GUTTER**

This item consists of removing and replacing concrete curbs and gutters according to “Montgomery County Department of Transportation,” Standards type A and type B.

Or Standards MC-102.01 Depressed Curb entrance or Type F as found in MCDOT Design Standards at: <https://montgomerycountymd.gov/dot-dte/common/standards.html>

The basis of payment will be the linear foot of completed and accepted structures. Payments shall constitute full compensation for furnishing and placing all materials, including expansion material, all necessary excavation, the removal and disposal of the existing curb, backfilling, tamping, including top soil and seeding for all labor, equipment, tools, and incidentals necessary to complete the item.

All transition sections of curb and gutter necessary due to type changes shall be ten (10) feet in length and shall be measured and paid as Standard type A concrete curb and gutter and valley gutters. Also included in this pay item is where back curb height is specified to be up to 6-inches higher than Type A Standard, the linear feet of curb and gutter shall be measured and paid for under this item.

Removal and replacement of inlet throats shall be measured and paid separately. Removing and replacing, all bituminous paving and gravel base course necessary to allow forming the front edge of the gutter to the point one (1) foot from the edge of gutter, should be included in this unit price. Also included shall be back filling the over dig gap in front of the gutter with concrete upon setting of the concrete and removal of the form. The top two (2) inches of the gap shall be paved with hot mix asphalt after application of sufficient tack coat.

**B.2. REMOVE AND REPLACE SINGLE SIDEWALK RAMP**

This item consists of removing and replacing an existing sidewalk accessibility concrete ramp curbs and gutters according to “[Montgomery County Department of Transportation,](#)” [Standards No. MC1112.01 and MC113.01](#) enclosed in the appendix. The basis of payment will be the square yard of completed and accepted structures. Any modification to the detail provided, will be directed by the City Engineer.

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**B.3. DETECTABLE WARNING MAT INSTALLATION**

The detectable warning mat shall be mounted on cast in place concrete sidewalk accessibility ramps unless otherwise specified by the City Engineer. Such mat shall meet the requirements outlined in Revised Draft Guidelines for Accessible Public Rights-of-Way. The dimension and color of such ramp shall be approved by the City Engineer prior to installation.

**B.4. NEW CURB & GUTTER INSTALLATION**

As defined in Section B.1, except that this item is constructed where there are no improvements.

**B.5. NEW HANDICAP RAMP INSTALLATION**

As defined in Section B.2, except that this item is constructed where there are no improvements.

**B.6. REMOVE AND REPLACE CONCRETE SIDEWALK**

Defective or distressed sidewalk shall be removed, subgrade inspected and 4-inch layer of approved select backfill shall be placed and compacted prior to forming casting in place 3000 psi 28-day compressive strength concrete. [MGC Standard 110.01, 111.01](#), shall be the basis of the unit price. The Contract unit price per square foot for "Concrete Sidewalk" shall include furnishing and placing all materials, including expansion material, necessary excavation, and backfilling and tamping, including seeding replacement and for all labor, equipment, tools, and incidentals necessary to complete the item.

**B.7. INSTALL NEW SIDEWALK**

As defined in Section B.6, except that this item is constructed where there is no existing improvement.

Unless otherwise indicated by the City Engineer, all concrete sidewalks and sidewalk ramps shall conform to "[Montgomery County Department of Transportation](#)" Standards. Two separate unit prices are requested as bid items for sidewalk and ramps, the first one as new construction and the second as replacement of existing defective structures. Additionally, a bid item is included for installation of detectable warning mat according to manufacturer recommended procedures and as directed by the City Engineer.

**B.8. REMOVE AND REPLACE CONCRETE DRIVEWAY APRONS (RESIDENTIAL)**

See description below

**B.9. REMOVE AND REPLACE CONCRETE DRIVEWAY APRONS (COMMERCIAL)**

The contract unit price per square yard for "Concrete Driveway Aprons" for both residential and commercial details shall include furnishing and placing all materials including expansion material, necessary excavation, and backfilling and tamping, seeding replacement and for all labor, equipment, tools, and incidentals necessary to complete the item. Unless otherwise designated by the City Engineer in the field, all concrete driveway aprons shall be constructed according to [Montgomery County Department of Transportation Standard MC-302.01](#).

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The price for Commercial Driveway Aprons shall be full compensation for all excavation, formation, and furnishing of all labor, equipment, tools, and incidentals necessary to complete this item.

**B.10. DRAIN LINE CONNECTION THROUGH CURB**

Curb connections shall consist of installation of a 3.5-inch solid PVC pipe inserted through the curb to drain a sump pump or down spout discharge. During the installation of new curb, the Contractor is responsible for noting all existing connections prior to the excavation and to ensure that these openings are maintained. The Contractor is to ensure that the drain lines are connected securely to the PVC pipe. The area is to be backfilled with soil, compacted and returned to original condition.

**B.11. SAW CUT 4 to 8 INCH ASPHALT OR CONCETE**

All material and labor to furnish the saw cutting as directed by the City Engineer is included in this unit price. All saw cutting operation shall be performed in a manner to minimize dust and runoff. For all saw cutting operations, no run-off generated from the operation and the particulates from the asphalt or concretes is allowed to flow into the stormwater system or any adjacent creek or stream. The contractor will be expected to capture any particulate discharge and filter it or remove it from site once operation is complete. Runoff control measures are considered a part of the saw-cutting operation and shall be conducted in general conformance to Section 308 of the [Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials](#), as directed by the City Engineer.

**B.12. INSTALLATION OF BRICK PAVERS ON SAND BEDDING**

All material and labor to furnish the brick paver installation using standard sidewalk/light traffic or traffic grade brick pavers on a 2-inch sand bedding on firm subgrade, as directed by the City Engineer, is included in this unit price. The brick pattern and edging material shall be installed in a workman-like manner with regard to appearance and durability subject to approval by the City Engineer. Open joints larger than 1/8 inch shall not be permitted.

**B.13. INSTALL BRICK PAVERS ON 4-INCH CONCRETE**

All material and labor to furnish the brick paver installation using standard sidewalk/light traffic or traffic grade brick pavers on a 4-inch concrete bedding of the same standard as sidewalk concrete, or as directed by the City Engineer, should be included in this unit price. The brick pattern and edging material shall be installed in a workman-like manner with regard to appearance and durability. Open joints larger than 1/8 inch shall not be permitted.

**B.14. INSTALL PERMEABLE INTERLOCKING CONCRETE PAVING BLOCKS**

The interlocking precast concrete block units leave drainage openings that typically comprise approximately 10% of the paver's surface area. For estimating proposes the paver block shall be supported by a stone base that has large pore spaces, such as AASHTO #57 Stone. A minimum

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thickness of 6-inch washed No. 57 stone shall underlie the pavers over suitable soils. Typical interlocking permeable paver specifications used by the City are as follows:

- A. Material Standard: Comply with material standards set forth in ASTM C 936
- B. Color: Natural
- C. Size: nominally 8.5 inches x 6 inches x 3.125 inches thick
- D. Average Compressive Strength (ASTM C140): 8000 psi (55 MPa) with no individual unit under 7200 psi (50 MPa).
- E. Average Water Absorption (ASTM C 140): 5% with no unit greater than 7%. Freeze/Thaw Resistance (ASTM C67): Resistant to 50 freeze/thaw cycles with no greater than 1% loss of material. Free-thaw testing requirements shall be waived for applications not exposed to freezing conditions.

Concrete pavers manufactured by EP Henry Corporation, such as Paver Type: Eco II Paver or approved equal. All the installation and tolerances shall be in strict accordance with guidelines provided in interlocking Concrete Pavement Institute (ICPI) Manual. The Contract unit price for this item shall include furnishing and placing all materials, labor, equipment, tools, and incidentals necessary to complete the work.

**B.15. INSTALL FLEXIBLE POROUS SIDEWALKS**

Flexible porous sidewalk shall be installed in the locations identified by the City. Flexible porous surface is typically used as an alternative to hardscape, sidewalks, pathways and trails to protect tree root systems. The contractor shall provide unit price to install a flexible, porous surface. Equivalent or similar products for flexible porous sidewalk surfaces are provided by the following manufacturers:

1. FLEXI-PAVE® <http://capitolflexipave.com/>
2. POROUS PAVE, <http://porouspaveinc.com/>
3. FILTER PAVE®, <http://filterpave.com/>
4. PERK E PAVE™, <https://perkepave.com/>

The contractor shall identify which of the flexible porous surface it plans to provide and the unit price, in accordance with material and installation specification as required by the manufacturer.

**B.16. RIP RAP PLACEMENT (CLASS I)**

For estimating purposes, refer to the description provided in [MGWC 2.1: RIPRAP-Maryland Department of the Environment Waterway Construction Guidelines](#). These guidelines are enclosed.

**B.17. IMBRICATED RIP RAP FOR CHANNEL PROTECTION (CLASS I & II)**

For estimating purposes, refer to the description provided in [MGWC 2.2: IMABRICATED RIPRAP. Maryland Department of the Environment Waterway Construction Guidelines](#). These guidelines are enclosed.

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**B.17.1 GROUTED ROCK RIP RAP PLACEMENT**

This work consists of furnishing, and installation of the item, revetment and blankets. It includes filter and bedding material where specified.

All material and installation methods shall generally comply to **Construction Specification 462—Grouted Rock Riprap** provided in the Appendix. This item shall be paid based on unit price for properly installed reinforcement steel in concrete in accordance with provisions of project plans and specifications, as directed by the City Engineer

**B.18. TRAFFIC CIRCLE CONSTRUCTION**

This item includes traffic circles with diameters up to 50 feet, to be constructed at paved intersections. This item includes removal of all asphalt, base, and sub-base, as well as the subgrade material in the middle of the intersection in a circular, semicircular, or oblong elliptic or irregular shape to a depth of 18 inches below asphalt surface. All the soils from excavation must be hauled and disposed of off-site. The curbs and gutter and perimeter brick stripes are to be installed in accordance with Montgomery County Residential Traffic Circles guidelines provided in attachment. Approved topsoil must be provided within the circle to a depth of 13 inches. The guidelines are intended to provide illustrations for cost estimating purposes. The Contract unit price for this item shall include furnishing and placing all materials, labor, equipment, tools, and incidentals necessary to construct the central island of the traffic circle up to a diameter of fifty (50) feet.

**B.19. REINFORCEMENT STEEL**

For Portland Cement Concrete reinforcement all provisions and specifications outlined in [SHA Manual Section 908](#). This item shall be paid based on unit price for properly installed reinforcement steel in concrete in accordance with provisions of project plans and specifications, as directed by the City Engineer.

**B.20. MSHA TYPE “A” OR “C” CURB AND GUTTER**

This item consists of removing and replacing concrete curbs and gutters according to “Maryland State Highway Administration,” Standards A and C. The basis of payment will be the linear foot of completed and accepted structures. Remaining descriptions are identical to that of Item B.1.

**B.21. TIMBER RETAINING WALL**

This item consists of construction of pressure treated timber retaining wall consisting of standard 5-8 inches’ nominal size timber and tiebacks dead men installed according to specifications given by the City. The exposed height of such wall will be a maximum of four (4) feet. Typically, the wall dead men tiebacks shall be installed at spacing of 24 inches vertically on staggered, alternating rows with typical horizontal spacing of eight (8) feet. The pay item shall be based on square feet of installed and backfilled wall.

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**B.22. INTERLOCKING CONCRETE BLOCK RETAINING WALL**

This pay item will be based on a typical interlocking wall of up to four (4) feet in exposed height. For estimating purposes, Keystone™ or versa grid™ retaining wall system may be used. All typical project specification provided in manufacturers guidelines and approved by the City Engineer should be assumed. Site preparation and foundation work, interlocking concrete block, backfill placement and earth reinforcing detail shall comply with above specifications. The pay item includes installed tieback, backfilling, and drainage furnished according to typical specifications.

**B.23. REINFORCED CONCRETE RETAINING WALL**

This item is inclusive of forming, reinforcement, and finishing of cast in place retaining wall with typical backfill and drainage requirement as provided in the appendix. All labor and materials to include site clearing and foundation preparations to be provided by the contractor for finished and approved masonry or cast in place concrete wall. The pay item will be based on measurement in square feet of wall surface.

**B.24. REMOVE AND RELOCATE FENCE**

This work shall consist of removing and relocating existing fence and gates where indicated on the contract plans.

**MATERIALS**

Concrete footings for chain link fence posts: MSHA Mix No. 2 concrete.

Concrete footings for wood fence posts: MSHA Mix No. 3 concrete.

Posts, Braces, Fittings and Hardware: MSHA 914.03.

Remove and Relocate Existing Chain Link Fence will be measured and paid for at the Contract unit price per linear foot.

**PART C - STORMWATER DRAINAGE STRUCTURES DEFINITIONS**

**C.1 REMOVAL OF DEFECTIVE PIPES (All Sizes)**

The Contract unit price per linear foot for “Defective Pipe Removal” shall include furnishing and placing all materials, necessary for safe excavation and removal of all defective pipes, labor, equipment, tools, and incidentals necessary to complete the work. One price is requested for all sizes of defective pipe to be removed. The operation shall be inspected and approved by the City Engineer or his designated representative. Please note that when an existing drainage structure is to be removed and replaced with a new drainage structure in the same location, the cost to remove the existing drainage structure and a section of the existing pipe will be incidental to the cost of the new drainage structure.

**C.2 TRENCH EXCAVATION & BACKFILL**

Information concerning existing underground utilities will be obtained from available records. The Contractor must determine the exact location and elevation of existing utilities by digging test pits by hand at all utility crossings well in advance of trenching. Maintain minimum one (1) foot vertical clearance between all storm drain crossings and other utilities. If clearance is less than one foot at any location, contact the City Engineer before proceeding with construction.

Trench backfill shall be compacted to 95 percent of Maximum Dry Density at optimum moisture content as determined by AASHTO T-99, Method C. It is the responsibility of the contractor to provide suitable backfill material compacted to comply with the above standards. Contractor may provide testing and quality control to ensure certified compaction test results from an independent Geotechnical Engineer licensed by the State of Maryland. The City Engineer may also arrange for discretionary supplemental quality assurance testing of fill material placed or accept contractor provided test results.

Where any part of the storm drain system is located in a fill section, provide select fill material compacted to 95 percent of maximum dry density at optimum moisture content as determined by AASHTO T-180, Method –C, from existing ground to approved pipe subgrade. Contractor shall supply City Engineer with field compaction test results certified by a Geotechnical Engineer Registered in State of Maryland.

Unless otherwise specified, all storm drain pipes shall be installed according to Montgomery County Standard “C” shaped subgrade bedding.

If springheads are encountered in any phase during construction, the operation must be stopped until the spring is capped and piped to a storm drain or stream, as directed by the City Engineer.

Site restoration shall be as directed by the City Engineer. If trench restoration is abutting existing paving, the edges shall be saw-cut to provide a clean, straight, and vertical joint. Restoring the

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curb and gutter or sidewalk shall be extended to existing contraction joints and include full sections.

The contract unit price per cubic yard of trench excavation shall include furnishing materials for all labor, equipment, tools, and incidentals necessary for completion of necessary excavation, backfilling, compaction, and testing the compacted soils at the discretion of the City Engineer. All shoring and protection for trench safety is to be included in the unit price. Excavated trench safety is the sole responsibility of the Contractor, as is the case with all other safety issues. The City reserves the right to stop the work, if conditions of the construction site are considered unsafe. Backfill materials shall be compacted and tested as deemed necessary by the City Engineer and work shall continue only after acceptance.

**C.3 - C.3.4      INSTALLATION OF DRAIN PIPE (various sizes)**

Storm drain construction shall be in accordance with the latest General Specifications and Standard Details in the Maryland State Highway Administration, Montgomery County, and the City, unless otherwise noted.

The Contract unit price per linear of "Drainpipe Installation" shall include furnishing and placing all materials, necessary for pipe installation, labor, equipment, tools, and incidentals necessary to complete the work. Unit prices are requested for RCP pipes and HDPE pipes of varying diameters. The operation shall be inspected and approved by the City Engineer or his designated representative. Subgrade for the pipes and pipe cover materials are subject to approval in adherence to general guidelines provided in Section 305 and 900 of the Maryland Department of Transportation, State Highway Administration, and [Standard Specifications for Construction and Materials](#), as directed by the City Engineer.

**C.4 – C.4.2      INLET TOP SLAB REPLACEMENT**

The Contract unit price for this item shall include furnishing and placing all materials, labor, equipment, tools, and incidentals necessary to complete the work of construction of inlet top slab placement or replacement, cast in place or pre-cast, according to [Montgomery County Standards, details 501.01](#). Payment is by the square yard (S. Y.)

**C.5      NEW INLET CONSTRUCTION**

The Contract unit prices for "New Inlet Top Slab" and "New Inlet Construction" shall include furnishing and placing all materials, all labor, equipment, tools, and incidentals necessary to complete the work. The typical Montgomery County Details shall be used for pre-cast or cast in place concrete inlets, as well as the top slabs and throat. ([See details 501 through 507.](#))

**C.6      INSTALL SIDEWALK TRENCH DRAIN**

This item consists of providing labor, material, and equipment necessary to install a typical 6-inch sidewalk drain under the direction of the City Engineer. Grating shall be removable and, if metallic, shall be rust resistant. The specification shall be equal to enclosed provided standards presented in the appendix, as determined by the City Engineer.

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**C.7 UNDER DRAIN INSTALLATION**

A typical underdrain is an 18-inch to 36-inch deep trench of 12 to 24-inch width housing a 4-6-inch PVC flexible perforated pipe surrounded by 3-inches of washed gravel or washed No. 57 stone and wrapped in filter fabric such that the gravel has no contact with the backfill or surrounding soils. If the discharge is to be connected to an inlet or transverse under sidewalk or paving the discharge pipe segment shall be Schedule 40 solid PVC pipe of the equal or larger diameter. The trench is backfilled and tamped to grade. The labor, material, and any incidental necessary to complete the work shall be compensated at the contract unit prices upon inspection and approval by the City Engineer. A typical detail ([MSHA Standard No. MD 387.11](#)) is provided in the appendix.

**C.8 UNDER SIDEWALK INTAKE STRUCTURE**

A under sidewalk intake structure may be prefabricated or monolithically poured concrete structure or cast in place structure poured in bottom end top segments. The concrete compressive strength shall be  $f'c = 3500$  psi at 28 days. The reinforcing steel shall be of  $f_y = 60$  ksi grade. The unit price shall include furnishing and placing all materials, all labor, equipment, tools, and incidentals necessary to complete the work.

**C.9 STANDARD CONCRETE END SECTION FOR 15"-30" R.C.P**

The labor, material, and any incidental necessary to complete the work shall be compensated at the contract unit prices upon inspection, and approved by the City Engineer. A typical detail is provided in the appendix. [MSHA STANDARD NO. 368.02.](#)

**C.10 END SECTION FOR 15"-30" HDPE**

The labor, material, and any incidental items necessary to complete the work shall be compensated at the contract unit prices upon inspection and approval by the City Engineer. Connections shall be done in accordance with manufacturer's recommendation upon approval by the City Engineer.

**C.11 STANDARD MANHOLES AND YARD INLET**

**([MSHA Standard NO. MD. 381.02, MD.383.00, MD. 384.03 AND MD. 384.01](#))**

The contract unit prices should cover all labor, material, and any incidental items necessary to complete the work. The listed Standards are enclosed in the appendix.

**C.12 INLET BRICK WORK REPAIR**

This item shall be compensated based on the exposed area of typical brick inlet repair needed as delineated for removal of the damaged walls and replacement in a good workmanship manner. The pay item shall be equal to the square feet of the brickwork repaired upon approval by the City Engineer.

**C.13 TEMPORARY CURB INLET PROTECTION (ANY SIZE)**

The purpose of this item is to prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area. All of the methods for storm drain inlet protection

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are prone to plugging and require a high frequency of inspection and maintenance. Temporary inlet protection can be accomplished either by using pre-manufactured proprietary devices or by constructing a device on site. Self-constructed devices generally consist of a means of filtering (geotextiles fabric, aggregate, straw bale), which is securely anchored and supported against the weight of ponded water by some type of support (wood posts, concrete blocks, wire mesh, the inlet structure itself). This can be accomplished in many different ways.

Inspect all inlet protection devices at least twice weekly and after every significant rainfall event (1/2" or more rainfall). During extended rainfall events, inspect inlet protection devices at least once every 24 hours. Replace clogged aggregate or filter fabric immediately. Look for damage caused by large flows. Inspect downstream inlets, pipes, and other infrastructure downstream after severe storms to check for bypassed material.

The pay item shall include the labor, material, and any incidental necessary to complete the work upon inspection and approval by the City Engineer.

**C.14 & C.15 FIELD CONNECTION OF PIPE TO PIPES OR EXISTING STRUCTURES**

This item consists of field connection of new pipe to another existing or new pipe. All sizes and pipe materials are included.

The item will be measured and paid at the contract unit price per each Pipe connection. Payment will be full compensation for all Mix No. 3 concrete or Non-shrink Hydraulic grout as specified, preparation of the existing pipe and/or structure, any prefabricated connections, galvanized hangers, and all material, labor, equipment, tools, and incidentals necessary to complete the work.

When connecting to existing catch basin or inlet structures, the item will be paid at the Contract unit price per each incident. Payment will be full compensation for cutting a hole in the existing structure, removal and disposal of all debris from the site, sealing the connection between the existing structure and the new pipe, any modification to the existing channel as necessary to facilitate continuous flow from the new pipe, and all material, labor, equipment, tools, and incidentals necessary to complete the work.

**PART D - TREE PROTECTION & MISCELLANEOUS MATERIALS DEFINITIONS**

**D.1 HAND EXCAVATION OF CURB WITHIN ROOT ZONE**

Contractors should refer to the “City of Takoma Park Tree Preservation Measures for Tree Protection Plans” included in the appendix, when the project limit of disturbance (LOD) or area within fifteen feet of LOD include existing trees equal to or greater than 7 5/8” inches DBH.

The extent of hand excavation zone will be determined by the City Arborist, but generally extends a minimum of 12 feet on either side of a tree.

**D.2 TREE PROTECTION FENCING**

For type of tree protection fence, contractors should refer to the “City of Takoma Park Tree Preservation Measures for Tree Protection Plans” included in the appendix, when the project limit of disturbance (LOD) or area within fifteen feet of LOD include existing trees equal to or greater than 7 5/8” inches DBH. The necessary length of the fencing shall be directed by the City Arborist, but generally requires a space of 6 feet on either side of the tree.

**D.3 ROOT ZONE PRUNING**

For root zone pruning, contractors should refer to the “City of Takoma Park Tree Preservation Measures for Tree Protection Plans” included in the appendix, when the project limit of disturbance (LOD) or area within fifteen feet of LOD include existing trees equal to or greater than 7 5/8” inches DBH.

When the contractor is excavating in an area within the critical root zone of a tree, all roots encountered during the excavation shall be pruned by hand with a sharp spade or blade to make a defined clean cut of the root. Designation of root pruning area will be identified by the City Arborist or Construction Manager prior to occurrence. The work shall be paid based on linear feet. The unit price for Root pruning using approved equipment should include all necessary material, equipment, tools, and trained operators to complete the work as directed and approved by the City Arborist

**D.4 INSTALLATION OF WOODEN TREE WRAPS**

When required by the City Arborist, as necessary to protect a tree from being damaged by equipment in a work zone, a contractor will install 2 x 4 pine boards vertically around the diameter of a tree. The boards shall be secured with a rope in several locations along the top, middle, and bottom of the boards to ensure that it does not slip or move.

**D.5 TOP SOIL**

Placement of top soil in preparation for vegetation establishment should conform to the specification describe on section [MSHA manual section 920.01.01 and 920.01.02](#). Top soil should be sourced from the list of qualified suppliers provided by Maryland Department of Transportation State Highway Administration (MDOT SHA). The list can be obtained online at: <https://www.roads.maryland.gov/Index.aspx?PageId=600#soil>

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**D.6 GRASS SEEDING AND COVER**

All seeding shall conform to Maryland Department of Highway Standard Specification Section 920.03. It shall be diligently placed in at least 3 inches of top soil and covered with straw for protection. The seeding shall be compensated at contract unit fees. Top soil placed must meet the minimum requirements of the aforementioned Standard.

**D.7 SOD ON 2-INCH TOP SOIL**

All sod where specified by the City Engineer shall be placed over 3-inches of topsoil and conform to Maryland Department of Highway Standard Specification Section 920.01.01 and 920.03. Seeding shall be diligently placed in at least three (3) inches of topsoil and covered with straw mulch for protection. The seed or sod placement shall be compensated at contract unit fees. Top soil placed must meet the minimum requirements of the aforementioned standard.

**D.8 SHREDDED HARDWOOD MULCH-3-INC**

This item shall conform to [MSHA Standards 920.04.03](#) indicating that Shredded Hardwood Bark (SHB) Mulch shall consist of natural bark derived from hardwood trees that has been milled and screened to a maximum 4 in. particle size.

**D.9 BIO RETENTION SOIL MIX (BSM)**

Topsoil, Subsoil, and Bio retention Soil Mix shall conform to requirements of [MSHA manual section 920.01.05 SOILS](#). Soils BSM shall be composed of Sand, Furnished Topsoil, and Hardwood Mulch. BSM may include approved soil amendments. No other components shall be used.

(1) Sand. Sand shall be washed silica sand that conforms to ASTM C-33 or ASTM M-6 with less than 1 percent by weight of any combination of diabase, Greystone, calcareous, or dolomitic sand.

(2) Furnished Topsoil. Refer to MSHA Standards 920.01.032.

(3) Hardwood Mulch. Hardwood Mulch shall be the bark and wood of hardwood trees that is milled and screened to a uniform particle size of 2 inch or less. Hardwood Mulch shall be aged for 6 months or longer, with negligible quantity of sawdust and no foreign materials.

(4) Amendments. Refer to 920.02. Limestone, Sulfur, and Iron Sulfate may be used to adjust pH of BSM. No other amendments shall be used. Certification of test results for all bio retention soil mixtures used on city's projects is a deliverable document and this item will only be compensated for upon furnishing such certification. An independent quality assurance test may be conducted at the City's discretion.

**D.10 SOIL STABILIZATION MATTING**

This item shall conform to [MSHA Standards 920.04.03](#). Install soil stabilization matting in conjunction with permanent vegetation for the areas that are at final grade in conjunction with Turf Grass Establishment, Seeding Establishment, and Meadow Establishment, or as specified by City Engineer or designee.

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**D.11 IMPERMEABLE LINERS**

All geotextiles used shall be listed on National Transportation Product Evaluation Program (NTPEP) for Geotextiles in accordance with [MSHA standards Section 921.09](#). The cost per square foot of installed impermeable liner is equivalent to 30-mil geo-membrane for fluid barriers and shall include installation, anchorage, and overlap requirements, as specified and directed by the City Engineer or designee.

**D.12 AGGREGATE MSHA NO. 57**

This item shall conform to MSHA section 901 and AASHTO Designation M-43 size No. 57 Coarse Aggregate. The stone shall also meet the quality requirements specified in 901.03. This gap graded free draining material is often used as drainage media for stormwater related construction. Washed or double washed No. 57 stone is generally specified for such application. The pay item will be paid when delivered and placed in accordance with provided specification at volume in cubic yard in- place basis.

**D.13 AGGREGATE NO. 7 OR NO. 8**

This item shall conform to Section 901 – AGGREGATES and AASHTO Designation M-43 size No. 7 or 8 coarse aggregate. When placed in accordance with provided specifications, this pay item shall be measured on the basis of cubic yard of aggregate at in place density.

**D.14 AGGREGATE NO. 2**

This item shall conform to [MSHA Section 901](#) and AASHTO Designation M-43 Size No. 2 Coarse Aggregate. The stone shall also meet the quality requirements specified in 901.03. The pay will be per cubic yard of material installed.

**D.15 RIP RAP PLACEMENT FOR EROSION PROTECTION (CLASS I, II)**

Rip Rap placement for channels and ditches shall conform to [MSHA Standards Section 901](#). This pay item will be compensated based on cubic yard of material installed.

**D.16 RIVER JACK BOULDERS STONE 4"-7"**

This item should be visually inspected and approved for landscaping purposes from local sources. It shall be placed as directed and in assortment of size specified. It will be compensated based upon tonnage of material installed.

**D.17 IMBRICATED RIP RAP STONE (CLASS IV AND V)**

Imbricated stone for rip rap should be uniformly graded from the smallest to the largest pieces and installed, as specified. These items shall be compensated on the basis of the Ton of Imbricated Rip Rap placed. The placement is illustrated in MDE publication designated as MGWC 2.1 enclosed in the appendix.

**D.18 PEA GRAVEL**

Pea Gravel shall be river washed, semi-round, clean, and free of organic/deleterious materials. Gradation shall conform to ASTM C-33 specifications for 3/8" aggregate.

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**D.19 SUPER SILT FENCE**

Install silt and super silt fence as per the [2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control](#).

**D.20 MINIMUM AMOUNT OF WORK ORDER**

This item should specify the minimum value of the work, a contractor is willing to perform per work order within the scope of this contract.

Small quantity repair is required frequently at various locations within the City. The City consider an aggregate of \$3,000 worth of work located within a one-mile radius to be a minimum work order. Such work order, delineates the work area and lists the repairs to be performed with estimated value based on this contract unit prices. Should the total amount of requested work within a one-mile radius equal \$3,000 then the contractor is required to schedule the work within 2-weeks of the receipt of the notice and perform the work within a month from the date of the work-order. Amounts of work under this value are not obligatory for the Contractor (See General Conditions.)

**D.21 PERIOD OF WARRANTY**

The City requires a warranty period of a minimum one (1) year from the date of completion against all defects due to any and all causes. Natural disaster and mechanically induced failures accidental or deliberate are barred from the warranty unless induced by the contractor's act during and after completion of the same or other work. The warranty period may be extended by agreement.

**D.22 REPAIR OF DEFECTIVE WORK**

For all the defective work within the warranty period, the contractor will receive a request to repair the defect. The contractor is responsible to response to the City request within the next five (5) business day. Should the repair not occur within two (2) months of the request, the City will reserve the right of full compensation for value of work and demolition cost and repair as determined by the City.

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INDEFINITE QUANTITIES - STREET, SIDEWALK, AND STORMWATER STRUCTURES**

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**CITY OF TAKOMA PARK, MARYLAND  
CERTIFICATION OF NON-INVOLVEMENT  
IN THE NUCLEAR WEAPONS INDUSTRY**

**KNOW ALL PERSONS BY THESE PRESENTS:**

Pursuant to the requirements of Chapter 14.04 of the Takoma Park Code, the Takoma Park Nuclear Free Zone Act, the undersigned person, firm, corporation or entity hereby certifies that he/she/it is not knowingly or intentionally a nuclear weapons producer.

Note: The following definitions apply to this certification per section 14.04.090:

A “nuclear weapons producer” is any person, firm, corporation, facility, parent or subsidiary thereof or agency of the federal government engaged in the production of nuclear weapons or its components.

“Production of nuclear weapons” includes the knowing or intentional research, design, development, testing, manufacture, evaluation, maintenance, storage, transportation or disposal of nuclear weapons or their components.

