

# Part 2

## Right-of-Way Design and Construction Standards Manual



**BETTER STREETS**  
CITY OF RICHMOND

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## CHAPTER 1

# INTRODUCTION & GENERAL POLICIES

The complete streets policy provides guidance for the design of Richmond's Streets. Once the vision for the street is determined, the design is then applied to the standards set for the city streets. The Roadway Geometric Design Manual establishes those standards.

The following chapters provide specific design standards as well as references to other applicable documents and publications. Any deviations or waivers to these standards will require the approval of the Department of Public Works.

The Better Streets Manual must be followed first. Once the elements of the streets and intersections have been determined, the designer can then turn to this Roadway Geometric Design Manual for the standards and details to create the construction documents for the improvements.





## GENERAL POLICIES

### 1.1 Applicable Standards

The provisions of this manual shall apply to all street design and construction in the City. Where no specific roadway construction, design standard, or specification is set forth in this manual, the provisions of the Virginia Department of Transportation (VDOT) ***Road and Bridge Standards, Road Design Manual, Subdivision Street Requirements, Minimum Standards for Entrances to State Highways and the Virginia Supplement to the Manual of Uniform Traffic Control*** Devices shall be applied.

The City of Richmond has been designated as an urban area by VDOT Subdivision Standards. All streets shall be designed as set forth in this manual or by VDOT requirements, whichever is more stringent.

All companies, entities, and persons working for the City of Richmond or in the City's right-of-ways shall be responsible for the knowledge of and compliance with all codes and regulations to include, but not limited to, those codes and regulations provided by the Department of Professional and Occupational Regulations and through the Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers, and Landscape Architects.

### 1.2 Functional Classifications of Streets

Functional classification is the process by which streets and highways are grouped together into systems according to the character of service they are providing or are intended to provide. The function of a road is determined by the volume of traffic, length of vehicle trips using the road and whether the road provides service primarily for vehicular movement or access to abutting land uses. Normally arterial roadways will carry significantly higher traffic volumes and a variety of traffic types at greater speeds than on collector roads. Similarly collector roads will carry higher traffic volumes at higher speeds than local streets. All roadways within the City are classified as to their function including other factors such as land use and pedestrian connectivity. The Department of Public Works utilizes the functional classification of a road along with existing and projected traffic volumes to determine the design features and requirements of the road. The functional classification of existing city streets can be obtained by contacting the City Traffic Engineer.

Street design shall be based on the street typologies listed in Part I, traffic generation, existing and projected future traffic, adequate levels of service, and the Transportation Element of the City's Comprehensive Plan. The following types of systems shall be utilized as guidelines to describe functional classifications within a street network:

**1.2.1 Principal Arterial Roadways:** These streets are designed to convey major movements of traffic within or through the City. On the principal arterial system, service

to the abutting land is subordinate to the provision of travel service to major traffic movements. Access to the abutting land is minimized and is consolidated into service roads, shared entrances and appropriate designated intersections. Generally, average daily traffic (ADT) volumes exceed ten thousand (10,000) vehicles per day (vpd). Principal arterials should also include a sidewalk/bicycle trail for non-motorized traffic and may carry local bus routes.

**1.2.2 Minor Arterial Roadways:** These streets are designed for traffic circulation between neighborhood boundaries. They generally do not penetrate identifiable neighborhoods. Access to neighboring development is achieved by good design and the appropriate intersection spacing established in this section. Generally, traffic volumes exceed six thousand (6,000) vehicles per day (vpd). These facilities may also carry local bus routes. Additional criteria may be required by the Department of Public Works Director or his designee.

**1.2.3 Major Collector Streets:** Major collector streets have the primary function to provide linkages between neighborhoods and to collect traffic, carrying it to the arterial system. They may also penetrate neighborhoods, distributing trips to their ultimate destinations. Generally, traffic volumes can exceed three thousand (3,000) vehicles per day (vpd). These facilities may also carry local bus routes.

**1.2.4 Minor Collector Streets:** A minor collector street is designed primarily to serve the collection function for a group of local streets. Additionally, its purpose is to provide direct access to individual parcels or developments. It is designed to serve internal traffic movements within an area or neighborhood of the City, and to connect those areas with the arterial system. It is not meant to handle long through trips. Generally, traffic volumes can exceed one thousand (1,000) vehicles per day (vpd).

**1.2.5 Local Streets:** A local street represents the lowest category of the functional classification system. Its traffic is local in nature and its sole function is to provide direct access to individual parcels or developments. Generally, traffic volumes should not exceed one thousand (1,000) vehicles per day (vpd).

**1.2.6 Alleys:** Alleys provide access to the side or rear of individual land parcels. They are characterized by a narrow right of way width typically ranging from 16' to 20' in residential areas and up to 30' in industrial areas. Alleys should have grades established to meet as closely as possible the existing grades of the abutting land parcels. The longitudinal grade should not be less than 0.5 percent. Alley cross sections may be V-shaped with traverse slopes of 2.0 percent minimum and 4.0 percent maximum toward the centerline. Runoff is thereby directed to a catch basin in the alley or to connecting street gutters. Proposed alleys shall conform to the detail provided in this section unless approved by the Director of Public Works.

## 1.3 Typical Sections

For guidance, see Part I. Additional details can be found in Geometric Design Standards tables from VDOT's ***Road Design Manual***.

The City will consider alternative road sections provided that they are consistent with the Better Streets policy, the City's ***Urban Design Guidelines*** and/or the Institute of Transportation Engineers ***Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities***.

#### 1.4 Department of Public Works Design Waivers & Exceptions

The Director of Public Works, or his designee, may utilize discretionary authority, as it relates to the provisions of this manual, in the application of geometric standards relative to the alignment and grade of roads and streets. Such judgments will take into consideration the individual situation, but in no instance will safety features or structural integrity prescribed by the standards be sacrificed. In addition, design waivers and exceptions will be subject to Department of Public Works review and approval.

#### 1.5 Department of Public Utilities Design Waivers & Exceptions

The Director of Public Utilities, or his designee, may utilize discretionary authority, as it relates to the provisions of this manual and others. Such judgments will take into consideration the individual situation, but in no instance will safety features or structural integrity prescribed by the standards be sacrificed. In addition, design waivers and exceptions will be subject to Department of Public Utilities review and approval.

#### 1.6 Listing of Documents (Publications) Incorporated by Reference

Unless otherwise noted in this manual, design criteria for all roadways constructed within the City of Richmond shall conform to the latest edition of applicable provisions of the following documents.

**A. Road and Bridge Specifications**

VDOT Construction Division  
State Construction Engineer  
1401 E. Broad Street  
Richmond, Virginia 23219

**B. Road and Bridge Standards**

VDOT Location and Design Division  
Location and Design Engineer  
1401 E. Broad Street  
Richmond, Virginia 23219

**C. Road Design Manual**

VDOT Location and Design Division

- Location and Design Engineer  
1401 E. Broad Street  
Richmond, Virginia 23219
- D. VDOT Drainage Manual**  
VDOT Location and Design Division  
Location and Design Engineer  
1401 E. Broad Street  
Richmond, Virginia 23219
- E. VDOT Erosion and Sediment Control and Stormwater Management Program Specifications Manual**  
VDOT Location and Design Division  
Location and Design Engineer  
1401 E. Broad Street  
Richmond, Virginia 23219
- F. Pavement Design Guide for Subdivision and Secondary Roads in Virginia**  
VDOT Materials Division  
State Materials Engineer  
1401 E. Broad Street  
Richmond, Virginia 23219
- G. A Policy on Geometric Design of Highways and Streets**  
American Association of State Highway and Transportation Officials  
North Capital Street, Suite 225  
Washington, DC 20001
- H. Guide for Development of Bicycle Facilities**  
American Association of State Highway and Transportation Officials  
North Capital Street, Suite 225  
Washington, DC 20001
- I. Standard Specifications for Highway Bridges**  
American Association of State Highway and Transportation Officials  
North Capital Street, Suite 225  
Washington, DC 20001
- J. Virginia Erosion and Sediment Control Handbook**  
Division of Soil and Water Conservation  
Governor Street, Suite 206  
Richmond, Virginia 23219
- K. Manual on Uniform Traffic Control Devices (MUTCD)**  
U.S. Department of Transportation

- Federal Highway Administration  
<http://mutcd.fhwa.dot.gov/>
- L. Railroad-Highway Grade Crossing Handbook**  
U.S. Department of Transportation  
Federal Highway Administration  
[www.fhwa.dot.gov/tfhrc/safety/pubs/86215/intro.htm](http://www.fhwa.dot.gov/tfhrc/safety/pubs/86215/intro.htm)
- M. Virginia Supplement to the MUTCD**  
VDOT Traffic Engineering Division  
1401 E. Broad Street  
Richmond, Virginia 23219
- N. Virginia Work Area Protection Manual**  
VDOT Traffic Engineering Division  
1401 E. Broad Street  
Richmond, Virginia 23219
- O. Traffic Calming Guide for Local Residential Streets**  
VDOT Traffic Engineering Division  
1401 E. Broad Street  
Richmond, Virginia 23219
- P. Subdivision Street Requirements**  
VDOT Asset Management Division  
1401 E. Broad Street  
Richmond, Virginia 23219
- Q. Minimum Standards of Entrances to State Highways**  
VDOT Asset Management Division  
1401 E. Broad Street  
Richmond, Virginia 23219
- R. AASHTO Roadside Design Guide**  
American Association of State Highway and Transportation Officials  
North Capital Street, Suite 225  
Washington, DC 20001
- S. Roundabouts: An Informational Guide**  
U.S. Department of Transportation  
Federal Highway Administration  
(Publication No. FHWA-RD-00-67)
- T. Kansas Roundabout Guide: A Supplement to FHWA's Roundabouts: An Informational Guide**



Kansas Department of Transportation  
Dwight D. Eisenhower State Office Building  
700 SW Harrison Street  
Topeka, Kansas 66603-3754

**U. Roundabout Design Standards**

City of Colorado Springs – Transportation Engineering  
PO Box 1575, MC 450  
Colorado Springs, CO 80901

**V. Department of Professional and Occupational Regulation**

3600 West Broad Street  
Richmond, Virginia 23230-4917  
[www.dpor.virginia.gov/dporweb/ape\\_main.cfm](http://www.dpor.virginia.gov/dporweb/ape_main.cfm)

Many of these documents are available from the VDOT division indicated. Most of these are also available over the Internet at [www.virginiadot.org/business/manuals-default.asp](http://www.virginiadot.org/business/manuals-default.asp).

## CHAPTER 2

# STREET DESIGN IN GENERAL



## STREET DESIGN IN GENERAL

### 2.1 Street Layout

Unless proffered otherwise during a land use approval, or unless the Director of Public Works determines that traffic in adjoining developments will be increased in a manner threatening the safety of existing residents, the arrangement of major streets in a development shall provide for their proper continuation with developed adjoining properties, and for their proper extension into undeveloped adjoining properties. The proper connecting arrangement shall be accomplished by the use of stub streets and temporary cul-de-sacs, etc. which is intended to provide and maintain access for basic public services, to allow movement of vehicular, bicycle, and pedestrian traffic, and to provide a corridor for public utilities.

- Inter-parcel connecting streets shall be designed in consideration of the anticipated future traffic from undeveloped adjacent tracts based on the land use classifications of the Transportation Element of the City's Master Plan.
- The Transportation Element of the City's Master Plan indicates the necessity for major collector or arterial streets. The design and provision for the continuation of these streets shall be addressed in the design of all developments.
- The street network proposed by a development shall be designed to provide an orderly traffic progression from local streets, to collector streets, to arterial streets.
- New residential local streets shall implement approved and necessary traffic calming measures so as to prevent cut through movements of vehicles from arterial streets while still promoting connectivity throughout the transportation network.

### 2.2 Street Access

- When the traffic generated from an entire development is projected to exceed two thousand-one hundred fifty (2,150) vehicles per day (vpd), the development shall access an existing street in two locations. If approved by the Director of Public Works, one of the required connections may be made to a street constructed to City or VDOT standards to be included in the City street system.
- In situations where two access points in accordance with the above cannot be physically made (due to restrictions in topography or sight distance, or due to limitations in street frontage), a single connection may be allowed with the approval by the Planning Commission after receiving the recommendations of

the Director of Public Works, the Director of Community Development, the Chief of Police and the Chief of Fire and Emergency Services.

- All single-family detached dwelling unit sites, unless otherwise specified in the Zoning Ordinance, shall have frontage on existing city maintained public streets or streets approved with financial surety in place to guarantee the construction to a standard acceptable for addition to the City street system. The amount of frontage shall be established in accordance with the regulations for the zoning district as provisioned in the Zoning Ordinance.
- Commercial, institutional, and industrial lots may be approved for recording without public street frontage, provided that lots have an access easement which meets the approval of the Director of Public Works. To assure maintenance of the access easement, an association of owners must be established prior to the approval of any plats or plans. Improvements within the access easement must be sufficient to accommodate the type and volume of traffic anticipated and constructed to the standards satisfactory to the Director of Public Works.
- Townhouse, multifamily, mobile home, commercial, and industrial development shall have access to a City-maintained street. This access may be via private streets or travel ways, provided they meet the appropriate design standards in this manual. An association must be established for the ownership and perpetual maintenance of private streets in a development. Private streets serving residential development shall not carry in excess of one thousand (1,000) vehicles per day (vpd).
- Streets in townhouse and multifamily development, where the design traffic count exceeds one thousand (1,000) vpd shall be designed and constructed in accordance with the details in this manual. These local streets do not provide on-street parking and are to be utilized only in developments where there is off-street parking in separate parking bays as required by underlying zoning for the parcel and no individual unit fronts directly on the street. These streets are acceptable for inclusion in the City street system.
- In a mobile home development, streets with projected vehicle count in excess of four hundred and twenty (420) vehicles per day (vpd) shall be designed and constructed to a standard acceptable for incorporation into the City street system.
- Private streets shall be designed, constructed and platted such that all lot owners are assured perpetual right of access to a state-maintained street. Single family lots approved for suburban cluster standards may be platted with frontage and access consisting of a pipe-stem driveway. In such cases, the development shall

conform to the requirements for pipe-stem driveways in accordance with this manual.

- In commercial, institutional and industrial lots or developments, inter-parcel travel ways or private streets shall be required to provide inter access for the movement of vehicles. An easement shall be provided for the inter-parcel access. The recorded plat shall note the inter-parcel access as "privately owned and privately maintained by the lot owner(s)".
- All street access standards shall be in accordance with and not conflict with zoning ordinances or subdivision ordinances.

## 2.3 Survey Controls

A site survey includes control, boundary, and physical data surveys. Control surveys use permanent monuments and benchmarks to establish horizontal and vertical positions on which other surveys are based.

### 2.3.1 Aerial Mapping

Aerial photographs were last taken of the entire city in 2007. Before this, the City had aerial photographs from 2002 and 1980.

### 2.3.2 Horizontal Control

Richmond has a baseline system in place in the City as it existed before the 1970 annexation. It has approximately 50 points that are referenced to the State plane coordinate system (NAD-83). The baseline system was started in 1910 and expanded to annexed areas. New land development projects are required to relate their data directly to the State coordinate system.

Almost all block corners are marked with concrete or granite stone monuments. There may be a few corners that are still marked with iron rods or copper pins.

### 2.3.3 Vertical Control

There are over 700 benchmarks throughout the city that are described in the City's benchmark reference manual. These are tied to the City datum. See Table 2-1 for a partial list of City of Richmond benchmark elevations and descriptions.



Table 2-1

## Richmond Benchmarks

B.M.	Elevation	Description
1	19.87	S. Side Albany Ave., 5' West of 4 <sup>th</sup> St. N 52000, E 62000
2	38.19	9' E/W/L 9 <sup>th</sup> St. Rd., 21' S/S/L Dinwiddie Ave.
3	80.26	12.5' West of 17 <sup>th</sup> St., 6.6' N/S/L Dinwiddie Ave.
4	92.76	E. Side 21 <sup>st</sup> St., 5' North of Ingram Ave.
5	N/A	N/A
6	99.69	E. Side Jeff. Davis Hwy., 5' North of Edwards Ave.
7	143.32	In Sidewalk S. Side Hull St., 77.5' East of Clopton St.
8	171.36	S. Side Lawson St., 5' East of 30 <sup>th</sup> St.
9	136.64	1914 C.L. Stone, 50' South of Maury St. near N/W Cor. Cem.
10	173.68	1914 C.L. Stone, 150' S. Broad Rock Rd. about 25' W. of 32nd
11	191.04	W. Side 37 <sup>th</sup> St., 65' North of Lawson St.
12	192.44	S. Side Midlothian Tpke., 25' West of 33 <sup>rd</sup> St.
13	199.74	6.2 S/N/L Midlothian Tpke., on W/L Roanoke St.
14	141.56	S. Side Perry St., 5' East of 27 <sup>th</sup> St.
15	138.22	E. Side of 28 <sup>th</sup> St., 7' North of New Kent Ave.
16	153.43	N. Side New Kent Ave., on E/L of 32 <sup>nd</sup> St.
17	157.11	N. Side Semmes Ave., 5' West of 30 <sup>th</sup> St.
18	171.39	E. Side Dundee Ave., 20' South of Forest Hill Ave.
19	191.96	5' S/N/L Forest Hill Ave., 5' E/E/L 41 <sup>st</sup> St.
20	201.79	16.4' North of S/E Cor. 45 <sup>th</sup> & Forest Hill Ave. on E/L 45 <sup>th</sup> .

Table 2-1

## Richmond Benchmarks

B.M.	Elevation	Description
21	216.69	1' East of C/L of Cedar La. 2.3' N/N/Curb of New Kent Road.
22	198.32	1914 C.L. Stone, E/L of Chamberlayne Ave., 200' North of Westminster Ave.
23	196.81	28' E/E/L Brook Rd., 11' N/S/L Westminster Ave.
24	140.94	Rear sharp curve of Pump House Dr., approx. 1300' East of Pump House, 80' North & 80' West of Driveway.
25	221.81	3' W/W/L Cameron St., 7' S/N/L Ellwood Ave.
699	195.777	At the centerline of Rebecca Rd. projected, 22' west of the centerline of Patsy Ann Dr., 35' north of VEPCO pole no. HE86, 54' southeast of the northeast corner of a one-story brick house no. 3648 Patsy Ann Dr., 51.9' northeast of the southeast corner of the same house.
700	179.839	31.5' north of the centerline of Birdwood Rd., 29' east of the centerline of Bathgate Rd., 76.2' southwest of the northwest corner of a brick house no. 3748 Birdwood Rd., 57' southwest of the southwest corner of the same house, 31.5' west of a fire hydrant north of Birdwood Rd.
701	159.852	At the centerline of Bemiss Rd. projected, 16.5' south of the centerline of Bemiss Court, 72.5' southeast of a fire hydrant west of Bemiss Rd., 41.6' southwest of the east end of 1' metal culvert.
702	216.427	At the centerline of Stacie Rd. projected, 81' north of the centerline of Kendall Rd., 43.5' southwest of the southeast corner of a frame house no. 5604 Kendall Rd., 55.5' southeast of the southwest corner of the same house, 38' west of a fire hydrant north of Kendall Rd.
703	207.871	16.5' southwest of the centerline of Snead Rd., 23' northeast of the centerline of Huth Rd., 55' northwest of the northwest corner of a frame house no. 5747 Snead Rd., 5.5' east of VEPCO pole no. 8143A, 29.5' southeast of a sewer manhole.
704	213.422	17.5' north of the centerline of Snead Rd., 21' west of the centerline

Table 2-1

## Richmond Benchmarks

B.M.	Elevation	Description
		of Paul Ln., 43.5' south of VEPCO pole no. EM79, 59' southeast of the southeast corner of a two-story frame house no. 5300 Snead Rd., 81.5' southeast of the southwest corner of the same house.
705	204.176	25' northwest of the centerline of Brinkwood Dr., 26' northeast of the centerline of Brinkwood Court, 70' southwest of the southwest corner of a brick house no. 5400 Brinkwood Court, 77' south of the northwest corner of the same house.
706	202.946	25' west of the centerline of Hey Rd., 38' northeast of the east end of the curb at the centerline of Fawnbrook Blvd., 35' southwest of a telephone pole no. 8150E, 24.5' southwest of a sewer manhole.
707	180.528	24' northwest of the centerline of Shadybrook Ln., 23' northeast of the centerline of Kirby Dr., 60.5' south of the southwest corner of a brick house no. 2247 Kirby Dr., 73.4' southwest of the southeast corner of the same house, 54.3' northwest of VEPCO pole no. SN33.
708	205.745	23' northeast of the centerline of Heywood Rd., 27' northwest of the centerline of Clearfield St., 40' southwest of the southeast corner of a brick house no. 5600 Heywood Rd., 64' southeast of the southwest corner of the same house, 34' north of a sewer manhole.

### 2.3.4 Establishing a Site Survey

#### A. Research

- Baseline books (original and final) are available for all of the streets in the area to be surveyed and are indexed in green books that are one foot long, seven inches wide and three inches thick. The baseline books are located in the file cabinets beside the line and grade notes. Some books if not in file, can be found at the field office, in survey vehicles, or at some staff's workstations on the sixth floor. (*Note: Baseline Book 272 was lost in 1998*).
- Loose leaf notes for all of the streets in the area to be surveyed, i.e. notes created to reestablished baselines, reference notes to stones and to baseline point of intersections (P.I.'s), etc.

- Line and grade notes – reference to stones, etc.
- Plans – widening, closings, etc.
- Baseline sheets for the area to be surveyed.
- Cross section books for the area to be surveyed.

### *B. Field Reconnaissance*

- Recover and identify all original baseline point of intersection points. Many of the old baseline point of intersection points were and are lead hubs in granite blocks. Asphalt, tar and gravel, etc. will cover the majority of the point of intersections. It is important to exercise caution when uncovering a point of intersection to prevent the destruction of its original position.
- Recover all reference points to point of intersections, stones, etc.
- From the baseline, cross-section the area in question at the required interval (25', 50', or 100') and locate required features, sidewalk, curb and gutter, roadway, poles, trees, buildings, etc.

## 2.4 Design Speed

### **For guidance on design speed, refer to Part I. 2.5 Sight Distance**

The following shall be utilized to evaluate intersection sight distance. The sight distance requirements pertaining to commercial driveways are not classified as vertical and horizontal but are intersection sight distance requirements being composed of both vertical and horizontal components. Vertical sight distance shall be determined from an object mounted 3.5 feet above the grade of the vehicle path simulating a vehicle traveling the through lanes of the roadway. The sight distance shall be measured up from an eye height of 3.5 feet to the object. Horizontal sight distance shall be determined from an eye height of 3.5 feet with the object being 3.5 feet. For more information on sight distance, see AASHTO's 2004 edition of ***A Policy on Geometric Design of Highways and Streets***.

On a typical two-lane road with a horizontal curve, numerous objects restrict sight distance. These include, but are not limited to, cut slopes, vertical curvature of the roadway, buildings, vegetation, signs and vehicles. Landscaping in these areas shall conform to the AASHTO 2004 edition of ***A Policy on Geometric Design of Highways and Streets***. It is possible to have sight distance in the winter and not in the spring or summer due to the growth of vegetation. These obstructions should be considered when reviewing a commercial entrance permit. A divided highway may have similar problems. It is critical to obtain at least the minimum commercial entrance sight distance from the entrance as well as the left turn position into the entrance. Any waiver

of the required sight distance may only be granted by the Director of Public Works after a traffic engineering investigation has been conducted. Refer to Chapter 1 Design Waiver/Exceptions for requirements concerning approval of sight distance waiver.

Table 2-2 shows specific information about sight distances and speeds along major roads:

**Table 2-2**  
**Sight Distances Along Major Roads at Intersections with Minor Roads,**  
**Crossovers or Median Openings, and Commercial Entrances**

Height of Eye (3.5 ft.)	Height of Object (3.5 ft)						
Design Speed <sup>1</sup> (miles per hour)	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph
<b>2 or 3-Lane Major Road</b>	280 ft.	335 ft.	390 ft.	445 ft.	500 ft.	555 ft.	610 ft.
<b>4-Lane Major Road<sup>2</sup> Undivided &amp; 4-Lane Divided Highways at Crossovers</b>	295 ft.	355 ft.	415 ft.	475 ft.	530 ft.	590 ft.	650 ft.
<b>4-Lane Major Road<sup>3</sup> (Divided – 15 ft. min. Median)</b>	325 ft.	390 ft.	455 ft.	520 ft.	580 ft.	645 ft.	710 ft.