“Nuclear weapon” is any device the sole purpose of which is the destruction of human life and property by an explosion resulting from the energy released by a fission or fusion reaction involving atomic nuclei.

“Component of a nuclear weapon” is any device, radioactive substance or nonradioactive substance designed knowingly and intentionally to contribute to the operation, launch, guidance, delivery or detonation of a nuclear weapon.

IN WITNESS WHEREOF, the undersigned has signed and sealed this instrument this \_\_\_\_ day of \_\_\_\_\_, 2019.

Firm Name: \_\_\_\_\_

By: \_\_\_\_\_

Signature

\_\_\_\_\_  
Print Name & Title

State of \_\_\_\_\_, County of \_\_\_\_\_:

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 2019.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_

Failure to complete this Certification  
will cause your Proposal to be considered non-responsive.

**REQUEST FOR BID  
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**CITY OF TAKOMA PARK, MARYLAND  
LIVING WAGE REQUIREMENTS CERTIFICATION  
(Takoma Park Code, section 7.08.200.B)**

Business Name:  
Address:  
City, State, Zip Code:  
Phone Number:  
Fax Number:  
E-Mail:

Please specify the contact name and information of the individual designated by your business to monitor your compliance with the City's living wage requirements, unless exempt under Section 7.08.190 (see item B below):

Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_  
Phone Number: \_\_\_\_\_ Fax: \_\_\_\_\_ E-Mail: \_\_\_\_\_

CHECK ALL APPROPRIATE LINES BELOW THAT APPLY IN THE EVENT THAT YOU ARE AWARDED THE CONTRACT AND BECOME A "CONTRACTOR."

A. Living Wage Requirements Compliance

\_\_\_\_\_ This Contractor as a "covered employer" will comply with the requirements of the City of Takoma Park Living Wage Law (*Takoma Park Code, Section 7.08.180 et. seq. - Ordinance No. 2007-55*). Contractor and its subcontractors will pay all employees who are not exempt from the wage requirements and who perform measurable work for the City related to any contract for services with the City, the living wage requirements in effect at the time of the City contract. The bid price submitted under this procurement solicitation includes sufficient funds to meet the living wage requirements.

B. Exemption Status (if applicable)

This Contractor is exempt from the living wage requirements because it is:

\_\_\_\_\_ The total value of the contract for services (based on the bid or proposal being submitted under this procurement solicitation) is less than \$20,000.00.

\_\_\_\_\_ A public entity.

Failure to complete this Certification  
will cause your proposal to be considered non-responsive.

**REQUEST FOR BID**  
**INDEFINITE QUANTITIES - STREET, SIDEWALK, AND STORMWATER STRUCTURES**

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**REFERENCES**

Please provide a representative list of three (3) references involving work as specified herein. Failure to submit the required information with the Proposal may be cause for rejection of the Proposal.

The City may make such investigation, as it deems necessary to determine the ability of the Firm to furnish the services and the Firm shall furnish to the City all such information and data for this purpose as the City may request. The City reserves the right to reject any proposal if the evidence submitted by or investigation of such Firm fails to satisfy the City that such Firm is properly qualified to carry out the obligations of the contract and deliver the service herein.

Local Government/Organization Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

E-Mail: \_\_\_\_\_ Contract Value: \_\_\_\_\_

Project Description: \_\_\_\_\_

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Local Government/Organization Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

E-Mail: \_\_\_\_\_ Contract Value: \_\_\_\_\_

Project Description: \_\_\_\_\_

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Local Government/Organization Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

E-Mail: \_\_\_\_\_ Contract Value: \_\_\_\_\_

Project Description: \_\_\_\_\_

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RETURN THIS FORM WITH PROPOSAL.

**REQUEST FOR BID  
INDEFINITE QUANTITIES - STREET, SIDEWALK, AND STORMWATER STRUCTURES**

**METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS RIDER CLAUSE**

USE OF CONTRACTS(S) BY MEMBERS COMPRISING THE METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS PURCHASING OFFICERS COMMITTEE.

- A. If authorized by the bidder(s), resultant contract(s) will be extended to any or all of the listed members a designated by the bidder to purchase at contract prices in accordance with contract terms
- B. Any members utilizing such contract(s) will place its own order(s) directly with the successful contractor. There shall be no obligation on the part of any participating member to utilize the Contract(s).
- C. A negative reply will not adversely affect consideration of you bid/proposal.
- D. It is the awarded vendor’s responsibility to notify the members shown below of the availability of the contract(s).
- E. Each participating jurisdiction has the option of executing a separate contract with the awardees. Contracts entered into with a participating jurisdiction may contain general terms and conditions unique to that jurisdiction including, by way of illustration and not imitation, clauses covering minority participation, non-discrimination, indemnification, naming the jurisdiction as an additional insured under any required comprehensive General Liability Policies, and venue. If, when preparing such a contract, the general terms and conditions of a jurisdiction are unacceptable to the awardees’, the award may withdraw its extension of the award to that jurisdiction.
- F. The issuing jurisdiction shall not be held liable for any costs or damages incurred by another jurisdiction as a result of any award extended to that jurisdiction by the awardees.

**BIDDERS AUTHORIZATION TO EXTEND CONTRACT:**

<u>YES</u>	<u>NO</u>	<u>JURISDICTION</u>	<u>YES</u>	<u>NO</u>	<u>JURISDICTION</u>
___	___	Alexandria, Virginia	___	___	Maryland National Park & Planning Com.
___	___	Alexandria Public Schools	___	___	Metropolitan Washington Airports Authority
___	___	Arlington County, Virginia	___	___	Metropolitan Washington Council of Gov.
___	___	Arlington County Public Schools	___	___	Montgomery College
___	___	Bowie, Maryland	___	___	Montgomery County, Maryland
___	___	College Park, Maryland	___	___	Montgomery County Public Schools
___	___	Culpeper County, Virginia	___	___	Prince George’s County, Maryland
___	___	District of Columbia (DC)	___	___	Prince George’s County Public Schools
___	___	District of Columbia Public Schools	___	___	Prince William County, Virginia
___	___	DC Water & Sewer Authority	___	___	Prince William County Public Schools
___	___	Fairfax County, Virginia	___	___	Prince William County Service Authority
___	___	Fairfax County Water Authority	___	___	Rockville, Maryland
___	___	Falls Church, Virginia	___	___	Stafford County, Virginia
___	___	Fauquier County Schools & Government, VA	___	___	Takoma Park, Maryland
___	___	Frederick, Maryland	___	___	Vienna, Virginia
___	___	Frederick County, Maryland	___	___	Washington Metropolitan Area Transit Authority
___	___	Frederick County Public Schools	___	___	Washington Suburban sanitary commission
___	___	Gaithersburg, Maryland	___	___	Greenbelt, Maryland
___	___	Herndon, Virginia	___	___	Loudoun County, Virginia
___	___	Manassas, Virginia			

## RESPONDENT QUALIFICATION AND CERTIFICATION STATEMENT

**1. QUALIFICATION.** The Respondent to the Request for Proposals is:

\_\_\_\_\_ a. 1) A corporation incorporated under the laws of the State of Maryland, and in good standing to do business in the State of Maryland.

2) A corporation incorporated under the laws of (insert jurisdiction) \_\_\_\_\_, and registered or qualified and in good standing to do business in the State of Maryland.

3) List corporate name and the names and titles of the corporation's directors and officers:

---

---

\_\_\_\_\_ b. A sole proprietor doing business under his/her individual name.

Individual name:

\_\_\_\_\_ c. A sole proprietor doing business under a trade or business name (for example, John Doe t/a Doe Masonry). List individual name and trade or business name:

---

\_\_\_\_\_ d. A partnership. List type of partnership and the names of all general partners:

---

---

\_\_\_\_\_ e. A limited liability company organized under the laws of the State of \_\_\_\_\_, and authorized to do business in the State of Maryland

List the limited liability company name and the names of all members:

---

---

\_\_\_\_\_ f. Other (explain):

---

**REQUEST FOR BID**  
**INDEFINITE QUANTITIES - STREET, SIDEWALK, AND STORMWATER STRUCTURES**

---

**2. CERTIFICATION.**

The undersigned proposes to furnish and deliver all labor, supplies, material, equipment, or services in accordance with specifications and stipulations contained in the Request for Proposals for the price(s) and upon the terms and conditions set forth in the proposal.

The undersigned certifies that this proposal is made without any previous understanding, agreement or connection with any person, firm, or corporation submitting a bid/proposal for the same labor, supplies, material, equipment, or services and is, in all respects fair and without collusion or fraud. The undersigned further certifies that he/she is authorized to sign for the bidder.

Bidder Name (print): \_\_\_\_\_

By: \_\_\_\_\_

(Signature)

(Date)

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Business Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax: \_\_\_\_\_

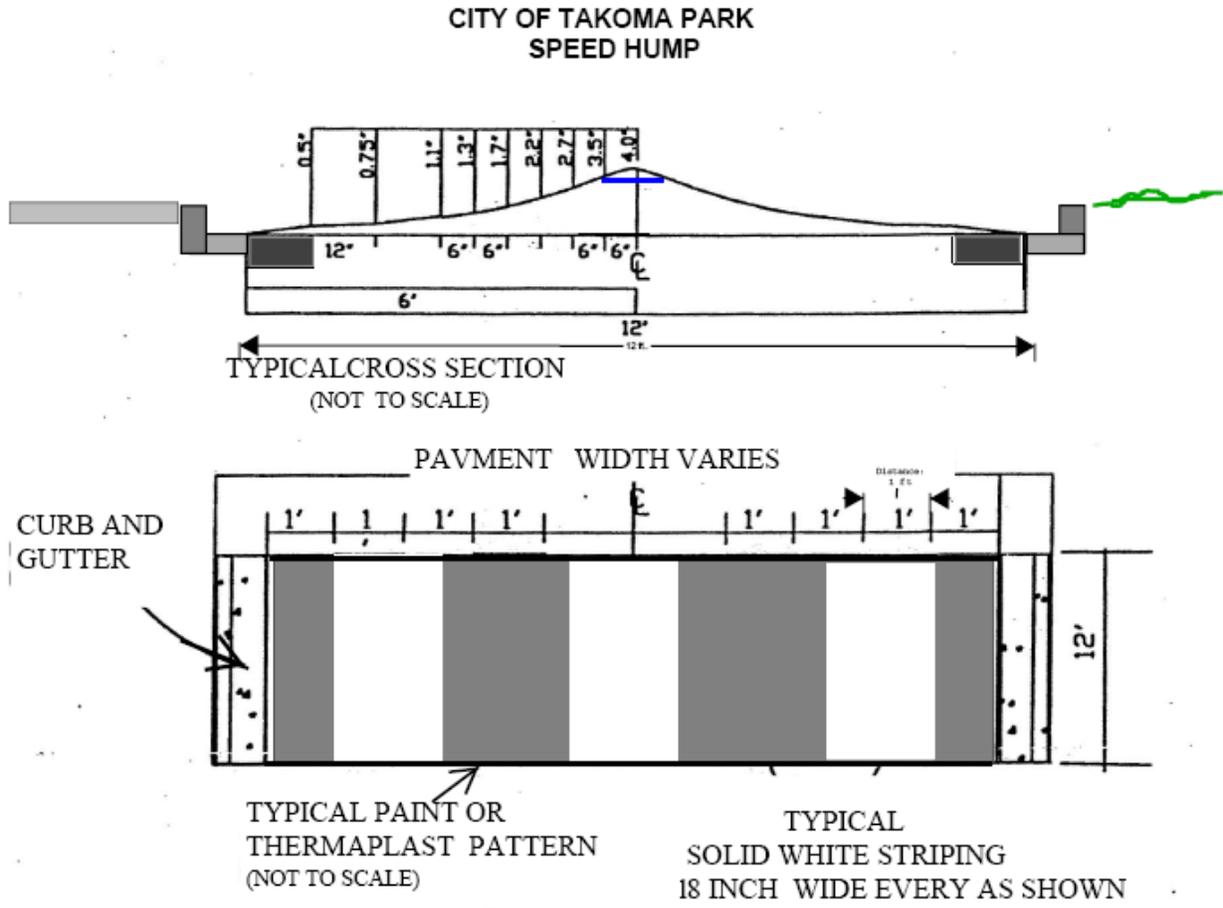
E-Mail: \_\_\_\_\_

Web Site: \_\_\_\_\_

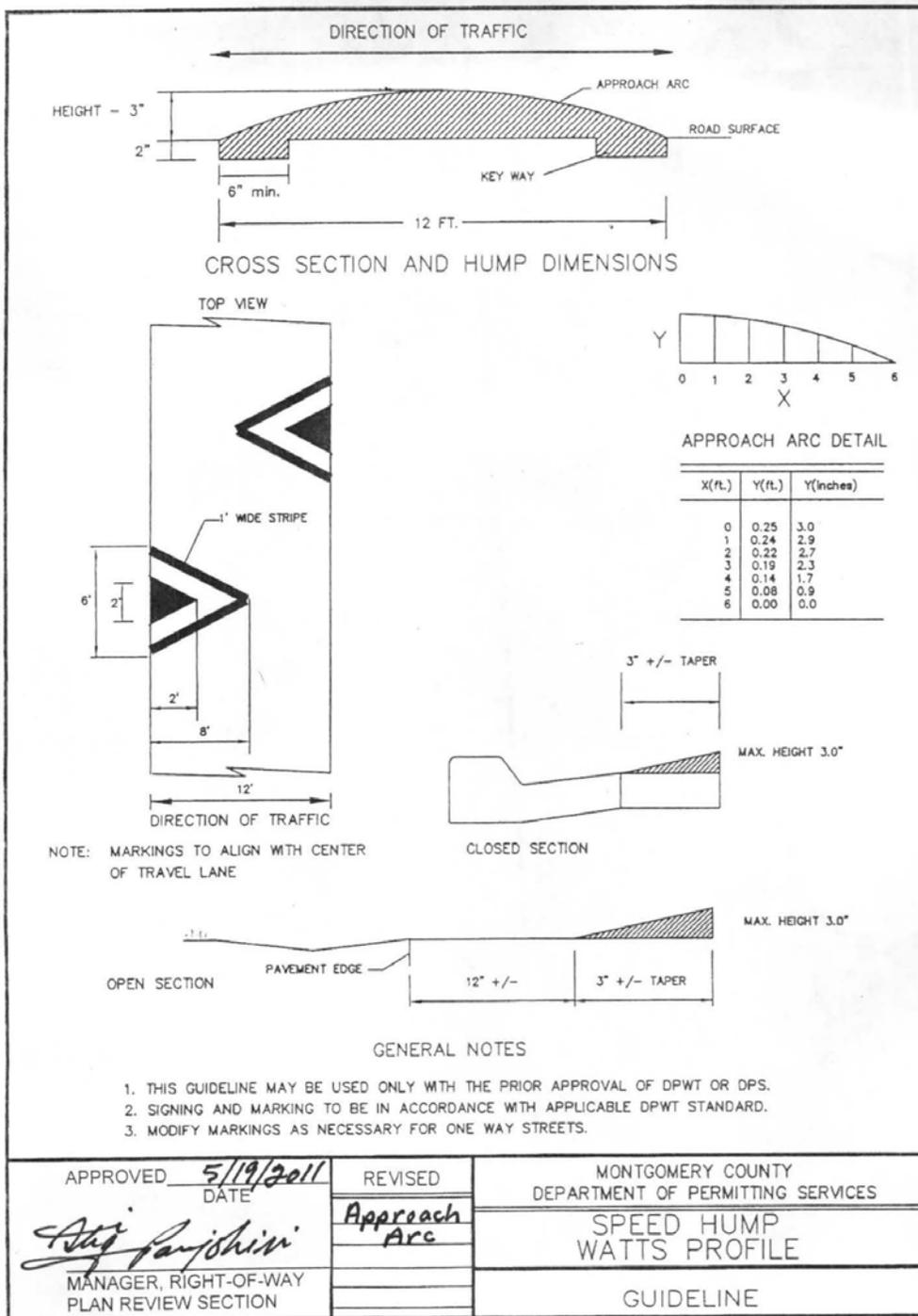
## **APPENDICES**

# APPENDIX A: SPEED HUMPS AND TRAFFIC CALMING STRUCTURES

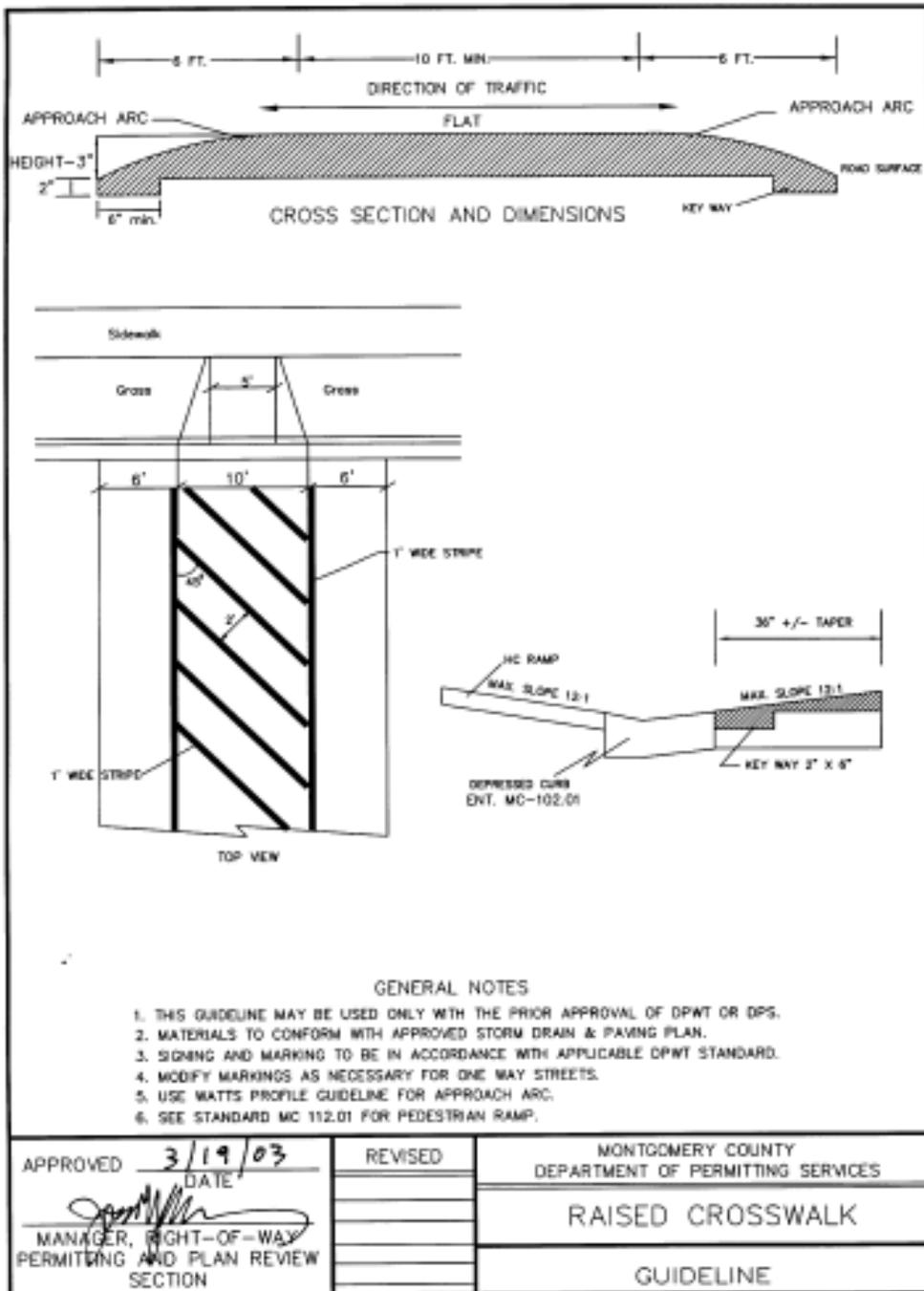
## Appendix A1. City of Takoma Park Speed Hump/Bump



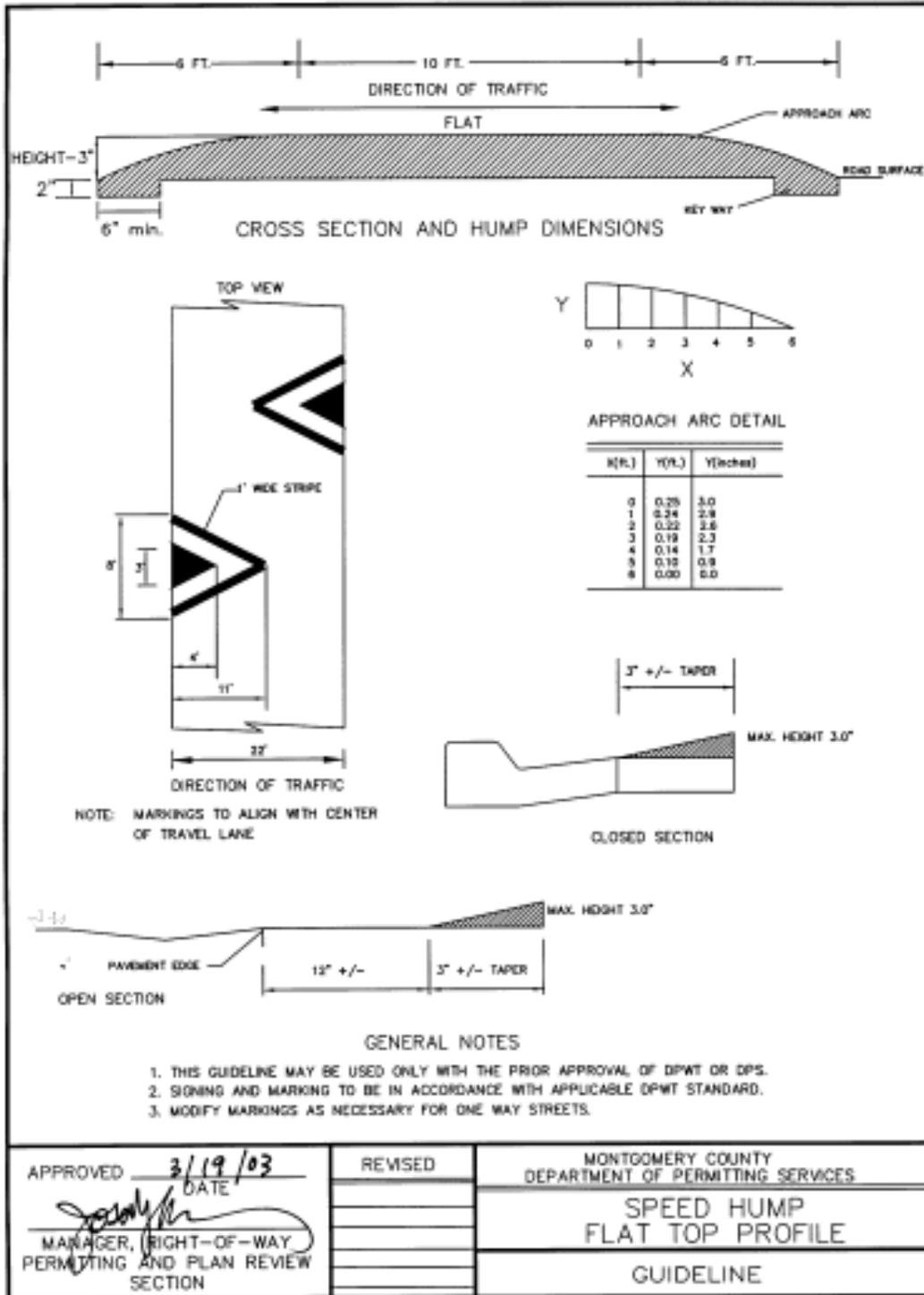
# Appendix A2. Montgomery County Speed Hump WATTS Profile



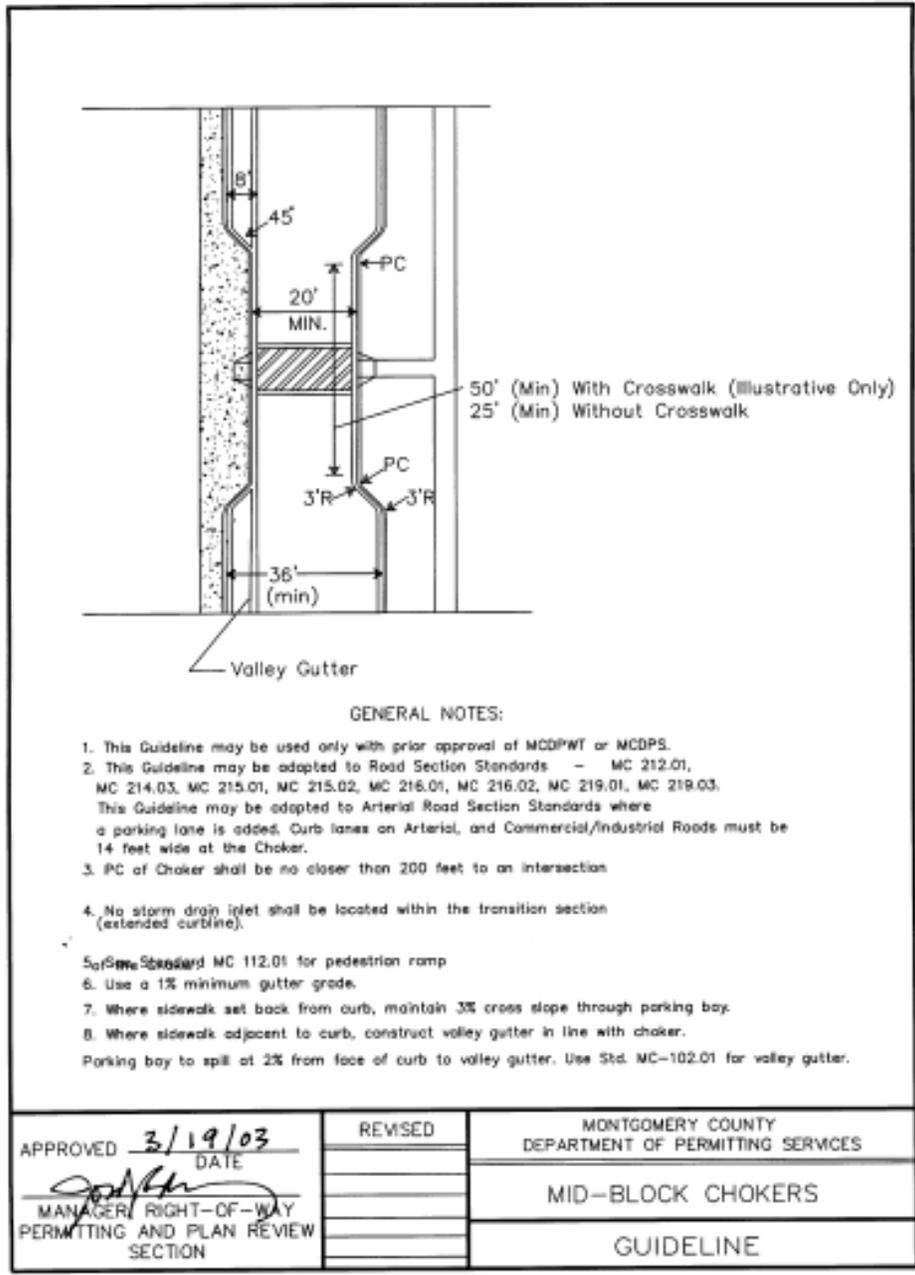
### Appendix A 3. Montgomery County Raised Crosswalk



Appendix A 4: Speed Hump Flat Top profile



# Appendix A 5: Mid-Block Chokers

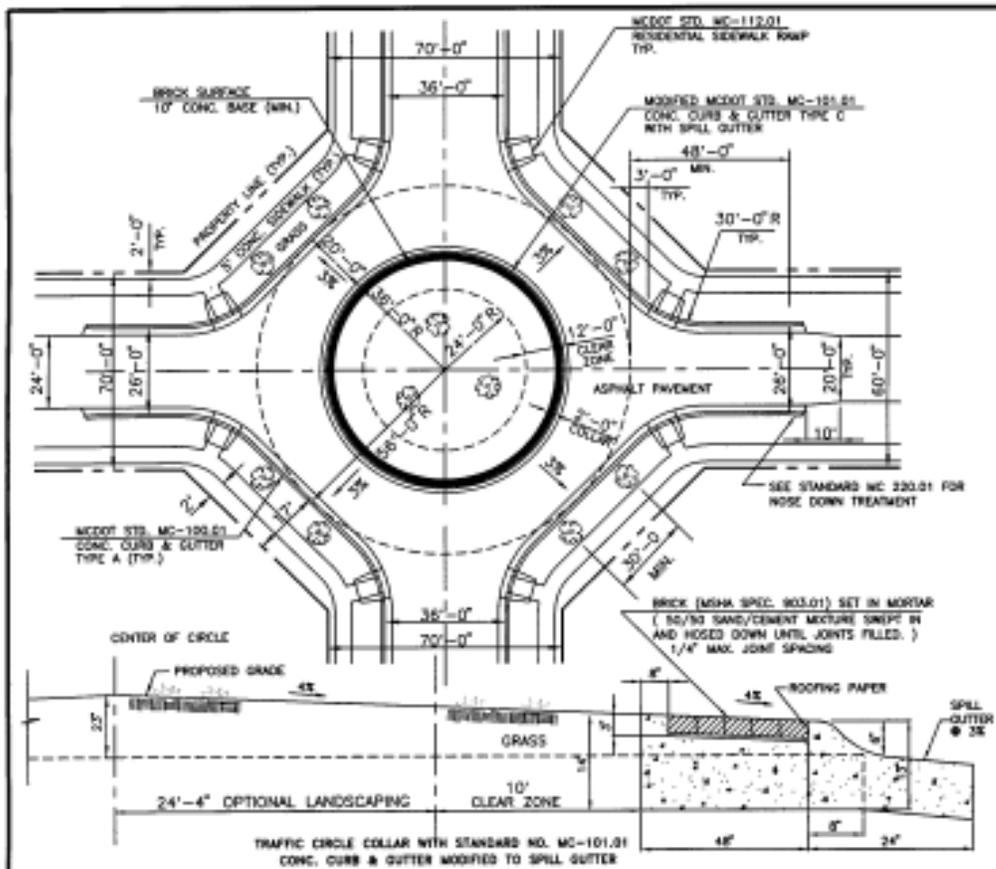


**GENERAL NOTES:**

1. This Guideline may be used only with prior approval of MCDPWT or MCDPS.
2. This Guideline may be adapted to Road Section Standards - MC 212.01, MC 214.03, MC 215.01, MC 215.02, MC 216.01, MC 216.02, MC 219.01, MC 219.03. This Guideline may be adapted to Arterial Road Section Standards where a parking lane is added. Curb lanes on Arterial, and Commercial/Industrial Roads must be 14 feet wide at the Choker.
3. PC of Choker shall be no closer than 200 feet to an intersection
4. No storm drain inlet shall be located within the transition section (extended curbline).
5. Use Standard MC 112.01 for pedestrian ramp
6. Use a 1% minimum gutter grade.
7. Where sidewalk set back from curb, maintain 3% cross slope through parking bay.
8. Where sidewalk adjacent to curb, construct valley gutter in line with choker. Parking bay to spill at 2% from face of curb to valley gutter. Use Std. MC-102.01 for valley gutter.

APPROVED <u>3/19/03</u> DATE	REVISED	MONTGOMERY COUNTY DEPARTMENT OF PERMITTING SERVICES
		MID-BLOCK CHOKERS
MANAGER, RIGHT-OF-WAY PERMITTING AND PLAN REVIEW SECTION		GUIDELINE

# Appendix A 6: Residential Traffic Circle

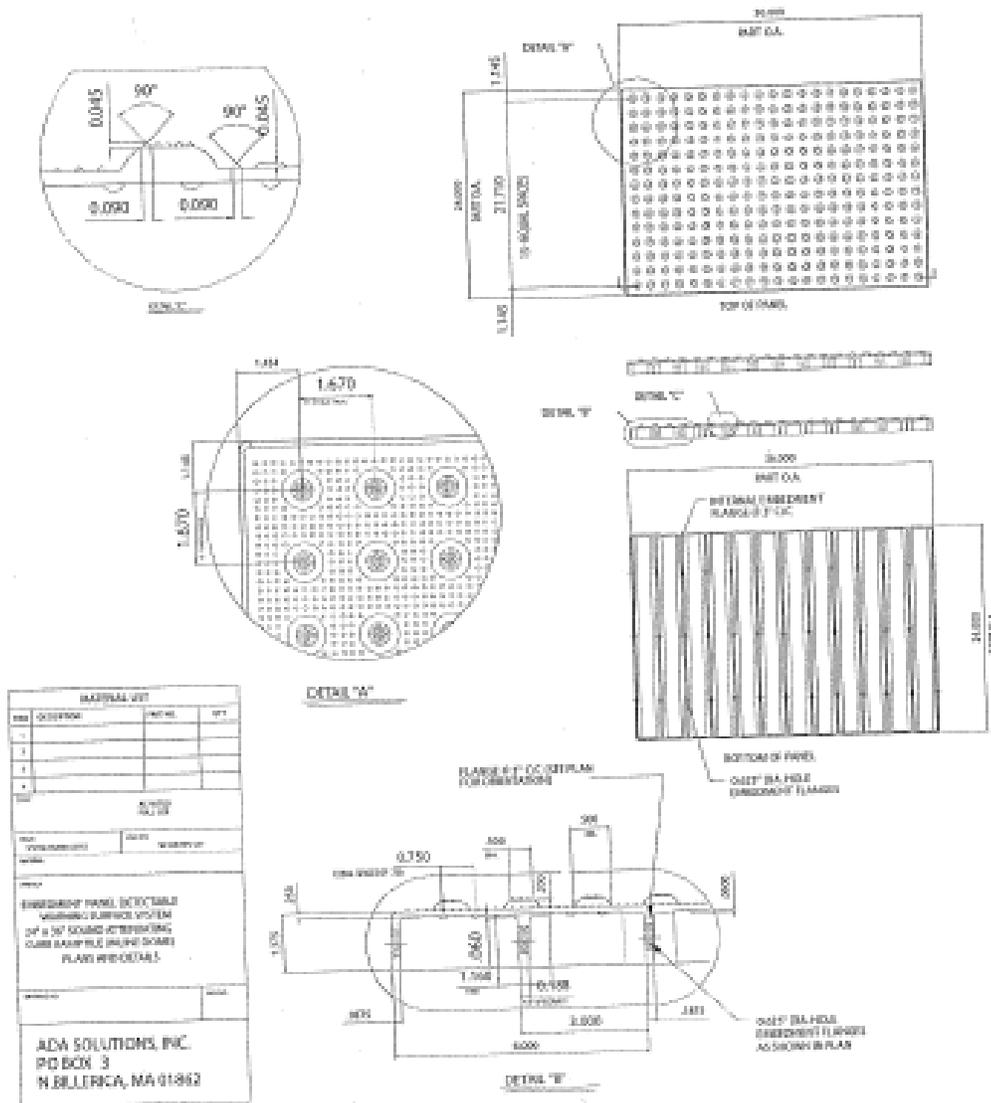


### GENERAL NOTES

1. THIS GUIDELINE MAY BE USED ONLY WITH THE PRIOR APPROVAL OF DPW&T / DPS.
2. THIS GUIDELINE IS APPLICABLE TO INTERSECTIONS OF SECONDARY AND PRIMARY ROADS WITH OTHER SECONDARY OR PRIMARY ROADS. TERMINATE CURB & GUTTER PER STD. MC-220.01
3. THE NEAREST POINT OF ANY DRIVEWAY APRON EXTENSIONS SHALL BE LOCATED AT LEAST 25' BEYOND THE HANDICAP RAMPS AWAY FROM THE CIRCLE.
4. USE A 1% MINIMUM GUTTER GRADE EXCEPT AROUND THE ISLAND. ROADWAY GRADES MUST NOT EXCEED 4%.
5. TRAFFIC CIRCLE LANDSCAPING PER DPWT APPROVED LANDSCAPE LIST
6. SIDEWALKS SHALL BE PROVIDED IN ACCORDANCE WITH THE APPLICABLE ROAD STANDARDS AND STANDARD MC-112.01 FOR RESIDENTIAL SIDEWALK RAMPS. THE SIDEWALK SHALL EXTEND ALONG THE INTERSECTION TRUNCATION, A MINIMUM OF TWO FEET FROM THE PROPERTY LINE.
7. RESIDENTIAL TRAFFIC CIRCLES AT T-INTERSECTIONS AND MID-BLOCK LOCATIONS SHALL USE THIS STANDARD (MODIFIED AS REQUIRED). FOR THESE USES, THE CIRCLE MUST REMAIN CENTERED IN THE TRAVELWAYS.
8. ALIGN COLLAR EXPANSION JOINTS WITH CURB EXPANSION JOINTS.

APPROVED <u>3/19/03</u> DATE  MANAGER, RIGHT-OF-WAY PERMITTING AND PLAN REVIEW SECTION	REVISED	MONTGOMERY COUNTY DEPARTMENT OF PERMITTING SERVICES
		<b>RESIDENTIAL TRAFFIC CIRCLE</b>
		<b>GUIDELINE</b>

# Appendix A 7: ADA Typical Detectable Warning Mat Detail



MATERIAL LIST		
NO.	DESCRIPTION	QTY.
1		
2		
3		
4		
5		
<b>NOTES</b> 1. SEE DRAWING FOR DIMENSIONS AND TOLERANCES. 2. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED. 3. FINISH: POLISHED ALUMINUM. 4. SURFACE: BRUSHED ALUMINUM. 5. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. 6. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. 7. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. 8. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. 9. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. 10. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED.		
<b>ADA SOLUTIONS, INC.</b> PO BOX 3 N BELLERICA, MA 01862		

ADA TYPICAL DETAIL FOR DETECTABLE WARNING MAT

**Appendix A 8: Product Specification Cast in Place Tiles**



**PRODUCT SPECIFICATIONS**  
**CAST-IN-PLACE COMPOSITE PAVER TILES**  
 Inline Dome Pattern: Tactile Warning Surface

View additional photos, drawings and specifications on our website: [www.adatile.com](http://www.adatile.com).  
 Call (800) 372-0519 with any questions.

<b>DOME GEOMETRY</b>	<i>In accordance with ADA Regulations for Detectable Warning on Curb Ramps: raised truncated domes with a diameter of nominal 0.9", a height of nominal 0.2", and a center-to-center spacing of 1.67" minimum, and 2.35" maximum.</i>
<b>PANEL DIMENSIONS</b>	TWS Units are available in 24"x36", 24"x48", 24"x60", 36"x48", and 36"x60" sizes. TWS Units may also be custom configured to accommodate specific project requirements. TWS Units measure 0.20" nominal thickness and feature embedment ribs 3" on center.
<b>MATERIAL</b>	A homogenous glass and carbon reinforced composite which is colorfast and UV stable. Truncated Domes are fiberglass reinforced for enhanced durability. The TWS panel color is uniform throughout and does not rely on any type of paint coating to achieve color stability. Standard colors include: Federal Yellow, Brick Red, Clay Red, Dark Gray, Black, and Blue.
<b>INSTALLATION</b>	TWS Units are to be used on new curb ramp locations. The TWS Units can be pre-filled with concrete and set in place or pressed into place in the freshly poured concrete.

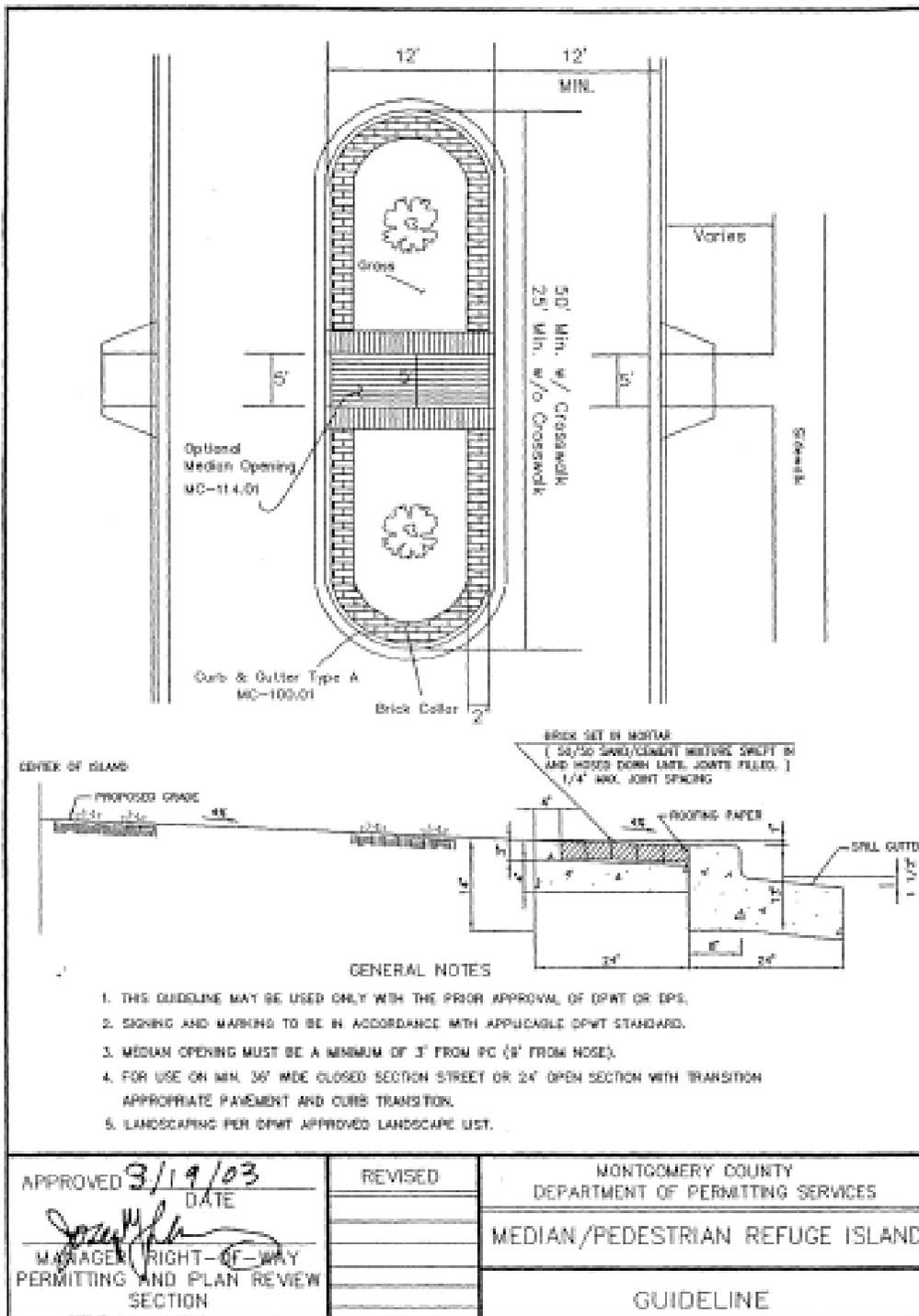
**PHYSICAL CHARACTERISTICS:**

Compressive Strength	28,900 psi	ASTM D 695
Flexural Strength	29,300 psi	ASTM D 790
Water Absorption	.07%	ASTM D 570
Slip Resistance	1.18 Dry/1.05 Wet	ASTM C 1028
Flame Spread Index	20	ASTM E 84
Salt Spray	No Change (200 hours)	ASTM B 117
Chemical Stain Testing	No Deterioration	ASTM 1308
Abrasion Resistance	549	ASTM C 501
Accelerated Weathering	Delta E < 5.0 (2,000 hours)	ASTM G 155
Tensile Strength	11,600 psi	ASTM D 638
Adhesion to Concrete (20° -180°)	No Delamination or Degradation	ASTM C 903
Freeze/Thaw/Heat	No Disintegration	ASTM C 1026

ADA SOLUTIONS, INC.  
 P.O. Box 3, North Ellisville MA 01862 Tel: 800.372.0519 Fax: 978.262.9125  
[www.adatile.com](http://www.adatile.com)

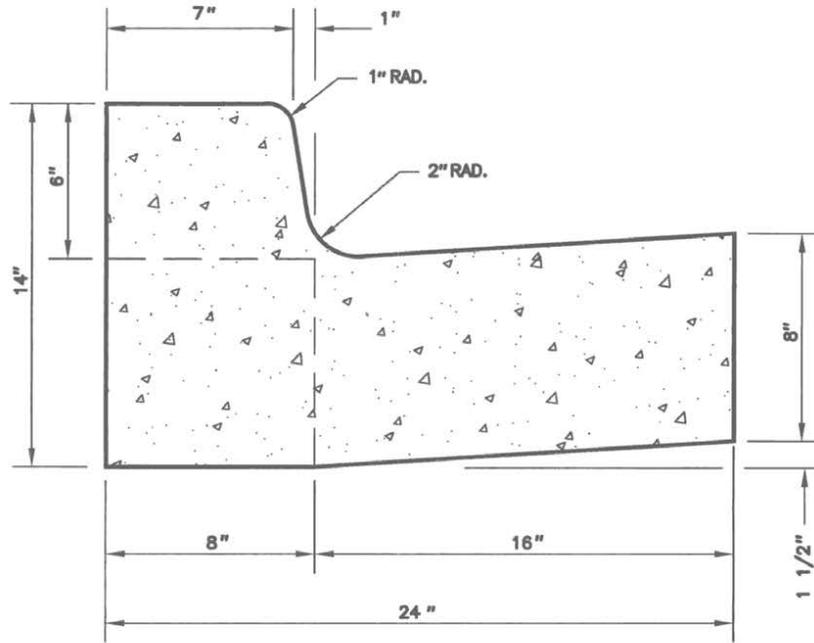
ADA Detectable Warning MAT TYPICAL SPECIFICATION

Appendix A 9: Median/ Residential Refuge Island



## **APPENDIX B: Montgomery County Standard Details for Various Structures**

Appendix B 1: MC-100.01 STD C & G TYPE A

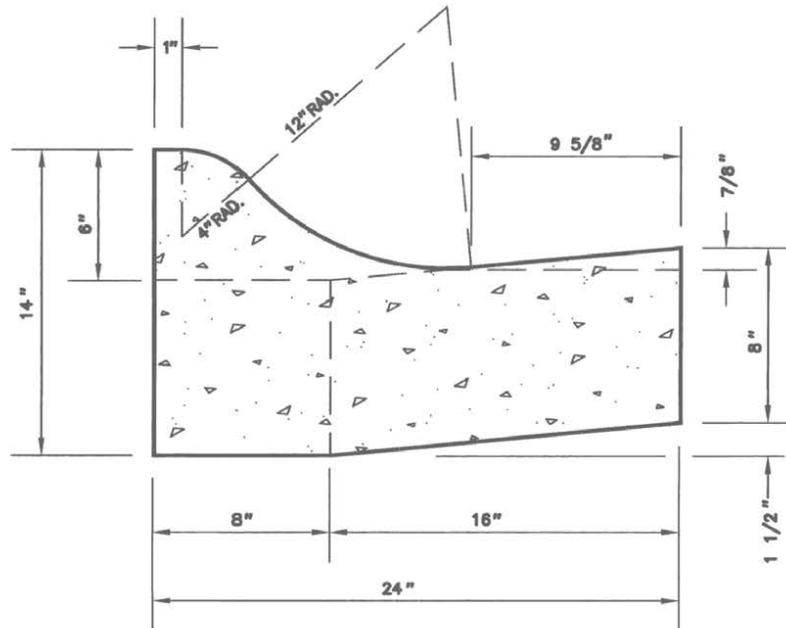


GENERAL NOTES

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. ⚠

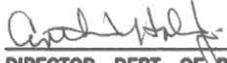
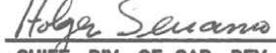
<p>APPROVED <u>14 APR '06</u> DATE</p> <p><i>[Signature]</i> DIRECTOR, DEPT. OF PUBLIC WORKS &amp; TRANSPORTATION</p> <p><i>[Signature]</i> for CHIEF, DIV. OF CAP. DEV.</p>	<p>REVISED</p> <p>⚠ ASTM-C920 4/2005</p>	<p>MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS &amp; TRANSPORTATION</p> <p>COMBINATION CONCRETE CURB AND GUTTER TYPE A</p> <p>STANDARD NO. MC-100.01</p>
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Appendix B 2: MC-100.01 STD C & G TYPE C

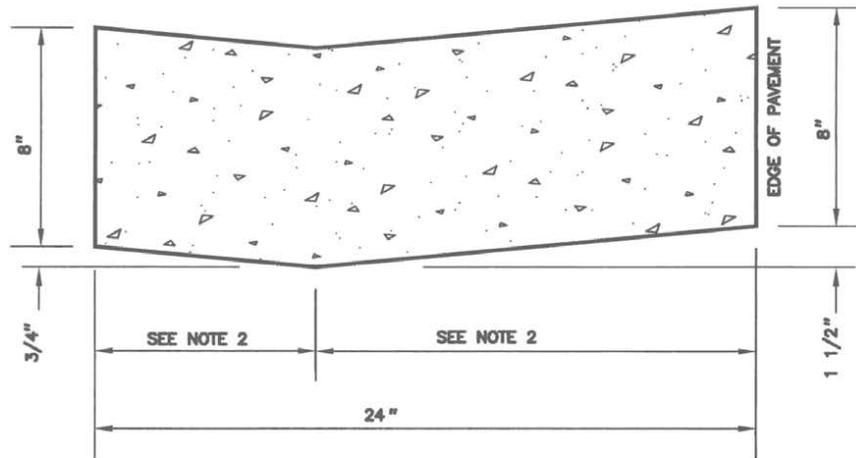


GENERAL NOTES

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. 

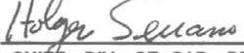
<p>APPROVED <u>14 APR '06</u> DATE</p>	<p>REVISED</p>	<p>MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS &amp; TRANSPORTATION</p>
<p> DIRECTOR, DEPT. OF PUBLIC WORKS &amp; TRANSPORTATION</p>	<p> ASTM-C920 4/2006</p>	<p>COMBINATION CONCRETE CURB AND GUTTER TYPE C</p>
<p> for CHIEF, DIV. OF CAP. DEV.</p>		<p>STANDARD NO. MC-101.01</p>

Appendix B 3: STANDARD MC-102.01

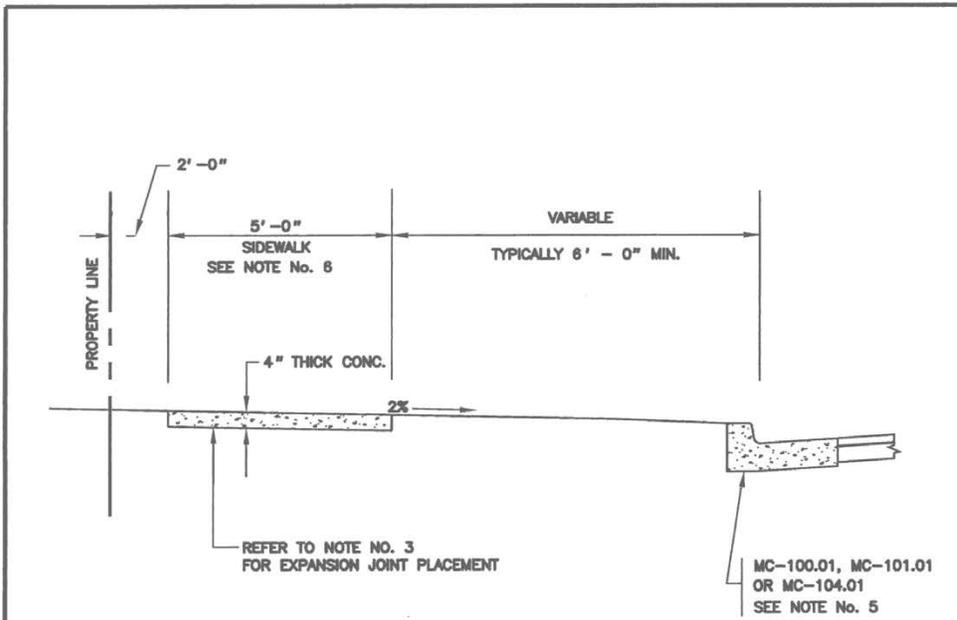


GENERAL NOTES

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. 

APPROVED <u>14 APR 86</u> DATE	REVISED	MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
 DIRECTOR, DEPT. OF PUBLIC WORKS & TRANSPORTATION  CHIEF, DIV. OF CAP. DEV.	 ASTM-C920 4/2006	DEPRESSED CURB ENTRANCE STANDARD NO. MC-102.01

Appendix B 4: STANDARD MC-11 0.01

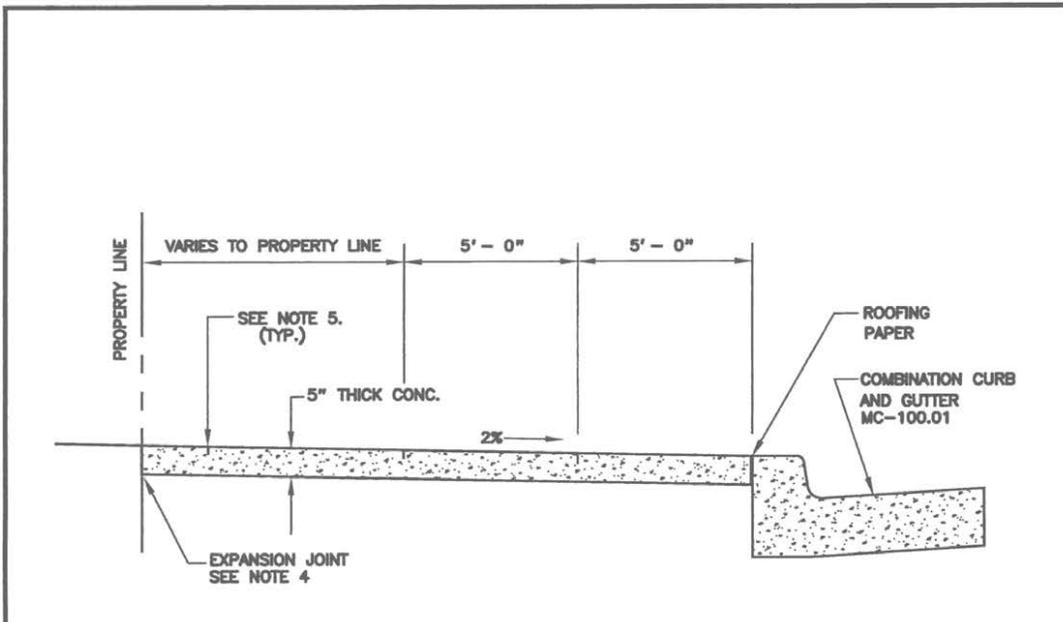


GENERAL NOTES

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. <sup>1</sup>
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.

<p>APPROVED <u>14 APR '06</u> DATE</p> <p><i>Arthur Holly</i> DIRECTOR, DEPT. OF TRANS.</p> <p><i>Holga Serrano</i> for CHIEF, DIV. OF CAP. DEV.</p>	<p>REVISED</p> <p><sup>1</sup> ASTM-C920 4/2006</p>	<p>MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION</p> <p><b>RESIDENTIAL SIDEWALK CLOSED SECTION</b></p> <p>STANDARD NO. MC-110.01</p>
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Appendix B 5: STANDARD MC-111.01

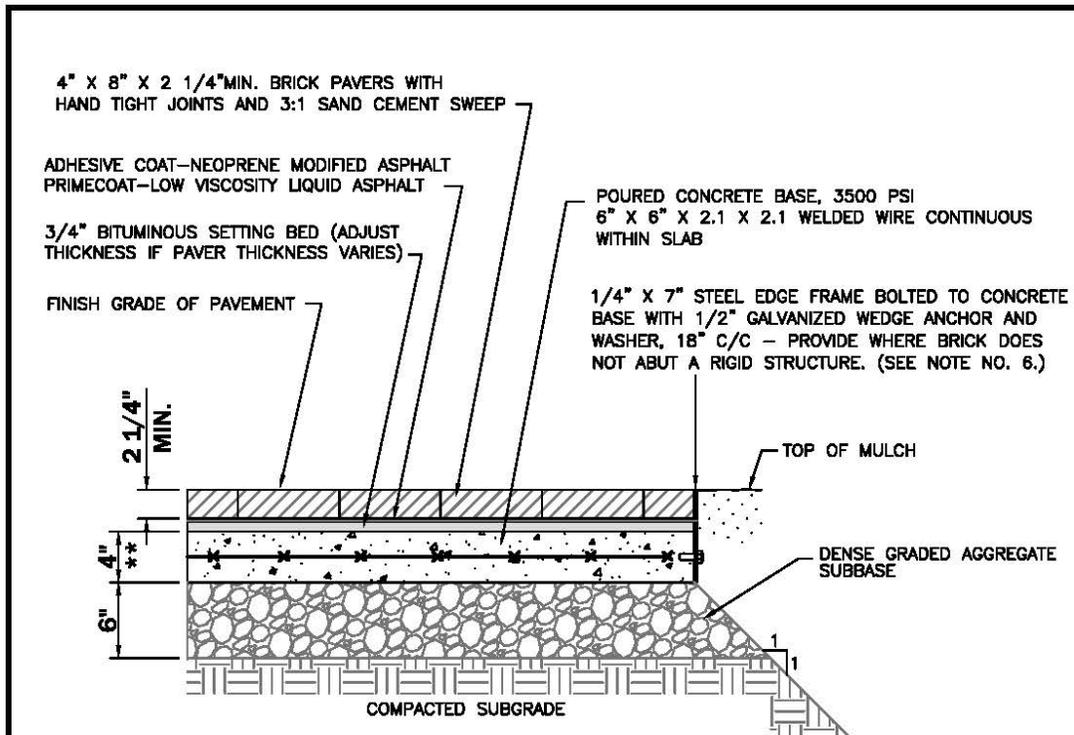


GENERAL NOTES

1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. REFER TO MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION DESIGN STANDARD No. MC-302.01 FOR DETAILS AT A DRIVEWAY.
3. EXPANSION JOINT MATERIAL SHALL BE PLACED AROUND POLES, HYDRANTS, ETC. AND ALONG THE PROPERTY LINE WHEN THE SIDEWALK ABUTS ANY RIGID PAVEMENT, SIDEWALK OR STRUCTURE.
4. EXPANSION JOINT MATERIAL SHALL HAVE A MAXIMUM LONGITUDINAL SPACING OF 100 FEET. THE 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. <sup>1</sup>
5. SCORE THE CONCRETE TO A DEPTH OF 1/3 THE SLAB THICKNESS TO PROVIDE WEAKENED PLANE TRANSVERSE JOINTS AT 5' - 0" INTERVALS PARALLEL WITH AND PERPENDICULAR TO THE CURBING.