1. The posted legal speed limit may be used in lieu of design speed at the discretion of the Director of Public Works. Where the operating speed on the respective segment of highway is determined to be lower than the legal speed limit, and, in the judgment of the Director, the operating speed shall not create hazards for either a driver at a connection or on the major roadway and the legal speed limit cannot and, in all probability, shall not be obtained in the foreseeable future as a result of improvement or reconstruction, the sight distance requirements for the operating speed may then be applied. Where the operating speed on the respective segment of highway is determined to be higher than the legal speed limit, the Director may require, in the interest of public safety, that the sight distance requirement for the operating speed be applied. The operating speed shall be determined by a traffic engineering study at the location in question. In all cases when the operating speed is used in lieu of the speed limit, full documentation of its determination shall be attached to the permit assembly.
2. For three-lane major roads, where crossing two opposing travel lanes, use the four-lane sight distance. When crossing one opposing travel lane, use two-lane sight distance.
3. For median widths greater than 60 feet, each roadway can be considered as a separate two, three, or four-lane roadway. (See the 2004 edition of AASHTO's ***Policy on Geometric Design of Highways and Streets***.)

### *Stopping Sight Distance*

Stopping sight distance is the sum of two distances: (1) the distance traversed by the vehicle from the instant the driver sights an object necessitating a stop to the instant the brakes are applied; and (2) the distance needed to stop the vehicle from the instant brake application begins. These are referred to as brake reaction distance and braking distance, respectively.

In computing and measuring stopping sight distances, the height of the driver's eye is estimated to be 3.5 ft. and the height of the object to be seen by the driver is 2.0 ft. equivalent to the taillight height of a passenger car.

Table 2-3 Stopping Sight Distances Along Major and Minor Roads							
Height of Eye (3.5 ft.)	Height of Object (3.5 ft.)						
Design Speed	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph
Required Stopping Sight Distance	200 ft.	250 ft.	305 ft.	360 ft.	425 ft.	495 ft.	570 ft.

## 2.6 Horizontal and Vertical Curves

- An existing horizontal curve may be retained as is, without further evaluation, if the existing curve design speed, with correct super elevation provided, corresponds to a speed that is within 15 mph of the running speeds of approaching vehicles and the average daily traffic volume is less than 750 vehicles per day.
- Reconstruction of horizontal curves should be considered and evaluated when the above speed and/or volume criteria are exceeded.
- When a roadway segment consists of a series of reverse curves or curves connected by short tangents, the succession of curves shall be analyzed as a unit rather than as individual curves.
- The first substandard curve in a series should receive special attention because this change in alignment prepares the driver for the remaining curves in the series.
- Any intermediate curve in a series of substandard curves that is significantly worse than the others in the series should be analyzed individually.
- These controlling curves can be used to determine the safety and/or other mitigation measures to apply throughout the series.
- An existing vertical curve may be retained if the existing design speed provides the stopping sight distance within 15 MPH of the overall project design speed and the average daily traffic volume is less than 750 vehicles per day.
- Reconstruction of crest vertical curves is to be evaluated when the above speed and traffic volumes are exceeded, and the vertical curve hides major hazards from view. Major hazards include, but are not limited to intersections or entrances, sharp horizontal curves and narrow bridges.
- Sag vertical curves should be investigated to ensure that potential hazards do not exist, especially ones that become apparent when weather conditions, or darkness, reduce visibility.
- Height restrictions for overhanging vegetation in season should be considered.

## 2.7 Grades

The street grade is the degree of inclination of the road surface. Grades in commercial and industrial areas should be less than 8 percent; desirably, less than 5 percent. The relationship of maximum grades to design speed for all other streets in the City of Richmond are outlined in Table 2-4 below.

**Table 2-4 Maximum Grades of City Streets**  
(other than commercial/industrial areas)

Functional Classification	Design Speed (mph)	Grade (Percent)
Arterial	30	9
Arterial	40	8
Arterial	45	7
Arterial	50	7
Collector	30	11
Collector	40	10
Collector	45	9
Collector	50	8

Refer to VDOT's **Road Design Manual** for additional guidelines.

## 2.8 Pavement Width Requirements

**For guidance on pavement width requirements, refer to Part I. 2.9 Side Slopes**

A side slope in a cut section is the slope between the outside hinge point of the roadway landing or the graded shoulder and the toe of the ditch. A side slope in a fill section is the slope between the outside hinge point of the roadway landing or the graded shoulder and the top of the bank. Side slopes in cut or fill sections shall be 2:1 or flatter. Steeper slopes may be approved by the Director of Public Works.

## 2.10 Street Extensions to the Property Line

All streets shall be constructed to the property line if eligible to be accepted into the City street system and shall terminate with an off-site temporary turnaround.

If the aforementioned construction causes hardship to the developer and the developer is unable to obtain the off-site easement necessary to construct the streets to the property line, the Director of Public Works may allow the street construction to stop a distance from the property line, to be determined at the time of site development plan review. The developer shall dedicate on-site grading easements for the future

completion of the street when the adjacent area is developed, provide a temporary turnaround easement on the site, and construct a temporary cul-de-sac within this easement. Escrow shall be obtained for the following:

1. Future completion of the street to the property line;
2. Removal of the temporary turnaround; and
3. Grading and stabilization of disturbed areas with the easement.

## **2.11 Right of Way Requirements**

A clear and unencumbered right-of-way shall be dedicated for public use for all proposed roadway additions to the City roadway system. Related easements for drainage, water quality, traffic devices and all other easements necessary to support the desired or required City infrastructure, including the proposed roadway, are required to be dedicated for public use in a form acceptable to the City Council and the Department of Public Works. All dedicated easements and rights-of-way shall be in accordance with the Transportation Element of the City's Master Plan. Utilities located outside of right-of-way have the potential to impact building setbacks and should be discouraged.

### **2.11.1 Widths of Right-of-Way**

The minimum right-of-way for streets to be accepted into the City Road System is based on functional classification. Typical roadway sections for these rights-of-way are shown on the typical section details, in Part I.

### **2.11.2 Right-of-Way Dedication**

When a development abuts one side of a state-maintained street(s), the developer shall be responsible for any right-of-way dedication, grading, surfacing, and drainage along such street(s) as may be deemed necessary by the Director of Public Works and to the extent commensurate with the additional traffic generated, to provide a safe entrance into the development. The development should also address the dedication of sufficient right-of-way, and the construction of a half-section improvement of the street(s) for its entire frontage, to conform to the design standard for that street(s) as shown in the Transportation Element of the City's Master Plan, City approved functional plan, six-year secondary road plan as approved by the City Council, centerline studies, engineering plans, and the appropriate standards of this manual.

### **2.11.3 Easement Dedication**

Easements shall be provided for water quality such as storm drainage systems and areas of concentrated flow. Access shall be provided for storm drainage system operation and maintenance. Storm sewer system shall be constructed to the property line. If a storm

drainage system terminates or starts short of a property line, easements shall be dedicated to allow for maintenance and future extension of the storm drainage system.

## **2.12 Plans**

Construction plans are needed to allow City staff to evaluate proposed construction and ensure correct installation in the field. Such plans may be more or less complex depending on the scope of the proposal. Should a proposal not be subject to a construction plan review by other agencies, one will be required by DOT. Review and approval of such plan(s) shall be completed prior to issuance of any permit to construct the proposed improvements. Ultimately a Work in Streets Permit (WISP) is required to perform work within the public right of way.



# CHAPTER 3

## INTERSECTIONS AND AUXILIARY LANES



## INTERSECTIONS AND AUXILIARY LANES

### 3.1 Street Intersections

For guidance on street intersections, refer to Part I. 3.2 Auxiliary Lanes & Tapers

**Auxiliary lane** is defined as a lane dedicated to traffic entering and/or exiting the roadway, reducing interference with through traffic.

**Deceleration lane** is a speed-change lane including tapered areas that enables a turning vehicle to exit a through lane and slow to a safe speed to complete its turn.

**Acceleration lane** is a lane, including tapered areas, that enables a motorist to increase its speed to a rate that enables it to safely merge with through traffic.

When deemed necessary by a traffic impact analysis and the Department of Public Works, the following intersection improvements shall apply:

#### 3.2.1 Right Turn Lanes

An exclusive right turn lane and taper shall be required on each approach of an intersection anticipated to carry three thousand (3,000) or more vehicles per day or when the number of right turns is anticipated to exceed 100 vehicles per hour during the peak hour. The required turn lanes and tapers shall be designed in accordance with VDOT and AASHTO standards (see Table 3-1).

#### 3.2.2 Left Turn Lanes

A protected left turn lane shall be required at all street intersections where existing or projected traffic count on either street exceeds three thousand (3,000) vehicles per day. The required turn lanes and tapers should be designed in accordance with VDOT and AASHTO standards (see Table 3-1).

**Table 3-1 Minimum Turn Lane Requirements for Un-signalized Intersections \***

<b>Design Speed (mph)</b>	<b>Minimum Length Turn Lane ** (feet)</b>	<b>Minimum Length of Taper (feet)</b>
30	100	100
35	100	200
40	100	200
45	100	200
50	200	200

\* Turn lane lengths for signalized intersections shall be determined as part of the traffic impact analysis.

\*\* Length shall be adjusted upward as determined by the traffic impact analysis.

### 3.3 Median Crossovers

A median crossover is defined as any connections of the opposing travel lanes that cross the median of a divided highway. Median crossover includes directional crossovers, U-turns or all-movement crossovers. A directional crossover usually provides for left-turns in one direction only. No left turns or straight across movements are allowed from the side street. A U-turn crossover allows a vehicle to make a U-turn and does not allow for through movements from a side street or driveway. All-movement crossovers provide for all movements at the intersection or driveway. All proposed median crossovers on existing and new facilities shall be evaluated from an operational and safety perspective.

#### 3.3.1 Crossover Spacing

Table 3-2 lists the desirable and minimum median crossover spacing for divided roadways, based on design speeds and minimum sight distances. This table is based on the **VDOT Road Design Manual**.

**Table 3-2 Crossover Spacing Criteria**

<b>Design Speed of Roadway (mph)</b>	<b>Minimum Crossing Spacing**(feet)</b>	<b>Minimum Sight Distance* (feet)</b>
55	1050	650
50	1050	590
45	660	530
40	660	475
35	660	415

\* The minimum sight distance requirement must be met at all crossover locations.

\*\* These minimum dimensions are not to be reduced unless exceptions are specifically approved by the City Traffic Engineer. Crossover spacing for Principal Arterials and signalized intersections will be higher.

The availability of adequate spacing for a crossover shall be considered when determining if a crossover is justified. However, the availability of adequate spacing alone does not warrant a new crossover.

### **3.3.2 Reduction of Minimum Crossover Spacing Standards**

Consideration will be given to intersecting public roadways that have a current ADT of 100 or greater, where the crossover spacing is less than the established minimum.

Installation of crossovers for private streets or commercial entrances will be considered on a case-by-case basis, following the evaluation of an individual traffic safety and operation study. This study will be submitted by the design consultant and evaluated by Department of Public Works. Operating speeds, volume of traffic for the crossover and associated through street, signal operation/progression, accident rates with and without the crossover, number of U-turn violations, observations of weaving maneuvers, alternative solutions, capacity analysis, and type of vehicles involved are just some of the factors that will be included in the study.

Final approval or waiver for reduction in median spacing will be made by the Director of Public Works and the City Traffic Engineer.

## **3.4 Intersection Curb Radii**

For guidance on curb radii, refer to Part I. 3.5 Bus Turnouts.

A bus turnout is a designated location at a transit stop, station, terminal, or transit center at which a bus stops to allow passengers to board and alight.

Bus turnouts will be installed at bus stops on major road arteries. The turnouts will be 12 feet wide (not including the curb and gutter) and a minimum tangent length of 80 feet, with a 50-foot pavement transition. The transition will have a reversed 300-foot radius (as a minimum), on both the entrance and exit of the turnout.

A "BUS STOP – NO PARKING ANYTIME" sign will be placed adjacent to the turnout near the bus loading point.

### 3.6 Cul-de-Sacs

A cul-de-sac is a dead-end street or road which widens sufficiently at the end to permit an automobile to make a U-turn. They are designed so children can play on street, with little or no through-traffic. Some are true cul-de-sacs (or culs-de-sac) with no passage possible; others allow cyclists, pedestrians or emergency vehicles to pass.

#### 3.6.1 Residential Cul-de-Sacs

A cul-de-sac serving a residential development on a road with maximum length of 150' (measured from the point of intersection to the end of pavement) shall have a radius of 35' minimum to either the face of curb or edge of pavement. Cul-de-sacs on roads longer than 150' shall have a radius of 42' minimum.

In the case where a residential cul-de-sac street intersects with a street presently carrying, or projected to carry, in excess of three thousand (3,000) vehicles per day (vpd), the Director of Public Works will require a cul-de-sac radius of fifty-five (55) feet.

#### 3.6.2 Commercial Cul-de-Sacs

A cul-de-sac serving a commercial and industrial development shall be designed to a maximum length of one thousand (1,000) feet. The minimum pavement radius of the cul-de-sac shall be fifty-five (55) feet to the face of curb or edge of pavement.

On the circular segment of a public street cul-de-sac, only one commercial entrance to a townhouse or multifamily development shall be permitted. The entrance shall align at one hundred eighty (180) degrees with the centerline of the public street. Two entrances shall be allowed for commercial and industrial developments, provided their centerlines align at one hundred eighty (180) degrees to each other.

### 3.7 Roundabouts

Roundabouts are a form of intersection control. Roundabout operations and safety performance are particularly sensitive to geometric design elements. The "design challenge" is essentially one of determining a design that will accommodate the traffic

demand while minimizing delay, accident potential, and costs to all users including motor vehicles, pedestrians and bicyclists. The referenced roundabout documents listed in this manual shall be utilized for designing roundabouts in the City of Richmond. All roundabout designs shall be submitted to and reviewed by Department of Public Works and Department of Community Development during the analysis, planning and design phases of development.

# CHAPTER 4

## ENTRANCES



## ENTRANCES

An entrance is a driveway used to access property abutting a roadway. It includes private residential driveways as well as commercial and other driveways. Any driveways constructed across the City Right-of-Way connecting to a City street must be constructed under a **“Work in the Streets”** permit. The location and width of any driveway is subject the terms of the adopted Driveway Policy and shall be approved by the Director of Public Works or his designee.

### 4.1 Dimensions and Details

The allowable radii at any given driveway entrance are based on the design parameters provided in the standard details. Each entrance will be reviewed to determine if the submission states the intended radius and if proposed radii are within guidelines. In general, the radii should stay within the public right-of-way. For additional guidance, refer to VDOT’s **Road and Bridge Standards**.

**4.1.1 Residential driveways** connecting to streets with curb and gutter shall provide a 6 in. thick apron and shall be built with 2 ft. 6 in. radii. The full radius must be constructed within the limits of the road frontage of the property served by the entrance. Note that residential driveways may utilize other forms depending on the existing conditions within a given neighborhood. Private entrance grades shall start at the back of shoulder or at the back of sidewalk on streets with curb and gutter. Private entrance grades shall be tied into the public roadway smoothly. The minimum vertical curve for a private residential entrance shall be fifty (50) feet and the desirable maximum grade for a private entrance shall be fifteen (15) percent. Residential entrance grades may be modified to meet specific site requirements as directed or approved by the Director of Public Works.

**4.1.2 Non-residential entrances** will require commercial aprons which comply with a modified version of the latest VDOT Standard CG-9B or D detail. The modification is that the entire apron will be constructed within the public right of way. All commercial entrance aprons, except those designated for industrial use, shall provide 8 in. thick concrete as minimum depth. The sidewalk zone within the apron and 5 ft. on each side of the apron must maintain the 8 in. thickness. Commercial driveways serving industrial locations shall be 10 in. thick and shall have a full radius (ROW to curb line) and shall have 8 in. thick sidewalk approaches for a distance of 5 ft. on each side of the apron.

*NOTE: Commercial driveway aprons to be used regularly by heavy trucks or tractor trailers shall be considered subject to industrial use. These locations shall be required to provide a minimum consistent depth of 10 in. concrete in all entrance aprons. All other business driveways shall conform to the commercial standard thickness requirement of 8 inches.*

Allowances will be considered on a case by case basis where existing conditions involving alleyways, business districts and other downtown entrances have physical constraints which prevent the Standard CG-9B or D design. These locations shall provide a minimum 2 ft. 6 in. radius entrance or the VDOT Standard CG-9B. Flared openings



may be the most appropriate at some locations. All entrances (excluding private roads and those generating over 1000 vehicles per day) shall incorporate a 2% landing for a minimum of twenty-five (25) feet from the existing edge of pavement.

**4.1.3 Pedestrian route** that complies with the Better Streets Manual shall be maintained across all private entrances. In certain circumstances, this may require special designs or other considerations

**4.1.4 Two-way driveways** must be constructed with the radii as indicated in the standard details. One-way entrances may have a full radius on the turning side and a minimum radius on the non-turning side.

**4.1.5 Driveway widths** at the back of the apron shall be 14 ft. residential, 24 ft. commercial, or 35 ft. industrial and 18 ft. for double entrances or as noted. A turn-around on the property may be required as a condition of permit approval.

**4.1.6 Future street connections** for both public and private improvements must follow the same design criteria as entrance aprons. All private street connections must provide a commercial entrance apron, unless granted an exception.

**4.1.7 Spacing** - A distance of at least two hundred (200) feet shall be maintained between centerlines of all commercial entrances.

**4.1.8 Curb cut ramps** (handicap access ramps) shall be provided at all curbed intersections even when sidewalks and trails are not present. Curb cut ramps shall be provided in accordance with current PROWAG standards. (See Section 5.4 Handicapped Accessibility for more information.) Truncated domes are not employed at private entrances unless they are intended to function as public street intersections.

## 4.2 Exceptions to Entrance Standards

When a submission indicates a design radius which exceeds the standard limit, it will be challenged for non-conformance with the design standards. After review with the submitting party, the radius shall be revised to meet the minimum/maximum allowances or as approved by the Director of Public Works or his designee.

Exceptions to entrance standards may be necessary to meet existing entrance site conditions and probable uses. All permit applicants who request a radius design approval must defend their submission to the Director of Public Works or his designee.

## 4.3 Maintenance and Materials

Entrances shall be constructed of Class A-3 (3,000 PSI), air-entrained non-reinforced concrete or as noted on the standard details. Curb returns less than fifteen (15) feet radius require the slab for the adjacent sidewalk to be Class A-3 non-reinforced concrete. When adjoining sidewalk requires replacement as part of the apron

construction a minimum 5 ft. long section of thickened slab concrete is required at each approach to the entrance.

The maintenance of the concrete entrance apron shall be the responsibility of the benefited property owner(s) for both residential and non-residential properties. Temporary maintenance on the walkway portion of the entrance apron may be performed by the City as a remedial measure to assure pedestrian safety. The City reserves the right to charge for this work at the discretion of the Director of Public Works.

The City will repair, replace, upgrade and clean existing approved driveway culverts in order to maintain drainage in residential areas. Standard paving materials will be replaced and standard concrete headwalls will be replaced as needed in conjunction with culvert maintenance or replacement. Non-standard surface materials such as concrete, exposed aggregate concrete, specialty pavers, etc., shall be replaced by the benefited property owner(s).

The City maintenance forces will only restore disturbed locations with an aggregate base and asphalt surface course where required.

All private residential streets shall provide appropriate signage at the entrance designating their non-public maintenance status. This sign shall state "Private Drive" and provide a range of lots or address numbers served by this street.

#### 4.4 Temporary Entrances

Temporary entrances or driveways shall be defined as driveways used for short-term access or those driveways intended for continued use on unimproved streets. The property owner shall be responsible for the initial installation of a driveway pipe culvert which meets the size and type approved by the Department of Public Works. The issuance of a "**Work in the Streets**" permit allows the entrance to exist. The pipe and entrance detail shall follow the City design standard for Ditch Line Crossings (see DPW-DPI-1 or RSD-1 detail). The owner may install headwalls by permit, but in no case shall these headwalls extend above the surface level.

#### 4.5 Unpermitted or Unused Entrances

Driveways that exist without a properly issued permit and/or a driveway that obstructs or impedes drainage, the property owner shall be required to obtain a permit for continued allowance which carries all associated costs for conforming installation. Note that such driveway application may be denied, requiring the property owner to remove the driveway and restore the right of way. The property owner shall bear all installation, removal and repair cost, unless agreed upon assistance is approved by the Director of Public Works.

Unused entrance crossings shall be removed by the property owner at his/her expense.

# CHAPTER 5

## STREET ELEMENTS



## STREET ELEMENTS

### 5.1 Street Elements in General

All proposed street improvements shall be designed and constructed in accordance with the most recent version of VDOT's *Road and Bridge Standards* and *Road and Bridge Specifications* unless otherwise specified in this manual or by the Director of Public Works. See Chapter 1 of this manual for typical road section requirements.

All proposed street improvements within designated historic districts of the City shall be designed and constructed in accordance with the historic context of the area, including items such as granite curb and noses, cobblestone streets, ornamental street lighting, brick sidewalk, etc., and as approved by the Commission of Architectural Review.

### 5.2 Curb and Gutter

Curb and gutter is a concrete structure at the edge of the pavement, which directs water away from the roadway and into a drainage structure. All curb and gutter shall be constructed in accordance with the City of Richmond standard details located in the back of this chapter.

#### 5.2.1 New Development

- Curb and gutter shall be installed on both sides of each street in the subdivision in accordance with the City Code and with City design standards and specifications. Curb and gutter shall be installed on both sides of each road in the subdivision if:
  - any block of any road is constructed with a grade of 0.5% or less within the block
  - 25% of the roads within a subdivision have a grade of 1.0% or less
  - 25% of the lots in the subdivision have a street frontage of less than 80 feet
- Standard curb and gutter shall be used on residential roadways.
- Standard curb and gutter shall be installed on collector and arterial roadways where curb and gutter is required.
- Roll face curb can only be used as directed and approved by the Director of Public Works.
- The type of curb and gutter that is used must remain the same for the entire length of the road.
- New curb and gutter constructed within the central business district shall be 9-inch curb with 18-inch gutter pan.
- New curb and gutter constructed outside of the central business district shall be 6" wide curb with 18" gutter pan.

### 5.2.2 Improvements to Existing Development / Infill Development

- Existing granite curb, concrete curb or concrete curb and gutter shall be maintained or replaced in-kind and in accordance with the City Code and with City design standards and specifications.
- In areas where public street infrastructure (curb, gutter, sidewalks, alleys, etc.) is missing or was never constructed, and the typology of the area is to be served by such infrastructure, it shall be installed in conjunction with new adjacent development.
- Existing culverts may need to be upgraded to the minimum 15 inches for public drainage structures. See Chapter 7 for additional information.
- Valley gutters shall only be used in areas of existing development and as directed and approved by the Director of Public Works, or his designee.
- ADA infrastructure adjacent to renovated or new infill construction will need to be updated or installed as appropriate.

### 5.3 Historic Infrastructure

- Existing historic infrastructure shall be retained in conjunction with new or infill development. This includes but is not limited to granite curb and noses, cobblestone alleys and gutters, brick or cobblestone aprons. These elements may need to be protected during construction or removed and reset once construction is complete.
- In certain circumstances, suitable replacements may be substituted for the original material.

### 5.4 Handicapped Accessibility (See Also Section 4.1.7 Curb Cut Ramps)

- All roadway construction shall incorporate a means of access for persons with mobility impairments. Curb ramps shall be provided at all intersections where sidewalks exist or are to be provided.
- One curb ramp is to be provided for each pedestrian crossing location at an intersection (bi-directional), with ramps being installed at a location perpendicular to the street to be crossed. Ramps shall be centered on the pedestrian route of the sidewalk feeding the ramp as much as possible.
- Diagonal curb ramps are not permitted for new construction, unless approved by the Director of Public Works.
- Retrofitted ramps will be reviewed on a case by case basis.
- Curb ramps shall be PROWAG compliant. Matching curb ramps shall be provided at all corners of an intersection. All raised domes of the curb ramps located within the designated historic areas of the City shall be federal red; all other curb ramps shall have federal yellow raised domes.

- Mid-block curb ramps are not acceptable except with special approval from the Director of Public Works or his designee.

## 5.5 Roadside Ditches and Culverts

- Roadside ditches move water alongside a road, street, or highway to a point where it can safely be diverted into vegetated areas away from lakes, wetlands, and streams. If water flowing in a roadside ditch eventually reaches navigable waters, the ditch is subject to the *Clean Water Act* and falls within the jurisdiction of the U.S. Army Corps of Engineers.
- In order for the City to grant a permit to perform the installation of pipe culvert within an existing street right of way, the applicant must submit a set of engineering drawings for approval. These drawings shall be prepared by a professional engineer and provide the following information details:
  - Site layout plan of the proposed improvements;
  - Indicated pipe sizing as recommended by the City's Watershed Study;
  - Plan and profile views of the proposed pipe, with adequate elevations to indicated gradients;
  - Final surface grade contours and/or elevations which assures the collection and distribution of existing roadside drainage. Inlet structures will be required when necessary to prevent water from running in and along the existing road surface; and
  - Description of the methods intended to achieve stabilization.
  - All inlet structures shall be Class III concrete and culverts shall comply with City and VDOT requirements.
  - The submitted plan will be reviewed for conformance with these details as well as impact on adjacent drainage course.
  - All pipe culverts shall be 15" minimum with the exception of driveway culverts which shall be designed in accordance with section 7.3 of this manual.