<p>APPROVED <u>14 APR 06</u> DATE</p> <p><i>[Signature]</i> DIRECTOR, DEPT. OF PUBLIC WORKS &amp; TRANSPORTATION</p> <p><i>[Signature]</i> for CHIEF, DIV. OF CAP. DEV.</p>	<p>REVISED</p> <p><sup>1</sup> ASTM-C920 4/2006</p>	<p>MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS &amp; TRANSPORTATION</p> <p><b>BUSINESS DISTRICT SIDEWALK</b></p> <p>STANDARD NO. MC-111.01</p>
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Appendix B 6: STANDARD MC-111.02



\*\* 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

*Auth. Halp*  
DIRECTOR, DEPARTMENT OF TRANSPORTATION

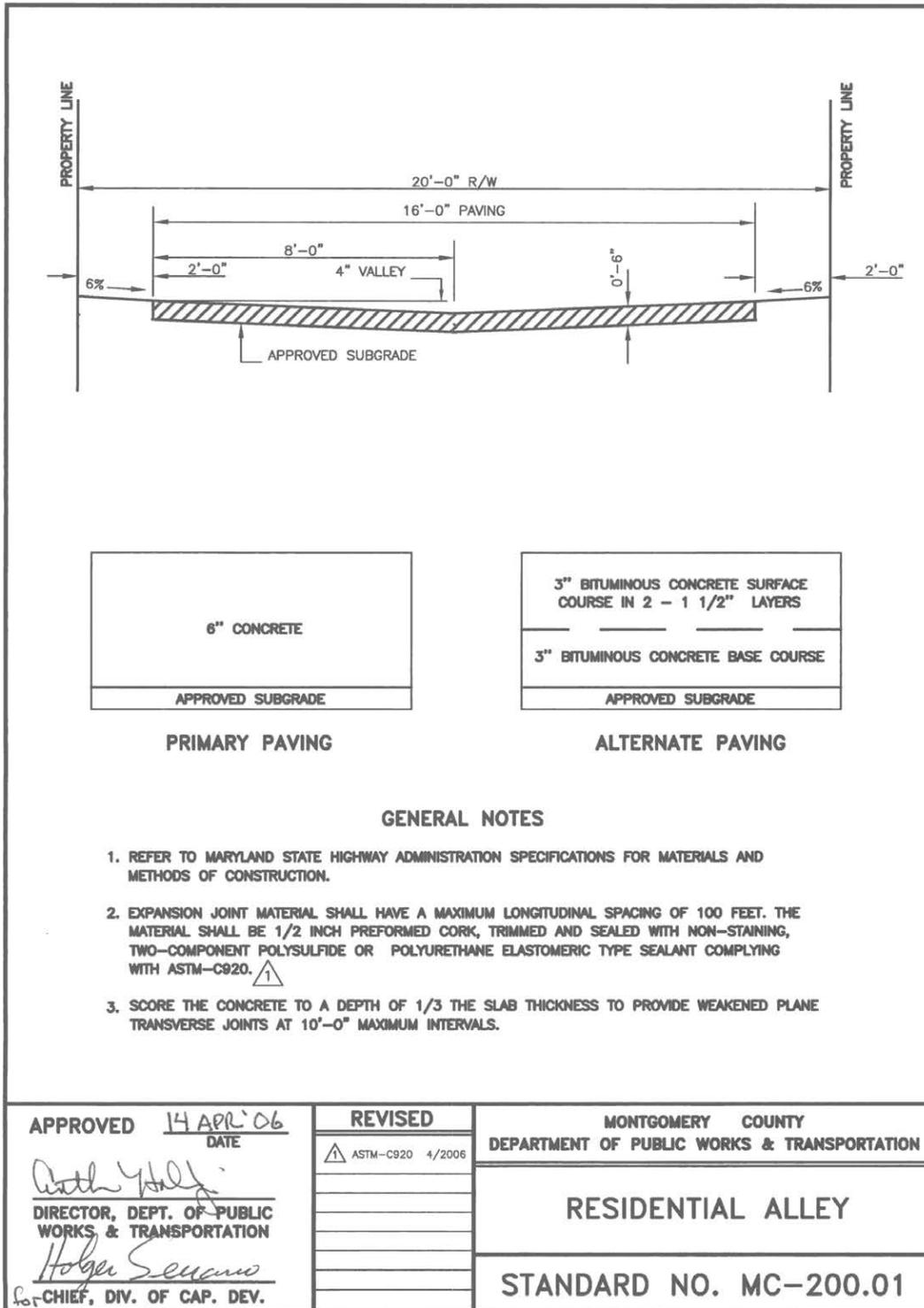
*Ben S. John*  
CHIEF, DIVISION OF TRANSPORTATION ENGINEERING

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION

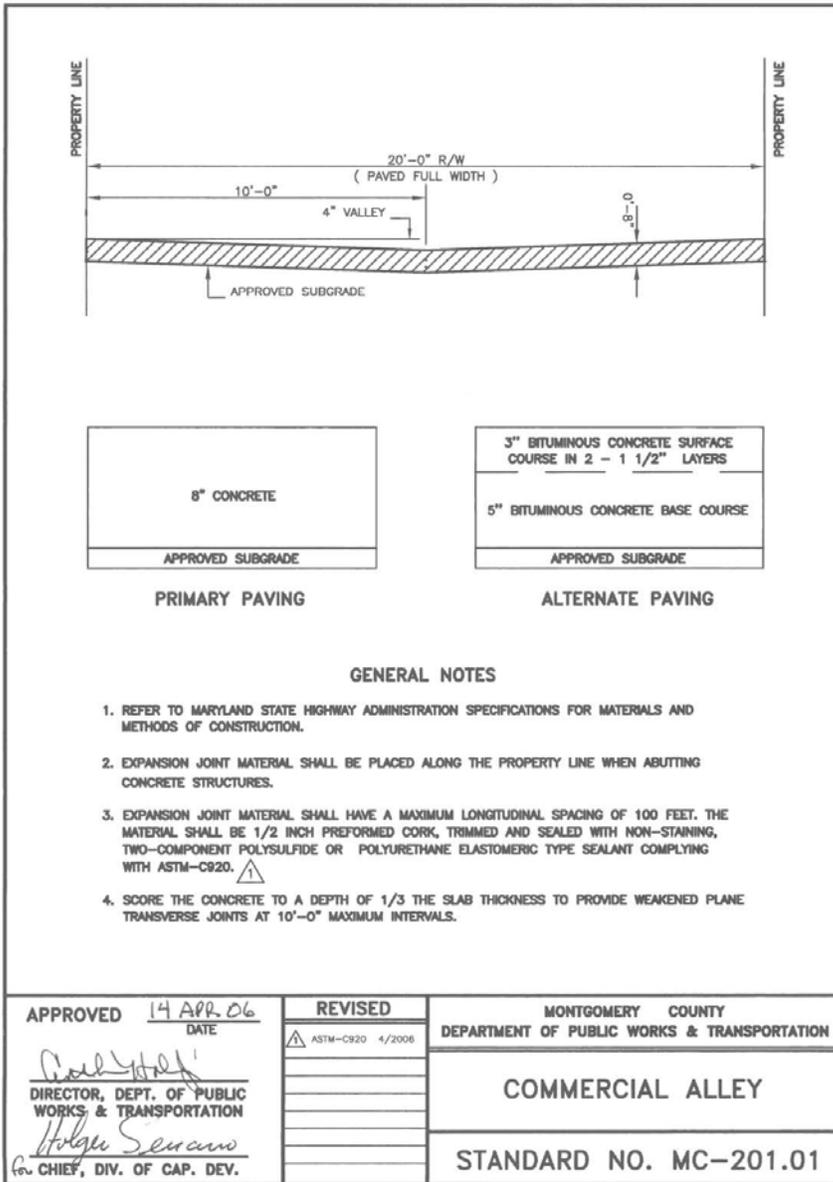
STREETSCAPE — PAVERS SIDEWALK

STANDARD NO. MC-111.02

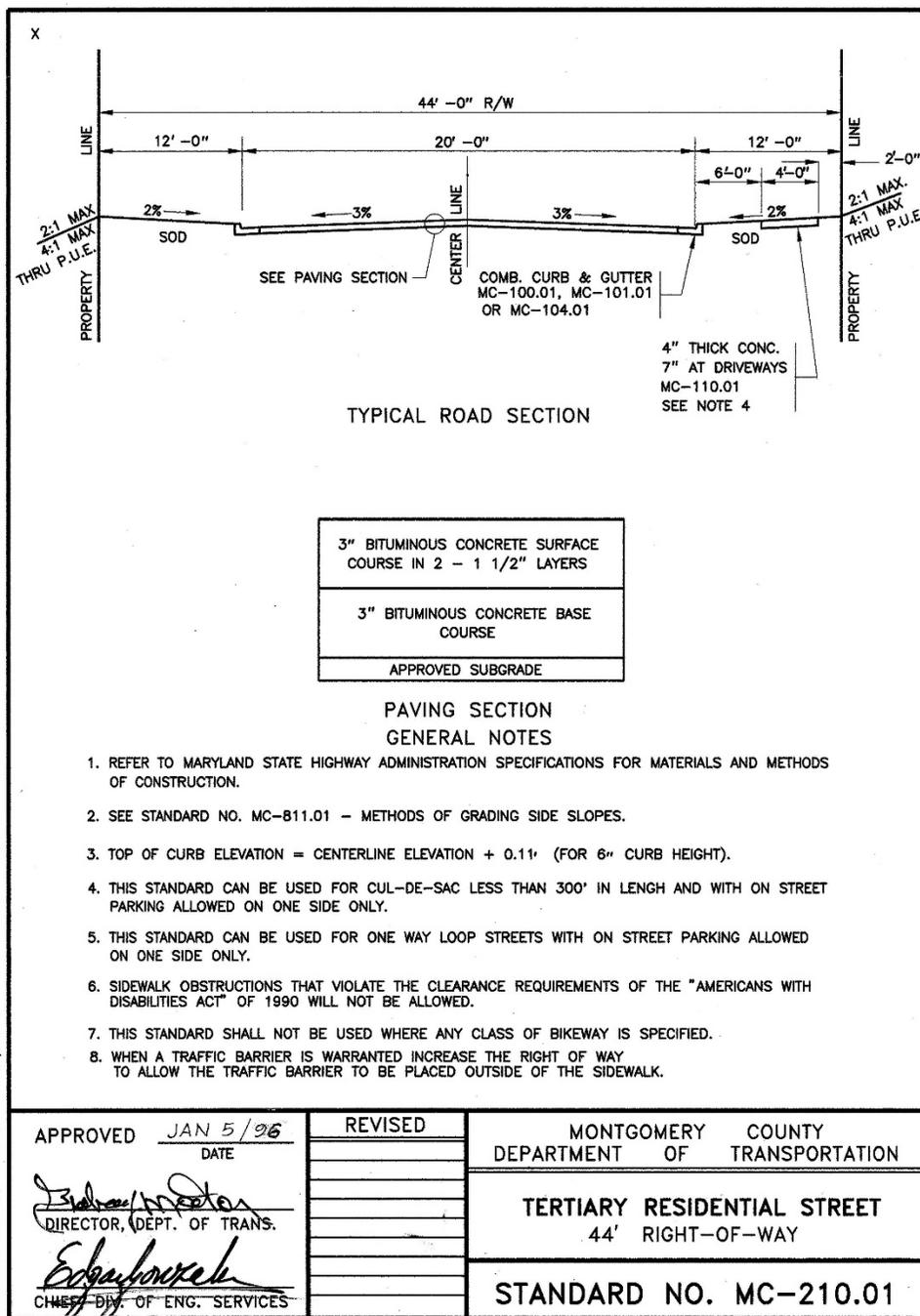
Appendix B 7: STANDARD MC -200.1



Appendix B 8: STANDARD MC-201.01

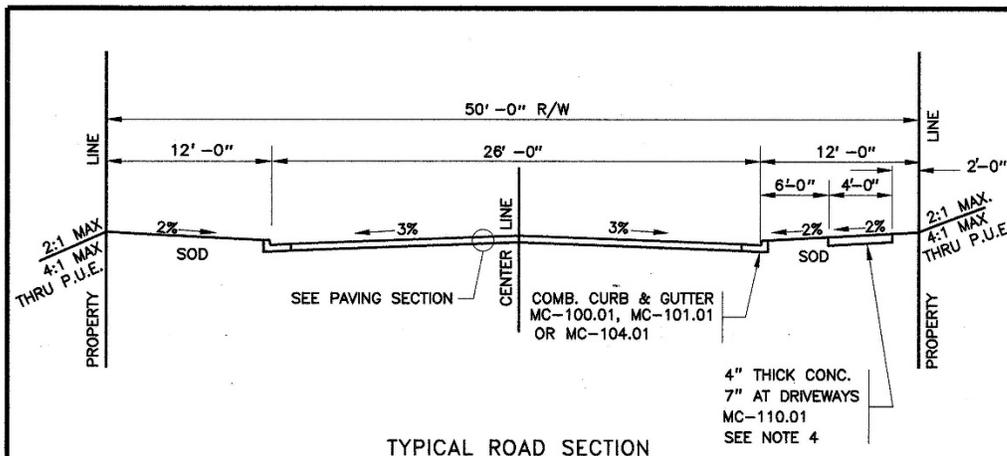


Appendix B 9: STANDARD MC-210.01



PA 10/15/95 MC210.01 9-26-95 2:04:19 pm EST

Appendix B 10: STANDARD MC-210.02



TYPICAL ROAD SECTION

3" BITUMINOUS CONCRETE SURFACE COURSE IN 2 - 1 1/2" LAYERS
3" BITUMINOUS CONCRETE BASE COURSE
APPROVED SUBGRADE

PAVING SECTION

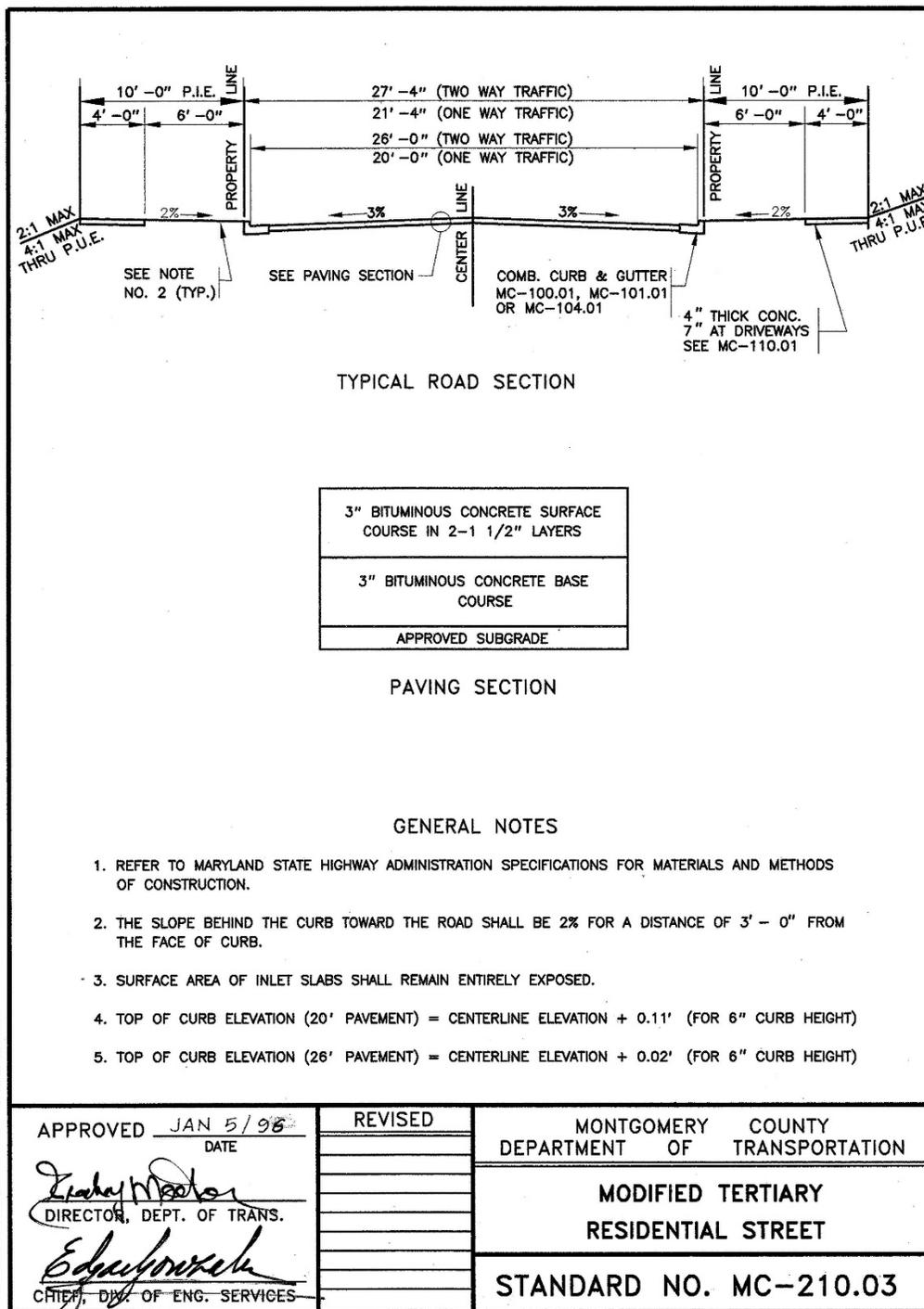
GENERAL NOTES

1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. SEE STANDARD NO. MC-811.01 - METHODS OF GRADING SIDE SLOPES.
3. TOP OF CURB ELEVATION = CENTERLINE ELEVATION + 0.02' (FOR 6" CURB HEIGHT).
4. SIDEWALK SHALL BE REQUIRED ON ONE SIDE ONLY FOR STREETS LONGER THAN 300'.
5. WHEN A TRAFFIC BARRIER IS WARRANTED INCREASE THE RIGHT OF WAY TO ALLOW THE TRAFFIC BARRIER TO BE PLACED OUTSIDE OF THE SIDEWALK.

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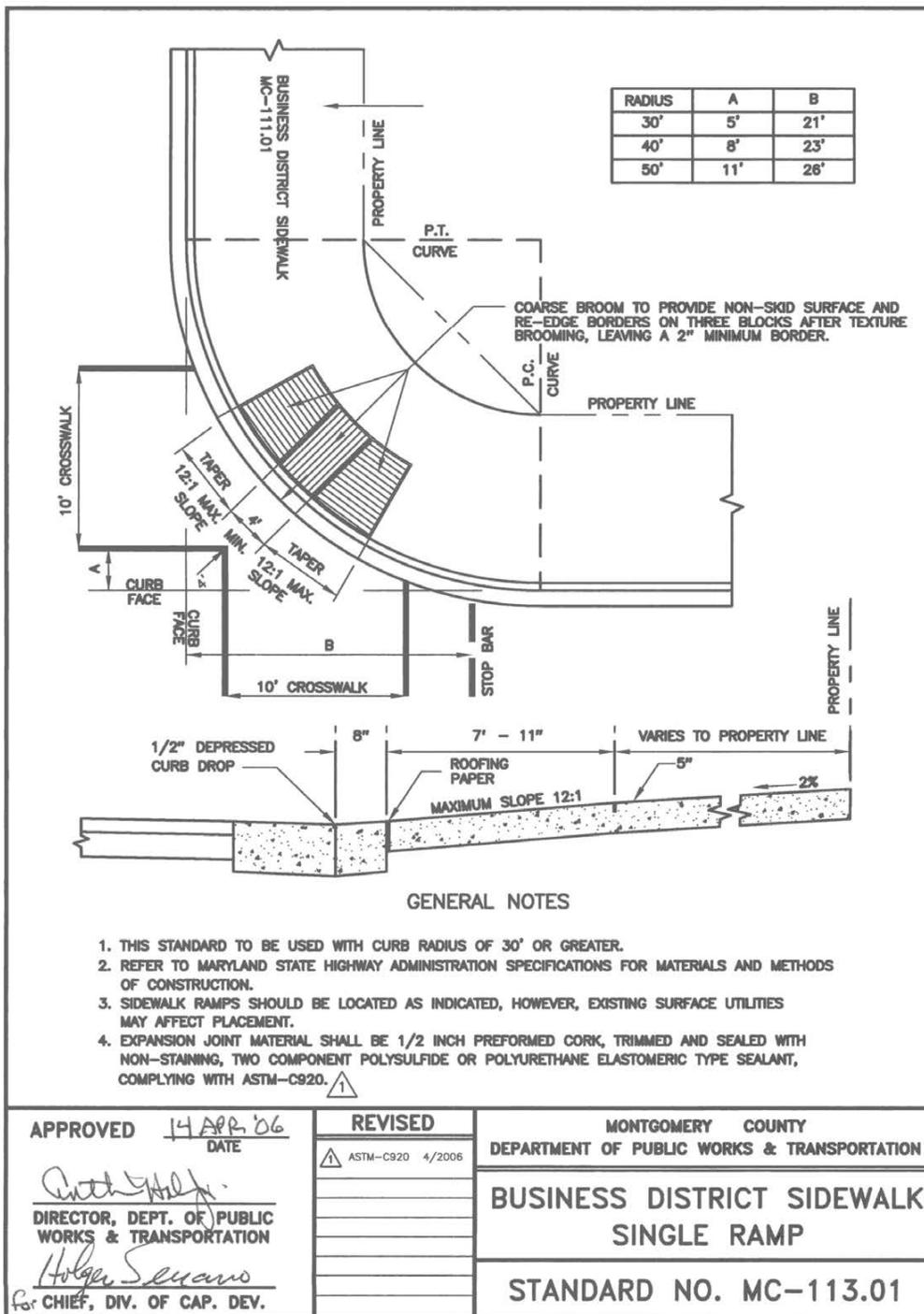
APPROVED <u>JAN 5/96</u> DATE	REVISED	MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION
 DIRECTOR, DEPT. OF TRANS.		TERTIARY RESIDENTIAL STREET 50' RIGHT-OF-WAY
 CHIEF, DIV. OF ENG. SERVICES		STANDARD NO. MC-210.02

Appendix B 11: Standard MC-210.03

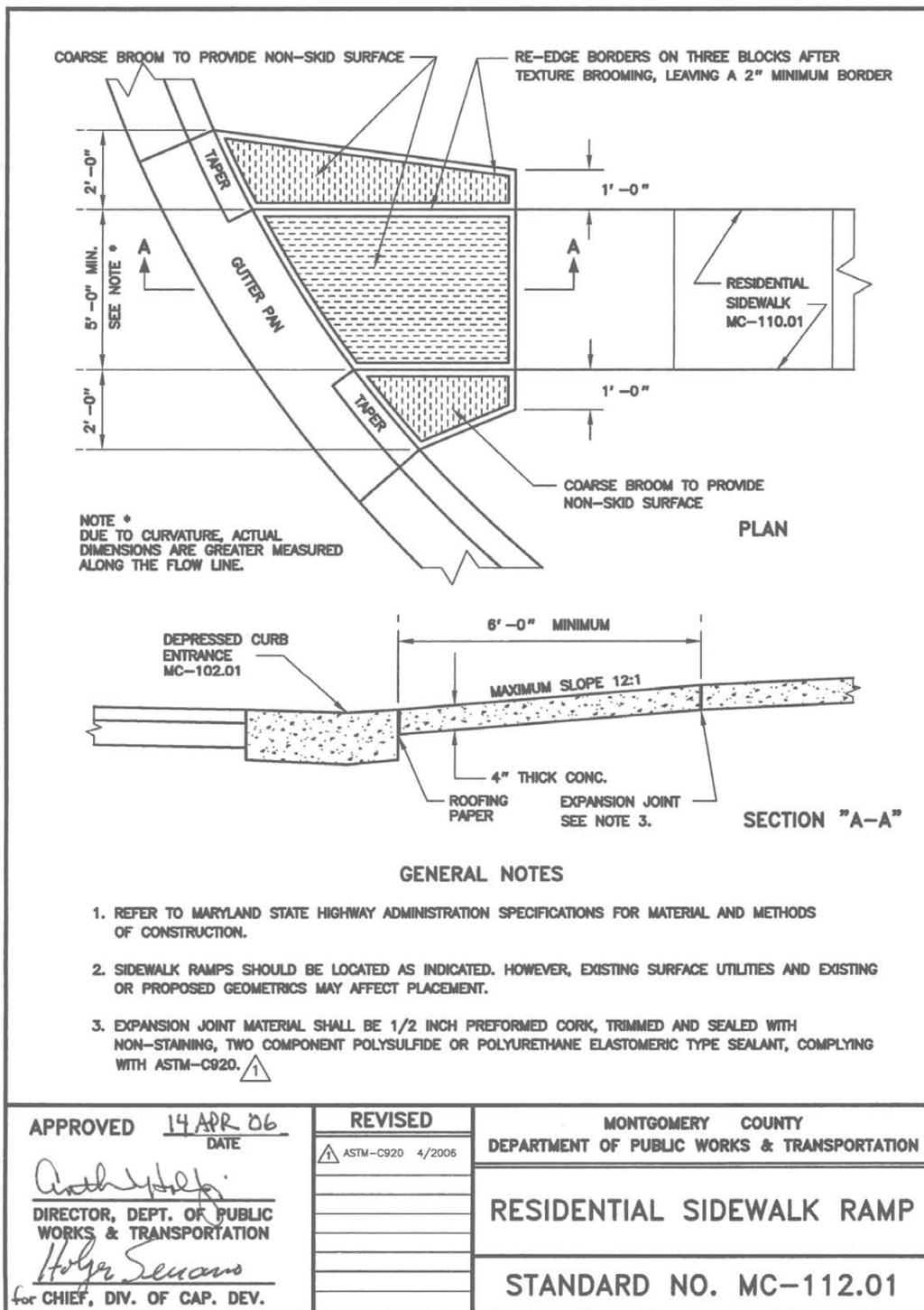


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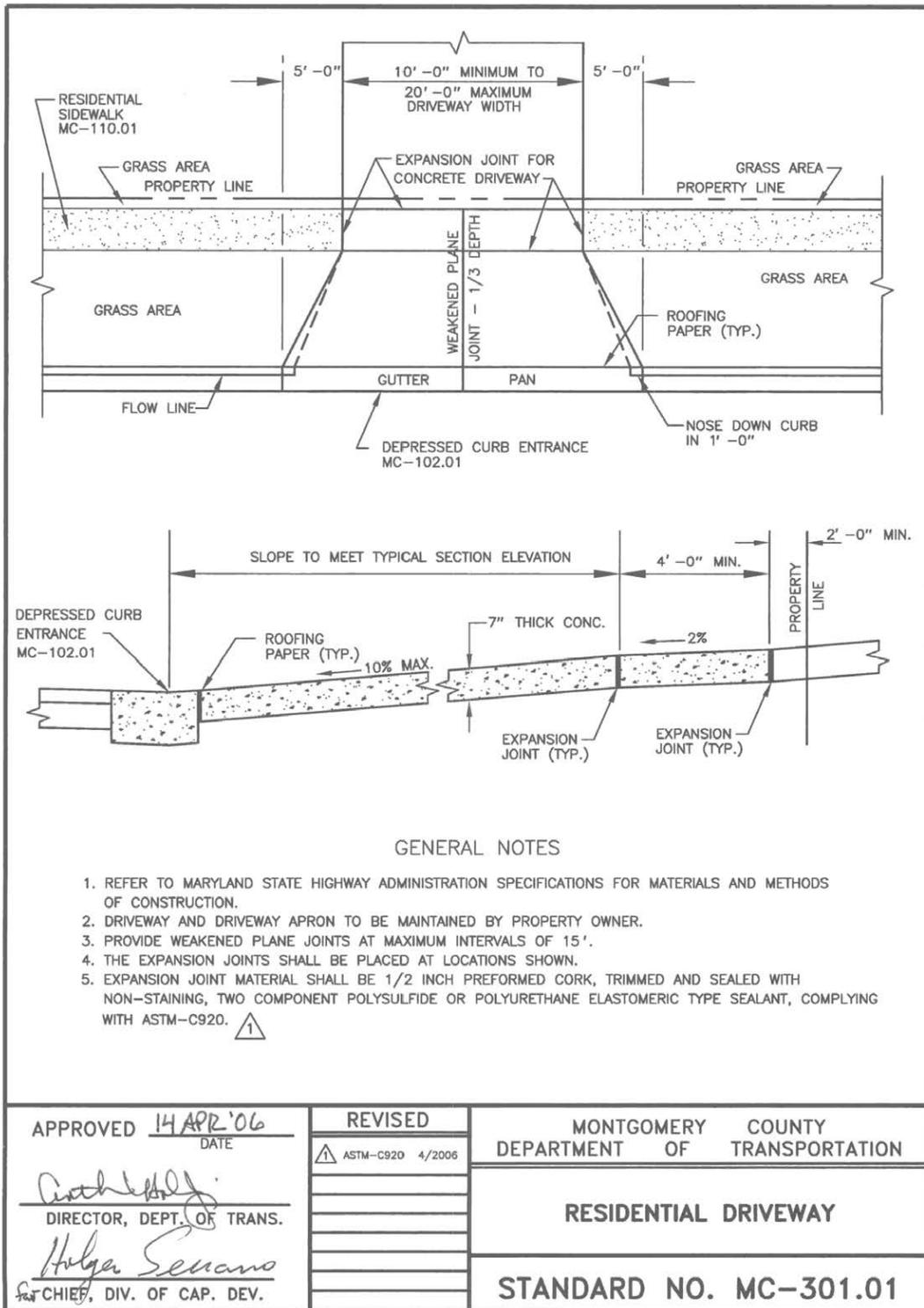
Appendix B 12: Standard MC-113.01



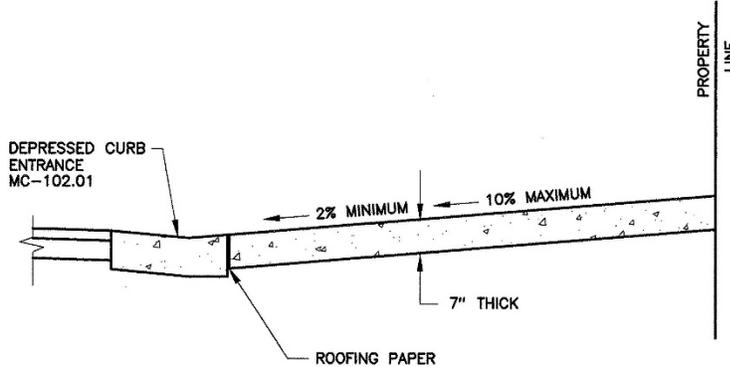
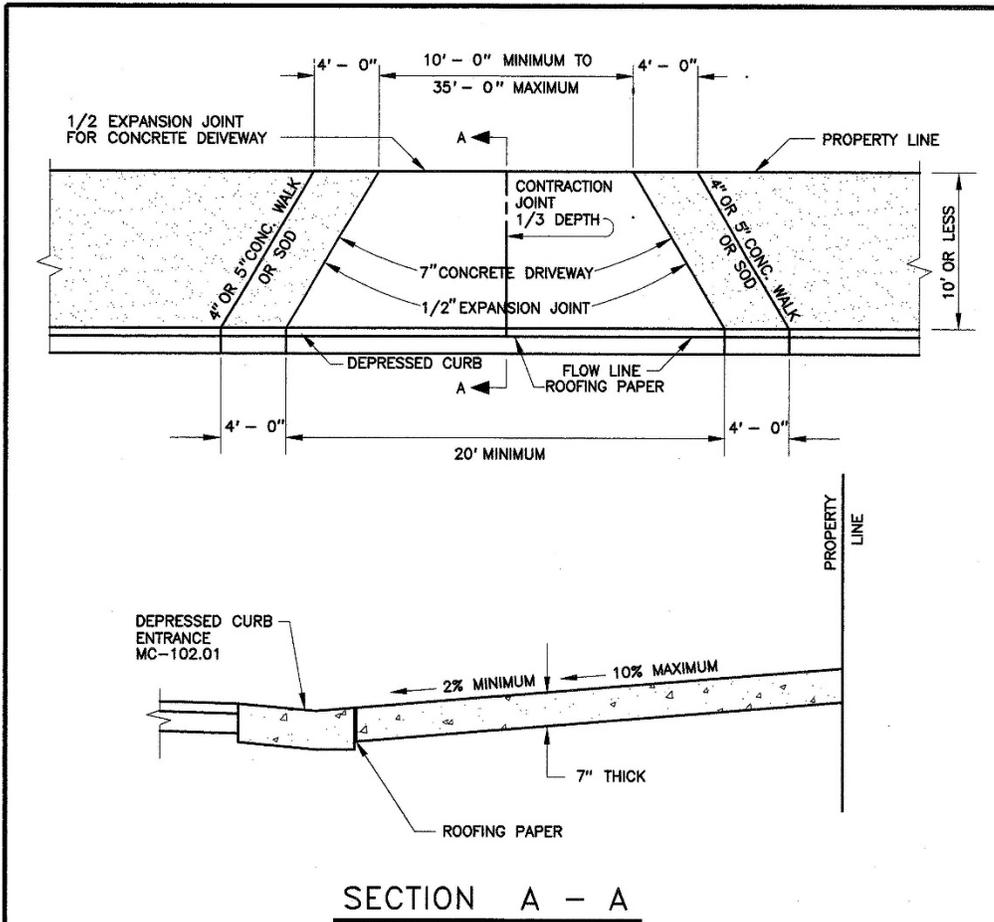
Appendix B 13: STANDARD MC-112.01



Appendix B 14: Standard mc-301.1



Appendix B 15: Standard MC-301.04



**SECTION A - A**

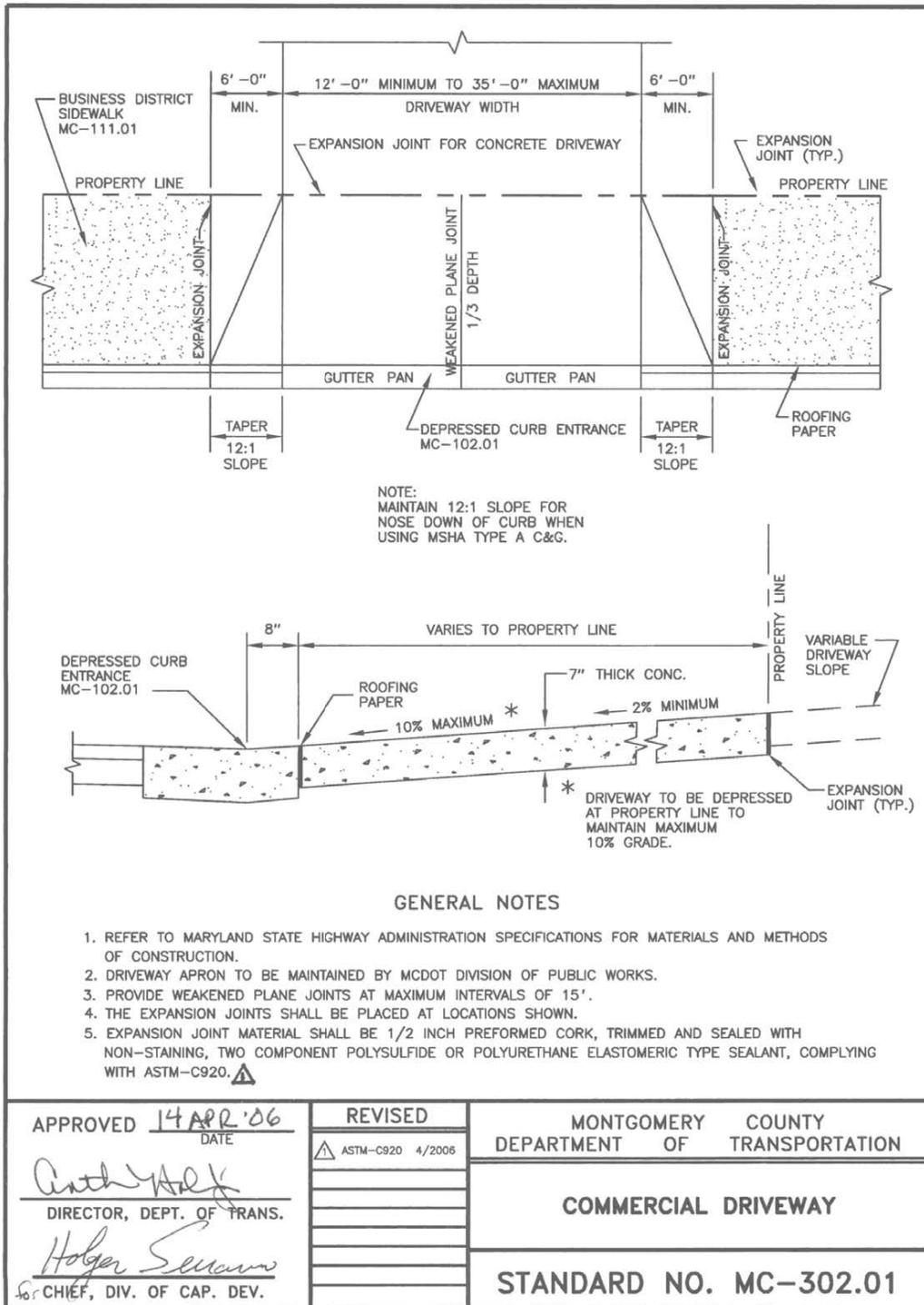
**GENERAL NOTES**

1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION SPECIFICATIONS FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. DRIVEWAY AND DRIVEWAY APRON TO BE MAINTAINED BY PROPERTY OWNER.
3. ALL DRIVEWAYS DEPRESSED 2" AT PROPERTY LINE WHEN USING 8" CURB.
4. PROVIDE WEAKENED PLANE JOINTS AT MAXIMUM INTERVALS OF 15'.