## 5.6 Underdrains

Underdrains are installed to carry water away from the base, subbase and subgrade of a paved roadway.

- All underdrains shall be installed in accordance with VDOT's ***Road and Bridge Standards***.
- As a minimum requirement, VDOT Standard UD-1 underdrains shall be installed at all drop inlet locations in curb and gutter sections to intercept subsurface

drainage; 25 feet in each direction of sag inlets and 25 feet on the upside of on-grade inlets.

- In addition, Standard UD-2 underdrains with outlets are required in all raised grass medians and/or islands to prevent water infiltration through or under the pavement structure.
- Longitudinal pavement edge drains, Standard UD-4 with outlets to provide for lateral drainage, are also required in all road classifications with a design ADT of 1,000 vehicles per day or greater.
- In addition, Standard CD-1 underdrains shall be installed under all vertical sags including roads without curb and gutter.
- The outlet end of all underdrains shall terminate in drainage structures or daylight out of fill slopes with a VDOT Standard EW-12 endwall placed at the outlet end of the underdrain.

These requirements may be waived for certain road classifications at the direction of the Director of Public Works.

## 5.7 Shoulders

Shoulders are the portion of the roadway contiguous to the traveled way for accommodation of stopped vehicles for emergency use, and for lateral support of the base and surface courses.

### 5.7.1 Roadway Shoulder Design

Roadway shoulders shall be graded to drain. Slopes and widths shall be in accordance with roadway typical cross-section details for the road classification contained in this manual. See Chapter 2 for these details.

### 5.7.2 Graded Shoulders

Topsoil shall be provided on graded shoulders to a minimum depth of 2 inches. Shoulders shall be seeded and fertilized in accordance with VDOT's *Road and Bridge Standards* and *Road and Bridge Specifications*.

### 5.7.3 Stabilized Shoulders

Paved or gravel shoulders may be approved for industrial access roads and on special exception on other roads by the Department of Public Works. Construction shall be in accordance with VDOT's *Road and Bridge Standards* and *Road and Bridge Specifications* and the design requirements specified at the time of approval.

### 5.7.4 Side Slopes on Roads

Side slopes in cut or fill sections shall be 2:1 or flatter. Steeper slopes may be approved by the Director of Public Works.

## 5.8 Sidewalks & Crosswalks

- For guidance on sidewalks and crosswalks, refer to Part I. All sidewalks will be a **minimum** of 4" thick, 5' wide and will be constructed according to the City of Richmond standard details located in the back of this chapter.
- Variations from the standard location of sidewalks and bike paths may be allowed or required by the Department of Public Works due to topographical or other physical features.
- Where used, all brick sidewalks shall be Autumn Red (or approved equal) with a herringbone pattern or conform to the existing pattern within the same block. In general, sidewalks shall be consistent within the neighborhood in which the sidewalk is being constructed.
- Tree Boxes - Wherever trees exist within the brick sidewalk area or wherever trees are to be placed in the brick sidewalk area, a tree box shall be formed with the bricks which are to be used in the brick sidewalk. The tree box shall be sized to prevent damage to the tree and sidewalk. Tree boxes shall be a minimum of 5' by 5' (unless otherwise determined and approved). Bricks shall form a soldier course and be embedded into concrete border a minimum of 2". The design engineer shall determine the exact location and size of any required tree boxes and shall be approved by the City.
- Tree boxes for new plantings shall conform to the requirements above, but spaced as per design recommendations.

### 5.8.1 Brick Sidewalks

#### 5.8.1.1 Brick Sidewalks on Concrete Base

Materials:

- Bricks shall be Autumn Red and measure nominally 2-1/4 inch thick, and
- 4" by 8" face size. Brick pavers shall conform to ASTM C 902, Class SX,
- Type II.
- Sand shall conform to ASTM C 33 and shall be uniform and free from foreign material.
- Cement shall be Portland Cement and conform to ASTM C150.



- Concrete shall be a minimum of VDOT class A3.
- Mortar shall be Type M Portland Cement-Lime Setting Bed Mortar complying with ASTM C 270.
- The cement-sand mixture shall be 1 part cement to 3 parts sand. The mixture may be mixed in place.
- Sidewalk Pattern – New sidewalks shall be “herring bone” pattern oriented 45° to the pedestrian travel path.
- Preparation of Subgrade - The subgrade for new brick sidewalks, reconstructed brick sidewalks, and sidewalks that replace existing concrete sidewalks shall be prepared by the removal and satisfactory disposal of all unsuitable material above the normal subgrade. All unsuitable material shall include existing concrete sidewalk. Any material removed above normal subgrade shall be disposed of by the contractor in an area approved by the Engineer. No tree roots encountered above normal subgrade will be cut unless approved by the Engineer.
- Wherever the existing ground surface is below normal subgrade, the ground surface shall be brought up to normal subgrade with a suitable material approved by the Engineer. The Contractor shall be responsible for supplying all material required to bring the existing ground surface up to normal subgrade and shall be part of the bid price for sidewalk.
- Subgrade shall be compacted to 95% of Standard Proctor maximum density at optimum moisture and shall be graded off to a surface that will not vary more than 1/2" at any one point from normal subgrade. Wherever tree roots prevent excavation of existing ground surface to normal subgrade, subgrade shall be determined by the design engineer and approved by the City.
- Concrete Base - Upon compaction and grading of subgrade, the subgrade shall be cleaned of all loose and foreign material before the concrete bedding is poured. After this has been done, a 4" thick minimum concrete slab shall be placed on the compacted subgrade.
- Laying Brick - Bricks shall be stored in areas designated by the Engineer. All bricks shall be carefully laid with the best face up in the pattern noted on the contract drawings or designated by the Engineer. Bricks shall be cut, not broken, using a high-speed masonry saw producing clean, sharp edges.
- The bricks shall be laid on a 1/2" mortar bed with 1/8" joints between bricks. A cement-sand mixture shall be swept into the joints between bricks and lightly sprayed with water. The contractor is responsible for removing all excess cement-sand mixture from surface of sidewalk prior to spraying water.

#### 5.8.1.2. Brick Sidewalk on Cement-Sand Bedding:

##### Materials:

- Bricks shall be Autumn Red and measure nominally 2-1/4 inch thick, and
- 4" by 8" face size. Brick pavers shall conform to ASTM C 902, Class SX,
- Type II.
- Sand shall conform to ASTM C 33 and shall be very in gradation uniform and free from foreign material.
- Cement shall be Portland Cement and conform to ASTM C150.
- Concrete shall be a minimum of VDOT class A3.
- Mortar shall be Type M Portland Cement-Lime Setting Bed Mortar complying with ASTM C 270.
- The cement-sand mixture shall be a minimum of 1 part cement to 3 parts sand. The mixture may be mixed in place.
- Sidewalk Pattern – New sidewalks shall be "herring bone" pattern oriented 45° to the pedestrian travel path.
- Preparation of Subgrade - The subgrade for new brick sidewalks and sidewalks that replace existing concrete sidewalks shall be prepared by the removal and satisfactory disposal of all unsuitable material above the normal subgrade. Unsuitable material shall include existing broken concrete sidewalk and existing brick sidewalk. Any material removed above normal subgrade shall be disposed of by the contractor in an area approved by the Engineer. Tree roots encountered above normal subgrade shall not be cut unless approved by the City.
- Wherever the existing ground surface is below normal subgrade, and a property wall exists as shown on the drawings, the ground surface shall be brought up to normal subgrade with a suitable material, such as 21A or 21B, and approved by the City. The contractor shall be responsible for supplying all material required to bring the existing ground surface up to normal subgrade. In addition, if any area adjacent to the brick sidewalk, on the property line side of the sidewalk, shall be lower than the proposed sidewalk, the area between the property line and the sidewalk edge shall be filled in and compacted with an approved material and seeded.

- Subgrade shall be compacted to 95% of Standard Proctor maximum density at optimum moisture and shall be graded off to a surface that will not vary more than 1/2" at any one point from normal subgrade. Wherever tree roots prevent excavation of existing ground surface to normal subgrade, subgrade shall be determined by the design engineer and approved by the City.
- Back Face of Sidewalk - Wherever curb or an adjoining property wall do not exist on the property line of a new brick sidewalk or sidewalks that replace existing concrete or existing brick sidewalks, a retaining row of bricks shall be set for the purpose of preventing the new brick sidewalk from sloughing off. This retaining row of bricks shall be formed by setting new sidewalk brick on end, side to side, in a row along the exposed edge of the sidewalk. The lower portions of the retaining row of bricks shall be embedded in 2" of concrete. The cost of the retaining row of bricks shall be included in the unit prices for brick sidewalk and will be shown on the drawings where needed.
- In the event the adjoining property is more than 10" above or below grade at the property line, a concrete retaining wall in accordance with RW-2 or RW-3 shall be constructed for the purpose of retaining the back-face edge of the proposed brick sidewalk.
- Cement-Sand Bedding - Upon completion of compaction and grading of the subgrade, the subgrade shall be cleaned of all loose and foreign material. A uniform layer of a 1:3 cement-sand mixture, 4" thick, shall be placed upon the subgrade. This cement-sand bedding shall be screeded off and densified by tamping or rolling so that the top surface of the cement-sand bedding will be smooth with no more than 1/4" variation from a flat plane and shall be densified to 95% of theoretical density, at optimum moisture.
- Laying Brick - Bricks will be stored in areas designated by the engineer. All bricks shall be carefully laid with the best face up in the pattern noted on the contract drawings or designated by the Engineer. Bricks shall be cut, not broken, using a high-speed masonry saw producing clean, sharp edges.
- The bricks shall be laid with a uniform 1/8" joint between each brick and joints shall be filled with a 1:3 cement-sand mixture. Wooden mallets or the wooden end of a brick mason's hammer will be used to strike each brick to insure a proper set during placement of the bricks and after sweeping the cement-sand mixture into the joints.
- Wetting Sequence - Once the cement-sand bedding is in place and the bricks have been set upon the bedding, water shall be applied to the bricks in a sufficient amount to insure hydration of the cement-sand bedding material. After the brick sidewalk surface has completely dried from the initial wetting for

hydration of the bedding, the joints shall be filled with a dry cement-sand joint filler and wet a second time for hydration of the joint filler. Wooden mallets or the wooden end of a brick mason's hammer shall be used to strike each brick to insure a proper set during placement of the bricks and after sweeping the cement-sand mixture into the joints. The contractor shall be responsible for cleaning the brick surface of any cement-sand material.

## 5.9 Carriage Walks

Carriage walks are small sections of sidewalk pavement, or steps, located within public street right-of-way and extending across the planting strip portion between an improved public sidewalk pavement and the street curbing.

- A property owner may obtain a City permit for this use of public street right-of-way and install a carriage walk at his own expense. Once installed, the ownership of the carriage walk and its maintenance responsibilities extend from the original permittee through each successive owner of the property. This is an allowable use of public right-of-way under the general premises of City Code Sections 25-41 and 25-44. All standard permit indemnity provisions will apply to any and all legal issues that may arise due to the existence of the carriage walk and its maintenance. The City, as authorized in Sections 25-44 and 25-11 through 25-13, may revoke any encroachment, including carriage walks, and, upon proper service of notice, cause it to be removed by the owner, or at the owner's expense.
- It is the City's policy that carriage walks and other forms of sidewalk crossings are private pavements allowed to encroach upon public street right-of-way for the convenience and particular benefit of the property abutting that section of street. The property owner bears the responsibility for the maintenance of the sidewalk crossing, and any potential liability that might arise from situations involving its condition or usage.
- As with other encroachments such as driveway crossings and areaways, the existence of a carriage walk, within public street right-of-way, and abutting a particular property is the standard for determining ownership, and the concomitant responsibilities, of this form of encroachment.
- The City will, upon the request and written authorization of the abutting property owner, or the owner's designee, remove a carriage walk. The disturbed area will be landscaped with topsoil. No other public maintenance is provided.
- If the City is reconstructing, or renovating, the street improvements along a block of a public street, and there are existing carriage walks, then the property owner may have his carriage walk that is in need of repair, renewed as part of the project by securing the necessary City permit and contacting the project inspector. If during

such a project, the property owner wishes to install a new carriage walk, then the property owner must secure the necessary City permit and have the carriage walk installed by a contractor of his choice. The property owner, at his own expense, can use the project contractor, however, the City of Richmond would not, in any way, be a party to this contractual arrangement. The carriage walk installation would be inspected in accordance with standard permit policy and procedures.

- As the City installs new sidewalks or reconstructs existing sidewalks, it is the City's policy not to install or replace lead walks, which are defined as the sidewalks leading from the public sidewalk towards the private property. However, if the gap between the public sidewalk and the property line is less than one foot, and there is an existing residential walk, then the City will install a lead walk to the property line.

## 5.10 Bike Lanes

### For guidance on bike lanes, refer to Part I. 5.11 Guardrail

Guardrail is a traffic barrier used to help redirect vehicles traveling off the traveled way back onto the roadway surface and away from fixed objects.

- Guardrail is typically required on sections of roadway when any of the following conditions exist within the clear zone:
  - A roadside embankment (fill slope) 3:1 or steeper and depth of 4 feet or more.
  - A water hazard with a depth of 2 feet or more (as measured from the near edge of pavement).
  - A ditch section with a depth of 3 feet or more (as measured from the near edge of pavement).
  - A fixed object (such as a culvert, pipe, headwall, retaining wall, bridge pier, or abutment).
- Other hazards as determined by the City Traffic Engineer.
- The Director of Public Works or City Traffic Engineer shall make the final determination as to whether guardrail is warranted along a section of roadway based on a review of the plans, a field inspection after rough grading has been completed, and/or prior to final acceptance.
- The installations of guardrail in the City of Richmond will follow the design criteria as established in the **Roadside Design Guide** published by the American Association of State Highway and Transportation Officials (2002) as well as the

most current edition of VDOT's **Road Design Manual** and **Instructional and Information Memoranda** (IIM).

- The City of Richmond uses VDOT Standard GR-2 or GR-2A (strong post) guardrail with standard GR-7 (wood post) breakaway cable end-treatment as the basic standard for guardrail selection. The designer/developer must justify any change from this standard to the City Engineer. The justifications will be considered for approval on a case-by-case basis.
- The Director of Public Works shall make the final determination as to whether Self-oxidizing guardrail will be used on a case-by-case basis.

## 5.12 Railroad Crossings

The term level crossing (also called a railroad crossing, railway crossing, train crossing or grade crossing) is a crossing on one level— without recourse to a bridge or tunnel — of a railway line by a road, path, or another railroad. It also applies when a light rail line with separate right-of-way (or a reserved track tramway) crosses a road.

- Full grade crossing protection including short-arm gates with flashing signals shall be provided at all new highway-railroad grade crossings. Design of the grade crossing protection shall be in accordance with Federal Highway Administration specifications and the latest edition of the **Railroad Highway Grade Crossing Handbook**.
- A crossing, comprised of rubber decking or better quality material, shall be provided and installed in conformance with the standards and requirements of the specific railroad and the Department of Public Works.
- Full-Depth Heavy Duty Crossings
  - The OMNI Heavy Duty rubber grade crossing system is the most durable full-depth rubber crossing available. Made of 100 percent virgin rubber, the product's durability, long life and low maintenance requirements make it ideal for most applications. Heavy Duty panels can be reused when a crossing is reconfigured or closed. Heavy Duty panels can be used with most rail fasteners.
- Steel Reinforced Crossings
  - The OMNI Steel Reinforced grade crossing system includes a virgin rubber panel reinforced with a 1/4" corrugated steel plate, installed on transverse or longitudinal, pressure-treated, hardwood shims. The virgin rubber absorbs the impact of concentrated loads such as lift trucks, while the steel plate provides the strength to carry heavy loads.

- RailGuard™ TM VRA Crossings
  - OMNI Virgin Rubber RailGuard™ (VRA) is made from 100% virgin rubber. VRA protects the track structure by absorbing traffic impact loads, provides a positive flange way which controls surface water runoff, and prevents breakup of the asphalt at the rail interface. Either asphalt or concrete can be used in conjunction with VRA.
- The cost of the installation of the grade crossing and grade crossing protection, including maintenance of rail traffic and vehicular traffic during the construction, shall be borne by the developer. The cost of future maintenance of the grade crossing and grade crossing protection shall be borne by the City and the railroad as specified in the Maintenance Agreement between the City and the railroad.

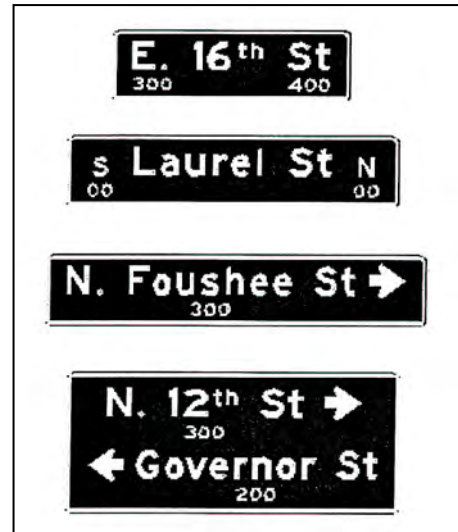
### 5.13 Signs and Pavement Markings

Street signs are of three general types: regulatory signs (used to indicate the rules for traffic movement); warning signs (used to indicate conditions that may involve risk to highway users); and guide signs (used to direct traffic along a route or toward a destination). Uniformity in the use of signs and other traffic control devices is the main objective of the policies contained in the ***Manual on Uniform Traffic Control Devices*** (MUTCD).

- For details regarding design, location, and application of regulatory signs, warning signs and pavement markings, reference shall be made to the MUTCD.
- The following standards are guidelines for designing overhead street name signs. The examples pictured should serve as additional guidelines. Since every street name is different, adjustments can be made to the recommended guidelines to make the sign more visually effective.
- A historic street sign design may be requested by a neighborhood community and may be allowed to vary from the standard upon recommendation from the Urban Design Committee and as approved by the Director of Public Works.

### 5.13.1 Overhead Street Name Sign Standards:

- Aluminum: .080 gauge with 1.5" radius corners
- Alloy: 5052-H32, 5052-H34, 5052-H38 or 6061-T6
- Height:
  - Single Name: 18" high
  - Double Name: 36" high
- Length: Varies (up to 96"); depends on length of sign message
- Guidance: Determine length by 6" increments (i.e. 48", 54", 60", 66", 72", 78", 84", 90", 96")
- Sheeting for sign face: Aluminum face is covered with 3M brand 3990 V.I.P. reflective white sheeting. Sign name is cut from 3M brand 1177C green cuttable overlay (letters are removed from green sheet so that the name shows up in V.I.P. white with a green background).
- Street name lettering and cardinal directions (N,S,E,W): Highway Gothic E/M (letter spacing increased 50%), upper and lower case (cardinal directions are always upper case) 7.5" high, 6" minimum (adjust to fit maximum of 96" sign length) street name length may be forced (condensed) to fit inside the standard lengths mentioned above, but not less than 80% of full length.
- Block numbers: 3.5" Highway Gothic E/M (letter spacing increased 50%)
- Smaller cardinal directions (above block numbers): 5" Highway Gothic E/M (capital letters)
- Note: When a sign is located on a divider street and the "00" block numbers have different cardinal directions, use 5" letters in the layout as shown and described.
- Periods should ONLY be used on full-sized cardinal directions (N,S,E,W) or abbreviated street names. NO periods should be used on a suffix (i.e. th, nd, st, rd).
- Border: 1" White along outside edge of sign with .5" inside radius
- Arrows: White, 8.75" high, 9.75" wide





### 5.13.2 Standards for Layout of Sign Message

- Cardinal directions (N,S,E,W) should be located to the left of the street name with a period and one letter space separating them.
- Street names with numbers as names (i.e. N. 10th St.) should have a suffix (i.e. th, nd, st, rd) in lower case at 60% of the number name height. The top of the suffix should be vertically flush to the top of the number name.

### 5.13.3 Single Name Street Signs:

- Street names are located 2.75" from top of sign and 5" from right or left edge of sign (varies according to height of letters, length of name and size of aluminum).
- Block numbers are located 2.25" from bottom of sign and the top of the block numbers will be 2" from the bottom of the street name.
- Street names with two different block numbers: The block number on the left should be flush left with the left side of the street name. The block number on the right should be flush right with the right side of the street name.
- Street names with only one block number: The block number should be vertically centered with the street name.
- Street names that have two "00" block numbers with cardinal directions: The block number should be 7" from the street name. This space is approximately the distance between words in the street name. So, if the street name letter height is smaller, this space should be adjusted accordingly. The cardinal directions for these street names should be horizontally flush bottom with the street name and vertically centered with the block number.
- Street names to the right should have an arrow pointing to the right 5" from the right side of the street name, centered horizontally with the street name.
- Street names to the left should have an arrow pointing to the left 5" from the left side of the street name, centered horizontally with the street name.

### 5.13.4 Double-Name Street Signs:

- The street name on the top line is located 4" from top of sign and 5" from left of sign. The arrow is pointed to the right 5" from the right edge of sign, centered horizontally with the street name. The top of the block number will be 2" from the bottom of the street name and will be centered with the street name.
- The street name on the bottom will be located 9" from the bottom of the sign and 5" from right edge of sign (varies according to height of letters, length of

name and size of aluminum). The arrow is pointed to the left 5" from the left edge of sign, centered horizontally with the street name. The block number will be located 3.5" from bottom of sign and centered vertically with the street name. The top of the block number will be 2" from the bottom of the street name.

- Note: For signs that have lower-case letters such as "g,j,p,q,y" that interfere with proper placement of block numbers, the block numbers may be adjusted to the right or left to accommodate the letters.
- T-Intersections with a private drive as a fourth leg should have an arrow on the sign for the public street. If no private drive is present, the arrow is suggested, but may be omitted.

### 5.13.5 Street Name Signs (Ground Mounted)

- 6" Street Name:
- 6" x varied length (24", 30", 36", 42") aluminum extruded blade
- Aluminum: 6063-TL Alloy
- Sheeting (backing): 5 ½" 3870 White High Intensity Sheeting (3M)
- Lettering is cut from 1177C Green Cuttable Overlay Film (3M)
- Lettering is removed and the rectangle of 1177C is applied to the 3870 backing (creates a green background with white lettering)
- Lettering: Name: 4" Highway Gothic "C" Font (all capital letters)
- Cardinal Direction (N,S,E,W), when applicable: same as name, placed before name with 2 letter spaces between it and name
- Suffix: 1 ¾" Highway Gothic "C" Font (all capital letters)
- (top of suffix is flush with top of name and located to right of name)
- Block Number: 1 ¾" Highway Gothic "C" Font (bottom of block # is flush with bottom of name and located to right of name)

(The right sides of the suffix and block numbers are flush: suffix on top, block # on bottom)



- 9" Street Name:

- 9" x varied length (30", 36", 42", 48") aluminum extruded blade
- Aluminum: 6063-TL Alloy
- Sheeting (backing): 8" 3870 White High Intensity Sheeting (3M)
- Lettering is cut from 1177C Green Cuttable Overlay Film (3M)
- Lettering is removed and the rectangle of 1177C is applied to the 3870 backing (creates a green background with white lettering)
- Lettering: Name: 6" Highway Gothic "C" Font (all capital letters)
- Cardinal Directions (N,S,E,W), when applicable: 3 ½" Highway Gothic "C" Font (all capital letters)
- (top of suffix is flush with top of name and located to right of name)
- Block Number: 2 ¾" Highway Gothic "C" Font
- (bottom of block # is flush with bottom of name and located to right of name)
- (The right sides of the suffix and block numbers are flush: suffix on top, block # on bottom)



#### 5.13.6 City of Richmond Parking Sign Standards:

- Aluminum: .080 gauge with 1.5" radius corners
- Alloy: 5052-H32, 5052-H34, 5052-H38 or 6061-T6
- Width: Single Sign: 12" Wide, Double Sign: 24" Wide
- Height: Varied (12" to 36"); depends on sign message
- Sheeting for sign face: Aluminum face is covered with 3M brand 3800 high intensity white sheeting. Sign message is printed with 880 series ink or cut from 3M brand 1177C green or 1172C red cuttable overlay. Completed sign face is covered with 1150 protective overlay film to protect it from graffiti.
- Border: 0.375" wide w/0.66" radius, 0.5" from edge of aluminum
- Symbolic "NO PARKING" with red "DO NOT" symbol and black "P" (at top of sign)


- Lettering: Highway Gothic "C", all capital letters (usually 1.5" high)
- A.M. and P.M. are done in capital letters with no periods at 60% of the number height, vertically flush to the top of the number
- Arrows: 2" high, 7.75" wide (at bottom of sign)
- Parking Sign Category Standards:
- 12" x 12" Symbolic No Parking-black border
- Red borders on all other parking restriction signs
- No Parking w/arrow, No Parking with Towing Enforced symbol, No Parking Loading Zone and other signs with 1-2 line message are 12" x 18"
- Larger message signs are 24", 30" or 36" high
- Parking regulation signs (i.e. 1 hour parking, 2 hour, etc.) have green borders and message
- Double message signs (parking restriction on top, parking regulation on bottom) have red message and border at top with green message and border at bottom
- Double signs (sign face w/left arrow on left and sign face w/right arrow on right) are placed beside each other, flush bottom, on the same piece of aluminum, with the aluminum cut to the appropriate height for each sign face (18", 24", 30" or 36")

These standards are guidelines for designing and making parking signs. The actual files for creating them can be obtained from the City of Richmond Sign Shop at no charge.