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APPROVED <i>JAN 5/95</i> DATE	REVISED	MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION
<i>[Signature]</i> DIRECTOR, DEPT. OF TRANS.		<b>RESIDENTIAL DRIVEWAY LIMITED WIDTH</b>
<i>[Signature]</i> CHIEF, DIV. OF ENG. SERVICES		<b>STANDARD NO. MC-301.04</b>

Appendix B 16: Standard MC-302.1



# APPENDIX C: Montgomery County Standard Details – Inlet

## Appendix C 1: MC 501.01

**PLAN TOP SLAB**

**SECTION THROUGH PIPE SUPPORT**

**PLAN BELOW SLAB**

**SECTION A-A**

**GENERAL NOTES**

- USE SOLID MASONRY (BRICK OR CONCRETE BLOCK) OR Poured CONCRETE FOR WALLS.
- INSTALL FOUNDATION DRAINAGE MATERIAL AROUND STRUCTURE FROM BOTTOM OF WEEP HOLES TO WITHIN 8" OF SURFACE.
- MORTAR SHALL CONFORM TO ASTM SPECIFICATION C 270 TYPE M.
- REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION FOR MATERIALS AND METHODS OF CONSTRUCTION.
- WALL THICKNESS WILL BE THE FOLLOWING: 8" THICK WALLS FOR THE FIRST 8'-0" OF DEPTH, 12" THICK WALLS 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.
- $f'_c = 3500$  PSI AT 28 DAYS.
- ALL REINFORCING STEEL TO BE ASTM A615, GR 60.
- FOR PIPES 30" AND LARGER, PROVIDE STEPS IN CHANNELS OR STRUCTURES. SEE STANDARD MC-520.02
- ON TERMINAL INLETS, THE INLET BOTTOM SHALL BE SLOPED TO OUTLET PIPE WITH SEWER BRICK OR CONCRETE, 9" MIN. FALL.
- 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 PIPE.

DESIGNATION	T THROAT OPENING	NUMBER OF PIPE SUPPORTS
A-5	5'-0"	0
A-10	10'-0"	1
A-15	15'-0"	2
A-20	20'-0"	3

PIPE SUPPORTS TO BE SPACED AT 8'-0" C/C

**APPROVED** JAN 5/96 DATE

**REVISD**

**RESTORED**  
1" DEPRESSION  
AT GUTTER EDGE  
6/25/12

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION

"A" INLET

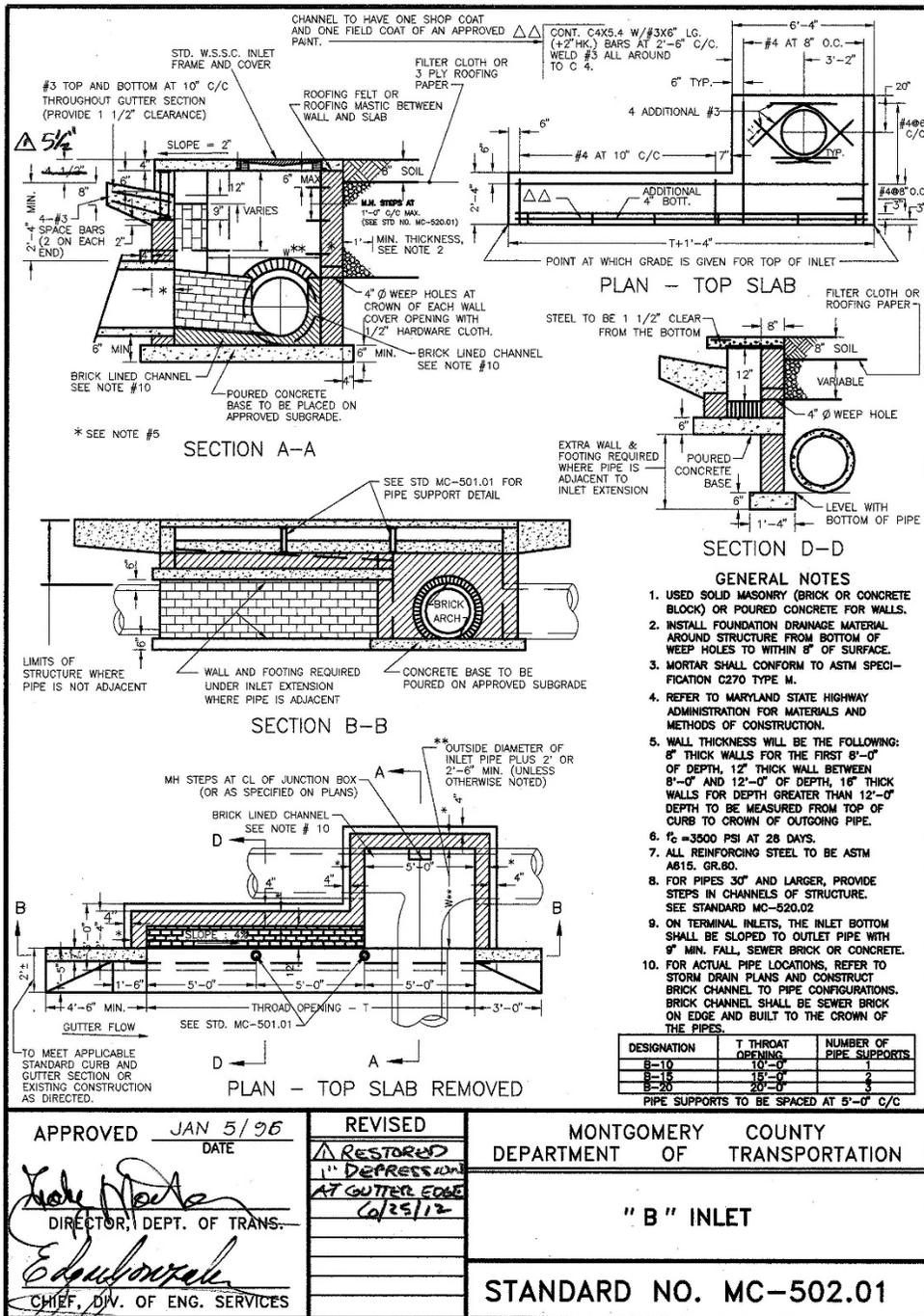
STANDARD NO. MC-501.01

*Lady [Signature]*  
DIRECTOR, DEPT. OF TRANS.

*Ed [Signature]*  
CHIEF, DIV. OF ENG. SERVICES

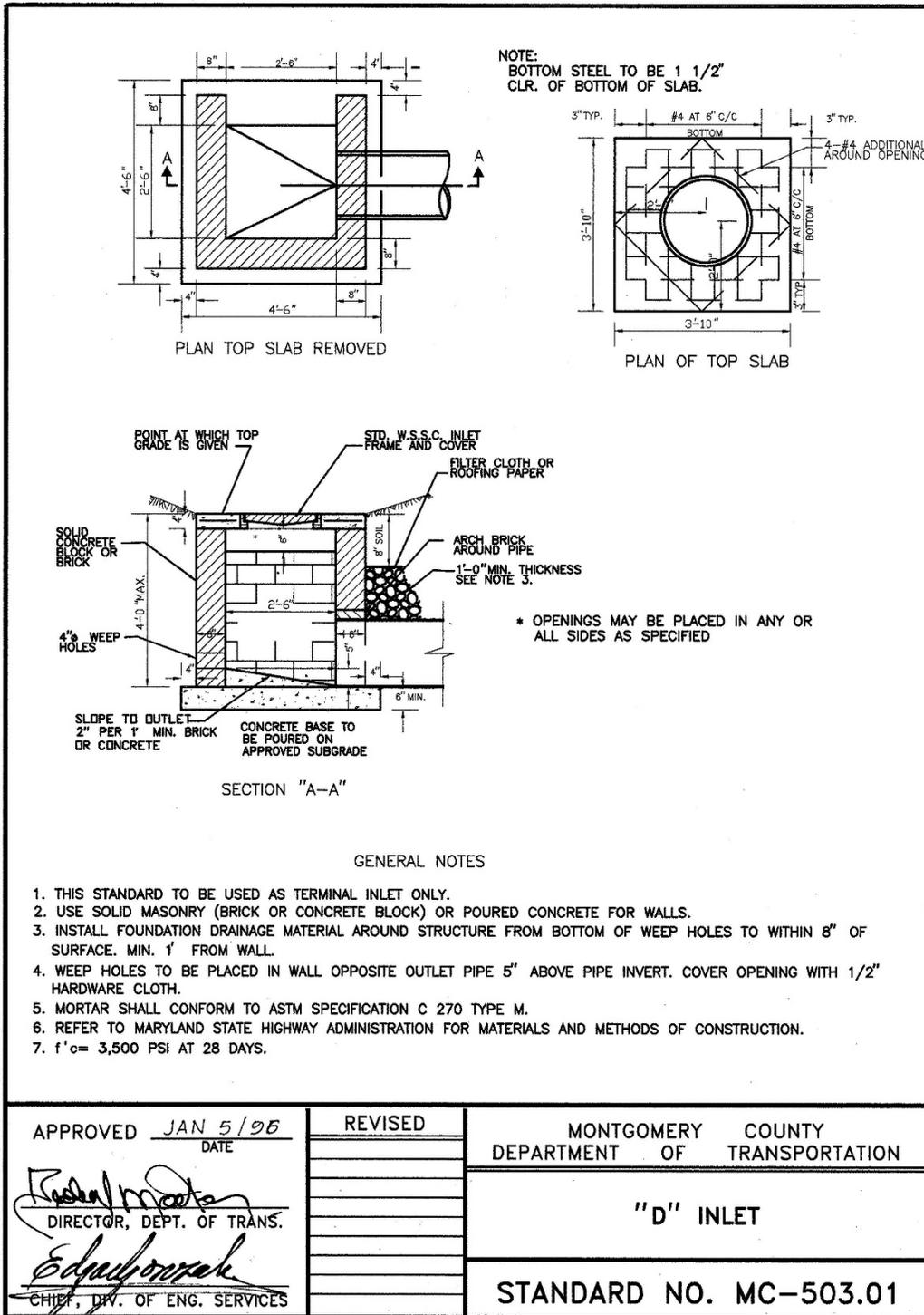
PADDISTD/MC501. 10-15-95 6-3829 PM EST

Appendix C 2: MC 502.01

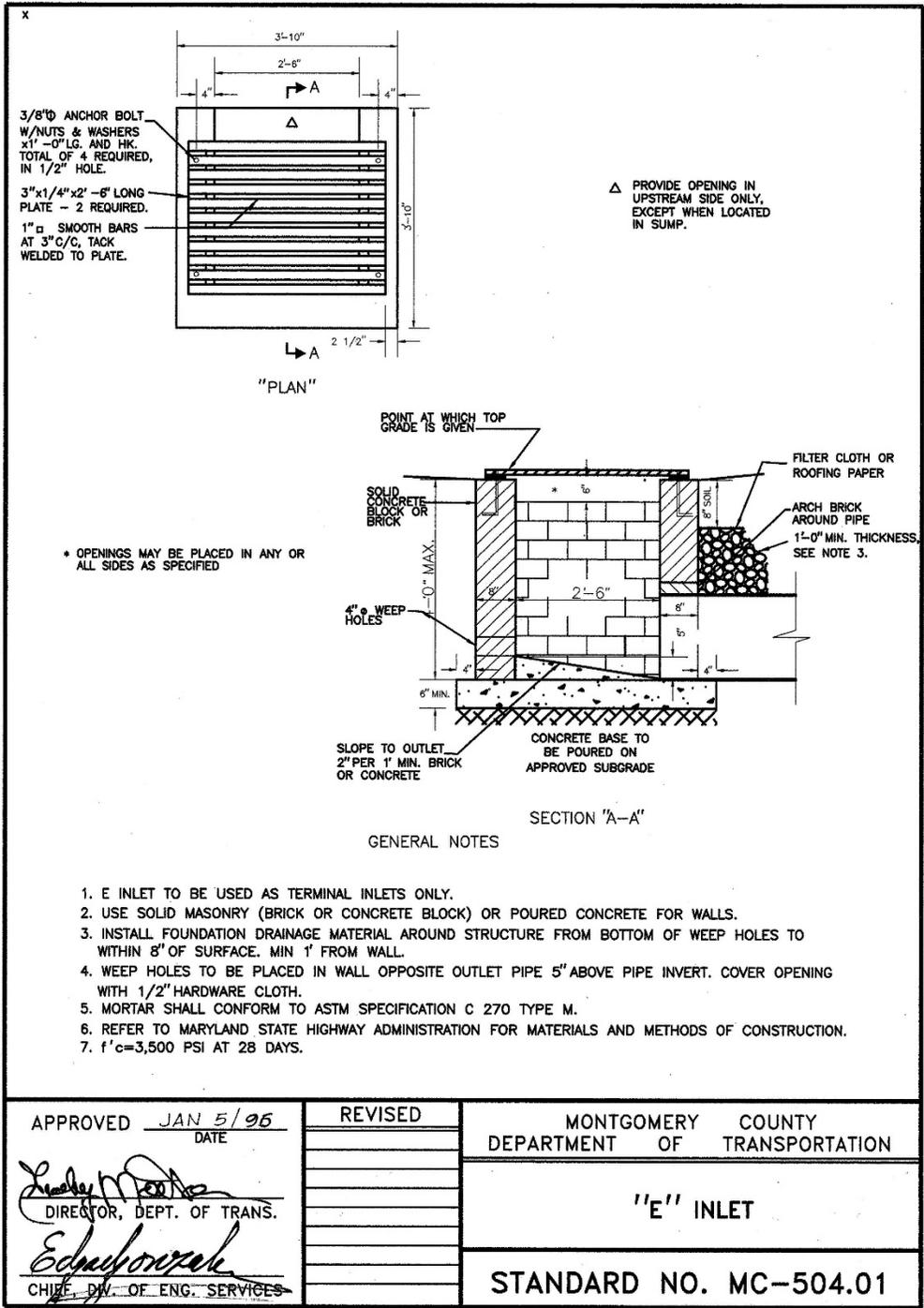


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Appendix C 3: MC 503.01



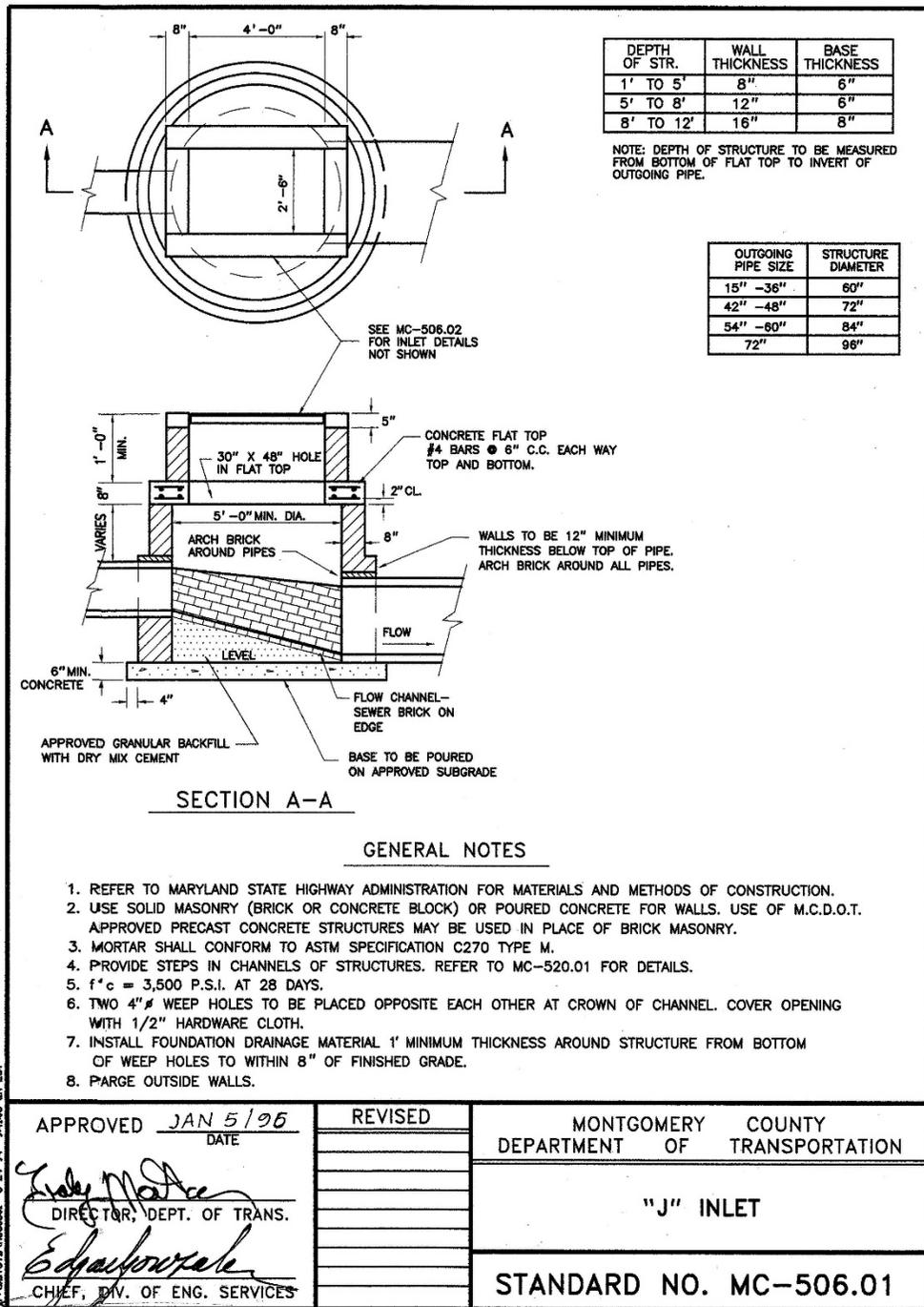
Appendix C 4: MC 504.01



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APPROVED <u>JAN 5/96</u> DATE	REVISED	MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION
<i>[Signature]</i> DIRECTOR, DEPT. OF TRANS.		"E" INLET
<i>[Signature]</i> CHIEF DIV. OF ENG. SERVICES		STANDARD NO. MC-504.01

Appendix C 5: MC 506.01



Appendix C 6: MC 507.01

X

4" x 3" x 1/4" L W/1/2" x 4" W#3  
(6" LG+2" HK) 6" -2" AT 2'-6" C/C)

TOP SLAB 2%

THROAT INVERT

USE WITH 6" CURB

1'-5"

2"

2" RAD.

1'-2"

ALL CHANNELS AND ANGLES TO  
HAVE ONE SHOP COAT AND ONE  
FIELD COAT OF AN APPROVED PAINT.

6" x 8.2" W/1/2" x 4" W#3  
(6" LG+2" HK) 6" -2" AT 2"  
C/C OR EQUIVALENT.

TOP SLAB 2%

THROAT INVERT

USE WITH 8" CURB

1'-1"

2"

2" RAD.

0'-10"

THROAT SECTION DETAIL

\* 5/8" DIAMETER DEFORMED STEEL  
BARS 8" LONG WITH 2" RADIUS AT  
30" CENTERS.

**GENERAL NOTES**

**THROAT SECTION NOTES:**

1. THE THROAT INVERT SHALL SLOPE A MINIMUM OF 1.5% TO THE PIPE CHAMBER WITH A 2" MINIMUM DEPTH AT THE CHAMBER OPENING AND A 5" MAXIMUM DEPTH AT THE FAR END, USING MSHA MIX NO. 2 CONCRETE.
2. A 4" GUTTER PAN DEPRESSION SHALL BE REQUIRED FOR THE FULL LENGTH OF THE THROAT SECTION.
3. THE GUTTER PAN MAY BE PRECAST OR CAST IN PLACE.
4. THE TOP SLAB SHALL BE 4" MINIMUM THICK WITH A 6" HIGH CURB; AND 6" MINIMUM THICK WITH AN 8" HIGH CURB. SUPPORT POSTS AT 5' O.C. ARE REQUIRED WITH 4" THICK TOP SLAB.

**PIPE CHAMBER NOTES:**

5. MAINTAIN A MINIMUM 12" CLEARANCE BETWEEN TOP OF BENCH AND BOTTOM OF FLATTOP OR EXTEND BENCH TO BOTTOM OF FLATTOP.
6. STRUCTURE OPENINGS SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 2" MINIMUM-5" MAXIMUM FOR PIPES UP THROUGH 36", AND 3" MINIMUM-6" MAXIMUM FOR PIPES 42" AND GREATER.
7. THE INVERT ON TERMINAL STRUCTURES SHALL SLOPE TO THE OUTLET A MINIMUM OF 2" PER 12". ON THROUGH STRUCTURES, A FORMED CHANNEL SHALL BE REQUIRED.
8. 6" DIAMETER KNOCKOUTS SHALL BE CAST INTO EACH END OF THE STRUCTURE FOR POSSIBLE UNDERDRAIN CONNECTIONS. 4" DIAMETER WEEPHOLE KNOCKOUTS SHALL BE CAST INTO THE FRONT AND BACK OF THE STRUCTURE, ONE PER FACE. LOCATE INVERT OF KNOCKOUT AT CROWN OF HIGHEST CHANNEL.
9. A MINIMUM OF 3.5' IS REQUIRED BETWEEN THE OUTLET PIPE INVERT AND THE FLATTOP.

**NOTES FOR BOTH:**

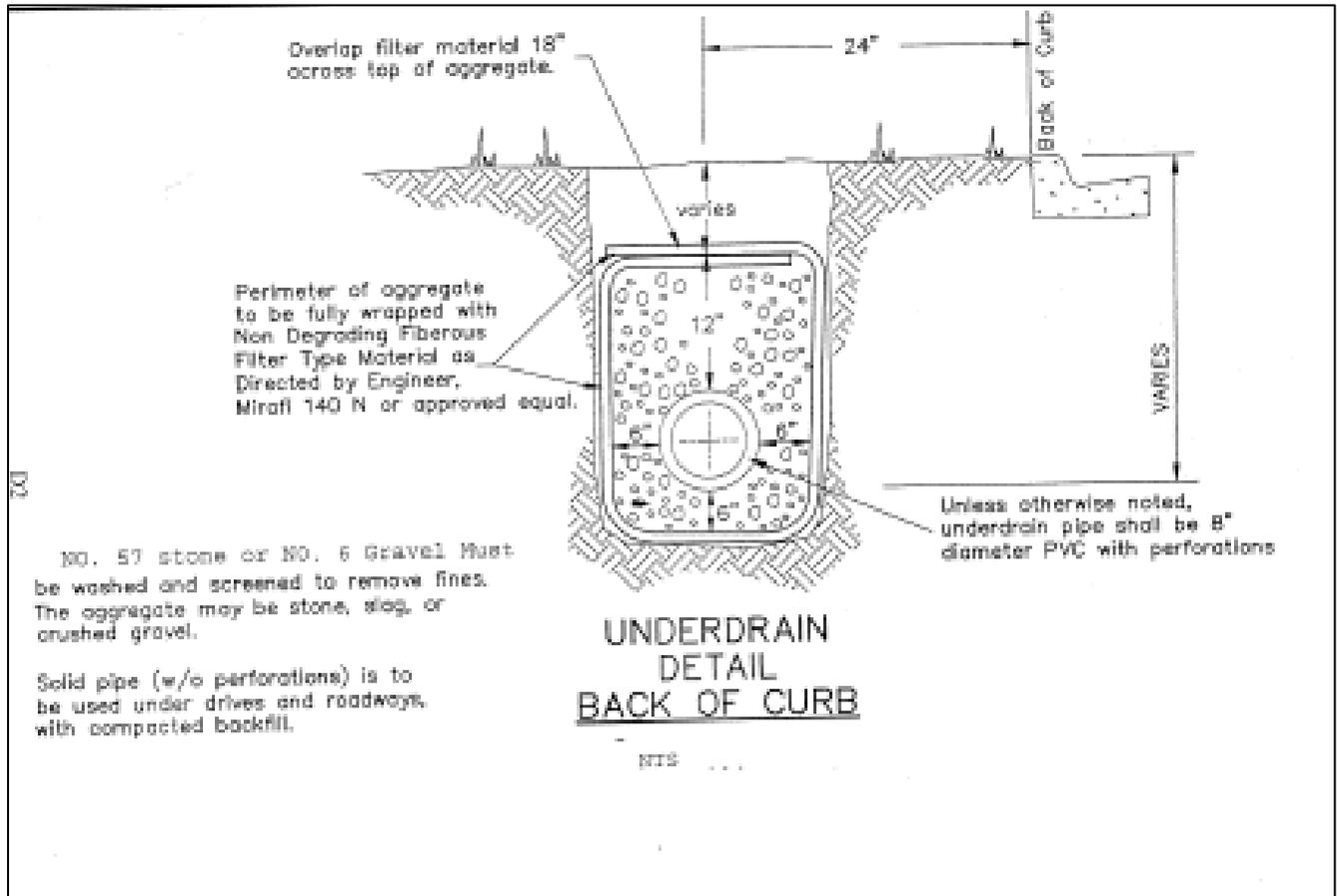
10. INVERTS SHALL BE PAVED WITH SEWER BRICK OR CONCRETE.
11. THE MANUFACTURER'S NAME AND DATE OF MANUFACTURE SHALL BE LOCATED ON THE INSIDE OF ALL STRUCTURE COMPONENTS.
12. THE MCDOT MATERIALS LAB SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF FABRICATION.
13. THREE (3) NOTARIZED CERTIFICATIONS OF SPECIFICATIONS WILL BE REQUIRED FOR ALL SHIPMENTS.
14. CONCRETE TO BE f'c=3500 PSI AT 28 DAYS.
15. STEPS WILL NOT BE PERMITTED IN THE FLATTOP.
16. MORTAR SHALL CONFORM TO ASTM SPECIFICATION C270 TYPE M AND WILL BE USED TO SEAL LIFT HOLES, THROAT SECTION TO PIPE CHAMBER, AND SEAL AROUND ALL PIPE CONNECTIONS.
17. OTHER SPECIFIED COMBINATIONS OF CONCRETE AND STEEL PROVIDING THE SAME OVERALL STRUCTURAL STRENGTH AS MCDOT STD.MC-501.01 AND MC-502.01 WILL BE CONSIDERED FOR APPROVAL ON A CASE BY CASE BASIS.
18. ADJUSTMENT OF THE THROAT SECTION TO THE PIPE CHAMBER SHALL BE LIMITED TO THREE (3) COURSES OF BRICK TALLING 8 INCHES IN THICKNESS INCLUDING PORTLAND CEMENT JOINTS. PRECAST ADJUSTMENT RINGS WILL BE REQUIRED IN COMBINATION WITH BRICK TO MEET THE MAXIMUM OF THREE COURSES.

<p>APPROVED <u>JAN 5/95</u> DATE</p> <p><i>Judy M. ...</i> DIRECTOR, DEPT. OF TRANS.</p> <p><i>Ed ...</i> CHIEF, DIV. OF ENG. SERVICES</p>	<p>REVISED</p> <p><del>RESTORED</del></p> <p>1" DEPRESSION AT GUTTER EDGE</p> <p>6/25/12</p>	<p>MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION</p> <p><b>PRECAST CURB INLET GUIDELINES</b></p> <p><b>STANDARD NO. MC-507.01</b></p>
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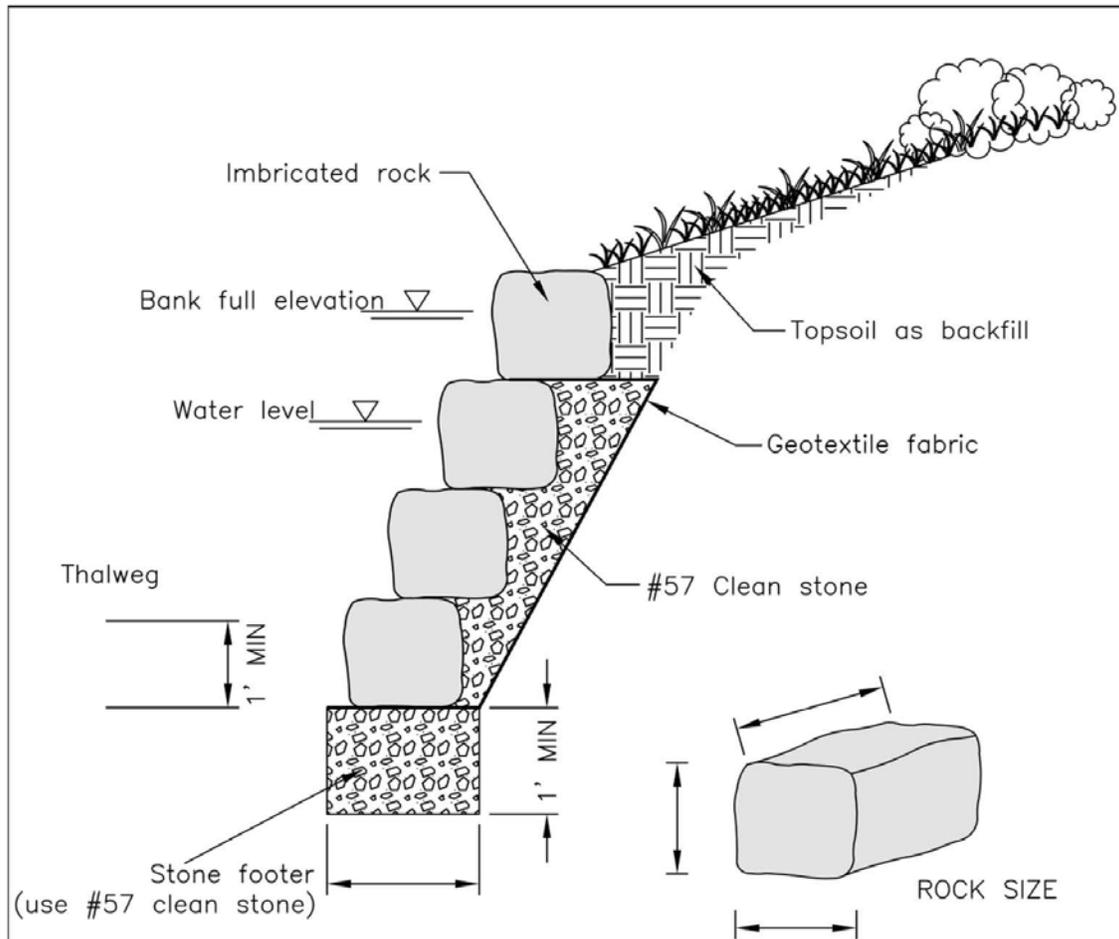
## APPENDIX D: Miscellaneous Details & Specifications

### Appendix D 1: Underdrain Detail





**APPENDIX D 3: BMPS DETAIL IMBRICATED ROCK**



CROSS SECTION OF BANK

*DRAWING NOT TO SCALE*

**NOTES:**

- Top of rock shall be above bank full elevation.
- Footer rock shall be 1' below CL of thalweg.
- Slope of rock shall be equal to existing bank slope.
- Depending on stream bottom type, geotextile at the bottom of the footer drain will be determined at time of construction.



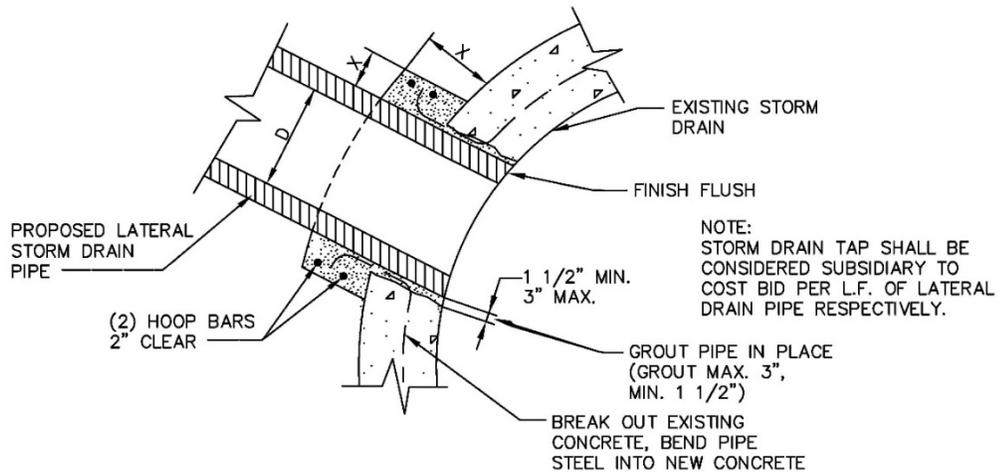
MARYLAND STANDARDS FOR  
AGRICULTURAL BMPS DETAIL  
IMBRICATED ROCK

DRAWING NO. MD\_0804

ISSUE DATE: 2/2016

**APPENDIX D 4: STORM DRAIN TAP DETAIL**

D	X	HOOP BARS
18" OR SMALLER	6"	#3
LARGER THAN 18"	9"	#4



**STORM DRAIN TAP DETAIL**

NOTE: PREFABRICATED FITTINGS SHALL BE USED ON ALL PROPOSED STORM DRAINS.



**APPROVED**

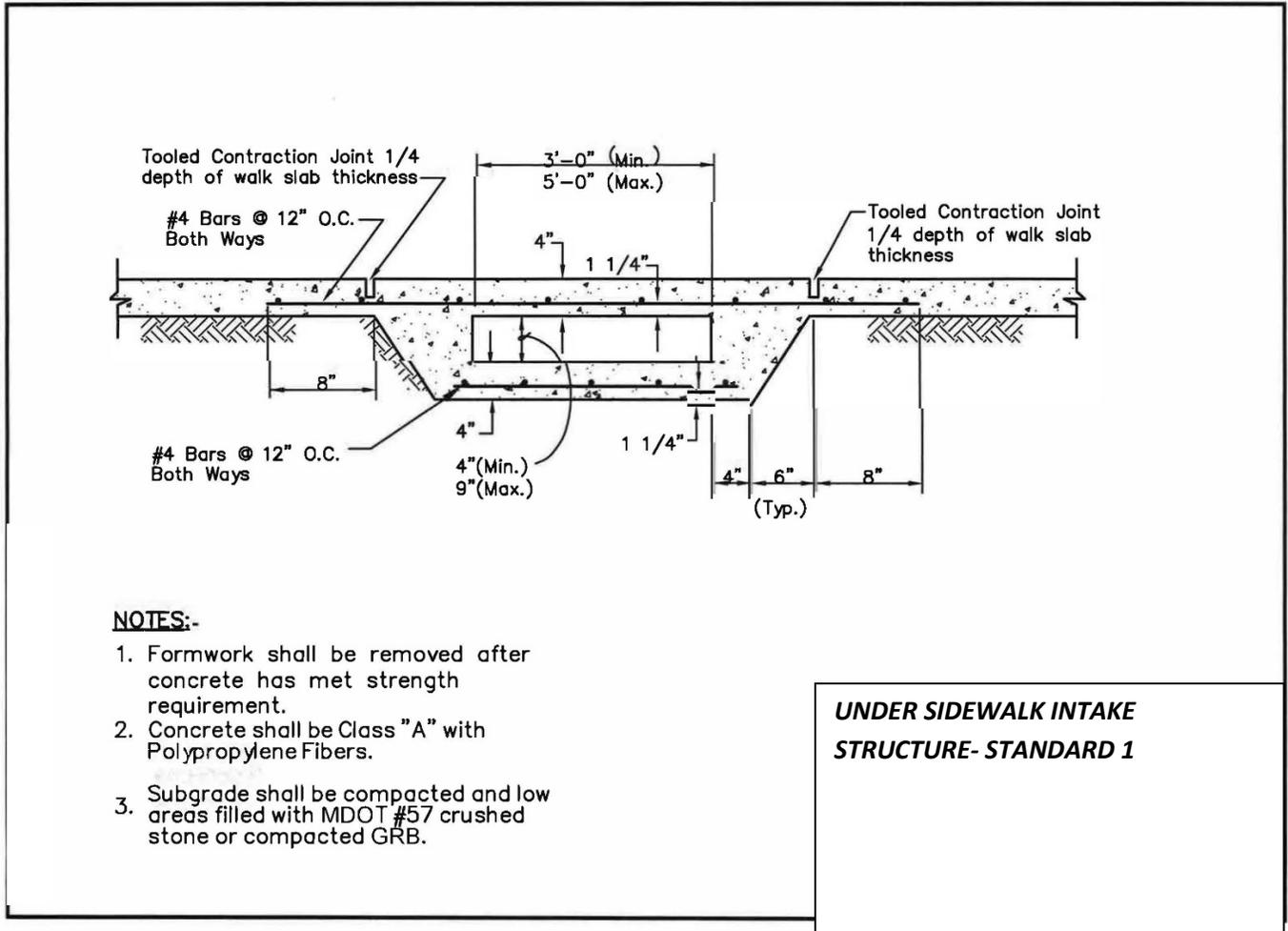
*Ali Khalil*

STORM DRAIN TAP DETAIL

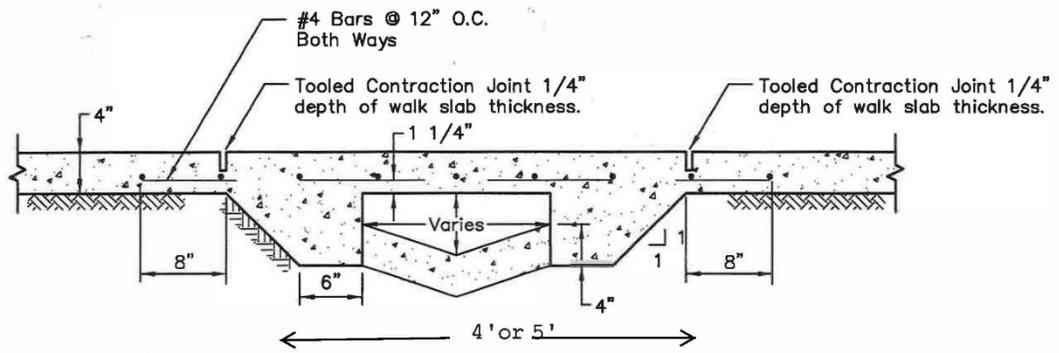
CITY OF TAKOMA PARK  
Engineering

FIGURE D

**APPENDIX D 5: UNDER SIDEWALK INTAKE STRUCTURE STANDARD 1**



## APPENDIX D 6: UNDER SIDEWALK INTAKE STRUCTURE STANDARD 2



### NOTES:

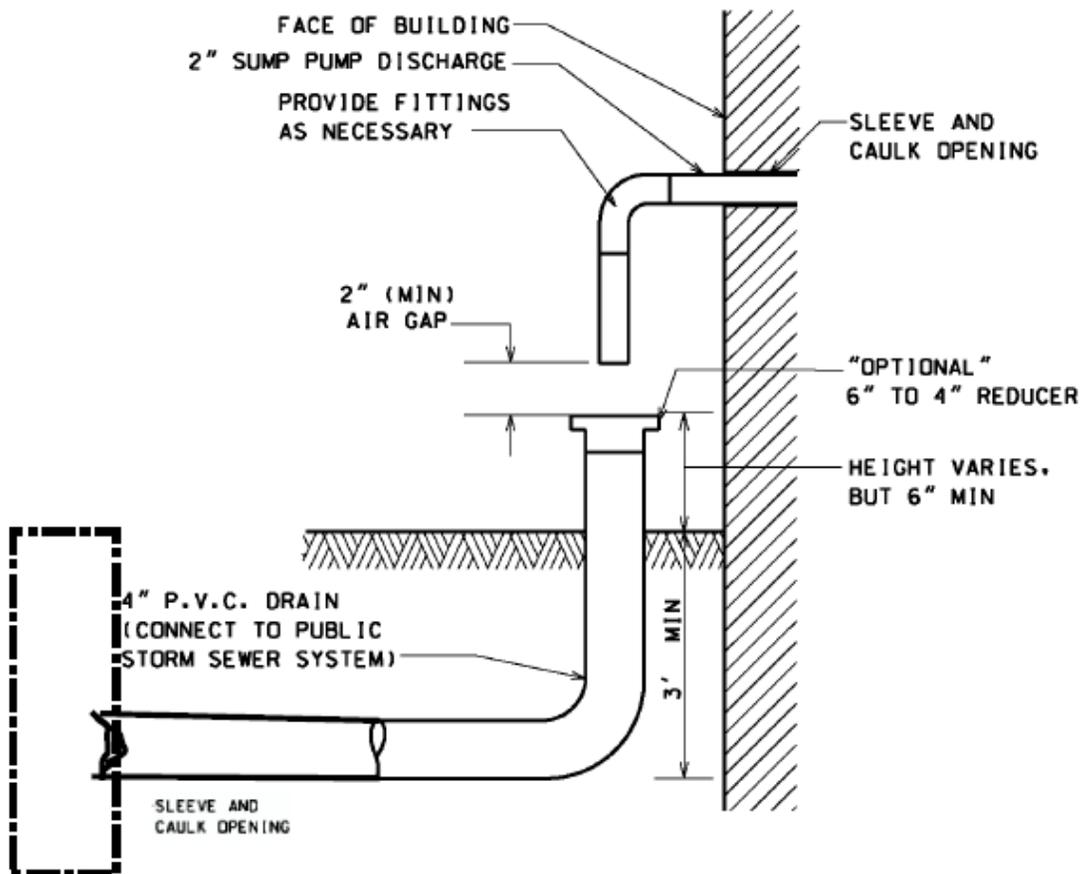
1. Formwork shall be removed after concrete has met strength requirement.
2. Concrete shall be Class "1" with Polypropylene Fibers. (per standard specifications)
3. Subgrade shall be compacted and low areas filled with MDOT #57 crushed stone. OR GRB

**UNDER SIDEWALK INTAKE  
STRUCTURE- STANDARD 2**



APPENDIX D 8: SUMP PUMP DISCHARGE CONNECTION DETAIL

U-13



**NOTE:**

1. SUMP PUMPS SHALL BE DESIGNED WITH A MINIMUM 2" AIR GAP. A RIGID FOUR-INCH (4") DIAMETER PVC PIPE CAN BE USED TO CONNECT THE INDIVIDUAL SUMP PUMP SERVICE TO THE STORM SEWER. IN NO EVENT SHALL THE SUMP PUMP DISCHARGE INTO THE SANITARY SEWER SYSTEM.
2. A PLUMBING PERMIT IS REQUIRED PRIOR TO ANY SEWER CONNECTION.

NOT TO SCALE

SUMP PUMP DISCHARGE  
CONNECTION DETAIL

## APPENDIX D 9: CONSTRUCTION SPECIFICATIONS FOR SAND FILTERS, BIO RETENTION AND OPEN CHANNELS

### Material Specifications for Sand Filters

Material	Specification/Test Method	Size	Notes
sand	clean AASHTO-M-6 or ASTM-C-33 concrete sand	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
peat	ash content: < 15% pH range: 5.2 to 4.9 loose bulk density 0.12 to 0.15 g/cc	n/a	The material must be reed-sedge hemic peat, shredded, uncompacted, uniform, and clean.
leaf compost		n/a	
underdrain gravel	AASHTO-M-43	0.375" to 0.75"	
geotextile fabric (if required)	ASTM-D-4833 (puncture strength - 125 lb.) ASTM-D-4632 (Tensile Strength -300 lb.)	<b>0.08" thick equivalent opening size of #80 sieve</b>	Must maintain 125 gpm per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to "separate" sand filter layers.
impermeable liner (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength 1,100 lb., elongation 200%) ASTM-D-624 (Tear resistance - 150 lb./in) ASTM-D-471 (water adsorption: +8 to -2% mass)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.
underdrain piping	F 758, Type PS 28 or AASHTO-M-278	4" - 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
concrete (cast-in-place)	MSHA Standards and Specs. Section 902, Mix No. 3, f'c = 3500 psi, normal weight, air-entrained; re-enforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland
concrete (pre-cast)	per pre-cast manufacturer	n/a	SEE ABOVE NOTE
non-rebar steel	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM-A-123

**APPENDIX D 10: MATERIALS SPECIFICATIONS FOR BIORETENTION**

<b>Material</b>	<b>Specification</b>	<b>Size</b>	<b>Notes</b>
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
planting soil [2.5' to 4' deep]	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA soil types loamy sand, sandy loam or loam
mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448 ornamental stone: washed cobbles	pea gravel: No. 6 stone: 2" to 5"	
geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
sand [1' deep]	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Gray stone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

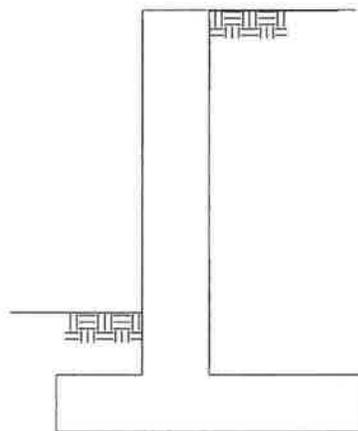
## **MISCELLANEOUS**

## **M 1: Typical Retaining Wall Details**

# *Fairfax County, Virginia*

## **Typical Retaining Wall Details**

Based on the 2009 International Residential Code



### **CONTENTS**

<b>Timber Retaining Wall</b> .....	2
General Requirements .....	2
Wall Construction .....	2
Deadmen .....	3
Connections.....	3
<b>Masonry Retaining Wall</b> .....	4
General Requirements .....	4
Wall Construction .....	4
Bond Beam and Reinforcement Details.....	4
Dowels and Keyway.....	5
Vertical Joints .....	6
Backfill and Drainage.....	6
<b>Concrete Retaining Wall</b> .....	6
General Requirements .....	6
Wall Construction .....	6
Dowels and Keyway.....	8
Vertical Joints .....	8
Backfill and Drainage.....	8

**This design document applies to residential non-tiered, non-stacked retaining walls with level backfill and no surcharge loading retaining no more than 4 feet of earth. Retaining walls must be constructed in conformance with the details contained herein. A copy of these details is required to be on the job site and available to the inspector during each required inspection.**

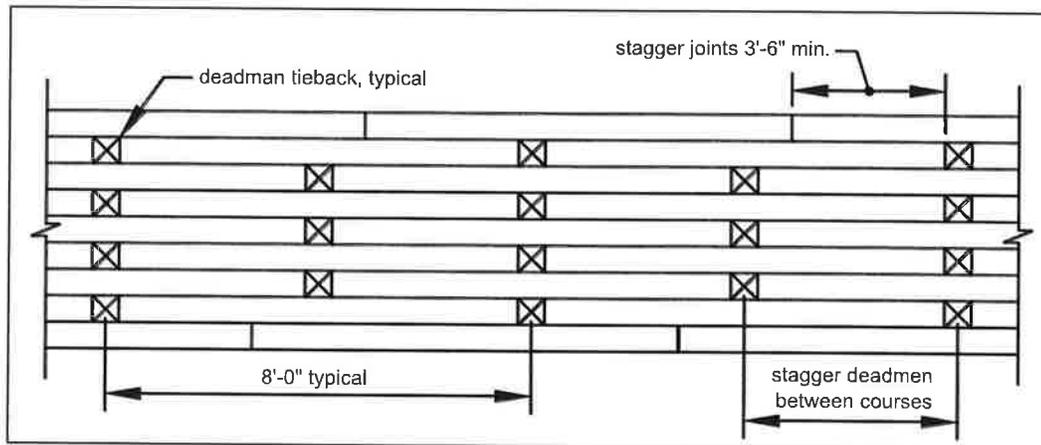
## TIMBER RETAINING WALLS

### General Requirements

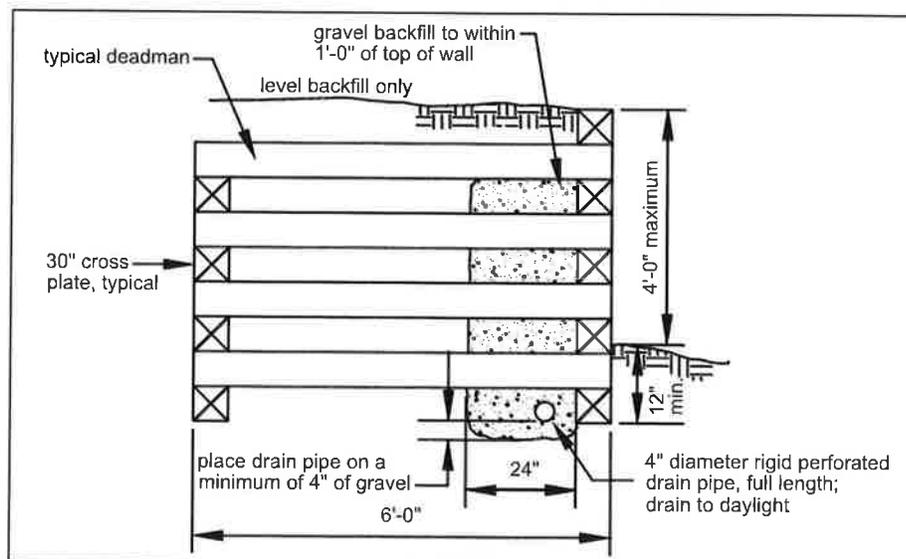
1. All lumber shall be 6x6, southern pine, grade #2 or better and pressure treated in accordance with American Wood-Preservers' Association standards for ground contact.
2. All spikes shall be 60d or equivalent, hot-dipped galvanized or stainless steel and driven into pre-drilled holes. Spikes shall be of sufficient length to penetrate the base member a minimum of 2 inches.
3. Member joints shall be staggered a minimum of 3.5 feet from the joints of the course above and below.

### Wall Construction

The construction of a timber retaining wall shall conform to the requirements shown in FIGURE 1 through FIGURE 3.



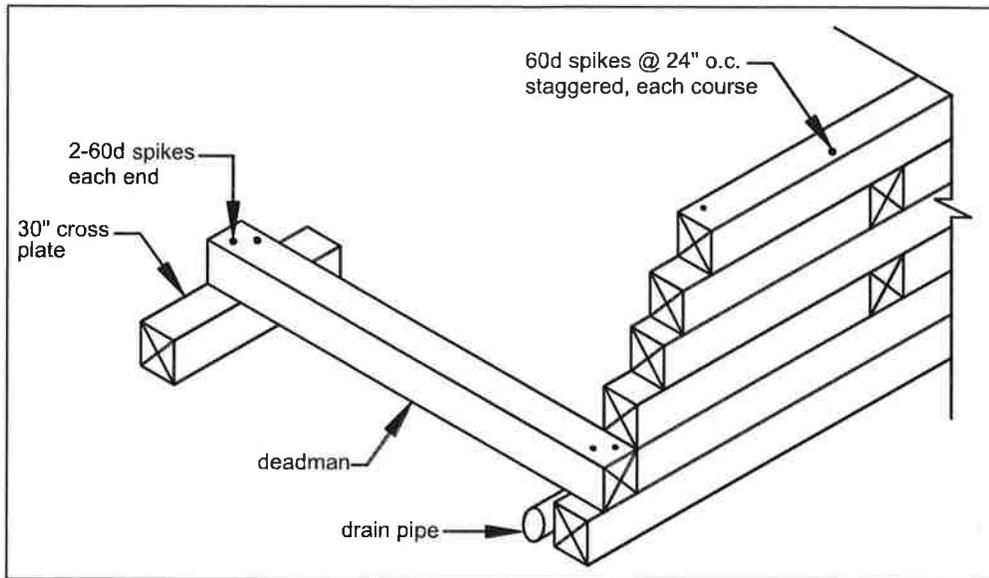
**FIGURE 1: TYPICAL ELEVATION**



**FIGURE 2: TYPICAL SECTION**

Deadmen

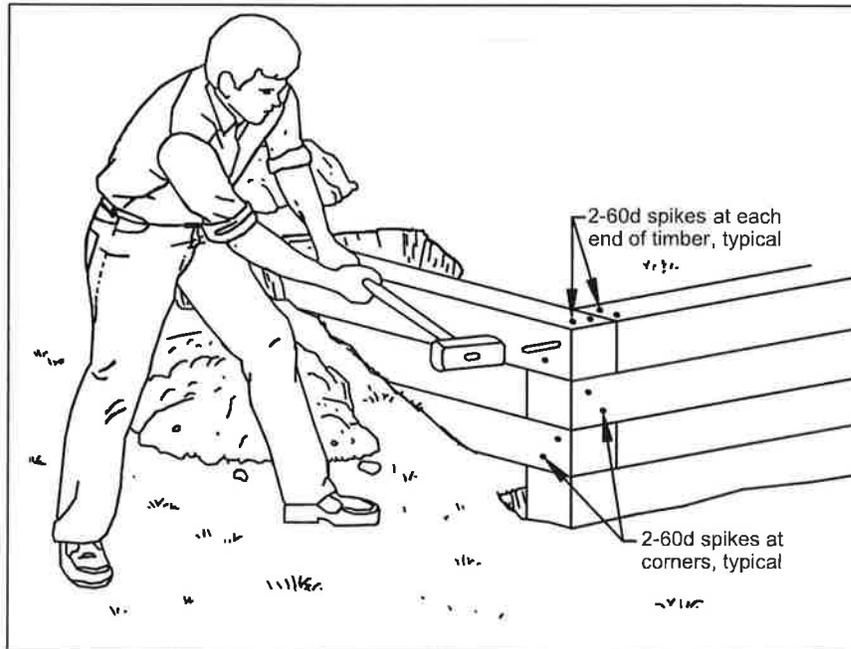
Deadmen shall be placed at 8 feet on center as shown in FIGURE 1. Deadmen and cross plates shall be constructed as shown in FIGURE 3. Deadmen are not required in the bottom course below grade.



**FIGURE 3: TYPICAL DEADMAN DETAIL**

Connections

Each 6x6 member shall be secured at each end with 2-60d spikes driven vertically into the member below. The corners shall be secured with 2-60d spikes and driven horizontally as shown in FIGURE 4.



**FIGURE 4: TYPICAL CORNER DETAIL**

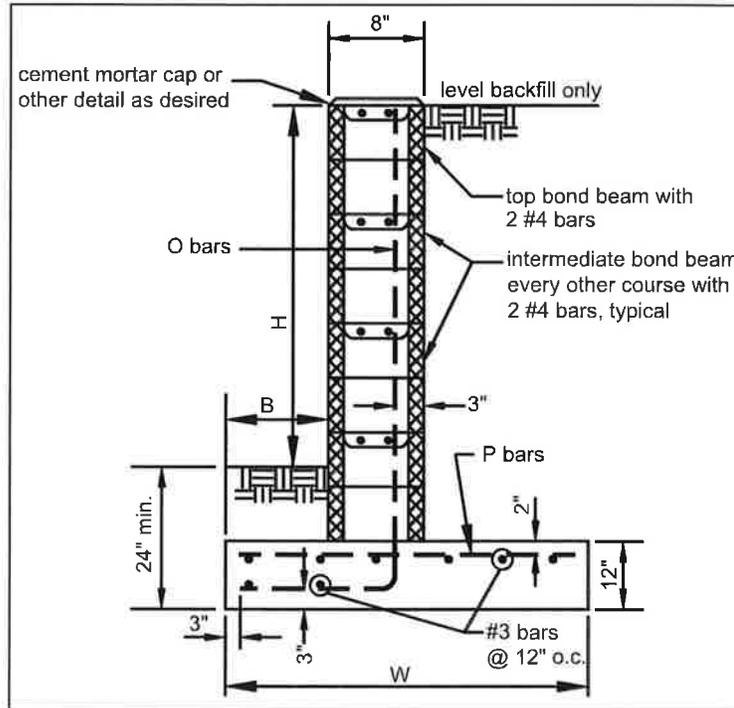
## MASONRY RETAINING WALLS

### General Requirements

1. The minimum concrete compressive strength at 28 days shall be 3,500 PSI and shall comply with ACI 318.
2. Reinforcing steel shall comply with ASTM A615 and shall have a yield strength of 60,000 PSI.
3. Concrete masonry blocks shall comply with ASTM C90.
4. All joint reinforcement, ties and other accessories shall be resistant to corrosion.
5. All head and bed joints shall be  $\frac{3}{8}$ -inch thick. Bed joints of the starting course over the concrete foundation may be between  $\frac{1}{4}$ -inch and  $\frac{3}{4}$ -inch. Mortar shall conform to ASTM C270.

### Wall Construction

The construction of a concrete masonry retaining wall shall conform to the dimensions and reinforcing steel requirements shown in FIGURE 5 and TABLE 1. O bars, or dowels, can be lapped above the footing in accordance with FIGURE 9.



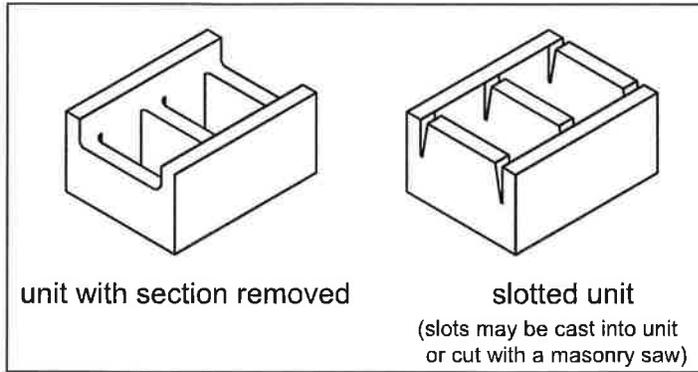
**FIGURE 5: TYPICAL MASONRY WALL SECTION**

**TABLE 1: TYPICAL MASONRY WALL SPECIFICATIONS**

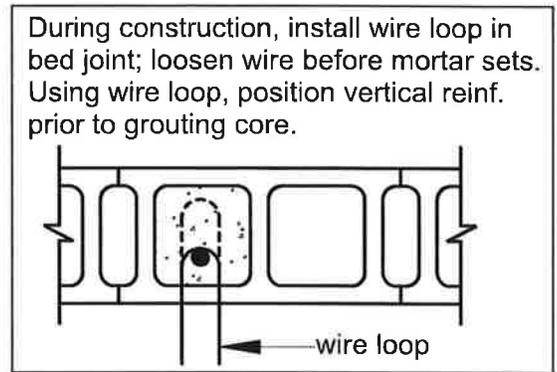
<b>H</b>	<b>B</b>	<b>W</b>	<b>O-bars (dowels)</b>	<b>P-bars</b>
24"	12"	39"	#3@32"	#3@27"
36"	12"	39"	#4@32"	#3@27"
48"	12"	63"	#4@16"	#4@30"

Bond Beam And Reinforcement Details

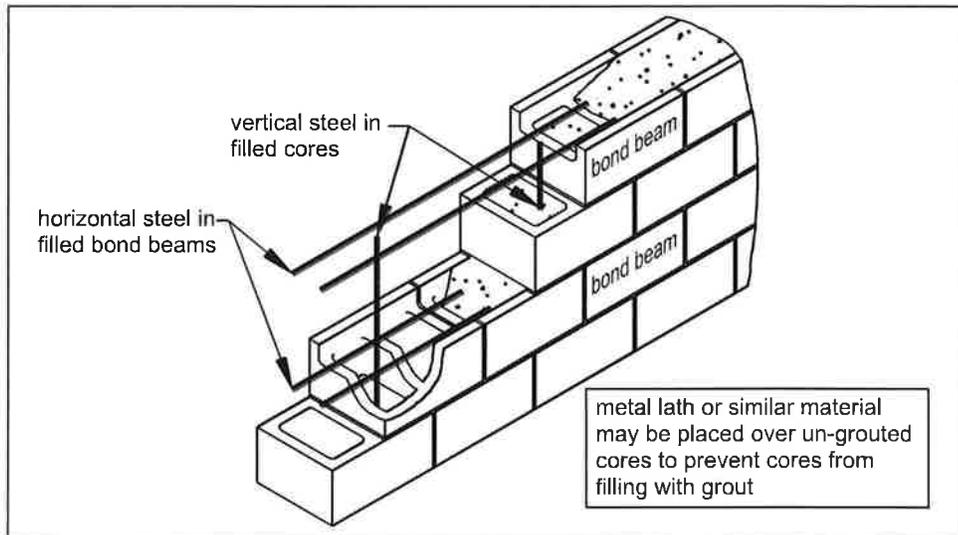
A bond beam shall be provided at the top course and at intermediate courses below as shown in FIGURE 5. Bond beams shall be constructed using the block types shown in FIGURE 6. Vertical and horizontal steel placement shall be per FIGURE 7 and FIGURE 8.