### 5.13 Street Lights

New residential development requires pedestrian scale lighting. Street lighting requirements for both levels of illumination, light pole and fixture selection and design and approval of new light infrastructure are provided by the Division of Street Lights within DPW.

### 5.14 Street Trees

Street trees are a requirement of new development and may be a requirement of infill development. The Division of Urban Forestry handles the approval of locations and species of trees that are planted in the City right of way. 

# CHAPTER 6

## PAVEMENT DESIGN



## PAVEMENT DESIGN

The pavement design for all streets and commercial/industrial access roads shall be in accordance with the appropriate road classifications and typical sections illustrated in Chapter 1. The pavement designs are based on a minimum California Bearing Ratio (CBR) value of 10 and set forth the **minimum** pavement design requirements for each road classification. These pavement designs shall be considered preliminary designs, **not approved for construction**, until substantiated by acceptable test results of the actual subgrade soil. Approval of the final design shall be obtained prior to the construction of the pavement.

Adjustments to the minimum required pavement designs shall be made in accordance with the latest edition of VDOT's ***Pavement Design Guide for Subdivision and Secondary Roads in Virginia***. Unless otherwise specified by the City Traffic Engineer, the Design ADT (used in the nomograph as to determine the Thickness Index for the pavement and for any adjustments to the minimum pavement design requirements) shall be the maximum vehicles per day shown for the appropriate road classification. The engineer shall take into consideration roadway grades where bus stops are present when making adjustments to the minimum pavement designs. The engineer shall also take into consideration possible future road improvements, growth rates, and the percent of heavy commercial vehicles when determining appropriate adjustments to the design ADT as required in the VDOT manual.

All CBR values are to be determined in accordance with the ***Virginia Test Method for Conducting California Bearing Ratio Tests*** (VTM-8). Field sampling of the subgrade soil shall be required to determine the actual CBR value, resiliency factor and other characteristics to verify the adequacy of the pavement design in relationship to the existing soil. If the test results reveal that the pavement design is less than adequate, adjustments to the pavement design shall be required.

The developer shall obtain the services of an independent testing firm to perform the tests and submit certified results and pavement recommendations to the City for review. Soil samples should be taken when the earthwork is within 0.1' from finished subgrade. The developer's construction schedule should take into account that the test results are normally available in approximately 10 days.

The pavement design determination process assumes that the properly compacted subgrade soil will produce a stable platform for pavement construction. If an unsuitable subgrade (wet, soft, unstable or unsuitable material) is encountered, it must be undercut to a firm foundation and replaced with adequately compacted material of suitable quality. Prior to the placement of the subbase/base layer, the subgrade must be

inspected by the Department of Public Works for grade, compaction and proof-rolling. Additional inspections shall be required on each subsequent pavement course.

The use of soil stabilization fabrics must be approved by the Director of Public Works. The soil stabilization fabric will not be considered as a substitute for undercut needs, nor will it be considered as added structural value in the pavement design.

## 6.1 Cobblestones Requirements

Cobblestone installation must match the existing alley cross section and method of construction. Do not mix construction methods within the same street or alley.

### NEW STREET/ALLEY CONSTRUCTION

#### 6.1.1 HISTORICAL (dry) METHOD:

- Base material may be compacted 21-A stone or concrete.
- Stones are set in a 2" deep bed of dry mix 1:3 cement-sand.
- Stones SHALL touch one another at some point on all four sides.
- FILL joints by sweeping in a dry 1:3 cement/sand (or stone dust) mix. A plate tamper may be utilized to achieve refusal of material.

#### 6.1.2 ALTERNATE (wet) METHOD:

- Base Material is concrete.
- Stones are set in a bed of wet mixed 1:3 cement-sand mix or 'lean mix'.
- Stones MAY BE set with gaps of no more than  $\frac{3}{4}$ " between stones, with  $\frac{3}{4}$ " being an exception rather than the rule. THIS requires the use of very regular stones to prevent large, irregular gaps.
- Joints are filled with approved grout OR with a 1:3 cement-sand (or stone dust) mix as noted above. Where stones are set touching, cement-sand must be used as grout cannot be put into the tighter stone gaps.

#### 6.1.3 GENERAL SPECIFICATIONS:

- Subgrade for cobblestone streets and alleys shall be SHAPED AND compacted TO A UNIFORM FIRM GRADE BEFORE PLACING SUBSEQUENT COURSES.
- Base material shall be 6" A-3 concrete or 6" compacted 21-A stone.
- When reusing old stones, the worn, historic face shall be set 'UPRIGHT'.
- Stones must be set in a vertical configuration – similar to teeth. Some stones are longer than they are tall; this is ok as long as the smaller dimension is still side to side (when viewed from the top).

- Note that in “as found” condition, SOME stones may have been laid incorrectly originally); in such a case consult with the DPW inspector.
- Stones are set perpendicular to the centerline of the street.
- Stones are set such that longitudinal joints shall be broken with a lap of at least 2”.
- Uniformity of rows of stone is desired.
  - For historical method installations, minor ‘waves’ can occur and should be taken up in the next row or two by using different size stones.
  - Single rows of stone can become double rows of stone, especially to make a bend in the alignment of a street or alley.
  - For the Alternate method, uniformity can be achieved by adjusting the gap between the stones.
- The upper surface of the stones shall be such that all the stones achieve a uniform general elevation. This is not meant to be a flat surface, rather that all the stones have a point or points that are generally in the same plane as those of the adjacent stones.
- For alleys, an inverted crown is established and a centerline shall be established using very rectangular and consistently sized stones in a double row.



## CHAPTER 7

# DRAINAGE REQUIREMENTS



## CHAPTER 7

# DRAINAGE REQUIREMENTS

### 7.1 General Requirements

- All drainage structures (culverts, paved ditches, inlets, junction boxes, manholes, storm sewer, etc.) shall be designed and constructed in accordance with the current approved version of VDOT's ***Drainage Manual, Road and Bridge Standards***, and ***Road and Bridge Specifications*** unless otherwise specified in this manual or by the Director of Public Utilities.
- All drainage design plans for proposed development shall be prepared by a Professional Engineer registered in Virginia.
- The Department of Public Works and Department of Public Utilities shall review all site plans, subdivision plans, and building permits to ensure there are adequate provisions by the developer to convey drainage across and/or off the site. Such drainage improvements shall be adequate for a minimum 10-year design frequency, unless a 100-year flood study is required. Inlets shall be sized per VDOT's requirements: rainfall intensity of 4"/hour for spread; and 6.5"/hour for overtopping.
- A 100-year flood plain study shall be required when the offsite drainage area onto the site is greater than 100 acres. In the event that a FEMA flood plain is shown to exist on the FEMA panel for the area being developed, or the drainage area is sufficient to justify a FEMA flood plain, the study shall meet the requirements for development within a FEMA flood plain in addition to any City requirements. Required flood studies and flood plain amendments shall be approved prior to approval of site development plans.
- The 100-year backwater elevation must be shown on plans for all stormwater conveyance systems in proximity to buildings to ensure flooding does not occur.
- Such easements necessary for the roadway and infrastructure improvements must be recorded and the corresponding deed book and page number shown on the construction plans prior to approval. Flood plains for the 100-year flood event shall be shown on recorded plats for all land development. Copies of recorded deeds shall be submitted to the Department of Public Utilities within ten (10) days of recordation.

### 7.2 Drop Inlets

- All inlets shall be designed to intercept drainage based on a rainfall intensity of 4 inches per hour.
- Inlets shall be located at the low point of all sag vertical curves and on continuous grades where the spread exceeds the following (maximum gutter flow spread, 4 inches per hour):
 

○ Major and Minor Arterial Roads	8 feet
○ Collector Roads	10 feet
○ Local Roads	12 feet
- Where the actual curb and gutter grade is less than 0.3 percent, flanking inlets shall be provided.
- New inlets shall not be permitted in the curb radius of an intersection.
- Drainage inlets are required to intercept yard drainage in lieu of open pipe. Front yard drainage structures shall be limited to VDOT Standard DI-1, DI-5, DI-7, and DI-12 structures. All yard inlets and grate inlets must be located at an elevation to drain, with appropriate grading limits shown on the construction plan. When DI-5 and DI-7 structures are utilized, Grate Type III shall be installed in pedestrian areas and Grate Type I shall be installed in wooded areas. Load carrying grates (Grate B) shall be used in areas subject to vehicular traffic. All grates and angle iron shall be hot-dipped galvanized.

### 7.3 Storm Sewer

- All storm sewers shall discharge into an adequate outfall channel, or pipe system, which has positive gravity flow to a natural outfall. If such an outfall is not available, it shall be the responsibility of the developer to obtain the outfall easements and construct the outfall system.
- The minimum design frequency for storm sewer shall be the 10-year storm. The minimum design frequency of storm sewers associated with primary roads shall be the 25-year storm.
- The minimum design velocity in storm sewers shall be three feet per second based on a two-year storm. Minimum slope shall be 0.30%; alternative designs will be considered on a case by case basis.
- Driveways culverts will be considered on a case by case basis for size and slope.
- When velocity exceeds five feet per second, based on a 10-year storm, at the storm sewer discharge, energy dissipation methods shall be required.

- The minimum pipe size within road right-of-way and public easements will be 15 inches in diameter.
- Radial pipe and/or special bends may be used where the design permits or dictates and on approval of the Director of Public Utilities.
- Hydraulic grade lines are required with all proposed storm sewer calculations. The proposed storm sewer system must contain the design storm.
- All new connections to existing storm sewer systems shall be made via manholes. Blind connections will not be permitted.

## 7.4 Installation

- All drainage structures shall be of concrete and/or reinforced concrete construction (poured-in-place or precast) and shall be designed in accordance with the VDOT standards and requirements.
- The minimum class of concrete pipe used in the right-of-way shall be ASTM, C-76 Class III pipe. This pipe shall be used in road right-of-way, parking areas, driveways, and all other areas subject to vehicular traffic. Alternative pipe materials will be considered on a case by case basis.
- Concrete pipe ASTM, C-76 Class II for sizes up to 24" diameter may be used in easements and areas outside the right-of-way not subject to vehicular traffic. Other pipe materials such as HDPE pipe may also be used in easements outside the right-of-way with approval from Department of Public Utilities.
- All drainage pipes and structures shall be installed on a firm foundation. A minimum of 4 inches of pipe bedding shall be required under all storm sewer pipes, paved ditches, and drainage structures.
- Precast drop inlets shall not be permitted at locations where the grade on the adjacent curb and gutter is less than 1.5 percent. Precast drop inlets having throats with flat inverts shall not be permitted in sag locations when the total length of the required throat opening exceeds 6 feet.
- Smooth dowels (#4 x 8 inches) shall be provided at approximately 12 inches, on center, in all areas adjacent to abutting concrete to prevent settlement.
- Abandoned storm sewers and drainage pipe shall be removed when no longer needed. If removal is not practical, as deemed by the Department of Public Utilities, the pipes shall be plugged and filled with flowable fill in accordance with VDOT requirements.

## CHAPTER 8

# BRIDGES, RETAINING WALLS, AND CRITICAL STRUCTURES



## BRIDGES, RETAINING WALLS, AND CRITICAL STRUCTURES

### 8.1 Bridges

All bridges and culverts shall be of concrete construction and shall be HS 20-44 loading or alternate military loading, or both, in accordance with the most recent VDOT requirements and with the current AASHTO bridge design specifications. All supporting design calculations for the structure shall be submitted with the bridge plan for approval. The construction plans, design calculations and specifications shall be signed and sealed by a professional engineer responsible for the structural design. The engineer shall be responsible for geotechnical and associated engineering during construction and shall perform independent inspections to ensure compliance of the plans and specifications. Prior to acceptance, the engineer shall submit a signed and sealed certification that the structure was built in accordance with the plans and specifications.

Travel lanes, clear of all obstructions, shall be in accordance with the road cross-section details for the road classification. All drainage facilities for bridges shall be in accordance with current VDOT requirements and this manual.

All improvements to any designated historical bridge in the City shall meet City, State and/or Federal requirements and guidelines.

### 8.2 Retaining Walls

#### 8.2.1 Review Authority

Retaining walls shall require a structural design certified by a professional engineer to be submitted for plan review approval and issuance of a building permit. All hand rail and retaining wall designs shall be reviewed by the City Building Commissioner for final approval.

- A single retaining wall that does not support the surge from any other structure and retains a total elevation difference equal to or less than two (2) feet in height shall be exempt from the requirements set forth above.
- The structural design for a single retaining wall or a tiered retaining wall system that retains a total elevation difference equal to or less than forty-eight (48) inches and is not associated with any other buildings or structures shall not require the certification and signature of a professional engineer, but does require plan review approval and issuance of a building permit from the City Building Commissioner.
- Structures owned by the Virginia Department of Transportation (VDOT) such as roadway tunnels and bridges shall be governed by construction and design standards approved by the Commonwealth Transportation Board.

### 8.2.2 Retaining Wall Design

- The design of all wall systems shall show all topographic information for a distance of one and one-half (1.5) times the height of the wall to the high side and at least twice the height in front of the wall; under no circumstances shall the distance shown on either side of the wall be less than twenty (20) feet.
- Walls greater than two (2) feet made of timber or other materials subject to decay or rot or walls located in more than one lot shall have an easement for maintenance, repair, reconstruction and/or restoration. The owner shall record restrictive covenants on the property that shall prohibit the installation of other structures, buildings and utility lines which were not designed in conjunction with the wall design.
- All non-engineered walls greater than two (2) feet and less than or equal to forty-two (42) inches shall be subject to restrictive covenants, which are in accordance with the distances set forth below, that prohibit the installation of other structures, buildings and utility lines on, below, or through the retaining wall system.
- When required, retaining wall maintenance easements shall be granted to property owners, homeowners associations or other similar organizations. The scope of the retaining wall maintenance easement and/or restrictive covenants shall encompass the entire retaining wall system. This easement and/or restrictive covenants shall extend along the ground above the retaining wall system and along the ground below the retaining wall system a distance of at least two and one-half (2.5) times the total height of the retaining wall system, and the distance of this easement and/or restrictive covenants shall be not less than ten (10) feet, regardless of the height of the retaining wall system. The retaining wall maintenance easement and/or restrictive covenants shall extend a minimum of ten (10) feet from each end of the retaining wall system. The retaining wall maintenance easement and/or restrictive covenants shall be placed to provide an equal amount of clear access space on all sides of the retaining wall system.
- For retaining walls that utilize soil reinforcement techniques for stability, appropriate "soil reinforcement zone easements" shall be recorded and shown on the plat to ensure the long-term stability of the retaining wall.
- When the proposed retaining wall crosses multiple lots, the City Building Commissioner or Director of Public Works may require that the retaining wall be located on common areas owned by the homeowners association.
- When a retaining wall is determined by a City field inspection to have the characteristics or conditions that may be hazardous to public health, safety, and

welfare, safety devices such as guardrails, fences or any other measures as required by the City Building Commissioner shall be installed.

- In areas prone to graffiti vandalism, the surface of retaining wall shall be treated by a protective coating which can easily be washed and wiped. Instead of a protective surface coating, the retaining wall can be covered or access to the wall blocked with plantings.
- No occupancy permit shall be issued until all retaining walls in the general area of the units scheduled for occupancy have been constructed, inspected and approved.



APPENDIX

# ROAD GEOMETRICS MANUAL DETAILS



# CITY OF RICHMOND

## Road Geometrics Manual Details

### TYPICAL SECTIONS

- RGM-TS-01 Typical Section for Principal Arterial Roadways – Divided (ADT 10,000+ VPD)
- RGM-TS-02 Typical Section for Principal Arterial Roadways – Undivided (ADT 10,000+ VPD)
- RGM-TS-03 Typical Section for Minor Arterial Roadways (ADT 6,000+ VPD)
- RGM-TS-04 Typical Section for Collector Streets (ADT 1,000 to 6,000 VPD)
- RGM-TS-05 Typical Section for Local Streets (ADT < 1,000 VPD)
- RGM-TS-06 Typical Section for Alley Section and Parks Roadway Section
- RGM-TS-07 City Standard Asphalt (TYPE I) Path
- RGM-TS-08 City Standard Stone Dust (TYPE II) Path
- RGM-TS-09 City Standard Woodchip (TYPE III) Path

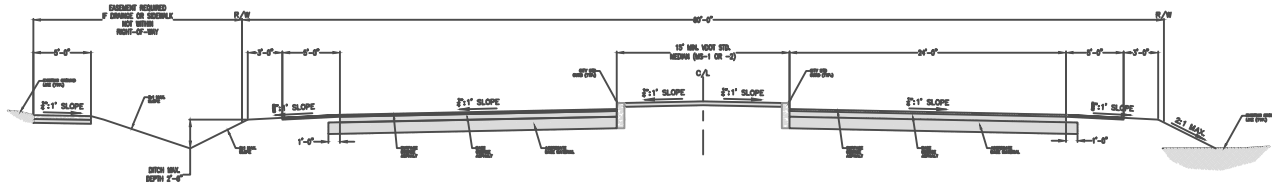
### CONSTRUCTION DETAILS

- RGM-CD-01 City Standard Curb and Curb & Gutter
- RGM-CD-02 City Standard Roll-faced curb (Repair only)
- RGM-CD-03 City Standard Valley Gutter Detail
- RGM-CD-04 City Standard Concrete Sidewalk
- RGM-CD-05 City Standard Brick Sidewalk Detail – New construction
- RGM-CD-06 City Standard Brick Sidewalk Detail – Repair Only
- RGM-CD-07 City Standard Granite Curb Detail
- RGM-CD-08 City Standard Granite Spall Pavement Detail
- RGM-CD-09 City Standard Paver Crosswalk
- RGM-CD-10 City Standard Paver Crosswalk Expansion Joint
- RGM-CD-11 City Standard Driveway Culvert

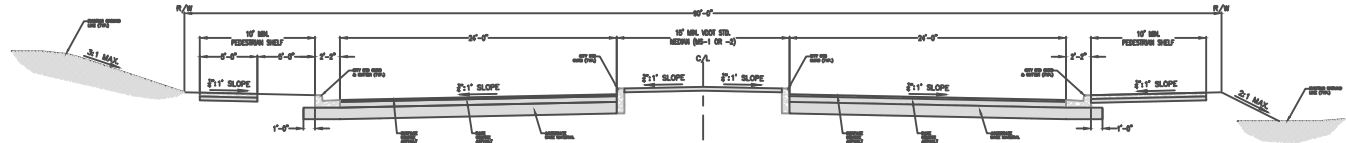
# PRINCIPAL ARTERIAL ROADWAYS

## 4-LANE DIVIDED

### (ADT $\geq 10,000$ VPD)



TYPICAL ROAD SECTION WITHOUT CURB & GUTTER  
NOT TO SCALE



TYPICAL ROAD SECTION WITH CURB & GUTTER  
NOT TO SCALE

MINIMUM PAVEMENT DESIGN REQUIREMENTS		
SURFACE	BASE	SUBBASE
2" ASPHALT SURFACE COURSE	6" ASPHALT BASE COURSE	12" AGGREGATE SUBBASE MATERIAL

#### NOTES:

- CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE VDOT ROAD AND BRIDGE SPECIFICATIONS AND VDOT ROAD AND BRIDGE STANDARD DRAWINGS, EXCEPT WHERE CITY STANDARDS ARE APPLICABLE.
- THE SHOULDER WIDTH (NON CURB & GUTTER SECTION) AND PEDESTRIAN SHELF (CURB & GUTTER SECTION) SHALL BE EXTENDED BEYOND THE RIGHT-OF-WAY WITH PERMANENT EASEMENTS PROVIDED TO ACCOMMODATE THE INSTALLATION OF GUARDRAIL AS REQUIRED.
- MINIMUM PAVEMENT DESIGN DEPTHS ARE COMPACTED DEPTHS.
- PAVEMENT AND SHOULDER DESIGN PAVEMENT DEPTHS ARE BASED ON A MINIMUM CBR VALUE OF 10. INCREASES TO THE REQUIRED DESIGN PAVEMENT STRATA SHALL BE BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. FINAL PAVEMENT DESIGN SHALL BE APPROVED BY THE DEPARTMENT OF PUBLIC WORKS.
- UNDER-DRAINS SHALL BE INSTALLED IN ACCORDANCE WITH VDOT SPECIFICATIONS AND THE REQUIREMENTS OF THIS MANUAL.
- PERMANENT EASEMENTS ARE REQUIRED FOR PUBLIC FACILITIES NOT WITHIN THE RIGHT-OF-WAY.
- ALL ROADSIDE DITCHES SHALL BE SEEDED AND HAVE A PERMANENT STAND OF GRASS AS A MINIMUM. WHERE THE ROADSIDE DITCH 10-YEAR DESIGN VELOCITY EXCEEDS FOUR (4) FEET PER SECOND, JUTE MESH OR OTHER CHANNEL LINING SHALL BE INSTALLED. WHERE THE ROADSIDE DITCH 10-YEAR DESIGN VELOCITY EXCEEDS SEVEN (7) FEET PER SECOND, RIPRAP, CONCRETE OR OTHER ALTERNATE LINING SHALL BE PROVIDED. ALTERNATE LININGS SHALL BE DESIGNED UPON SOIL CONDITIONS, CERTIFIED BY A PROFESSIONAL ENGINEER, AND MAY BE ACCEPTED BY THE CITY.
- UNIFORM CROSS-SECTION WIDTH AND PAVEMENT DESIGN SHALL BE PROVIDED FOR ALL ROADWAYS.
- VDOT STD MS-1 CONCRETE MEDIAN SHALL BE REQUIRED WHERE THE MEDIAN WIDTH IS 6'-0" OR LESS.
- IF AN IRRIGATION SYSTEM IS PROPOSED WITHIN THE RIGHT OF WAY, AN UNDER-DRAIN SYSTEM SHALL BE PROVIDED ADJACENT TO ANY CURB OR CURB & GUTTER. A MAINTENANCE AGREEMENT SHALL BE REQUIRED BETWEEN THE DEVELOPER AND CITY.
- STREET LIGHTING SHALL BE LOCATED WITHIN THE RIGHT-OF-WAY. CONTACT THE DEPARTMENT OF PUBLIC UTILITIES-STREETLIGHTS FOR REQUIREMENTS.