**FIGURE 6: BOND BEAM BLOCK TYPE**



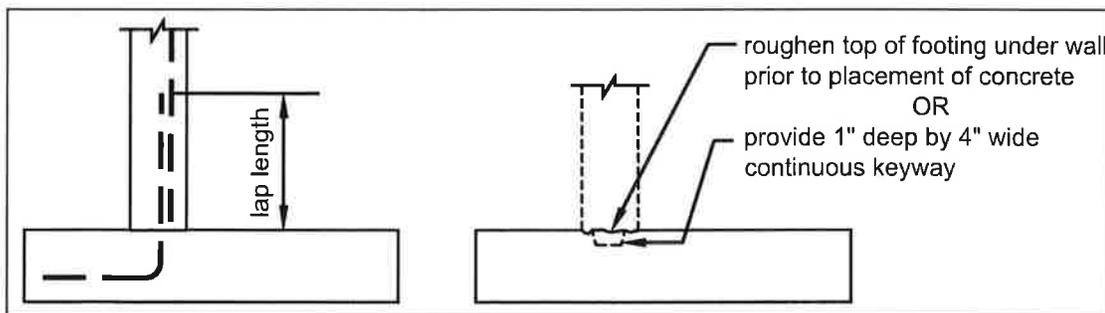
**FIGURE 7: VERTICAL REINFORCEMENT TIE HOLD DETAIL**



**FIGURE 8: TYPICAL WALL REINFORCEMENT DETAIL**

Dowels And Keyway

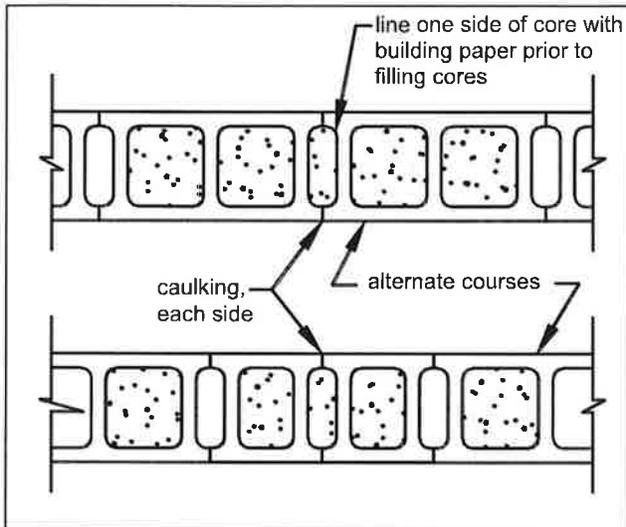
O bars, or dowels, can be lapped as shown in FIGURE 9. The minimum lap length shall be 15 inches for a #3 bar, 20 inches for a #4 bar, 25 inches for a #5 bar and 30 inches for a #6 bar. A keyway or roughened concrete shall be placed on the footing surface below the block wall; see FIGURE 9.



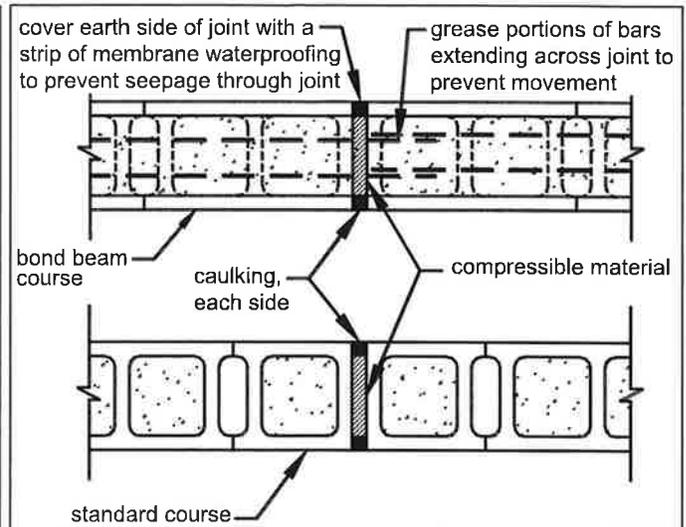
**FIGURE 9: TYPICAL DOWEL AND KEYWAY DETAIL**

Vertical Joint

Control joints, constructed per FIGURE 10, shall be placed no more than 20 feet on center. Expansion joints, constructed per FIGURE 11, shall be placed at every fourth control joint.



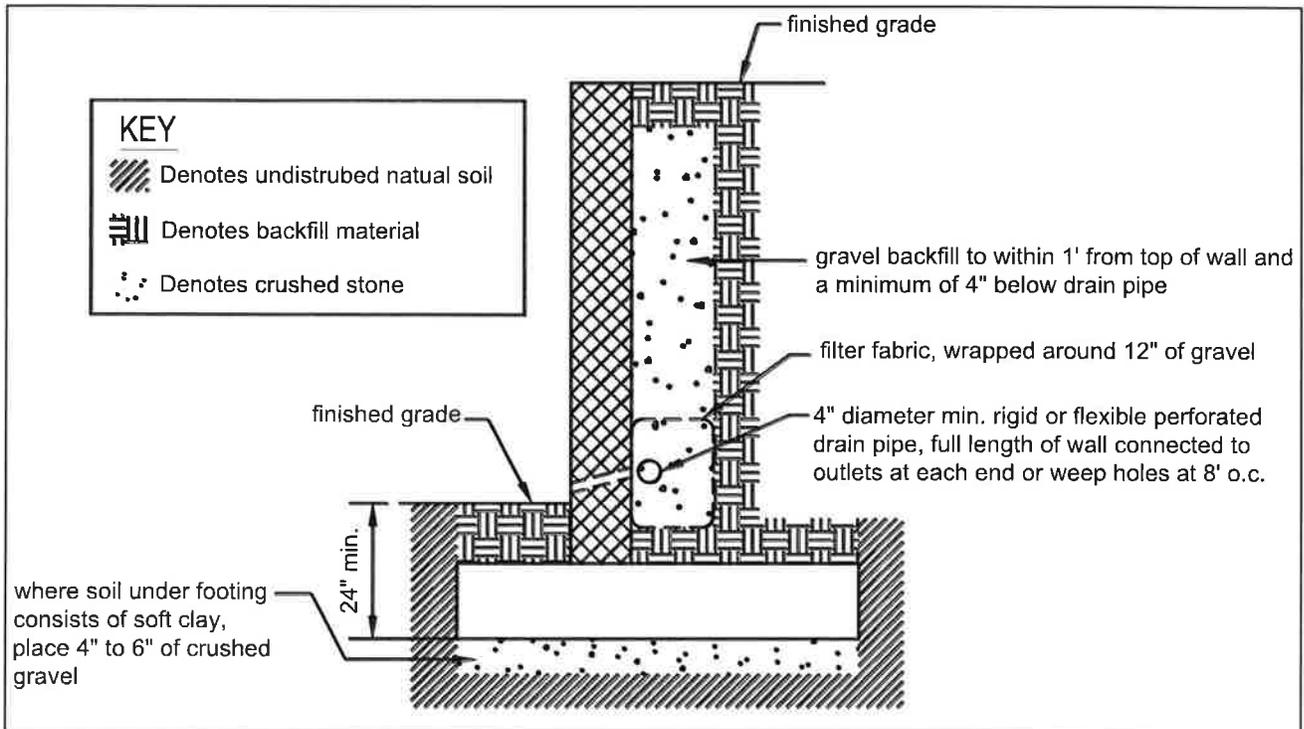
**FIGURE 10: CONTROL JOINT DETAIL**



**FIGURE 11: EXPANSION JOINT DETAIL**

Backfill And Drainage

Backfilling against reinforced masonry retaining walls shall not be permitted until at least 7 days after placing concrete or grout in cores. Heavy equipment shall maintain a distance away from the wall equal to the wall's height. Care shall be taken to avoid exerting large impact forces on the wall.

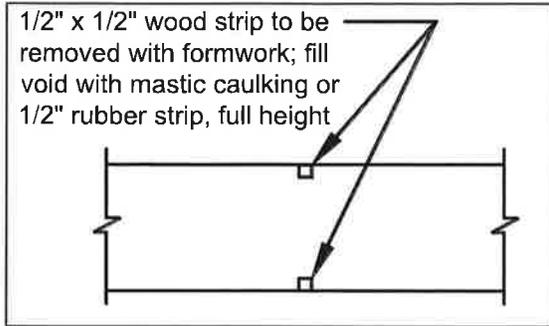


**FIGURE 12: TYPICAL BACKFILL AND DRAINAGE DETAIL**

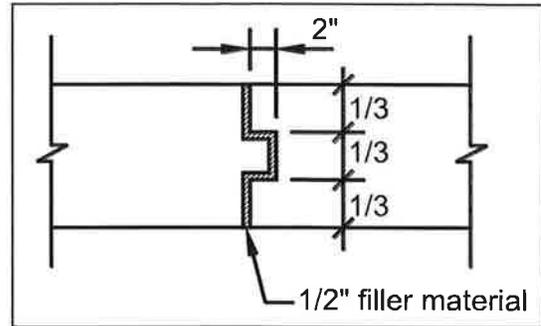


Vertical Joint

Control joints, constructed per FIGURE 15, shall be placed no more than 20 feet on center. Expansion joints, constructed per FIGURE 16, shall be placed at every fourth control joint.



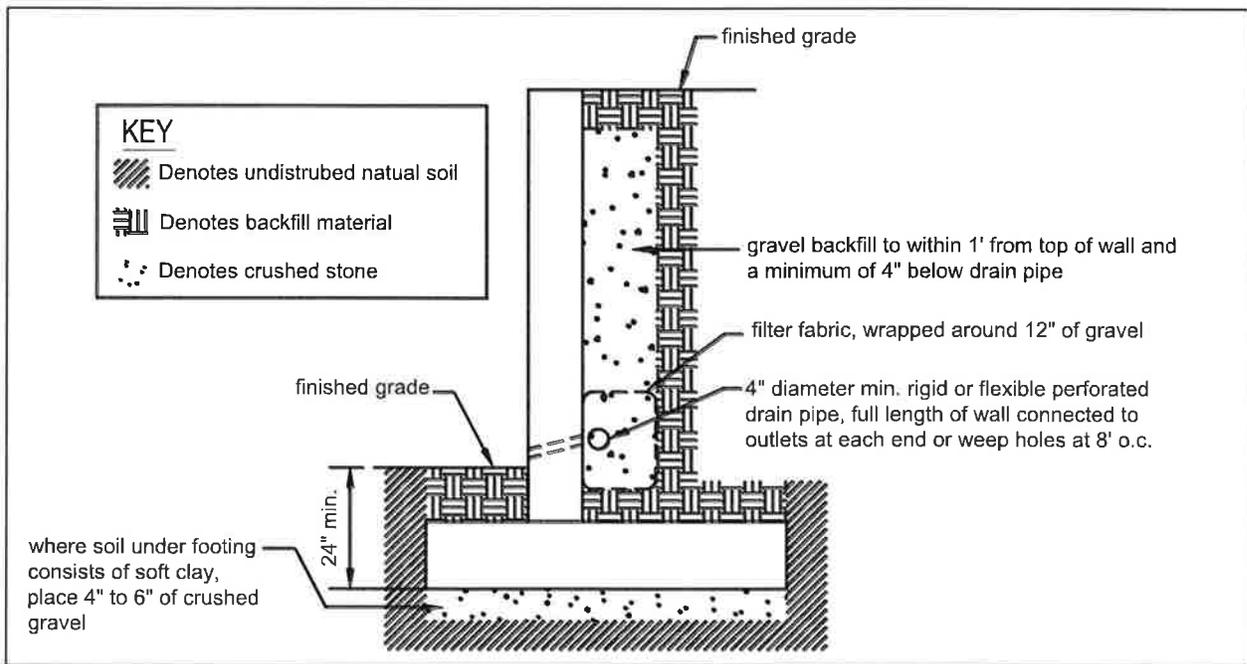
**FIGURE 15: TYPICAL CONTROL JOINT**



**FIGURE 16: TYPICAL EXPANSION JOINT**

Backfill And Drainage

Backfilling against reinforced concrete retaining walls shall not be permitted until the concrete has reached its 28-day strength. Heavy equipment shall maintain a distance away from the wall equal to the wall's height. Care shall be taken to avoid exerting large impact forces on the wall.



**FIGURE 17: TYPICAL BACKFILL AND DRAINAGE DETAIL**

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A Fairfax County, Virginia Publication

**M 2: MGWC 2.1. RIP-RAP & MGWC 2.2 IMBRICATED RIP-RAP**

## **MGWC 2.1: RIPRAP**

*Rigid engineering technique for bank  
stabilization*

### **DESCRIPTION**

Riprap is used to protect and stabilize embankment soils from the erosive forces of flowing water and piping forces resulting from groundwater seepage. A well-engineered riprap system should consist of the following:

- a filter layer of gravel or cloth designed to prevent soil movement into or through the riprap layer while allowing water to drain from the embankment, and
- a stone layer of appropriate gradation and thickness to resist the shearing forces of channelized water.

### **EFFECTIVE USES & LIMITATIONS**

When properly designed and installed, riprap is an effective method where soil conditions, water turbulence and velocity, expected vegetative cover, and groundwater conditions are such that the soil may erode under the design flow conditions. Some common areas of riprap applicability are:

- diversion channel banks and/or bottoms,
- roadside ditches,
- drop structure outlets, and
- laterally expanding banks threatening infrastructure or personal property.

Additionally, properly graded riprap forms a flexible, self-healing cover which can be easily repaired in localized areas by the timely replacement of stone. Uniform-grade riprap can also be used with a geotextile filter cloth.

Filter cloth should only be utilized when the bank material is noncohesive such as sand or gravel.

### **MATERIAL SPECIFICATIONS**

- *Filters:* Material and design specifications for granular filters are found in Table 3.1a.

*Table 3.1a: Granular Filter Material Grading Specifications*

<b>% less than</b>	<b>U.S. Standard sieve size</b>
100	2 ½ in (64 mm)
85-100	1 in (25 mm)
60-100	½ in (13 mm)
35-70	No. 10
20-50	No. 40
3-20	No. 200

The thickness of the filter should not be less than 6 inches (15 cm). Generally, filters that are one-half the thickness of the riprap layer are satisfactory.

Synthetic filter cloth may be used cautiously based on the *1994 MD Standards and Specifications for Soil Erosion and Sediment Control*.

- *Riprap:* The maximum diameter or weight of stone for riprap should be based upon the design flow velocity using Figure 3.1. This chart is based on a maximum slope of 2H:1V. The stone gradations for Classes I - III are found in Table 3.1b.

## **MGWC 2.1: RIPRAP**

Table 3.1b: Stone Gradations for Riprap Stone Classes

<b>Class</b>	<b>Size</b>	<b>% Total Weight &lt; Given Size</b>
I	150 lb (70 kg) 2 lb (1 kg)	100 10 max
II	700 lb (320 kg) 20 lb (10 kg)	100 10 max
III	2000 lb (910 kg) 40 lb (20 kg)	100 10 max

Uniform-grade riprap should incorporate angular rock to promote interlocking.

**Approximate Cost (\$1999):**  
\$78 per linear ft

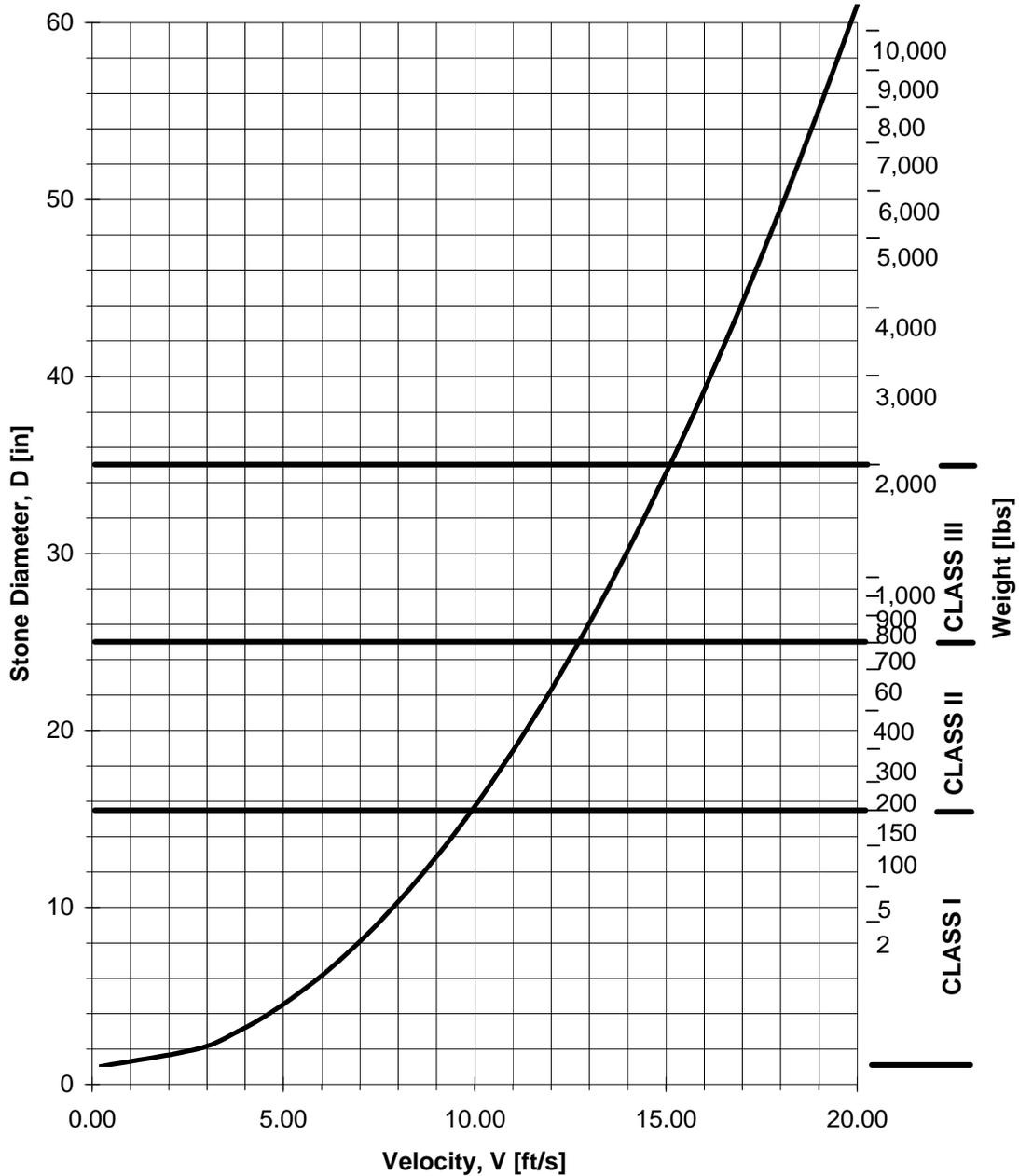
### **INSTALLATION GUIDELINES**

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Once a slope stabilization project is initiated, preparation and placement of the riprap should immediately follow the initial disturbance to minimize the chances for further slope degradation. The recommended construction procedure for riprap is as follows beginning with initial slope preparations (refer to [Detail 2.1](#)):

1. The contractor should install all sediment and erosion control devices as the first order of business.
2. Excavation should be made in reasonably close conformity with the existing stream slope and bed.
3. All fill in the subgrade should be compacted to a density approximating that of the surrounding undisturbed material.
4. Provisions must be made to anchor the riprap at the stream bed so as to provide protection against undermining. If this cannot be accomplished by creating a toe trench, an alternative method of protection must receive prior written approval from the WMA or local authority.
5. The filter layer or blanket should be placed immediately after slope preparation.
  - The stone for granular filters should be spread in a uniform layer to the specified depth. Where more than one layer is employed, they should be spread such that there is minimal mixing.
  - When cloth filters are used, special care should be taken not to damage the fabric during riprap placement.
6. Riprap placement should begin with the toe. The larger stones, as specified by the design gradation, should be placed in the toe and along the perimeter of the slope and channel protection. The riprap should be placed with suitable equipment in such a manner as to produce a reasonably graded mass of stones with zero drop height. The placing of stones that cause extensive segregation is not allowed. Where appropriate, a low flow channel shall be constructed through the riprap.
7. Any excavation voids existing along the edges of the completed slope and channel protection should be backfilled and compacted.
8. All disturbed areas should be permanently stabilized in accordance with an approved sediment and erosion control plan.

**Note:** The use of rock vanes ([MGWC 3.3: Rock Vanes](#)) should be considered to redirect high-velocity flows at the toe.

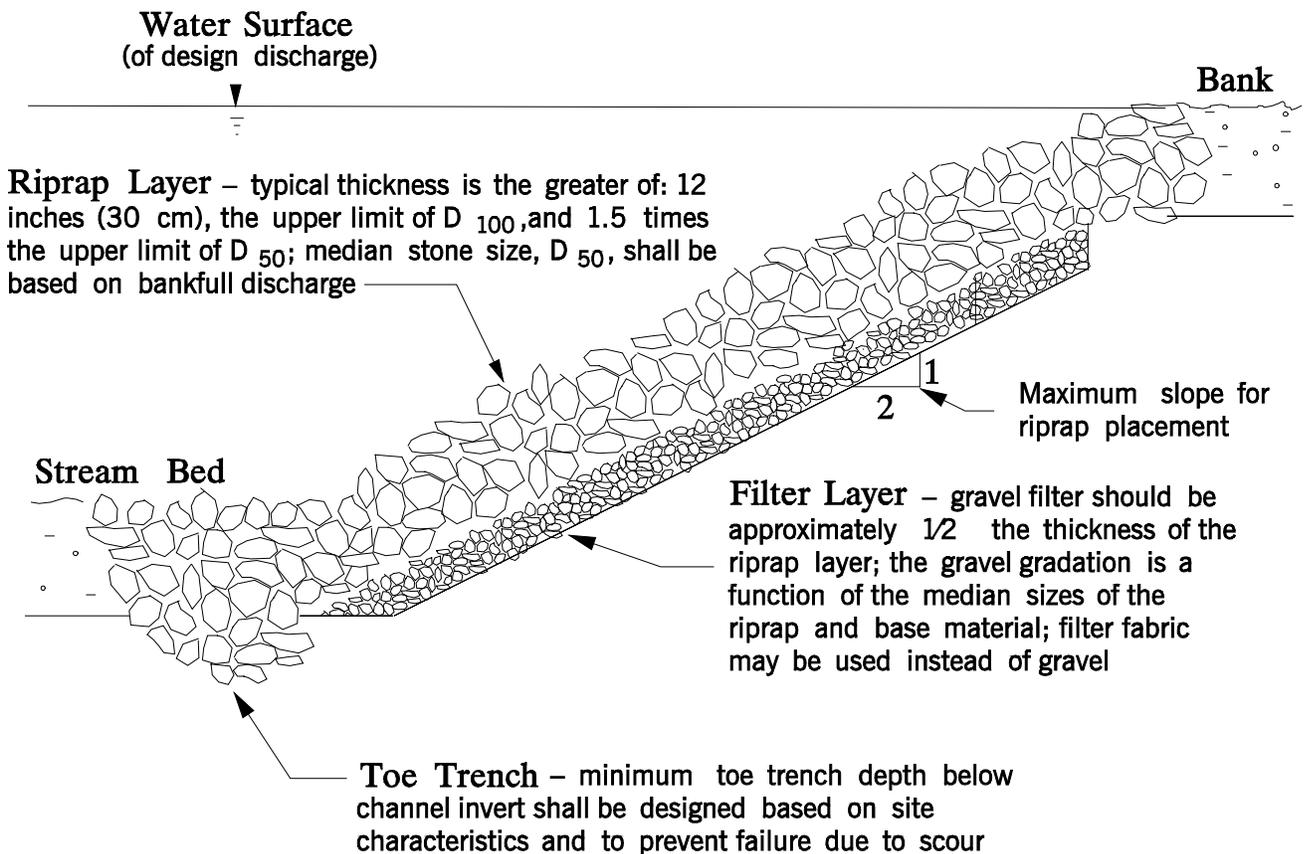
**FIGURE 2.1: RIPRAP DIAMETER AS A FUNCTION OF STREAM VELOCITY**  
**(BASED ON ISHBASH EQUATION)**



# Maryland's Guidelines To Waterway Construction

## DETAIL 2.1: RIPRAP

### SECTION VIEW



## **MGWC 2.2: IMBRICATED RIPRAP**

*Rigid engineering technique for bank stabilization*

### **DESCRIPTION**

Imbricated riprap is used to protect and stabilize embankment soils from the erosive forces of flowing water and piping forces resulting from groundwater seepage. A well-engineered imbricated riprap revetment should consist of the following:

- a filter layer of gravel or cloth designed to prevent soil movement into or through the riprap layer while allowing water to drain from the embankment, and
- a stone wall of appropriate size and positioning to resist the shearing forces of channelized water and the lateral earth pressures of the enveloped bank.

### **EFFECTIVE USES & LIMITATIONS**

When properly designed and installed, imbricated riprap revetments resist lateral earth pressures to some extent and can be an effective method of bank armoring where soil conditions, water turbulence and velocity, expected vegetative cover, and groundwater conditions are such that the soil may erode under the design flow conditions and threaten infrastructure or personal property.

Filter cloth should only be utilized when the bank material is a noncohesive material such as sand or gravel.

### **MATERIAL SPECIFICATIONS**

Materials for imbricated riprap construction and installation should meet the following requirements:

- *Filters:* Synthetic filter fabric may be used cautiously based on the *1994 MD Standards and Specifications for Soil Erosion and Sediment Control*. Whenever possible, however, granular filters with a minimum thickness of 6 inches (15 cm) should be used with a gradation as found in Table 2.2.

*Table 2.2: Granular Filter Material Grading Specifications*

<b>Percent Less Than</b>	<b>U.S. Standard Sieve Size</b>
100	2 1/2 in (64 mm)
85 - 100	1 in (25 mm)
60 - 100	1/2 in (13 mm)
35 - 70	No. 10
20 - 50	No. 40
3 - 20	No. 200

- *Toe Riprap:* The maximum diameter or weight of stone for toe riprap should be based upon the bankfull stream channel velocity as detailed in the [MGWC 2.1: Riprap](#) and Figure 2.1.
- *Imbricated Stones:* Imbricated riprap should be angular and blocky in shape such that they are stackable and should be sufficiently large to resist displacement by both the design storm event and the site-specific lateral earth stresses. Therefore, the length of the longest axis of each stone should be the greater of 1/3 the height of the proposed wall and the size necessary to resist the design stream flow according to [MGWC 2.1: Riprap](#). A typical minimum axis length is 24 inches (0.6 meters).

## **MGWC 2.2: IMBRICATED RIPRAP**

<p>Approximate Cost (\$1999): \$90 per linear ft</p>
--

### **INSTALLATION GUIDELINES**

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. The recommended construction procedure for imbricated riprap is as follows (refer to [Detail 2.2](#)):

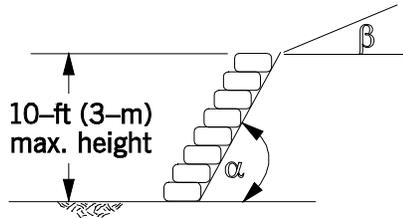
1. The stream should be diverted according to a WMA recommended procedure (see [Section 1, Temporary Instream Construction Measures, Maryland's Guidelines to Waterway Construction](#)), and the construction area should be dewatered.
2. All excavation should be made in reasonably close conformity with the existing stream slope and bed. The slope of the cut face should be in the range of 1H:6V to 2H:6V. Loose material at the toe of the embankment should be excavated until a stable foundation is reached, usually within 2 to 3 feet (0.6 to 0.9 meters) of the surface. The subgrade should be smooth, firm, and free from protruding objects or voids that would effect the proper positioning of the first layer of stones.
3. A graded granular filter or filter fabric should be placed on the face of the cut slope to prevent the migration of fine materials through the revetment. If filter fabric is used, it should be carefully and loosely placed on the prepared slope and secured. Adjacent strips should overlap a minimum of 8 inches (0.20 meters). If the filter fabric is torn or damaged, it should be repaired or replaced.
4. The rock layers should be neatly stacked with staggered joints so that each stone rests firmly on two stones in the tier below. Additionally, smaller stones should be used to fill voids so that each rock rests solidly on the previous rock layer with minimal opportunity for movement. Upon completion of the first layer of stone, the toe trench should be filled with Class III riprap sized according to [MGWC 2.1](#): Riprap or additional imbricated stone. Two footer stones should be used where high potential for channel incision exists. The height of the imbricated revetment is dictated by the size of the stone used, and the height should not exceed 3 times the length of the longest axis and should not be greater than 10 feet (3 meters).
5. Placement of the granular backfill should occur concurrently with the stone placement. The backfill slope angle should be 2H:1V or flatter but should be greater than 0 degrees to facilitate drainage. Once all of the backfill is in place, it should be covered with a filter layer and a layer of topsoil sufficient to support a native vegetative cover.
6. The disturbed sections of the channel, including the slopes and stream bed, should be stabilized with methods approved by the WMA.

*Note: The use of rock vanes ([MGWC 3.3: Rock Vanes](#)) should be considered to dissipate excessive toe velocities.*

# Maryland's Guidelines To Waterway Construction

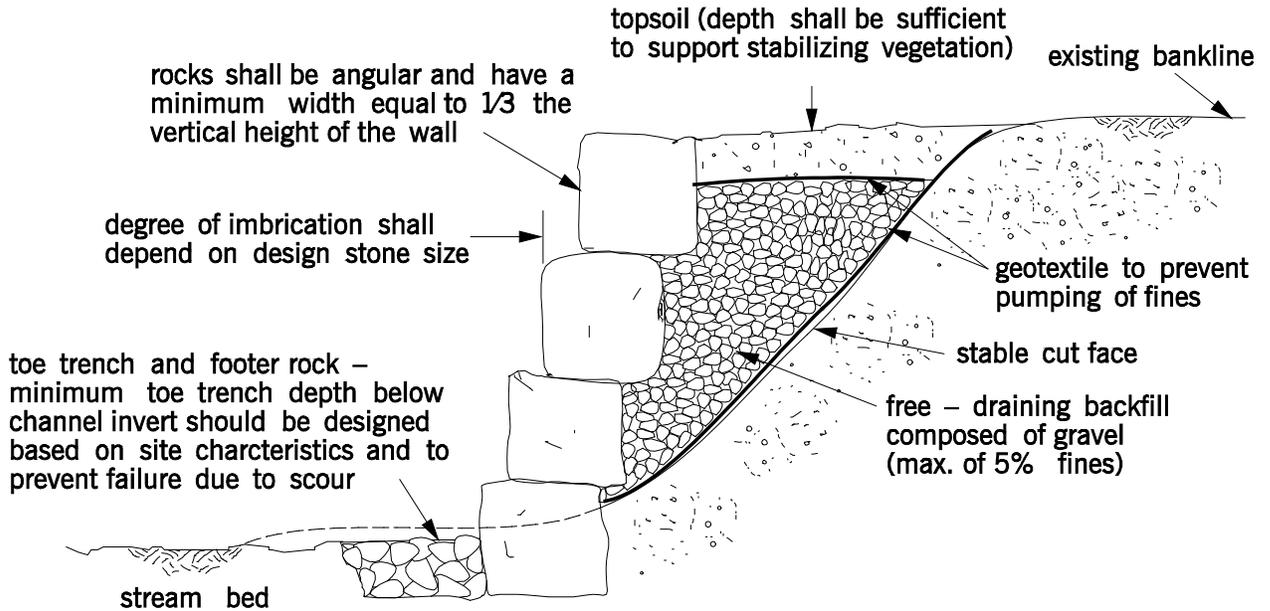
## DETAIL 2.2: IMBRICATED RIPRAP

### DEFINITION SKETCH



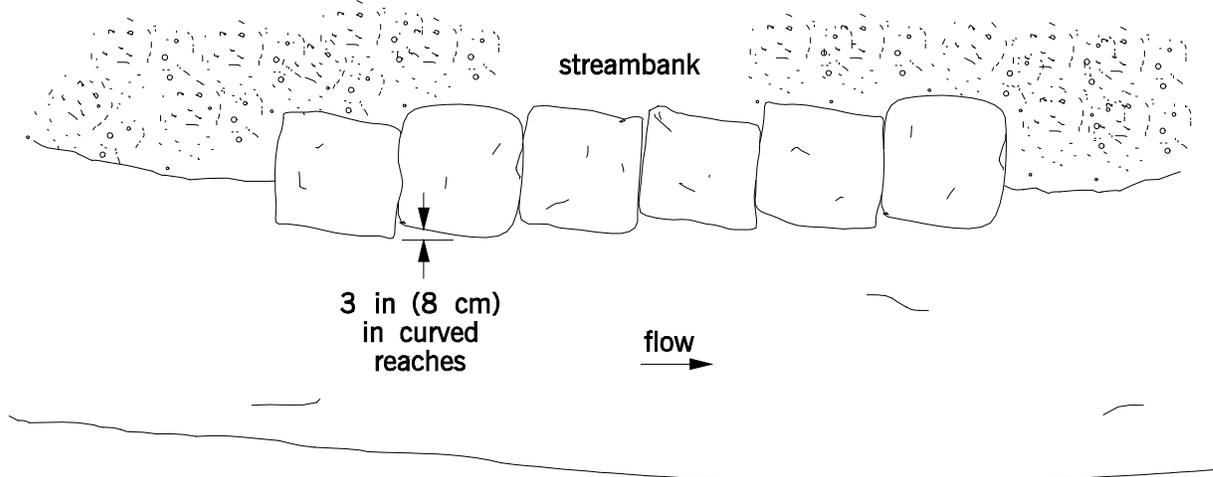
$\beta$  = backfill slope angle (2H:1V or flatter but greater than 0°)  
 $\alpha$  = inclination of wall from horizontal (1H:6V to 2H:6V)

### SECTION VIEW



### PLAN VIEW

**Construction Note:** stone blocks shall be rotated into the bank during placement such that the upstream blocks overlap the downstream blocks by a minimum of 3 inches (8 cm)



**M 3: CITY OF TAKOMA PARK TREE PRESERVATION MEASURES FOR TREE PROTECTION  
PLANS**

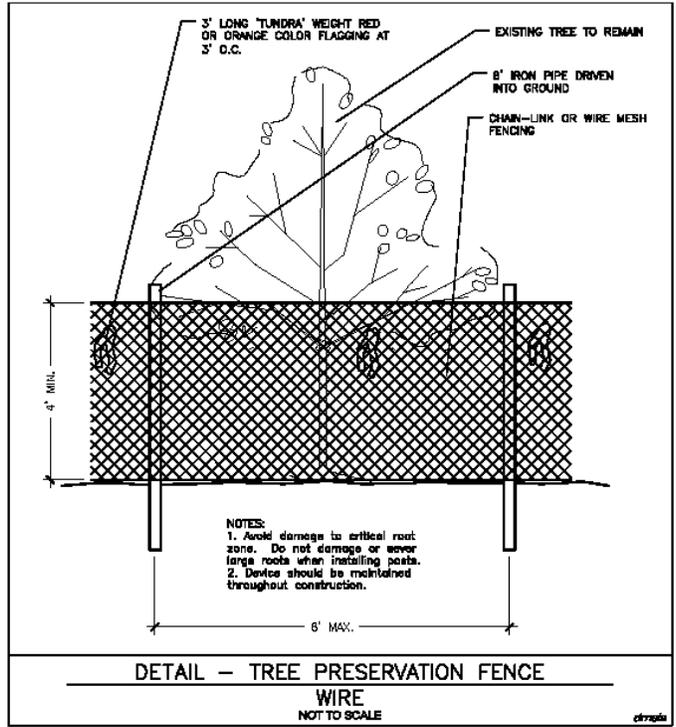
# City of Takoma Park Public Works Department



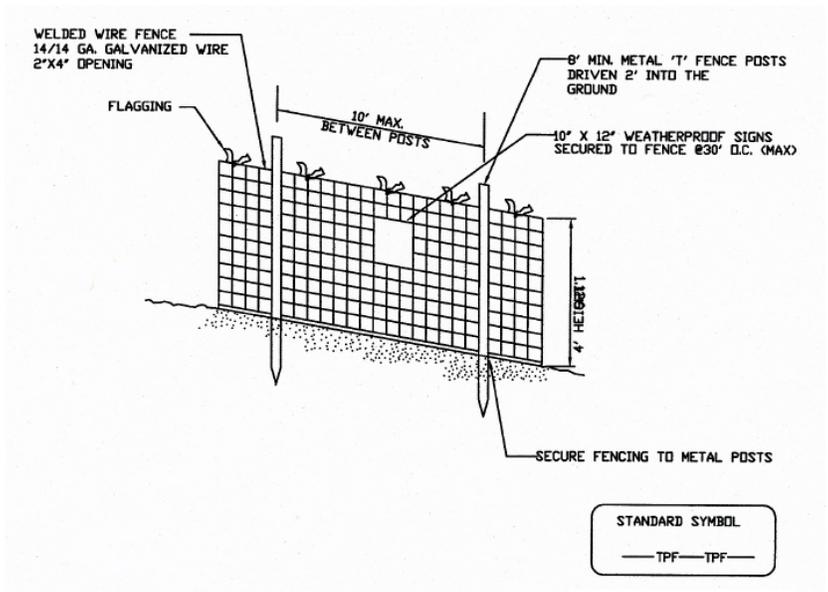
31 Oswego Avenue, Silver Spring, Maryland 20910  
Office: 301-891-7633 Fax: 301-585-2405  
[www.takomaparkmd.gov](http://www.takomaparkmd.gov)

## City of Takoma Park Tree Preservation Measures for Tree Protection Plans

1. City code section 12.12.50 requires that the location, diameter at breast height (DBH), and species of all existing trees equal to or greater than 7 5/8” inches DBH within the limits of disturbance (LOD) and within fifteen feet of the LOD be shown on a (landscape) plan for any project requiring a tree protection plan.
2. Is the tree/are the trees considered for preservation healthy? If the tree(s) are not healthy, more than likely, it is best to have the tree(s) removed and mitigated for: <https://s3.amazonaws.com/permits-and-licenses-takomapark/publicworks/tree-removal-application.pdf> In some cases the City may require that a level III tree risk assessment be done by a Licensed Tree Expert or Licensed Arborist.
3. City code section 12.12.050 requires that the following tree preservation measures (as applicable) be shown on the plans for trees that will be preserved:
  - a. **Tree preservation fencing:**
    1. Depending on the project, either chain link fence with 8’ metal pipe or welded wire fence with 8’ metal ‘T’ fence posts will be required. In some cases orange blaze fencing with 8’ metal ‘T’ fence posts may be used.
    2. If possible combine practice with sediment control fencing
    3. Location and type of fencing (include a detail) shall be shown on the plan
    4. At the on-site pre-con meeting with City staff exact location of fencing will be determined based on the approved plans
    5. Fencing shall be maintained throughout construction



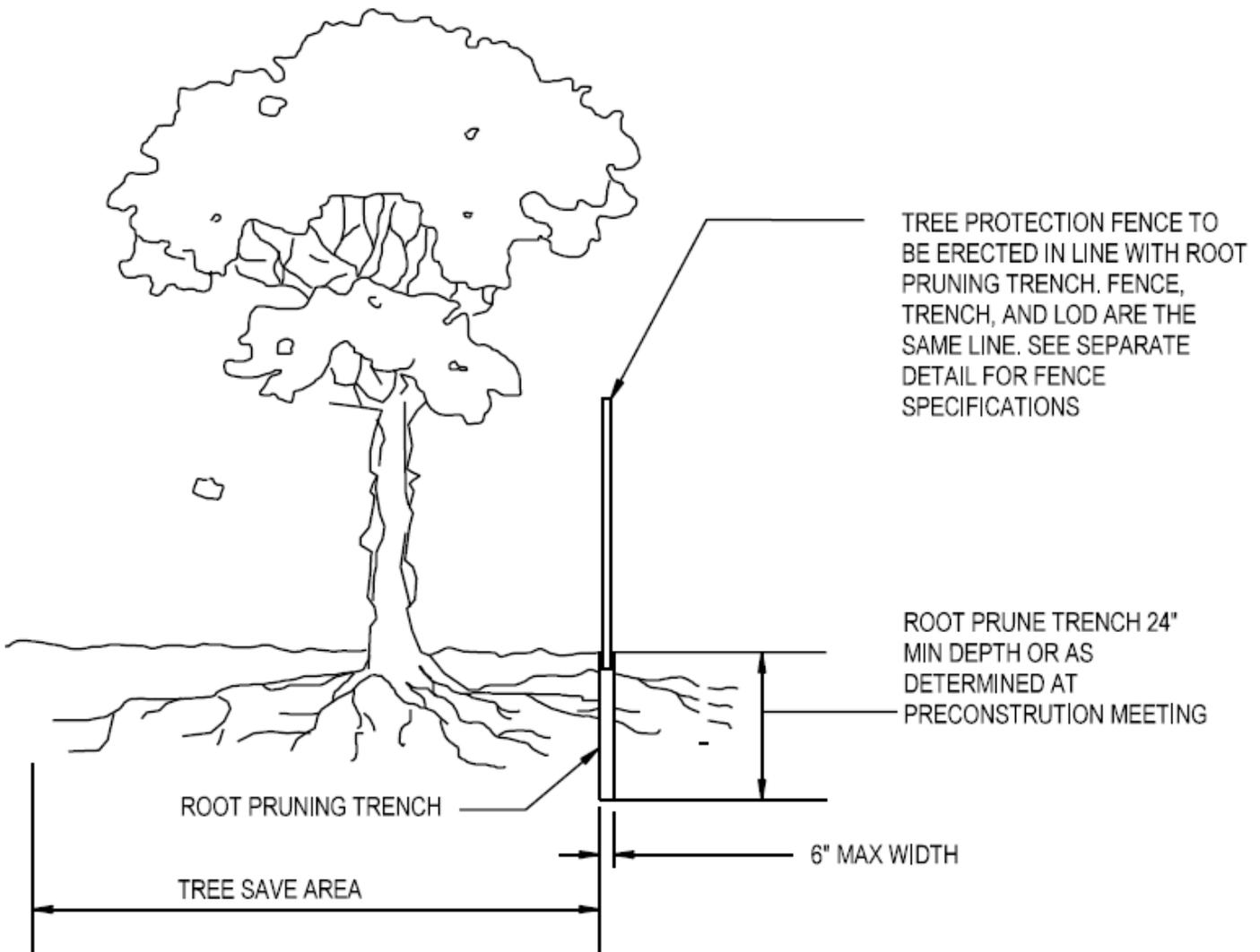
Source: Deborah M. Schwab Landscape Architecture



Source: Montgomery County Planning Department

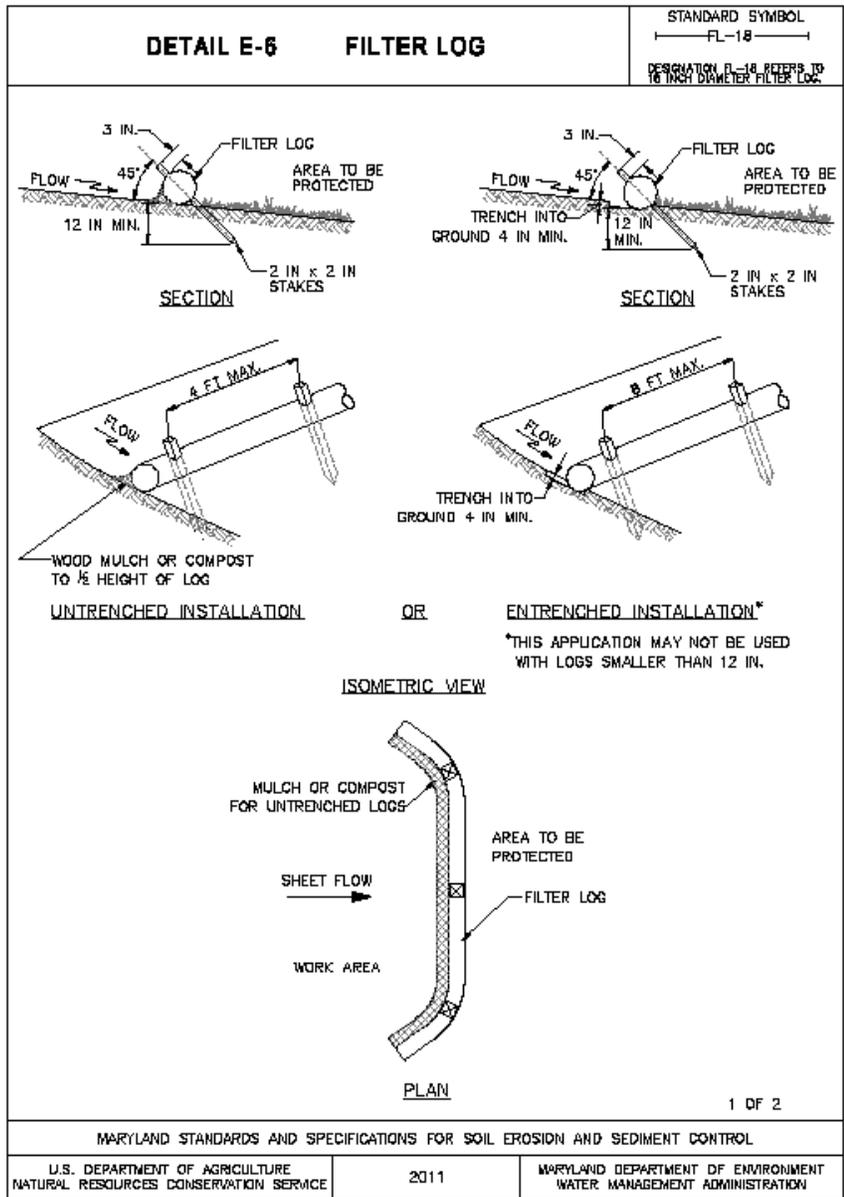
**b. Root pruning**

1. Root pruning will need to be done by a Licensed Tree Expert or Licensed Arborist
2. If possible install tree preservation and sediment and erosion control fencing in the root prune trench
3. Location of root pruning shall be shown on the plan
4. At the on-site pre-construction meeting with City staff exact location of root pruning will be determined based on the approved plans



**c. Filter log**

1. Filter log may be used in certain situations instead of sediment and erosion control fencing to protect tree roots
2. Use the untrenched installation option for filter log
3. When more than one log is needed, overlap ends 12” minimum and stake
4. Tree preservation fence will need to be installed next to filter log
5. Location of filter log (include a detail) and tree preservation fence shall be shown on the plan
6. At the on-site pre-construction meeting with City staff exact location of filter log will be determined based on the approved plans
7. Filter log and tree protection fencing shall be maintained throughout construction



#### **d. Air spading to facilitate construction near trees**

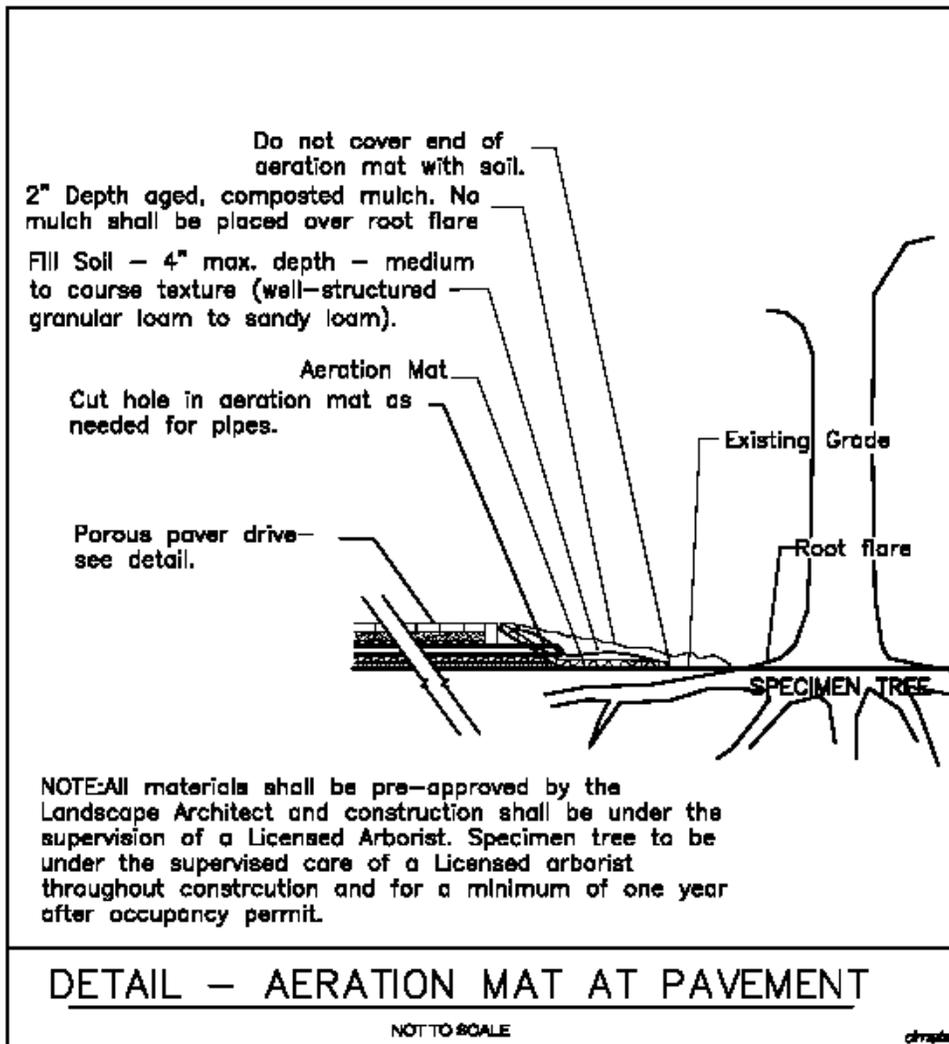
1. Air spading will need to be done by a Licensed Tree Expert or Licensed Arborist
2. Air spading allows excavation of soil around a tree's roots with limited to no damage. High pressure air exposes the root architecture and this enables a variety of activities:
  - Determining whether or not construction, such as a foundation, in an area with tree roots is possible
  - Installation of sidewalks, walkways, driveways, etc. near tree roots
  - Installation of utility lines through tree roots
  - Removing compacted soil and replacing it with well-structured soil
  - Less invasive root pruning can be done

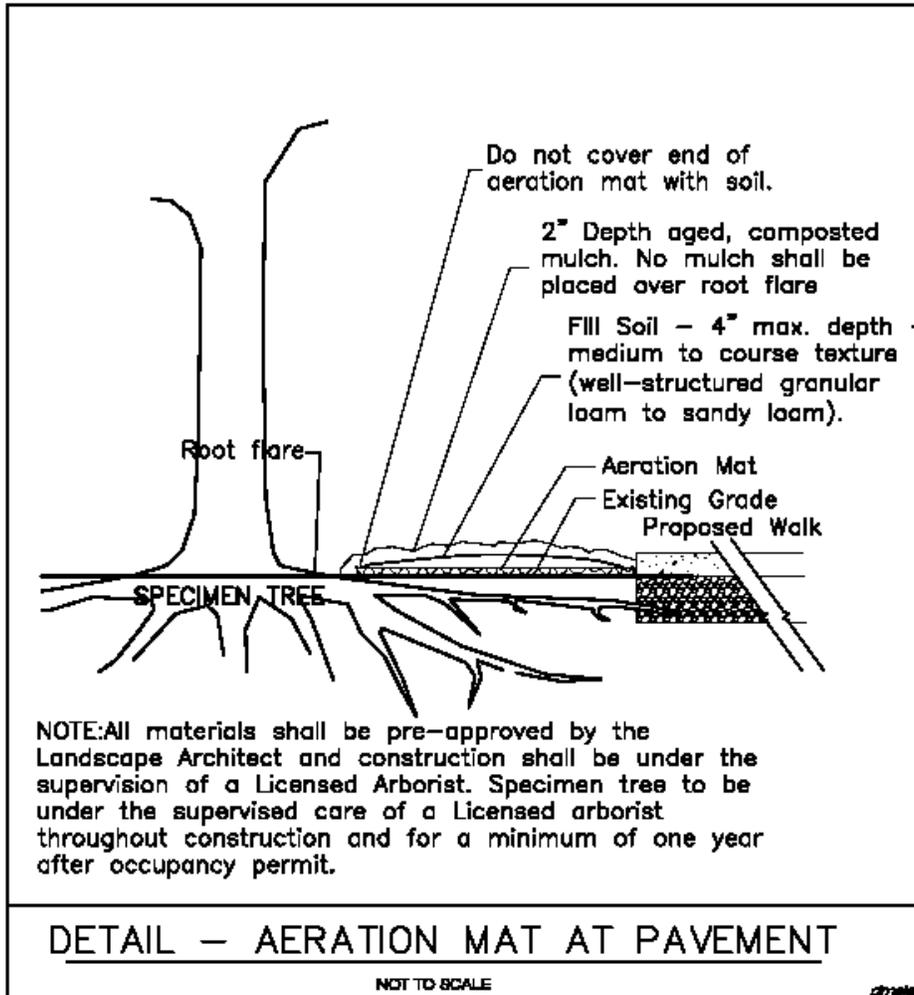


**e. Wood chips with plywood or root protection matting**

**f. Aeration matting**

1. Location of aeration matting (include a detail) shall be shown on the plan
2. At the on-site pre-construction meeting with City staff exact location of aeration matting will be determined based on the approved plans

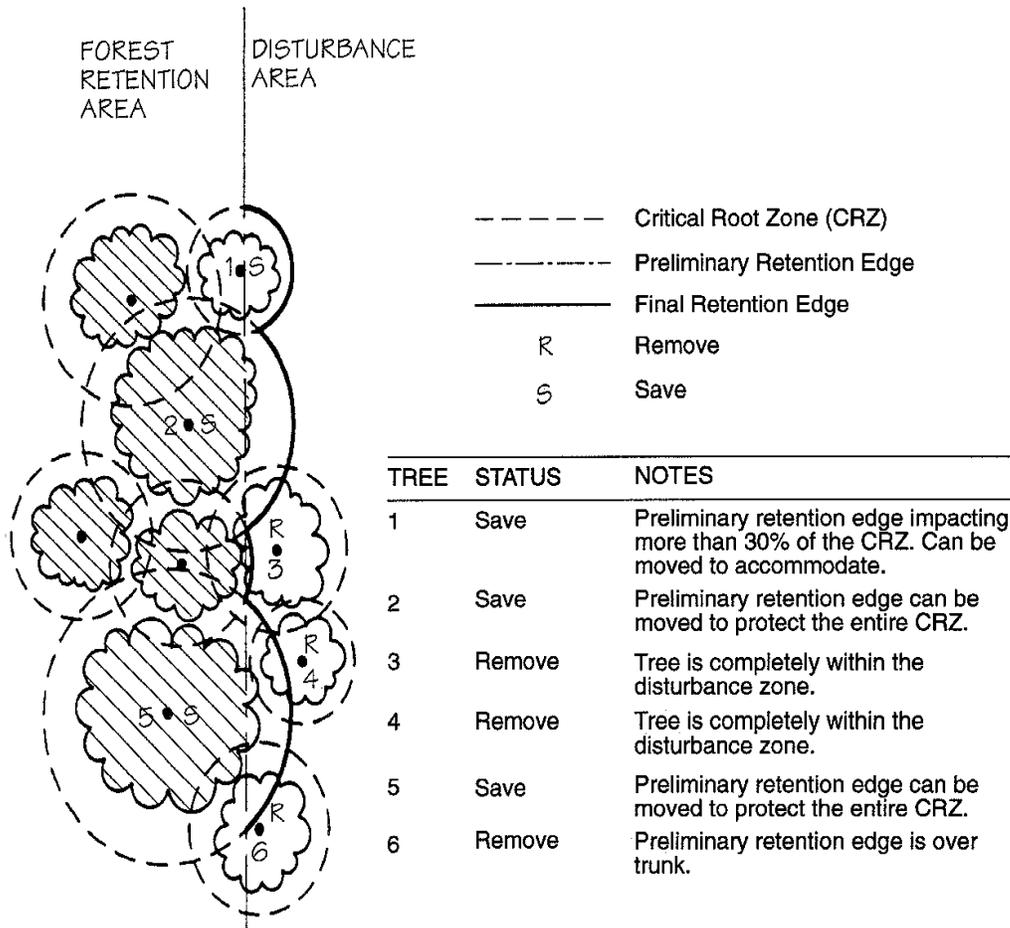




Source: Deborah M. Schwab Landscape Architecture

**g. Trees on the edge of a forested area**

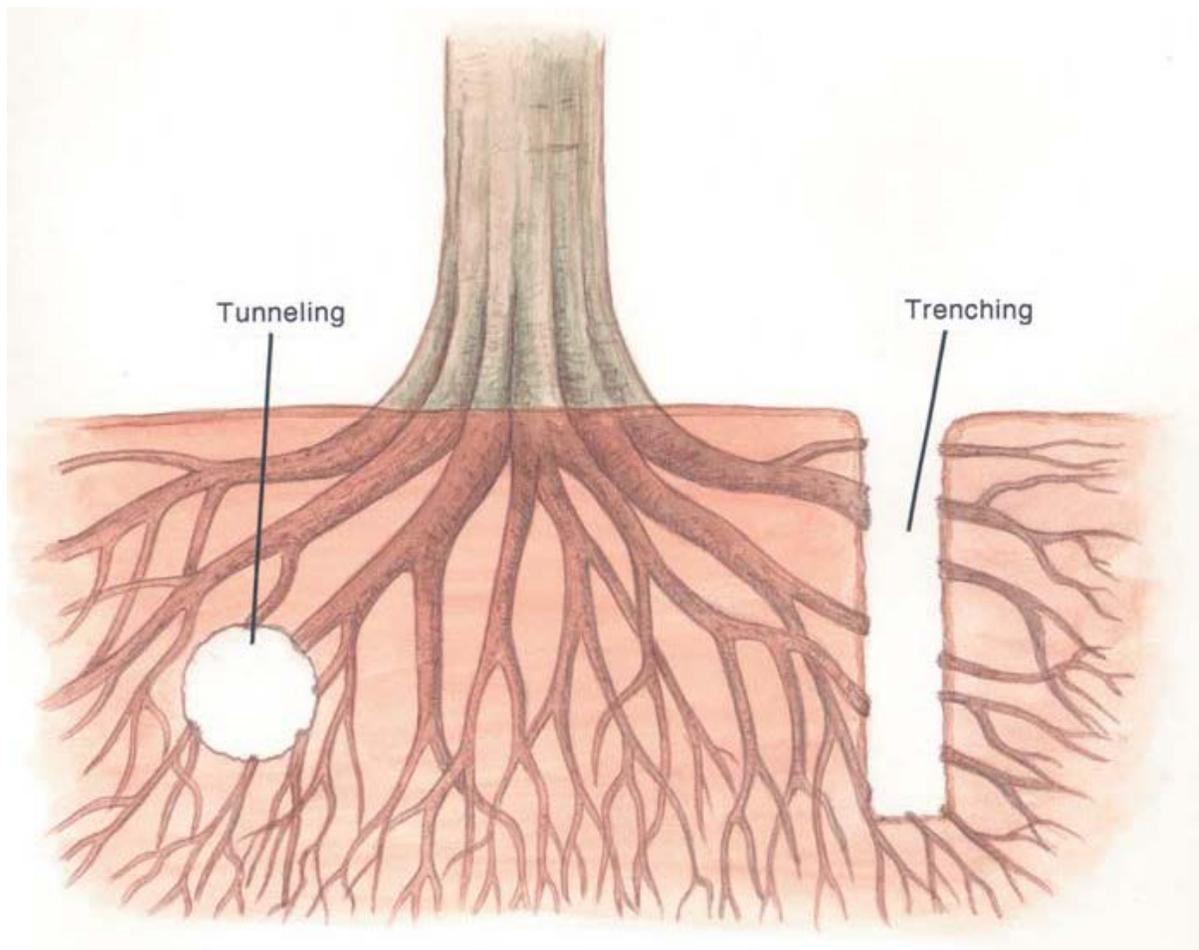
1. On the tree preservation plan show the location, species, size, and condition of trees inside the LOD and within 15' of the LOD and all the required tree preservation measures.
2. LOD will need to be staked prior to the pre-construction meeting.
3. City staff and project staff will walk the LOD at the pre-construction meeting to determine which trees close to the LOD will be saved or removed.



Staking Retention Edges in the field requires tree-by-tree decisions. The above example demonstrates the use of Critical Root Zone, but tree health and tree species must also be considered when laying out a final retention line.

**h. Tree roots and utilities**

1. Underground utilities installed via a tunneling system cause less root damage than convention trenching operations
2. If a tunneling system is used, use it as far away from the tree trunk as possible
3. Location of tunneling shall be shown on the plan



Source: US Forest Service Urban Tree Risk Management Manual