#### NOTES

- SUPERCEDES ALL PVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS

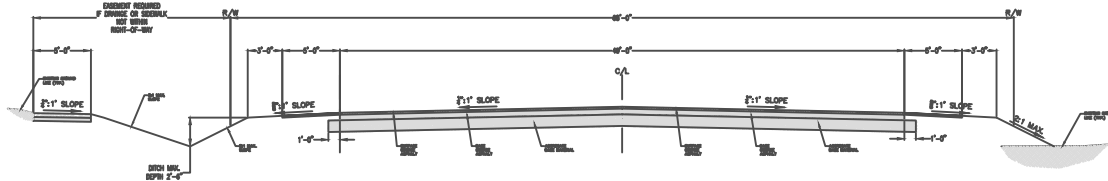
### PRINCIPAL ARTERIAL ROADWAY-DIVIDED

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# PRINCIPAL ARTERIAL ROADWAYS

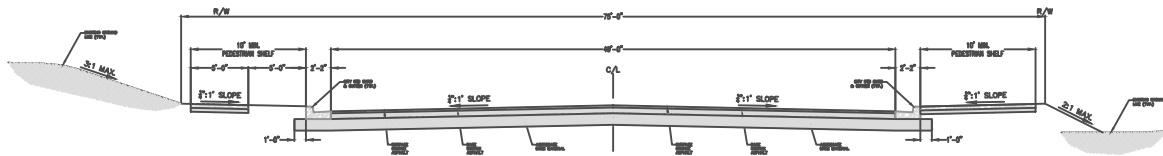
4-LANE UNDIVIDED

(ADT  $\geq 10,000$  VPD)



TYPICAL ROAD SECTION WITHOUT CURB & GUTTER

NOT TO SCALE



TYPICAL ROAD SECTION WITH CURB & GUTTER

NOT TO SCALE

MINIMUM PAVEMENT DESIGN REQUIREMENTS		
SURFACE	BASE	SUBBASE
2" ASPHALT SURFACE COURSE	6" ASPHALT COURSE	12" AGGREGATE SUBBASE MATERIAL

## NOTES:

- CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE VDOT ROAD AND BRIDGE SPECIFICATIONS AND VDOT ROAD AND BRIDGE STANDARD DRAWINGS, EXCEPT WHERE CITY STANDARDS ARE APPLICABLE.
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- UNDER-DRAINS SHALL BE INSTALLED IN ACCORDANCE WITH VDOT SPECIFICATIONS AND THE REQUIREMENTS OF THIS MANUAL.
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- STREET LIGHTING SHALL BE LOCATED WITHIN THE RIGHT-OF-WAY. CONTACT THE DEPARTMENT OF PUBLIC UTILITIES-STREETLIGHTS FOR REQUIREMENTS.

## NOTES

- SUPERCEDES ALL PVIOUS VERSIONS.

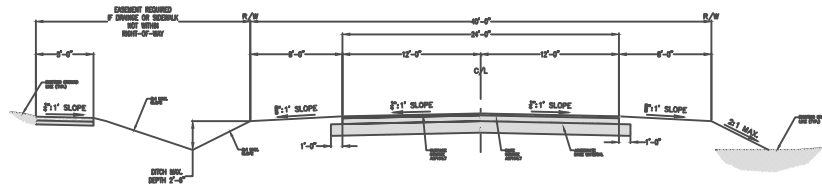


## ROADWAY GEOMETRIC DETAILS PRINCIPAL ARTERIAL ROADWAY-UNDIVIDED

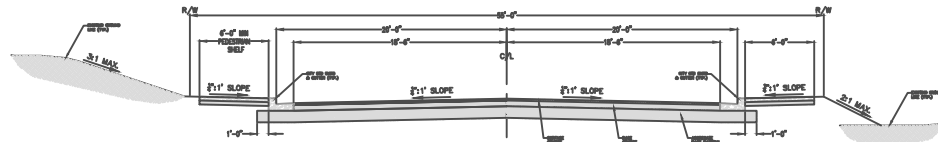
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# MINOR ARTERIAL ROADWAYS

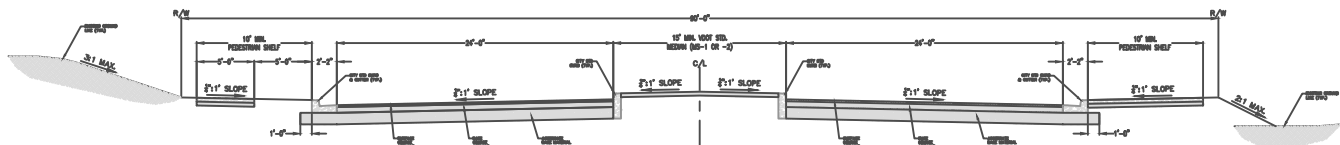
(6,000 ≤ ADT < 10,000 VPD)



TYPICAL ROAD SECTION WITHOUT CURB & GUTTER  
NOT TO SCALE



TYPICAL ROAD SECTION WITH CURB & GUTTER  
AND ON-STREET PARKING  
NOT TO SCALE



TYPICAL ROAD SECTION WITH CURB & GUTTER  
NOT TO SCALE

MINIMUM PAVEMENT DESIGN REQUIREMENTS		
SURFACE	BASE	SUBBASE
2" ASPHALT SURFACE COURSE	6" ASPHALT BASE COURSE	10" AGGREGATE SUBBASE MATERIAL

## NOTES:

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## NOTES

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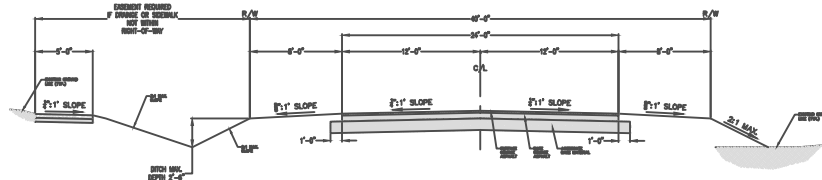
## ROADWAY GEOMETRIC DETAILS

### MINOR ARTERIAL ROADWAY

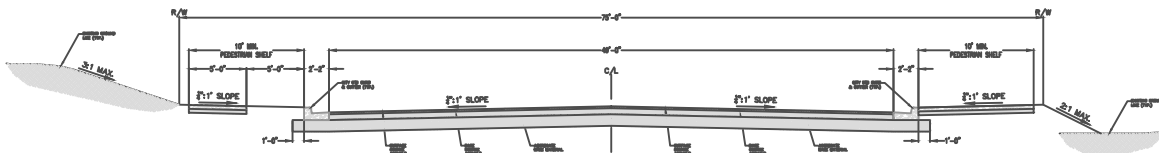
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# COLLECTOR STREETS

MAJOR (3,000 ≤ ADT < 6,000 VPD)  
MINOR (1,000 ≤ ADT < 3,000 VPD)



TYPICAL ROAD SECTION WITHOUT CURB & GUTTER  
NOT TO SCALE



TYPICAL ROAD SECTION WITH CURB & GUTTER  
NOT TO SCALE

MINIMUM PAVEMENT DESIGN REQUIREMENTS		
SURFACE	BASE	SUBBASE
2" ASPHALT SURFACE COURSE	6" ASPHALT COURSE	10" AGGREGATE SUBBASE MATERIAL

## NOTES:

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## NOTES

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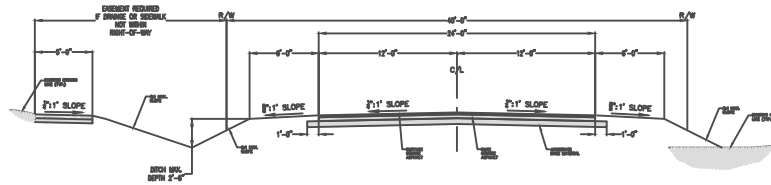


## ROADWAY GEOMETRIC DETAILS

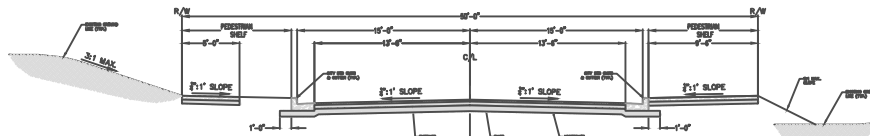
### COLLECTOR STREETS

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-TS-04
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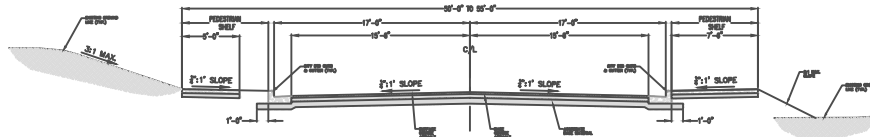
# LOCAL STREETS (ADT < 1,000 VPD)



TYPICAL ROAD SECTION WITHOUT CURB & GUTTER  
NOT TO SCALE



TYPICAL ROAD SECTION WITH CURB & GUTTER  
AND SHARED USE LANE  
NOT TO SCALE



TYPICAL ROAD SECTION WITH CURB & GUTTER,  
ON-STREET PARKING (ONE LANE) AND SHARED USE LANE  
NOT TO SCALE

MINIMUM PAVEMENT DESIGN REQUIREMENTS		
SURFACE	BASE	SUBBASE
2" ASPHALT SURFACE COURSE	4" ASPHALT BASE COURSE	6" AGGREGATE SUBBASE MATERIAL

## NOTES:

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- UNIFORM CROSS-SECTION WIDTH AND PAVEMENT DESIGN SHALL BE PROVIDED FOR ALL ROADWAYS.
- ADDITIONAL RIGHT-OF-WAY MAY BE REQUIRED FOR LANDSCAPING.
- A 10-FT MINIMUM PEDESTRIAN SHELF IS REQUIRED FOR LANDSCAPING WITH STREET TREES.
- IF AN IRRIGATION SYSTEM IS PROPOSED WITHIN THE RIGHT OF WAY, AN UNDER-DRAIN SYSTEM SHALL BE PROVIDED ADJACENT TO ANY CURB OR CURB & GUTTER. A MAINTENANCE AGREEMENT SHALL BE REQUIRED BETWEEN THE DEVELOPER AND CITY.
- STREET LIGHTING SHALL BE LOCATED WITHIN THE RIGHT-OF-WAY. CONTACT THE DEPARTMENT OF PUBLIC UTILITIES-STREETLIGHTS FOR REQUIREMENTS.

## NOTES

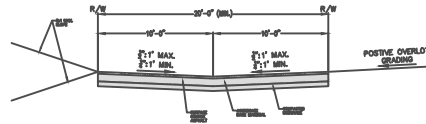
- SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS MINOR ARTERIAL ROADWAY

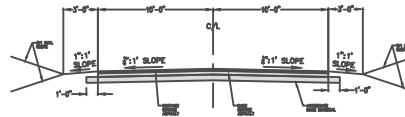
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## ALLEY SECTION (TYPICAL SECTION)



MINIMUM PAVEMENT DESIGN REQUIREMENTS	
SURFACE	SUBBASE
2" ASPHALT SURFACE COURSE	8" AGGREGATE SUBBASE MATERIAL

## PARK ROADWAY (TYPICAL SECTION)



MINIMUM PAVEMENT DESIGN REQUIREMENTS		
SURFACE	BASE	SUBBASE
2" ASPHALT SURFACE COURSE	4" ASPHALT BASE COURSE	6" AGGREGATE SUBBASE MATERIAL

### NOTES:

1. CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE VDOT ROAD AND BRIDGE SPECIFICATIONS AND VDOT ROAD AND BRIDGE STANDARD DRAWINGS, EXCEPT WHERE CITY STANDARDS ARE APPLICABLE.
2. MINIMUM PAVEMENT DESIGN DEPTHS ARE COMPACTED DEPTHS.
3. PAVEMENT AND SHOULDER DESIGN PAVEMENT DEPTHS ARE BASED ON A MINIMUM CBR VALUE OF 10. INCREASES TO THE REQUIRED DESIGN PAVEMENT STRATA SHALL BE BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. FINAL PAVEMENT DESIGN SHALL BE APPROVED BY THE DEPARTMENT OF PUBLIC WORKS.
4. UNDER-DRAINS SHALL BE INSTALLED IN ACCORDANCE WITH VDOT SPECIFICATIONS AND THE REQUIREMENTS OF THIS MANUAL.
5. PERMANENT EASEMENTS ARE REQUIRED FOR PUBLIC FACILITIES NOT WITHIN THE RIGHT-OF-WAY.
6. ALL ROADSIDE DITCHES SHALL BE SEEDED AND HAVE A PERMANENT STAND OF GRASS AS A MINIMUM. WHERE THE ROADSIDE DITCH 10-YEAR DESIGN VELOCITY EXCEEDS FOUR (4) FEET PER SECOND, JUTE MESH OR OTHER CHANNEL LINING SHALL BE INSTALLED. WHERE THE ROADSIDE DITCH 10-YEAR DESIGN VELOCITY EXCEEDS SEVEN (7) FEET PER SECOND, RIPRAP, CONCRETE OR OTHER ALTERNATE LINING SHALL BE PROVIDED. ALTERNATE LININGS SHALL BE DESIGNED UPON SOIL CONDITIONS, CERTIFIED BY A PROFESSIONAL ENGINEER, AND MAY BE ACCEPTED BY THE CITY.
7. UNIFORM CROSS-SECTION WIDTH AND PAVEMENT DESIGN SHALL BE PROVIDED FOR ALL ROADWAYS.

### NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.

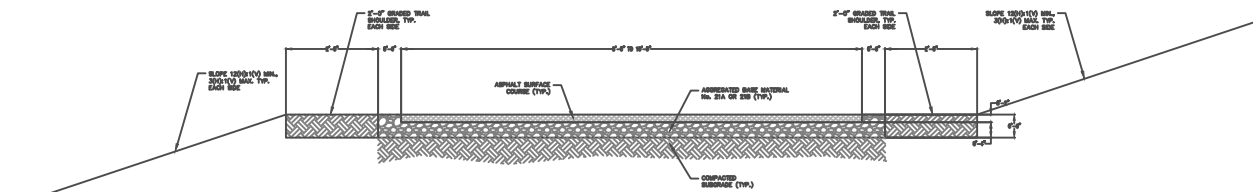


## ROADWAY GEOMETRIC DETAILS ALLEY SECTION & PARKS ROADWAY

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-TS-06
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# PATHWAY CROSS SECTION (TYPE I)



## NOTES

1. SUITABLE FOR BICYCLE AND GENERAL PEDESTALIAN USE.
2. MINIMUM TRAIL WIDTH SHALL BE 10'-0" FOR SHARED USE AND/OR BIKEWAYS. MINIMUM TRAIL WIDTH SHALL BE 5'-0" FOR WALKWAYS. FOR HEAVILY TRAVELED AREAS, TRAIL WIDTH MAY BE WIDER THAN THE MINIMUMS STATED.
3. TRAIL CROSS SLOPE SHALL BE GRADED TO DRAIN. THE MAXIMUM CROSS SLOPE FOR IMPROVED TRAIL SHALL NOT EXCEED 2% NOR LESS THAN 1%.
4. ASPHALT SURFACE COURSE SHALL BE SM-9.5A OR SM-12.5A; PLACED IN ACCORDANCE WITH THE PLACEMENT LIMITATIONS PER VDOT SPECIFICATIONS.

## NOTES

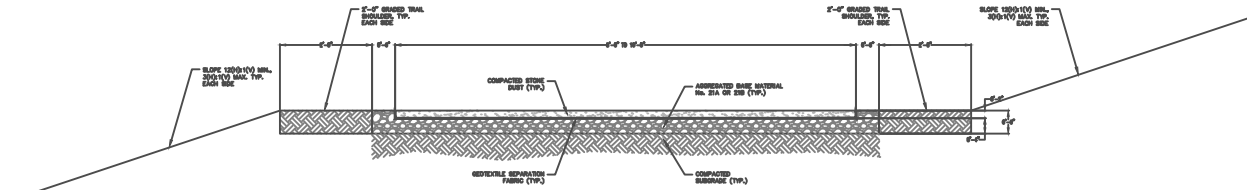
1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS CITY STD PATH - ASPHALT

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-TS-07
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# PATHWAY CROSS SECTION (TYPE II)



## NOTES

1. SUITABLE FOR HIKING, EQUESTRIAN, AND ALL-TERRAIN (MOUNTAIN) BICYCLE USE IN GENTLY SLOPED TOPOGRAPHY. THIS PATH TYPE IS SUSCEPTIBLE TO WASHOUTS AND SHEET EROSION ON SLOPES GREATER THAN 3%.
2. MINIMUM TRAIL WIDTH SHALL BE 10'-0" FOR SHARED USE AND/OR BIKEWAYS. MINIMUM TRAIL WIDTH SHALL BE 5'-0" FOR WALKWAYS. FOR HEAVILY TRAVELED AREAS, TRAIL WIDTH MAY BE WIDER THAN THE MINIMUMS STATED.
3. TRAIL CROSS SLOPE SHALL BE GRADED TO DRAIN. THE MAXIMUM CROSS SLOPE FOR IMPROVED TRAIL SHALL NOT EXCEED 2% NOR LESS THAN 1%.

## NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.

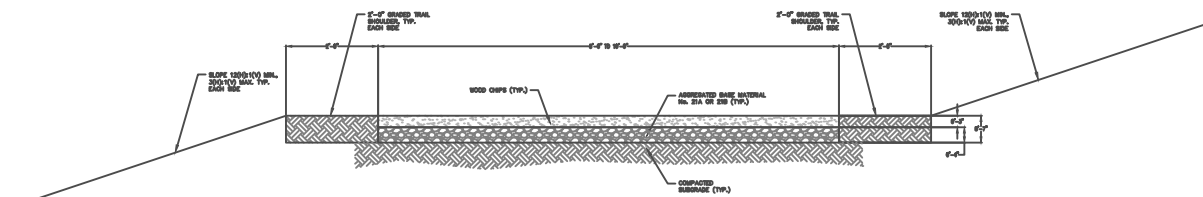


## ROADWAY GEOMETRIC DETAILS CITY STD PATH - STONE DUST

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-TS-08
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PATHWAY  
CROSS SECTION

(TYPE III)



## NOTES

1. SUITABLE FOR HIKING OR EQUESTRIAN USE.
2. MINIMUM TRAIL WIDTH SHALL BE 10'-0" FOR SHARED USE AND/OR BIKEWAYS. MINIMUM TRAIL WIDTH SHALL BE 5'-0" FOR WALKWAYS. FOR HEAVILY TRAVELED AREAS, TRAIL WIDTH MAY BE WIDER THAN THE MINIMUMS STATED.
3. TRAIL CROSS SLOPE SHALL BE GRADED TO DRAIN. THE MAXIMUM CROSS SLOPE FOR IMPROVED TRAIL SHALL NOT EXCEED 2% NOR LESS THAN 1%.
4. ENGINEERED WOOD FIBER MATERIAL MAY BE USED IN LIEU OF WOOD CHIPS.

## NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.



ROADWAY GEOMETRIC DETAILS  
CITY STD PATH – WOOD CHIPS

**REFERENCES:**

## REVISIONS

DEPARTMENT OF PUBLIC WORKS  
RICHMOND, VIRGINIA

**DRAWN BY:**  
**DPW**

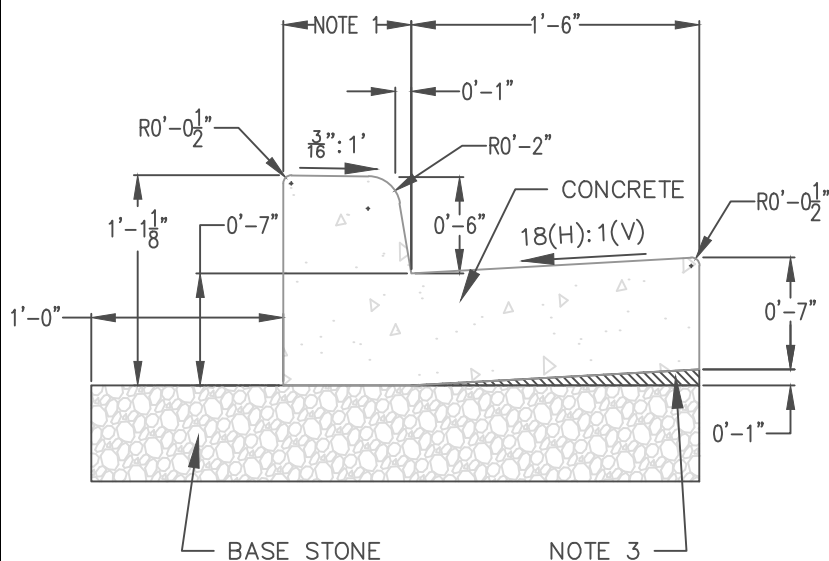
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FIELD NOTES

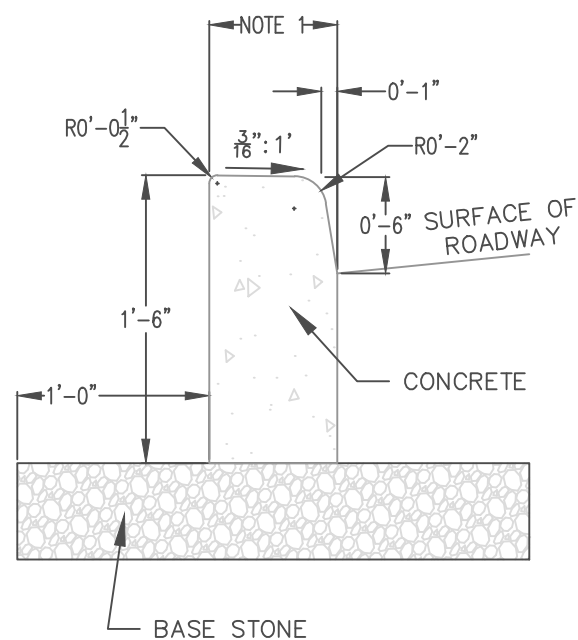
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**DATE:**  
**8/31/18**

DRAWING NO.  
RGM-TS-09



## MONOLITHIC CONCRETE CURB & GUTTER



## CONCRETE CURB

### NOTES:

1. CURB THICKNESS SHALL BE 8" IN COMMERCIAL, CENTRAL BUSINESS DISTRICT, INDUSTRIAL, THE FAN, HIGH DENSITY AND MULTI-FAMILY AREAS. CURB THICKNESS SHALL BE 6" IN SINGLE-FAMILY RESIDENTIAL AREAS.
2. BASE STONE SHALL MATCH ROADWAY PAVEMENT SECTION OR BE 6" COMPACTED THICKNESS, WHICHEVER IS THICKER. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B.
3. THE BOTTOM OF THE CURB AND GUTTER MAY BE CONSTRUCTED PARALLEL TO THE SLOPE OF SUB-BASE COURSE, PROVIDED A MINIMUM DEPTH OF 7" IS MAINTAINED.
4. CONCRETE SHALL BE CLASS A3 (MIN.).

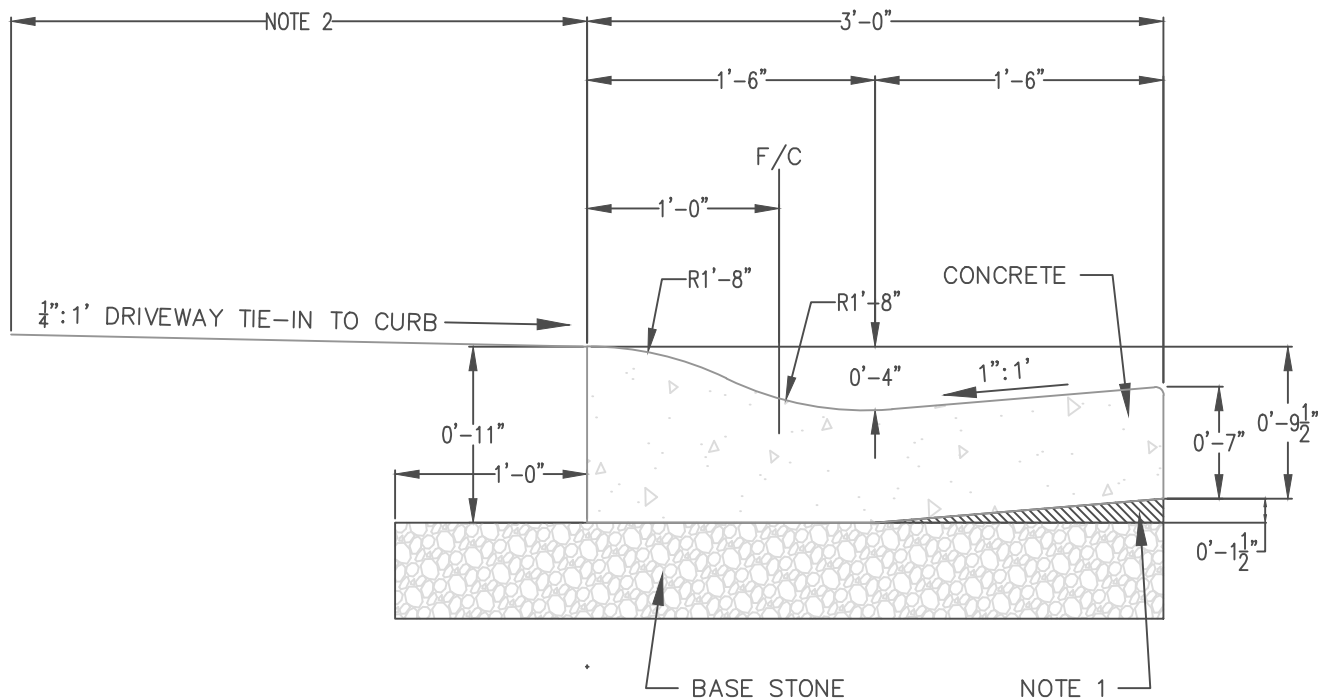
### NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS MONOLITHIC CURB AND CURB & GUTTER

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-01
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NOTES:

1. THE BOTTOM OF THE CURB AND GUTTER MAY BE CONSTRUCTED PARALLEL TO THE SLOPE OF SUB-BASE COURSE, PROVIDED A MINIMUM DEPTH OF 7" IS MAINTAINED.
2. TIE-IN DISTANCE SHALL BE 6' OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS GREATER. SLOPE OF TIE-IN SHALL MATCH PEDESTRIAN SHELF.
3. BASE STONE SHALL MATCH ROADWAY PAVEMENT SECTION OR BE 6" COMPACTED THICKNESS, WHICHEVER IS THICKER. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B.
4. CONCRETE SHALL BE CLASS A3 (MIN.).
5. APRONS ARE NOT REQUIRED AT DRIVEWAYS WITH ROLL-FACE CURB & GUTTER UNLESS A CURB DETAIL IS USED.
6. TYPE 'B' NOSING IS REQUIRED ON ALL INLETS INSTALLED WITH ROLL-FACE CURB & GUTTER. SEE ROLL-FACE TRANSITIONS IN VDOT ROAD & BRIDGE STANDARDS.
7. THIS STANDARD IS FOR REPAIR OR RENOVATION OF EXISTING ROLL-FACE CURB & GUTTER ONLY. ALL NEW CURB & GUTTER INSTALLATIONS SHALL UTILIZE CITY STANDARD CURB AND GUTTER.

## NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS

### MONOLITHIC CURB AND CURB & GUTTER

**REFERENCES:**

## REVISIONS

DEPARTMENT OF PUBLIC WORKS  
RICHMOND, VIRGINIA

**DRAWN BY:**  
DPW

**CHECKED BY:**

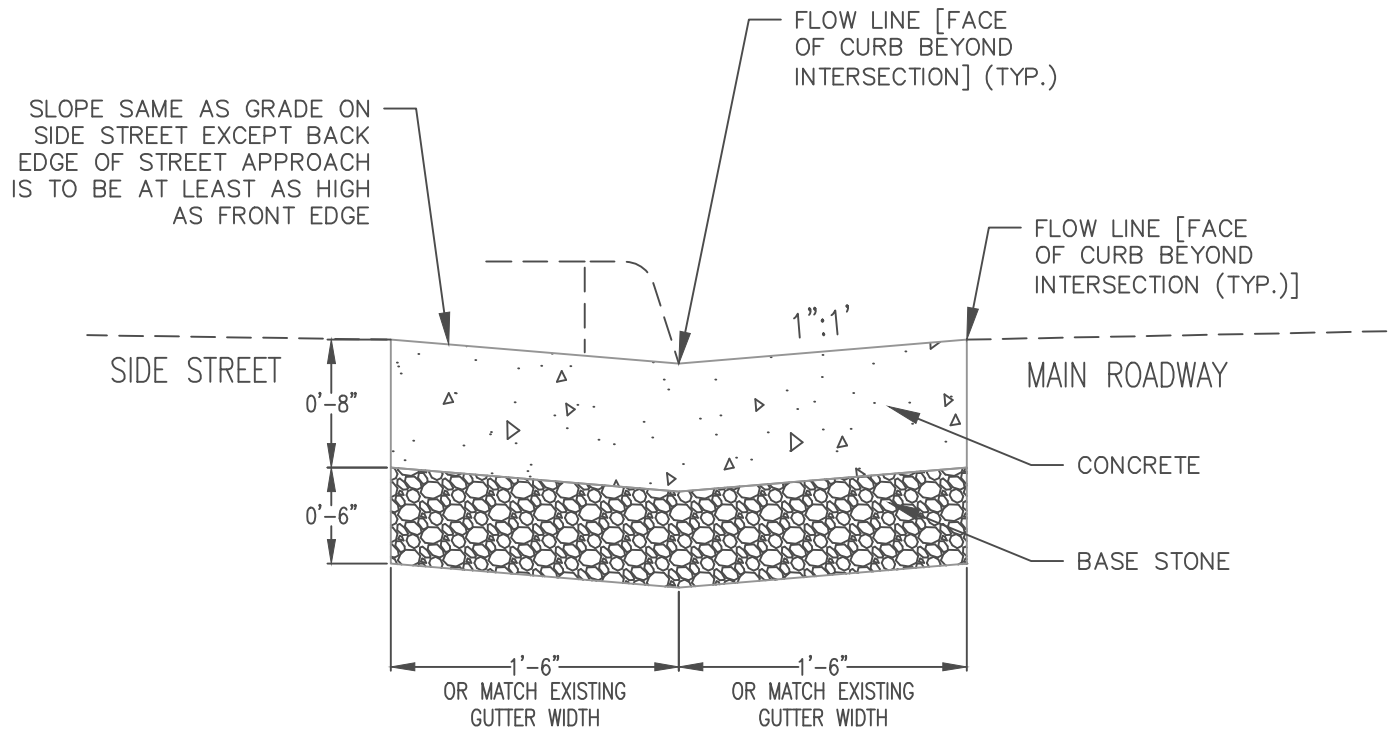
FIELD NOTES

SCALE:  
NO SCALE

**DATE:**  
8/31/18

DRAWING NO.  
RGM-CD-02

# STANDARD VALLEY GUTTER



## NOTES:

1. CONCRETE SHALL BE CLASS A3 (MIN.)
2. BASE STONE SHALL BE 6" (MIN.) COMPACTED THICKNESS 21A OR 21B

### NOTES

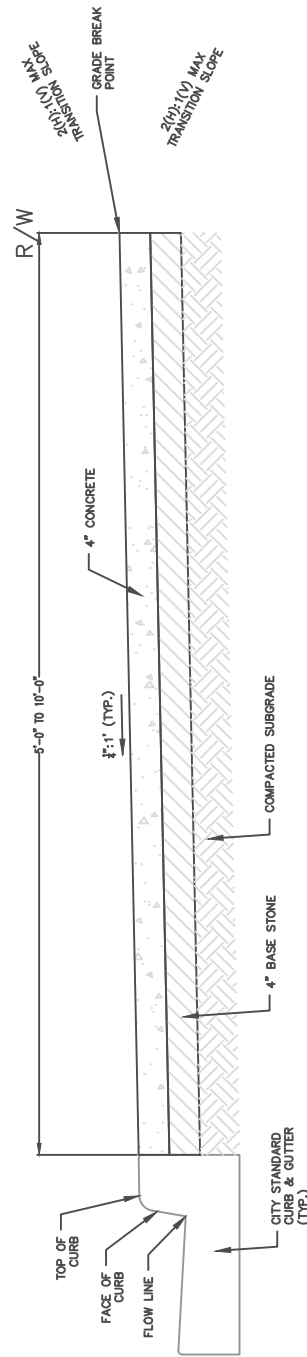
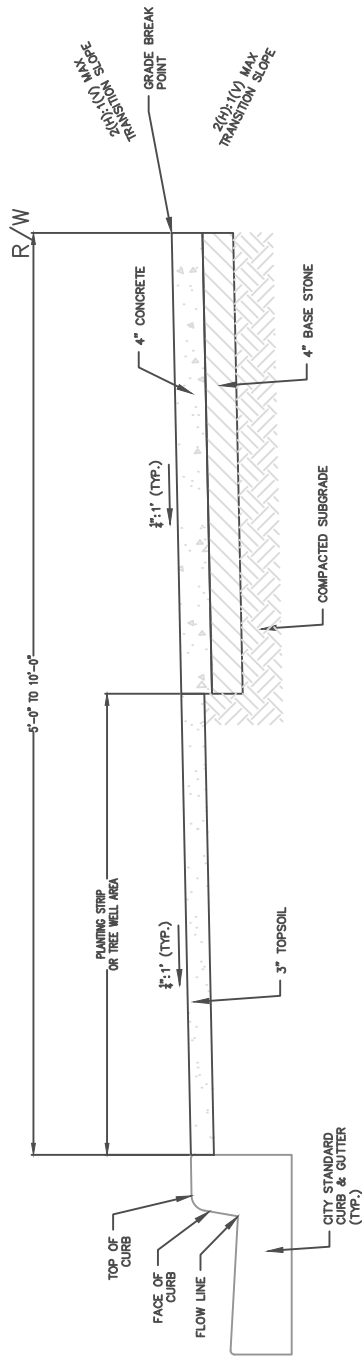
1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS MONOLITHIC CURB AND CURB & GUTTER

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-03
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# CONCRETE SIDEWALK



## NOTES - ALL CONCRETE SIDEWALKS:

1. ACCESSIBLE PATH SHALL CONFORM WITH ADA (MAXIMUM CROSS SLOPE OF  $\frac{1}{4}$ :1').
2. PLANTING STRIPS, WHERE USED, SHALL BE A MINIMUM OF 3'.
3. TREE WELL DIMENSIONS ARE TYPICALLY 5'X5'. TREE WELL DIMENSIONS MAY VARY CONTINGENT ON AVAILABLE SPACE AND SELECTED TREE SPECIES.
4. SCORING PATTERN SHALL BE 5'X5' TYPICAL. 5'X5' ALTERNATE POUR PLACEMENT METHOD IS PERMISSIBLE. ALIGN ANY SCORING AND/OR JOINT PATTERNS WITH EXISTING ADJACENT CONCRETE SIDEWALK.
5. WELDED WIRE FABRIC OR STEEL REINFORCEMENT IS PROHIBITED UNLESS BY SPECIAL DESIGN AND CITY APPROVAL.
6. CONCRETE SHALL BE AIR ENTRAINED CLASS A3 (MIN.), PER VDOT SPECIFICATIONS.
7. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B. ALTERNATE BASE STONE MAY BE USED WITH APPROVAL OF THE ENGINEER.

## NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS CONCRETE SIDEWALK

REFERENCES:

REVISIONS

DEPARTMENT OF PUBLIC WORKS  
RICHMOND, VIRGINIA

DRAWN BY:  
DPW

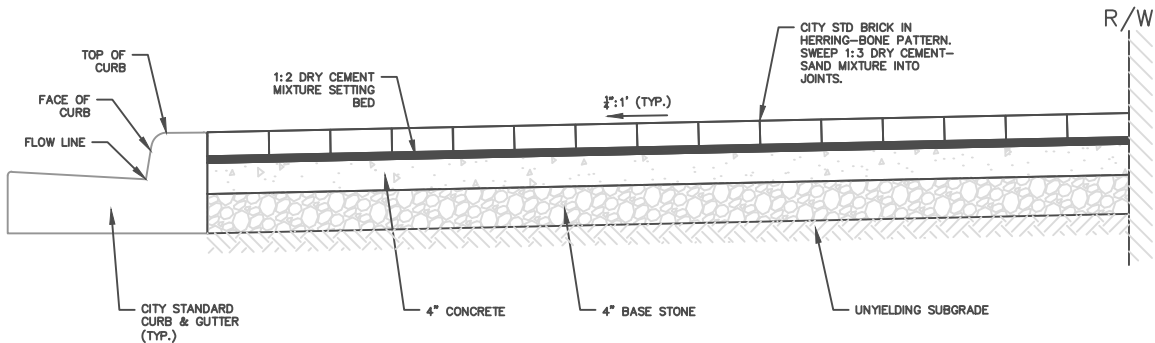
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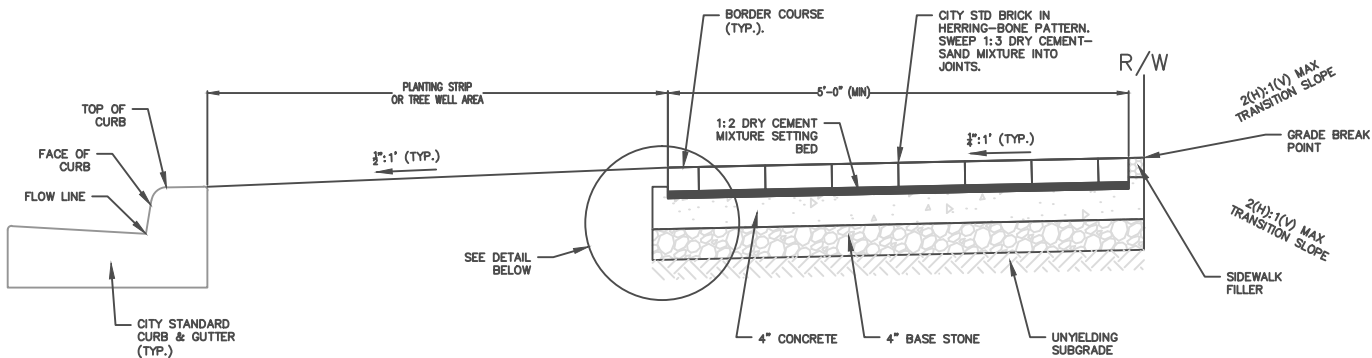
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DATE:  
8/31/18

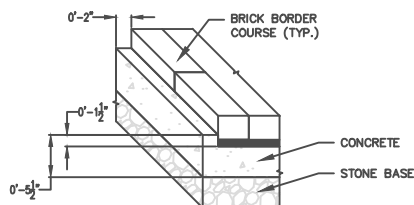
DRAWING NO.  
RGM-CD-04



**TYPE A - FULL WIDTH BRICK SIDEWALK**  
NOT TO SCALE



**TYPE B - BRICK SIDEWALK WITH GREEN SPACE**  
NOT TO SCALE



**BORDER COURSE DETAIL**  
NOT TO SCALE

**NOTES:**

1. FULL WIDTH BRICK SIDEWALK SHALL BE USED CITYWIDE, DOWNTOWN OR IN COMMERCIAL ZONES.
2. ACCESSIBLE PATH SHALL CONFORM WITH ADA (MAXIMUM CROSS SLOPE OF  $\frac{1}{4}\":1'$ ).
3. PLANTING STRIPS, WHERE USED, SHALL BE A MINIMUM OF 3'.
4. TREE WELL DIMENSIONS ARE TYPICALLY 5'X5'. TREE WELL DIMENSIONS MAY VARY CONTINGENT ON AVAILABLE SPACE AND SELECTED TREE SPECIES.
5. PREFABRICATED EDGE RESTRAINT MAY BE USED ON A CASE BY CASE BASIS WHERE APPROVED THE (CITY) ENGINEER.
6. SIDEWALK FILLER MAY BE TOPSOIL, CONCRETE, OR OTHER APPROVED MATERIALS DEPENDING ON ADJACENT USE.
7. BRICK HERRING BONE PATTERN SHALL BE ORIENTED 45° TO THE PEDESTRIAN TRAVEL PATH.
8. CONCRETE SHALL BE AIR ENTRAINED CLASS A3 (MIN.), PER VDOT SPECIFICATIONS.
9. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B. ALTERNATE BASE STONE MAY BE USED WITH APPROVAL OF THE ENGINEER.
10. SUBGRADE SHALL BE SHAPED TO  $\pm\frac{1}{2}"$  TOLERANCE OF FINISHED CROSS SECTION.

**NOTES**

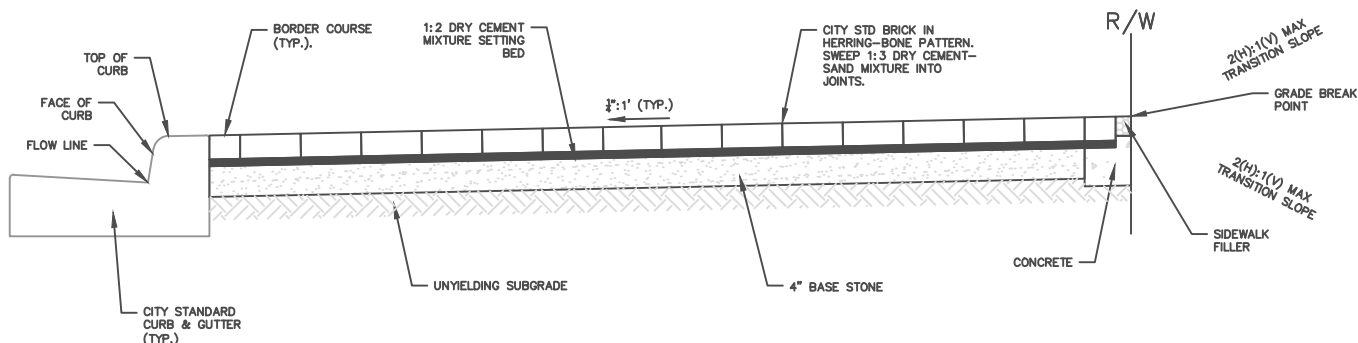
1. SUPERCEDES ALL PREVIOUS VERSIONS.



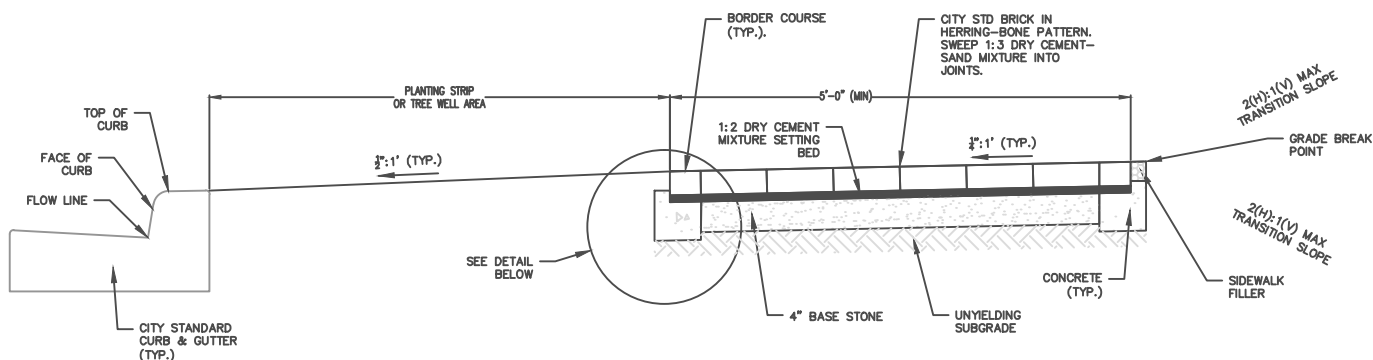
**ROADWAY GEOMETRIC DETAILS**  
**BRICK SIDEWALK (NEW CONSTRUCTION)**

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-05
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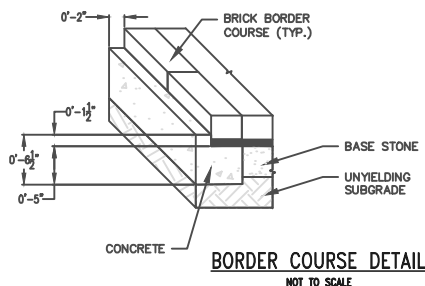




TYPE C - FULL WIDTH BRICK SIDEWALK  
NOT TO SCALE



TYPE D - BRICK SIDEWALK WITH GREEN SPACE  
NOT TO SCALE



BORDER COURSE DETAIL  
NOT TO SCALE

**NOTES:**

1. THESE DETAILS ARE FOR REPAIR ONLY. IF REPAIRS EXCEED  $\frac{1}{3}$  OF THE TOTAL BLOCK FACE/LENGTH, THEN EXISTING BRICK SIDEWALKS SHALL BE UPGRADED TO THE STANDARD FOR NEW CONSTRUCTION (RGD-12).
2. FULL WIDTH BRICK SIDEWALK SHALL BE USED CITYWIDE, DOWNTOWN OR IN COMMERCIAL ZONES.
3. ACCESSIBLE PATH SHALL CONFORM WITH ADA (MAXIMUM CROSS SLOPE OF  $\frac{1}{4}\text{:}1$ ).
4. PLANTING STRIPS, WHERE USED, SHALL BE A MINIMUM OF 3'.
5. TREE WELL DIMENSIONS ARE TYPICALLY 5'X5'. TREE WELL DIMENSIONS MAY VARY CONTINGENT ON AVAILABLE SPACE AND SELECTED TREE SPECIES.
6. PREFABRICATED EDGE RESTRAINT MAY BE USED ON A CASE BY CASE BASIS WHERE APPROVED THE ENGINEER.
7. SIDEWALK FILLER MAY BE TOPSOIL, CONCRETE, OR OTHER APPROVED MATERIALS DEPENDING ON ADJACENT USE.
8. BRICK HERRING BONE PATTERN SHALL BE ORIENTED 45° TO THE PEDESTRIAN TRAVEL PATH.
9. CONCRETE SHALL BE AIR ENTRAINED CLASS A3 (MIN.), PER VDOT SPECIFICATIONS.
10. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B. ALTERNATE BASE STONE MAY BE USED WITH APPROVAL OF THE ENGINEER.
11. SUBGRADE SHALL BE SHAPED TO  $\pm\frac{1}{2}$ " TOLERANCE OF FINISHED CROSS SECTION.

**NOTES**

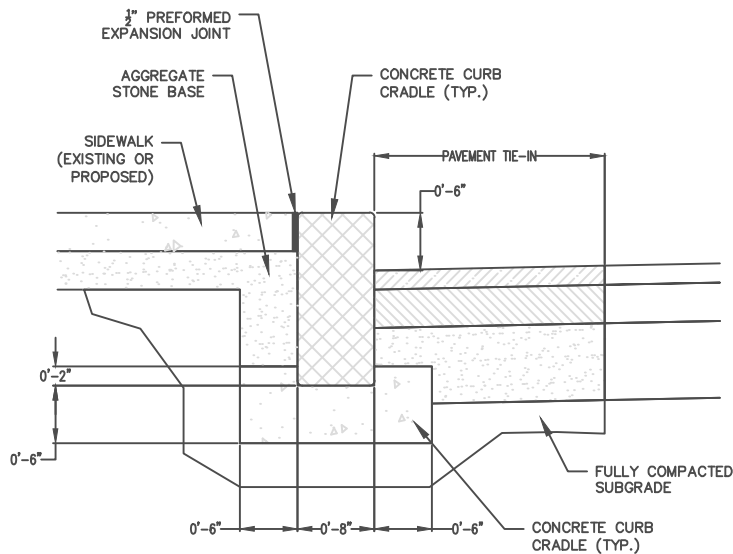
1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS BRICK SIDEWALK (REPAIR ONLY)

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-06
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## STANDARD GRAINTE CURB



NOTES:

1. BRACE AND SUPPORT GRANITE CURB ON FINAL GRADE PRIOR TO POURING OF GRANITE CURB CRADLE.
2. GRANITE CURB REVEAL TO BE 6" OR TO MATCH ADJACENT EXISTING REVEAL.
3. GRANITE CURB WIDTH MAY VARY. GRANITE CURB TO MATCH ADJACENT EXISTING GRANITE CURB TO THE EXTENT PRACTICABLE. CONTRACTOR SHALL PROVIDE A SAMPLE FOR CITY REVIEW AND APPROVAL PRIOR TO INSTALLATION.
4. CONCRETE CURB CRADLE SHALL NOT EXCEED 2" UP THE SIDES OF THE GRANITE CURB.
5. CONCRETE SHALL CLASS A3 (MIN.), PER VDOT SPECIFICATIONS.
6. BASE STONE SHALL CONSIST OF AGGREGATE BASE MATERIAL 21A OR 21B. ALTERNATE BASE STONE MAY BE USED WITH APPROVAL OF THE ENGINEER.
7. PAVEMENT TIE-IN SHALL TO MEET MINIMUM CITY STANDARDS OR EXISTING PAVEMENT SECTION.

## NOTES

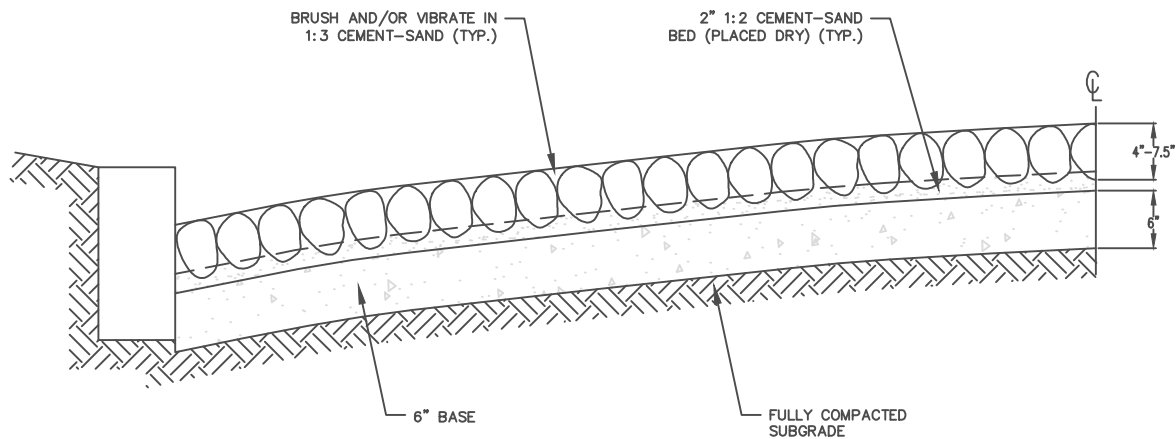
1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS

### GRANITE CURB DETAIL

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-07
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CONSTRUCTION NOTES:

SUBBASE PREPARATION:

1. SHAPE SUBGRADE TO CORRECT ELEVATIONS.
2. PROFILE GRADE SHALL MAINTAIN A STRAIGHT LINE ON A CONTINUOUS POSITIVE FALL ON VALLEY OR STRAIGHT LINE CROSS-SECTION.
3. SUBGRADE SHALL BE PLACED IN A MINIMUM STATE OF 95% COMPACTION BY STANDARD PROCTOR, AND SHALL BE PROVEN NON-YIELDING THROUGHOUT.
4. SUBGRADE ELEVATION CHECKS SHALL ACCOMMODATE EXISTING FACILITIES (THRESHOLDS, DOWNSPOUTS, WINDOW WELLS, STAIR WELLS, ETC.) WITHOUT CREATING DRAINAGE ISSUES.
5. 6" BASE SHALL BE AGGREGATE BASE MATERIAL (21A OR 21B) OR 3,000 (MIN.) PSI CONCRETE AS REQUIRED BY THE ENGINEER.

GRANITE SPALL PLACEMENT

1. GRANITE SPALL OR PAVING BLOCKS SHALL BUTTRESS TIGHTLY AGAINST EACH UNIT AND SHALL BE SET ON A 2" (MIN.) CEMENT-SAND (1:2 MIX) SETTING BED.
2. CEMENT-SAND (1:3) MIX SHALL PROVIDE THE VOID FILLER MATERIAL BETWEEN EACH UNIT.
3. FILLER MATERIAL SHALL BE SWEEPED INTO AND/OR VIBRATED INTO THE VOIDS TO A STATE OF TOTAL REFUSAL. THE CEMENT-SAND MIX SHALL BE WATERED BETWEEN EACH LAYER.
4. AFTER TOTAL REFUSAL HAS BEEN OBTAINED, THE FILLER MATERIAL SHALL BE WETTED DOWN COMPLETELY THEN ALLOWED TO DRY.

NOTES

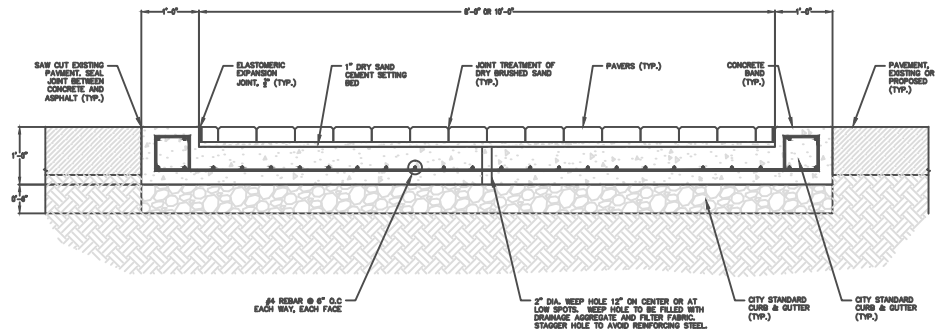
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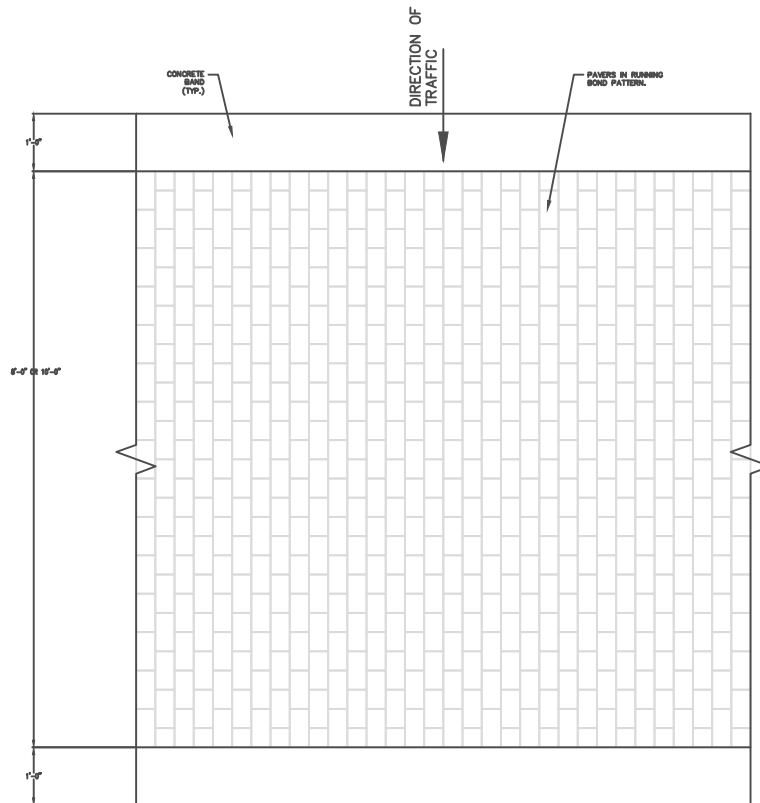
## ROADWAY GEOMETRIC DETAILS

### GRANITE SPALL PAVEMENT DETAIL

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-08
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PAVER CROSSWALK - TYPICAL SECTION  
NOT TO SCALE



PAVER CROSSWALK - PARTIAL PLAN  
NOT TO SCALE

- NOTES:
1. PAVERS SHALL CONFORM TO CITY STANDARDS.
  2. SAND CEMENT RATIO IS 2 PARTS SAND TO 1 PART CEMENT.
  3. MASON SAND TO BE USED FOR JOINT TREATMENT

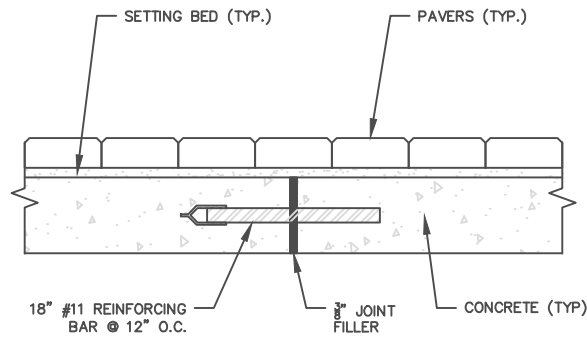
NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.



ROADWAY GEOMETRIC DETAILS  
PAVER CROSSWALK

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-09
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**NOTES:**

1. ALL WORK SHALL ALSO BE IN ACCORDANCE WITH THE CITY'S STANDARD PAVER CROSSWALK CONSTRUCTION DETAIL. THE NOTES FOLLOWING THIS NOTE ARE TO MORE CLARIFY THE REQUIREMENTS OF THIS DETAIL.
2. CONSTRUCTION JOINTS IN THE CONCRETE SHALL BE FORMED AROUND ALL APPURTENANCES SUCH AS MANHOLES, VALVE BOXES, AND METERS, THAT EXTEND INTO OR THROUGH THE CROSSWALK. THESE JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALED WITH SILICONE JOINT SEALANT IN ACCORDANCE WITH VDOT STD PR-2.
3. EXTENSION OF CONCRETE BASE SHALL FOLLOW VDOT STD. PR-2 FOR TRANSVERSE EXPANSION JOINT.
4. SETTING BED SHALL CONFORM CITY SPECIFICATIONS AND HAVE A SAND CEMENT RATIO OF 2 PARTS SAND TO 1 PART CEMENT.
5. PAVERS SHALL CONFORM TO CITY STANDARDS. A SAMPLE OF THE PAVING UNITS TO BE USED SHALL BE SUBMITTED AND THE FINAL COLOR SELECTION SHALL BE APPROVED BY THE PROJECT MANAGER.
6. JOINTS (EXCEPT FOR EXPANSION JOINTS) BETWEEN PAVING UNITS SHAL BE HAND TIGHT, SAND SWEEPED AND NOT TO EXCEED  $\frac{1}{4}$ ". MASON SAND SHALL BE USED FOR JOINT TREATMENT.
7. PAVING UNITS SHALL BE PLACED AND VIBRATED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. WHEN NECESSARY TO CUT PAVERS, THE PAVER TO BE TRIMMED SHALL BE SAW CUT WITH NO APPARENT SPALLS OR BREAKS.
8. PAVING FOR PAVING UNITS SHALL BE RUNNING BOND PATTERN, MATCH EXISTING, AND ORIENTED AT RIGHT ANGLE TO THE CONCRETE EDGE RESTRAINT OR LONGITUDINAL EDGE.
9. EXISTING PAVEMENT TO BE REMOVED SHALL BE SAW CUT AND EXCAVATED AS NECESSARY FOR THE CONSTRUCTION OF THE CROSSWALK.
10. PAVING WORK SHALL BE PLUMB AND TRUE TO LINE AND GRADE AND SHALL BE INSTALLED TO COINCIDE WITH ADJACENT WORK AND ELEVATIONS.

**NOTES**

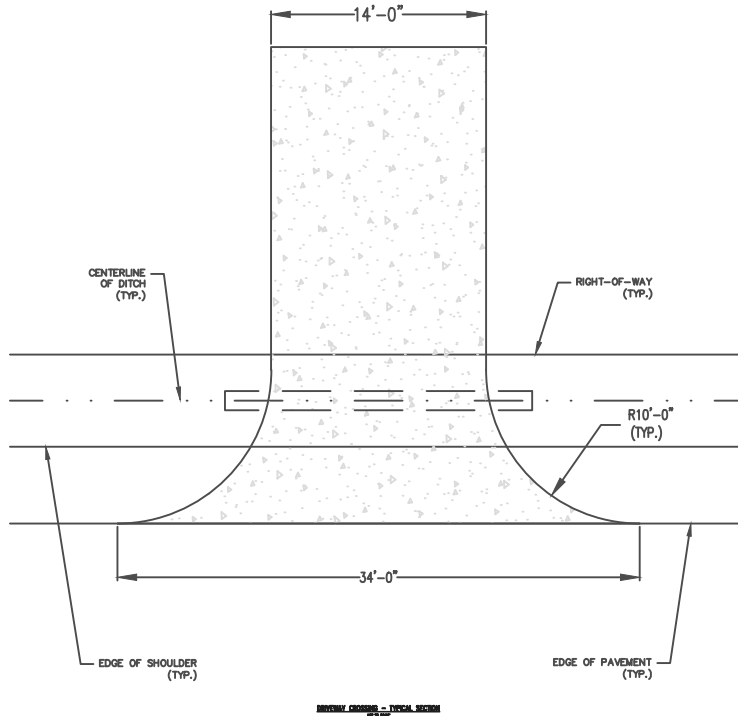
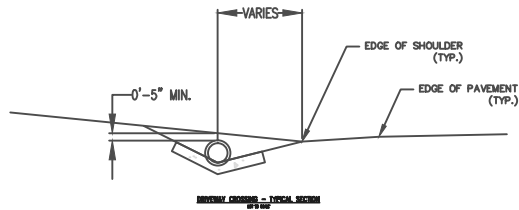
1. SUPERCEDES ALL PREVIOUS VERSIONS.



## ROADWAY GEOMETRIC DETAILS

### PAVER CROSSWALK EXPANSION JOINT

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-10
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- NOTES:**
1. ALL PORTIONS OF THE DRIVEWAY CROSSING, DITCHLINE, AND ADJACENT RIGHT OF WAY SHALL BE MAINTAINED BY THE BENEFITED PROPERTY OWNER.
  2. ALL CULVERTS SHALL BE A MINIMUM OF 20' IN LENGTH.
  3. ALL CULVERTS SHALL BE CLASS III REINFORCED CONCRETE PIPE.
  4. THE CULVERT PIPE SIZE SHALL BE DETERMINED THROUGH NORMAL HYDROLOGY AND HYDRAULIC CALCULATIONS FOR THE LOCATION. THE PIPE SIZE SHALL BE SHOWN ON THE PLANS. THE MINIMUM ACCEPTABLE PIPE DIAMETER IS 15".
  5. THE PORTIONS OF CONCRETE DRIVEWAYS WITHIN THE RIGHT OF WAY SHALL BE AT LEAST 6" THICK. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3,000 PSI (VDOT AS CONCRETE). AN EXPANSION JOINT SHALL BE PLACED AT THE RIGHT-OF-WAY LINE.
  6. ASPHALT DRIVEWAYS SHALL CONSIST OF A MINIMUM OF 6" BASE COURSE AND 2" SURFACE COURSE.
  7. ALL IMPROVED DRIVEWAYS SHALL EXTEND TO THE EDGE OF PAVEMENT AND SHALL FULLY MEET THE ROAD SECTION.
  8. TRANSITIONS OF THE DITCHLINE TO PIPE CULVERT SHALL BE A MINIMUM OF 10' IN LENGTH ON BOTH ENDS OF THE CULVERT.
  9. A PAVED DITCH SHALL BE PROVIDED WHERE SOIL CONDITIONS AND DITCH VELOCITIES CAUSE EROSION. CONCRETE USED FOR PAVED DITCHES SHALL HAVE WELDED WIRE FABRIC (W6X6) AS A MINIMUM REINFORCEMENT. THE THICKNESS OF CONCRETE USED FOR PAVED DITCHES SHALL FOLLOW VDOT PG-2A IN THE VDOT ROAD AND BRIDGE STANDARDS, CURRENT EDITION.
  10. IN AREAS WHERE THE AFOREMENTIONED DITCHLINE GRADING CAN NOT BE ACHIEVED, THE PERMITTEE SHALL PROVIDE ALTERNATE STABILIZATION METHODS AND MATERIALS AT LEAST 10' IN LENGTH ON BOTH ENDS OF THE CULVERT.
  11. ALL DRIVEWAY GRADES SHALL START IN BACK OF THE EDGE OF SHOULDER LINE.
  12. GRADING TIE-INS AT THE SIDES OF THE DRIVEWAY SHALL BE GRADED NOT TO EXCEED A 3(H):1(V) SLOPE.
  13. FOR CONTEXTUAL DESIGNS, THE DRIVEWAY WIDTH MAY BE REDUCED TO 12'. ALSO, RADII MAY BE MODIFIED, RANGING FROM NOT LESS THAN 5' NOR GREATER THAN 10'.

#### NOTES

1. SUPERCEDES ALL PREVIOUS VERSIONS.

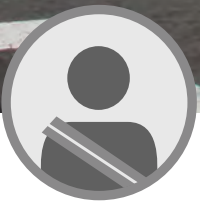


## ROADWAY GEOMETRIC DETAILS STANDARD DRIVEWAY CULVERT

REFERENCES:	REVISIONS	DEPARTMENT OF PUBLIC WORKS RICHMOND, VIRGINIA	DRAWN BY: DPW	CHECKED BY:	FIELD NOTES	SCALE: NO SCALE	DATE: 8/31/18	DRAWING NO. RGM-CD-11
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# Part 3

## Right-of-Way Excavation & Restoration Manual



**BETTER STREETS**  
CITY OF RICHMOND



***CITY OF RICHMOND***  
***Department of Public Works***

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### **FOREWORD**

- Chapter 90 Article VII. of the Code of the City of Richmond specifically addresses EXCAVATION IN PUBLIC RIGHT-OF-WAY. See Attachment 1, Ordinance 2005-113-55 and Attachment 2, Ordinance 2005-205-173.
- The Policy for excavation in the public right-of-way is to coordinate excavations with one another, to coordinate excavations with ongoing or scheduled construction and maintenance work by the City, to complete excavation work before the City begins construction and maintenance work, and to minimize impediment and inconvenience.
- The Department of Public Works shall have a three-year street construction plan of proposed reconstruction, repaving, and resurfacing of the public rights-of-way whereby the Director shall not issue a permit for excavation in any public right-of-way (except for good cause) that has been constructed, reconstructed, repaved, or resurfaced in the preceding three years. Twice yearly, owners must submit an updated, three-year excavation plan in a specified GIS format for DPW to compile and integrate into a complete database of work in the right-of-way. See Attachment 3 for the specifications for the submittal in GIS format and for a description of the integration, coordination and tracking of this information.
- The City has established a utility coordination committee composed of a representative of DPW, DPU, DCD and an advisory representative, that was a permittee from the previous calendar year. The purpose of the Committee shall be to coordinate street and utility projects with the goal of minimizing the frequency of pavement cuts and openings.



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- The Department of Public Works Office of Right-of-Way Management, located at Room 603 in the City Hall Building (telephone 804-646-0435), has the fundamental responsibility of facilitating and enabling planned use, development, and movement within the City rights-of-way. This office will coordinate all work within the public right-of-way to minimize the adverse impact of excavation and construction, to facilitate construction means and methods to protect the City's investment, conduct inspections and to provide for public safety.
  
- The Director shall promulgate rules and regulations necessary to minimize the adverse impact of excavation in the public rights-of-way. It is the focus of this Excavation & Restoration Manual to include the general policy and uniform specifications and standards specific to right-of-way practices and policies, and requirements of infrastructure design, construction and management under the scope and purview of the Department of Public Works, in conjunction with other stakeholders in the public right-of-way.
  
- Permittee is responsible to obtain and comply with the most current information from the Department of Public Works including the City of Richmond Right-of-Way Design and Construction Standards Manual in order to adequately perform the work.



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### **1. GENERAL**

#### **1.1 EXCAVATION IN THE PUBLIC RIGHT-OF-WAY**

This manual shall govern excavation in the public rights-of-way within the City of Richmond to minimize the adverse impact of such excavation on the City's investment in its system of public rights-of-way.

The City owns and maintains public rights-of-way within the City for the benefit of its citizen. The Director of Public Works is responsible for managing use of the public rights-of-way.

This policy applies to all excavation in the public right-of-way, whether the excavator is private or public

#### **1.2 DEFINITIONS**

For purpose of this policy, the following terms shall have the following meanings:

**“Annual Permit”** means a single permit issued to cover repetitive work by a permittee in the public right-of-way (see Attachment 26).

**“Applicant”** means a person or duly authorized agent thereof who submits an application for a permit to Work in Streets and Alleys.

**“As-built drawing”** means a drawing or plan that shows the horizontal and vertical alignment, facility dimensions, type of encasement, and any other information



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required by the Director of Public Works to help identify and protect the facility installed in the right-of-way.

**“Block”** means that part of the public right-of-way that includes the street area from the property line to the parallel and/or opposite property line in width and extending from the centerline of an intersecting street to the nearest property line or to the centerline of the next intersecting street in length.

**“City”** means the City of Richmond, Virginia.

**“Department”** means the Department of Public Works (DPW).

**“Deposit”** means any bond, letter of credit, corporate check, cash deposit, or other security provided by the applicants in accordance with their permit or franchise agreement and is acceptable to the City of Richmond pursuant to the Code of Virginia.

**“Destructive work”** means work that requires destruction of infrastructure in the right-of-way in order to construct the permitted facilities and improvements.

**“Director”** means the Director of the Department of Public Works or designee thereof.

**“Downtown Richmond Coordination Zone”** means the area bounded by Interstate 95, the Interstate 64 corridor, 1<sup>st</sup> Street and the Interstate 195/Downtown Expressway corridor. Special conditions apply to excavations in this Zone including specific application deadlines and time for excavation.





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**“Emergency excavation”** means excavation in the public right-of-way as a result of a sudden or unexpected occurrence involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.

**“Excavation”** means any work in Public Right-of-Way that removes, fills or otherwise disturbs soil, pavement, driveways, curbs, or sidewalks, including, but not limited to, installing, servicing, repairing or modifying any facility or facilities in or under the surface and the restoration of the subsurface or surface, including pavement markings.

**“Excavation sequence”** means a document describing the order, estimated start dates and estimated completion dates of all excavation projects approved during a six-month period.

**“Facility”** or **“Facilities”** means property or equipment permanently located or proposed to be permanently located in the public right-of-way and includes, but is not limited to, any and all cables, cabinets, ducts, conduits, equipment, drains, manholes, pipes, pipelines, splice boxes, tracks, tunnels, utilities, vaults and other appurtenances or tangible things owned, leased, operated, or licensed by an owner or person or company.

**“Non-destructive work”** means work where precautions have been taken to prevent damage to infrastructure in the right-of-way.

**“Owner”** means a person who owns a facility that is installed or maintained or is proposed to be installed or maintained in the public right-of-way.



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**“Permit”** means a document issued by the Director pursuant to City Code and policy regarding Excavation and Restoration, as may be amended or extended by the Director from time to time, that permits a person to perform an excavation in the public right-of-way.

**“Permittee”** means a person to whom a permit has been granted by the Department of Public Works to excavate or otherwise work in the public rights-of-way.

**“Person”** means any natural person, corporation, partnership or other legal entity and includes any federal, state or local governmental entity and any authority.

**“Public utility”** means any person or owner whose facility or facilities in the public right-of-way are used to provide electricity, natural gas, information services, sewer services, steam, chilled water, telecommunications, transit service, cable television, video, or other services to customers regardless of whether such person or owner is deemed a public service corporation by the Virginia Corporation Commission.

**“Public right-of-way”** means the area across, along, beneath, in, on, over, under, upon, and within any street or other public way within the City.

### **1.3 PERMITS REQUIRED FOR EXCAVATION IN PUBLIC RIGHT-OF-WAY**

In accordance with the applicable sections of Chapter 90 of the City Code of Richmond, it is unlawful for any person to excavate or cause an excavation within any public right-of-way, under the jurisdiction of the Department of Public Works, unless the Director has



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issued all applicable permits for such excavation to the person.

The Department shall issue applicable permits to excavate only if the applicant has the legal authority to occupy and use the public right-of-way for the purposes identified in the application for the permit.

Permit requirements pertaining to emergency excavation are addressed in Section 2.8 of this manual.

#### **1.4 ORDINANCES AND REGULATIONS**

In addition to the requirements described in this manual, the City may adopt such ordinances, regulations, or policies, as it deems necessary in order to preserve and maintain the public health, safety, welfare, convenience, and roadway infrastructure. Each excavation in the public right-of-way pursuant to this manual shall be performed in accordance with:

- (a) The applicable sections of Chapter 90, STREETS, SIDEWALKS AND PUBLIC WAYS of the Code of the City of Richmond.
- (b) The latest edition and applicable sections of the Virginia Department of Transportation Road and Bridge Specifications.
- (c) The latest edition of the Manual for Uniform Traffic Control Devices (MUTCD).
- (d) The latest edition of the Virginia Work Area Protection Manual.
- (e) The Virginia Underground Utility Damage Prevention Act.
- (f) Virginia Administrative Code, Virginia Excavation Standard, Construction Industry
- (g) The requirements and regulations of the Department of Public Works (DPW).



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- (h) The requirements and regulations of the Department of Public Utilities (DPU).
- (i) The requirements and regulations of the Department of Community Development.
- (j) The requirements and regulations of the Department of Parks, Recreation and Community Facilities.
- (k) The latest adopted revision of the Franchise Agreement between the permittee and the City of Richmond.

It is the permittee's responsibility to comply with the most recent revision of the referenced standards. Unless otherwise directed, permittee shall comply with the City of Richmond Right-of-Way Design and Construction Standards Manual which shall take precedence over all other referenced requirements and regulations.

#### **1.5 PLAN REVIEW PRIOR TO PERMIT APPLICATION**

Before entering the permit process, the applicant should have already taken the proposed excavation work through the plan review process with DPW-Streets, DPW-Stormwater, DPW-Traffic, DPU-Technical Services, and any other stakeholders as required. See Attachment 4 for the flow chart depicting the Plan Review process.



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## **2. PERMITS**

### **2.1 APPLICATION FOR PERMIT**

The owner of the facility for which an excavation is performed shall apply for all applicable permits for the excavation. If the owner will not perform the excavation with its own forces, the owner's contractor shall join the owner's application as an applicant in seeking the permit.

### **2.2 PERMITS THAT APPLY TO EXCAVATION IN THE RIGHT-OF-WAY**

The Department of Public Works controls the multitude of varying activities conducted in public right-of-way. The limits of this right-of-way extend both below and above the surface.

The permit application process begins with a visit to the Department of Permits & Engineering Services in Room 110 on the first floor of City Hall. Here, the applicant shall get the application(s) that apply to the proposed excavation work and pay the appropriate fees.

The various types of permits are outlined in the following

#### **(a) Work in the Streets and Alleys Permit**

Typically referred to as the "*Work in the Streets Permit*," (see Attachment 5) this is the primary permit governing excavation in the public right-of-way. The



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following are documents that define the type and scope of work applied for in the “*Work in the Streets Permits*”.

Information to be submitted with application:

- Engineering drawings (to scale) and specifications for typical structures and installations. Special designs not conforming to VDOT shall be signed and sealed by a professional engineer registered in the Commonwealth of Virginia. Submit three (3) full-size sets of construction documents, and all applicable Attachments and details.
- Limits of excavation.
- Traffic maintenance plan.
- Certificate of insurance naming the City as an additional insured, a clause specifying 45 days of notification for commercial policies and 30 days for homeowner/renter policies prior to cancellation.
- Contact information for the owner and an emergency contact.
- Proposed schedule for work.
- Engineer’s estimate of the construction cost of the proposed work, to be used in determination of the posted surety bond, if required.

See Attachment 6 for the process flow chart related to the “*Work in the Streets Permit*” application review.

#### **(b) Encroachment Permits**

The installation of non-typical materials, special design facilities, enfranchised utilities, obstructions, projections, affixed structures, irrigation systems, feature lighting, and a multitude of various items which fall within the public right-of-



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way as defined, can only be allowed under approved encroachment. All encroachments must be applied for in Room 110, a determination for administrative or City Council approval will be rendered. Qualifying administrative encroachment permits (see Attachment 7) can be completed in Room 110. Encroachment packages to be approved by City Council are prepared through applicant coordination with DPW-Surveys. Plan and ordinance packages are prepared by DPW-Surveys for Director of Public Works approval and future presentation to City Council. Some encroachment applications will need preliminary review and approval by other agencies such as Planning & Urban Design, Commission of Architectural Review, Special Districts, etc. for conformance with current policies and allowances. An application fee is required in advance. Approved encroachment permits will track with the eventual installation permit. Reviewers will be dependent on the type of encroachment installation requested. Generally DPW-Permits & Inspections, DPW-Stormwater, and DPW-Traffic Engineering will be the review track necessary for most encroachments.

#### **(c) Driveway Entrance Permit**

The owner of a residential, commercial, or industrial property who desires a street entrance to benefit their property, must obtain an entrance permit. The entrance location must be approved by the DPW-Traffic Engineering (see Attachment 8). Entrance design will be reviewed by the DPW-Permits & Inspections for final approval.



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(d) Crane, Ladder & Scaffolding Permits (non-destructive work)

When it becomes necessary to stage a crane, ladder, or scaffolding equipment on public right-of-way to perform certain work activities, a “*Work in the Streets Permit*” must be obtained in advance. In urgent cases or cases with short lead times, contractors are requested to provide a minimum of three high quality photographs depicting the existing surface conditions present at the proposed staging location. These accompanying pictures will expedite the permit approval processing. Locations will be reviewed by the DPW-Permits & Inspections as well as DPW-Traffic Engineering in cases where equipment extends into the street corridor.

(e) Dumpster, Temporary Fencing, Storage Container, Barricade & Partial Street Closure Permits (non-destructive work)

Where no alternatives are available to the permit applicant, use of public right-of-way may be considered for the above purposes. Cases of need are examined by the DPW-Permits & Inspections and DPW-Traffic Engineering on an individual basis only. Special conditions may require the applicant to provide alternate temporary facilities. This work would be carried out under a “*Work in the Streets Permit*”.

(f) Hauling or Moving Permit (non-destructive work)

This permit covers a single hauling trip or blanket trips (all related to same excavation project). The application (see Attachment 9) is required in addition to a “*Work in the Streets Permit*” and is reviewed by DPW-Traffic Engineering.





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(g) Utility Pole, Line & Underground Relocation, Extension, Modernization and Repair Permits (Primary Utilities)

All submissions from both public and private utility agencies must follow a review track from Permits & Engineering Services in Room 110 of City Hall to the City Department of Public Utilities (DPU), DPW-Stormwater, DPW-Permits & Inspections, DPW-Traffic Engineering. This work would be carried out under a “*Work in the Streets Permit*”.

(h) Storm Sewer, Sanitary Sewer, Water, Gas, Mainline Extension Permits (Subsurface Work)

All subsurface utility main extensions except those constructed as a City Public Works Capital Improvement Project are done under a “*Work in the Streets Permit*”. Review tracking for a main extension of this kind is as follows: DPU-Technical Services, DPW-Stormwater, DPW-Traffic Engineering, DPW-Permits & Inspections. Submitting parties are responsible for non-city agency reviews. Primary utility networks may not exist in some layouts which traverse virgin property or limited easement corridors. In these cases, reviewer steps may be deleted.

(i) Storm Sewer and Sanitary Sewer Service Connection Permits

Outfall connections for stormwater discharge and sanitary effluent must be performed under strict permit inspection. Applications for this “*Work in the Streets Permit*” will be circulated for review, but will not be issued until availability connection fees have been verified as posted. The permit is applied for at the Department of Permits & Engineering Services offices in Room 110 of



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City Hall. Reviewers are generally limited to DPU-Technical Services, DPW-Stormwater, DPW-Permits & Inspections, and DPW-Traffic Engineering.

(j) Cable Trunks, Fiber Optics, Secondary Utility Extension Permits (Subsurface & Aerial)

This “*Work in the Streets Permit*” generally applies to communication cable and support structures such as conduit placement, duct bank installations, crossover borings, and other allied work related to the network expansions. Permits of this kind will typically require a full review by DPU-Technical Services, DPW-Stormwater, DPW-Permits & Inspections, and DPW-Traffic Engineering. In some cases the permit must be reviewed and approved by the other major utilities before final issuance. A special requirement for City Council approved encroachments may be necessary when considering non-franchised utilities and/or non-typical utility work. Preliminary plan review will be necessary when evaluating and determining encroachment issues.

(k) Sheeting & Shoring Permits

Some work in the right-of-way may require an additional encroachment permit when/if special conditions of removal, burial, and cutback cannot be met. Preliminary plan approval from the DPW-Permits & Inspections is recommended on the installation and removal requirements. DPW has specific guidelines and standards (see Attachment 10) that have to be met on the engineering drawings. The general permit tracking is as follows: DPU-Technical Services, DPW-Stormwater, DPW-Permits & Inspections, DPW-Traffic Engineering, Verizon Telephone, Dominion Power, and all necessary secondary utilities.



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### **(l) Subsurface Investigation Permits**

Geotechnical and subsurface utility locators must obtain “*Work in the Streets Permits*”. This form of permit generally tracks to DPU-Technical Services, DPW-Stormwater, DPW-Permits & Inspections, and DPW-Traffic Engineering.

### **(m) Commercial Development, Developer Permits**

New public facility and utility installations, sewer connections, sewer main extensions, stormwater management facilities, lane widening, entrances and many other public improvements associated with new site development must be performed under several “*Work in the Streets Permits*”. General tracking of these types of permit packages is DPU-Technical Services, DPW-Stormwater, DPW-Permits & Inspections, and DPW-Traffic Engineering. See Attachment 11 for the process flow chart related to Plan of Development application review.

The typical permit arrangements include sewer connection permits, entrance permits, and/or all-inclusive public improvement permit package. Projects, which have large-scale public improvement work exceeding \$75,000 or more, may be required to enter into a developer contract and be backed by a posted surety.

### **(n) Residential Subdivision Development, Developer Permits**

New residential land development work is performed under a Land Disturbing Permit issued by the Department of Community Development and a “*Work in the Streets Permit*” monitored by DPW. These permits will allow the clearing of land and the extensions of public facilities and utilities to serve new lots.



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Portions of the new site development will be accepted into the City's road and utility network. Official inspections and approvals must be obtained throughout the development activities from DPW, DPU and the Department of Community Development for their respective engineering or planning models. Land development activities such as these are required to have a developer contract and posted surety in-place prior to management signatures. Posted sureties must utilize the standard City format for this type of submission. Estimates for the site development cost will be set by DPW to establish the bonding amount. The Building Commissioners office, which handles the erosion and sedimentation reviews, will establish the required bonding amount for erosion and sedimentation controls, stabilization and stormwater management facilities.

Fees associated with the storm and sanitary service connections will be collected by Permits & Engineering Services (Room 110) prior to final permit issuance. Plan and permit review tracking for this form of development is Community Development Land Use Administration, DPU-Technical Services, DPW-Stormwater, DPW-Permits & Inspections, and DPW-Traffic Engineering. See Attachment 11 for the process flow chart related to Plan of Development application review.

(o) **Certificate of Occupancy Reviews**

Residential and non-residential use permits are reviewed by the DPW-Permits & Inspections to confirm the inspection, completion and acceptance of required installations in the public right-of-way. The applicant needs to give program inspection lead time so that all installation deficiencies in Public Works related



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issues can be reviewed and corrected thereby eliminating potential sign-off delays.

(p) Special Event, and/or Erected Event Structure(s) Permits (non-destructive work)

Fund raisers, concerts, block parties, church activities, parade structures (only), community group uses, major attractions, movie shootings, commercial filming, grand stands, scaffolding, etc. with structures within the right-of-way will require the approval of DPW-Permits & Inspections and DPW-Traffic Engineering. Some types of buildings or structures used in special events require Fire Marshall approvals (example – tents). Also, contact the Police Department—Special Events Division at 804-646-1717.

### **2.3 ISSUANCE OR DENIAL**

After receipt of a permit application, the Director shall issue a permit within thirty (30) calendar days to the applicant if the proposed work has previously been reviewed and approved by all City Departments with interest in or are affected by the excavation and the application has been properly completed.

A permit to excavate, as issued by the City, shall include the following information:

- (a) The location and a brief description of the excavation authorized.
- (b) The name and contact information of the permittee.
- (c) The date of issuance
- (d) The time period allowed for the excavation expressed with commencement and completion dates and as a number of calendar days.



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Where the permit authorizes two or more excavations, the permit may indicate different time periods for each excavation.

- (e) Any special conditions applicable to the permit. See Attachment 12, DPW-Traffic Engineering Permit Review Form and Attachment 13, DPW-Right-of-Way Management Review Form.
- (f) The name and contact information of the paving contractor.
- (g) Such other information deemed appropriate.

Grounds for Denial. The applicant may be denied, in writing, if one or more of the following conditions are present.

- (a) Proposed traffic control procedures or equipment do not comply with the requirements of the Manual on Uniform Traffic Control Devices.
- (b) It is determined that the applicant can perform the excavation without blocking or closing the street or without excavation in the public right-of-way.
- (c) The proposed excavation violates applicable law.
- (d) The applicant fails to furnish any required information.
- (e) The application contains misleading or false information.
- (f) The proposed excavation conflicts with a permit previously issued by the City.
- (g) The proposed excavation would cause a safety hazard or impede traffic flow and the application does not indicate that adequate protection for pedestrian or vehicular traffic at the location of the proposed excavation will be provided.
- (h) The owner does not possess any necessary legal right to place facilities in the public right-of-way.



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- (i) Any applicant set forth in the application does not possess any of the licenses or permits as required by City Code.
- (j) The applicant's proposed restoration method and schedule do not meet the requirements of the policy.
- (k) Any applicant set forth in the application has failed to restore an excavation site within the twelve months prior to the receipt of the permit application.
- (l) Any applicant set forth in the application owes the City delinquent taxes.
- (m) Any applicant or his contractor set forth in the application has been debarred.

#### **2.4 CONDITIONS**

- (a) **Bond.** Prior to permit issuance, the applicant shall post a surety bond, naming the City as the obligee in an amount and form prescribed by the Director. The surety bond shall guarantee the completion of the excavation and the maintenance thereof for two (2) years from the date of completion. The amount of the bond is determined by DPW. Projects, which have large-scale public improvement work exceeding \$75,000 or more, may be required to enter into a developer contract and be backed by a posted surety
- (a) **Indemnity.** Prior to permit issuance, the applicant shall execute an indemnity agreement where the applicant agrees to indemnify, hold harmless and defend the City against any claims or suits arising out of or relating to the excavation.
- (b) **Minimum insurance policies, coverages and limits to be maintained by permittees** shall include statutory application of worker's compensation insurance and commercial general liability insurance as follows: \$1,000,000



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combined coverage for bodily injury and property damage for commercial policies and \$300,000 for homeowner/renter policies.

- (c) Prior to issuance of the permit, the applicant shall furnish evidence of such insurance policies, coverages and limits with endorsements indicating that the City is an additional insured and that no fewer than 45 days' notice for commercial policies and 30 days' notice for homeowner/renter policies of any cancellation, modification, or non-renewal will be mailed to the Director.
- (c) Warranty. Prior to permit issuance, the applicant shall execute a written warranty for the benefit of the City. Such warranty shall guarantee that the permittee will perform the excavation in a timely manner and in accordance with the permit and that the excavation will comply with the permit, any drawings and specifications specified in the permit, policy and City Code for a period of two (2) years from completion.

#### **2.5 PERMIT IS NOT TRANSFERABLE**

- (a) An issued permit is not transferable to another person or used by any other person to perform the excavation authorized in the permit.
- (b) An issued permit is only valid for the location(s) described on the application, depicted on any drawings or specifications, and expressly authorized in the permit. No excavation at any other location shall be authorized without the issuance of a separate permit.
- (c) Unless extended by the Director upon written request and for good cause shown, a permit will become void if the excavation is not commenced within 60 days from the permit's issuance. However, this shall not apply to permitted work within the Downtown Richmond Coordination Zone.





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#### **2.6 AMENDMENTS**

A permit shall no longer be valid if there are material changes to the excavation, including but not limited to, a change in the scope of work or the method of performing the work of such consequence that the drawings and specifications no longer accurately depict the work. Should a permit become invalid for this reason, the permittee must obtain an amendment to the permit in order to continue the excavation. To obtain an amendment, the permittee must submit to the Right-of-Way Manager an application including amended drawings and specifications indicating all changes. A permit shall not be amended to include an excavation that is not related to the original permit or to extend the excavation into any geographical area not included in the original permit.

For good cause shown not relating to any failure of the permittee to diligently prosecute the excavation, the Director may extend the number of days set forth in the permit for the completion of the excavation. Under this condition, extensions of time shall not be regarded as amendments to the permit but noted on the records regarding the permit.

#### **2.7 FEES AND DEPOSITS**

Permittee shall remit to the City the applicable fees and deposits as required by Appendix A of the Code of the City of Richmond. Contact the Division of Permits and Engineering Services of the Department of Community Development (Room 110, City Hall, 804-646-6440) for current permit fee(s) information.



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#### **2.8 EMERGENCY EXCAVATION**

Nothing contained in this policy shall be construed to prevent any person from performing an emergency excavation for the preservation of life or property so long as such person ensures compliance with the following requirements:

- (a) Before the emergency excavation is initiated, the owner shall notify the Department at 804-646-0999. The owner shall also notify all other federal, state or local authority required by applicable law.
- (b) Within 24 hours after the initiation of the emergency excavation, or within 24 hours after the Department's offices first open following the initiation of the emergency excavation, the owner shall apply for a permit for the emergency excavation.



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### **3. EXCAVATIONS**

#### **3.1 STANDARDS**

Permittees shall perform all excavation work to comply with the standards and specifications set forth in this manual, policy and City Code.

- (a) **TRAFFIC CONTROL SPECIFICATIONS FOR STREET AND SIDEWALK CONSTRUCTION** (See Attachment 14). These specifications outline proper traffic control methods to be followed by all public and private organizations in the City when temporary disruption of traffic is required for street and sidewalk repairs or work on utility lines under the street.
- (b) **DEPARTMENT OF PUBLIC WORKS SPECIAL PROVISIONS – STREETS & DRAINAGE** (See Attachment 15). These special provisions (to the General Conditions of the Contract) are intended to add to and more fully describe the requirements for a particular project not otherwise detailed or set forth on the plans and specifications and to amplify or modify the character of workmanship and materials.
- (c) **TRENCH BACKFILL & CONTROL FILL – GEOTECHNICAL BRIEF** (See Attachment 16). This brief discusses soils and fill material requirements for satisfactory fill of excavated trenches.
- (d) **FIBER OPTIC/TELECOMMUNICATION ENCROACHMENTS** (See Attachment 17). This document describes the requirements specific to the fiber optic/telecommunication installations for encroachment approval and shall be used in conjunction with **POLICY FOR INSTALLATION OF TELECOMMUNICATIONS FACILITIES IN THE PUBLIC RIGHT-OF-WAY**.
- (e) **POLICY FOR INSTALLATION OF TELECOMMUNICATIONS**



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FACILITIES IN THE PUBLIC RIGHT-OF-WAY (See Attachment 18). This policy specifically addresses the use of the public right-of-way by telecommunication providers and is intended to present the current methods of construction that are being used to install telecommunication facilities. This policy provides for design of excess capacity, accessibility, spares, etc. This policy shall be used in conjunction with ADVANCED ENGINEERING REQUIREMENTS FOR NEW UNDERGROUND UTILITIES.

- (f) ADVANCED ENGINEERING REQUIREMENTS FOR NEW UNDERGROUND UTILITIES (See Attachment 19). General trenching guidelines are provided for both open cut and directional boring methods or any combination of methods regarding the installation of conduits and pipelines.
- (g) CERTIFIED CONTRACTOR FOR TRENCH LINE CONSTRUCTION (See Attachment 20). The City requires all contractors performing permitted, trench line construction (open cut or directional boring) within the public right-of-way to be certified.
- (h) A POLICY FOR TEMPORARY STEEL PLATE BRIDGING FOR GENERAL UTILITY STREET WORK (See Attachment 21). This policy specifies the requirements for the use, maintenance, and removal of temporary steel plate bridging over open excavations.
- (i) PERMIT ATTACHMENT / PRECONSTRUCTION GUIDELINES (See Attachment 22). The intra-city memorandum example preconstruction meeting agenda for CIP projects guide work in the public right-of-way under the purview of the DPW Construction Inspector.
- (j) TREE PROTECTION: If excavation activity is anticipated within the drip-line (crown-spread) of any tree, shrub, or other vegetation, contact the Urban Forestry Division at 804-646-0999 prior to commencement. (This does not include excavations that only impact the roadway or paved surface area of the



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public right-of-way.) The permittee shall use extra care during excavation in the city public right-of-way where there are adjacent trees that may be damaged. Urban Forestry Division must be notified of any trees that need to be pruned prior to the beginning of the project. Any damage to city tree branches, trunks or roots after the project has begun must also be reported to the Urban Forestry Division. Damage to the root system and trunks of the city trees must be avoided wherever possible. Any damage done to the trees or root system of the trees shall NOT be coated with any type of paint.

### **3.2 INSPECTIONS**

All excavations shall be inspected as specified in the permit. Based upon the complexity and nature of the excavation, inspections may be required during the performance of the excavation, immediately upon completion of the excavation, or both. An assigned DPW inspector shall perform all inspections at the permittee's expense.

Critical phase inspections shall be identified at the preconstruction meeting.

The permittee shall be responsible to arrange for each required (critical phase) inspection a minimum of 24 hours prior to the need, and to notify the assigned inspector of the date and time when each inspection will occur. All DPW inspectors are equipped with cell phones and pagers and voice mail. Permittee may be required to expose/reveal work that was not inspected due to noncompliance with scheduling of inspections. Excavation work performed under the permit will not be considered complete until it has passed the final inspection required by the permit.

Consistent with applicable laws, sound engineering practices, and the nature of the



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excavation, the Right-of-Way Manager or Permits Engineer may, in addition to or in lieu of the inspections, require that a permittee, at the permittee's expense, retain a qualified construction inspector under the supervision of a professional engineer licensed in Virginia to observe the excavation and for the professional engineer to provide written certification upon completion of the excavation stating that the public right-of-way has been restored in accordance with the drawings and specifications and all other applicable technical requirements.

### **3.2 INSPECTION FEES**

Permittee shall remit to the City the applicable fees as required by Appendix A of the Code of the City of Richmond. DPW is in the process of developing appropriate inspection fees and an implementation process including tracking and administration of these fees. See Attachment 23.

### **3.3 CORRECTION OF DEFECTS**

- (a) The Director shall be notified prior to pavement restoration within the public right-of-way so that the work done preparatory to pavement restoration may be inspected. The Director shall further be notified after pavement restoration has been completed in order that it may be final-inspected.
- (b) If any work performed under the permit is not in accordance with the terms and conditions of the permit or if a public right-of-way is not left in satisfactory condition, notice of such defect shall be given to the permittee. The permittee shall be required to correct the condition within the time specified in the notice.
- (c) Upon receipt of the notice, if the permittee refuses or fails to correct the condition within the specified time, the Director may cancel the permit and



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perform the necessary work to be done, deducting the cost from any financial guaranty filed with the permit.

#### **3.4 DAMAGE TO FACILITY**

A permittee who, in connection with an excavation, damages another owner's facility shall immediately notify the Director and the owner of the damaged facility.

#### **3.5 AS BUILT DRAWINGS AND SPECIFICATIONS**

Upon final completion of an excavation and not more than three (3) months post-excavation, the permittee shall furnish the Director with a set of as-built drawings (refer to Attachment 24 for specifications for as-built drawings) and specifications for the excavation. As-built drawings and specifications are required even if the excavation work was performed exactly in accordance with the drawings and specifications provided with the permit application.

#### **3.6 NOTICE**

The permittee shall comply with the requirements of utilities regarding notification of excavation and marking of subsurface facilities. The permittee shall call Miss Utility with all location information as necessary to properly identify the proposed excavation.



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#### **4. RESTORATION STANDARDS/RESTORATION OF THE PUBLIC RIGHT-OF-WAY**

##### **4.1 STANDARD NOTES (INCLUDED AS APPENDIX A)**

All public and private projects shall be constructed in accordance with the following Standard Notes. Standard Notes must be included in each set of engineering drawings. The Standard Notes include the following:

- (a) Geotechnical Notes
- (b) Construction Notes

##### **4.2 STANDARD DETAILS**

Standard details specific to restoration of the public right-of-way are included in Appendix B and include the following:

- (a) Pavements and Trench Repair
- (b) Temporary Steel Plate Bridging
- (c) Sheet piling and Shoring Systems

Standard details for construction in the public right-of-way not shown here are presented in subsequent sections of the City of Richmond Right-of-Way Design and Construction Standards Manual.

Standard details provided by DPW are specific and tailored for use within the City of Richmond and take precedence over those provided by VDOT. If not otherwise





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provided or specified or directed by DPW, standard details developed by the Virginia Department of Transportation or the City of Richmond Department of Public Utilities shall be applied. If and when there is a conflict between City of Richmond DPW or City of Richmond DPU or VDOT standards, the City of Richmond DPW standard details will apply.

#### **4.3 TRANSPORTATION**

- (a) **Signalized Intersections:** the permittee must not cut into the pavement of a signalized intersection without contacting the Miss Utility of Virginia Call Center at telephone 1-800-552-7001, 48 hours in advance of any digging, probing or excavation activity. Once the DPW-Traffic Operations receives notification from the Miss Utility Call Center, they will attempt to locate and mark all buried/underground traffic signal control infrastructure components, (loop and/or other detection devices, conduits, junction boxes, control wiring and other traffic signal control components). Any permittee who damages any traffic signal control infrastructure components must arrange to have the damaged items repaired or replaced within 48 hours of such damage. Any damaged traffic signal infrastructure components must be replaced or repaired to original condition or better by the permittee before restoration will be considered complete.
  
- (b) **Pavement Markings:** Lane striping or other painted and affixed delineators, which were removed or damaged, must be replaced by the permittee before restoration will be considered complete. Replacement materials for lane striping and other affixed delineators shall be furnished as specified and approved by DPW-Traffic Operations.



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#### **4.4 MULTIPLE STREET CUTS**

Once a street is resurfaced there will be a three-year moratorium on destructive utility cuts. If during this three-year period, it becomes unavoidable to cut the street, an exception must be requested and explained, and granted, and the minimum restoration requirement will be a full width overlay of the entire street section. See Attachment 2 for DPW Guidelines for the Restoration of Trench Cuts.

- (a) Based on the Age of Pavement
- (b) When dealing with Longitudinal, Intermediate Length, Transverse, Multiple, Sequential and/or Single Hole Cuts



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## **5. POST-EXCAVATION REQUIREMENTS**

Each owner that performs an excavation in the public right-of-way shall maintain, repair or reconstruct the site of the excavation as necessary to maintain a condition satisfactory to the Director until such time as the City reconstructs, repaves or resurfaces the public right-of-way or until the expiration of the 2 year warranty.

### **5.1 SUBSURFACE MATERIAL OR PAVEMENT FAILURES**

In the event that a subsurface material or pavement over or immediately adjacent to any excavation should become depressed or broken or should fail in any way at any time after the excavation has been completed, the Director shall reasonably determine the responsible party. The Director shall notify the responsible party of the condition, its location, and the required remedy. The responsible party shall repair or restore such condition or cause such condition to be repaired or restored to the satisfaction of the Director within 72 hours of the written notification. In cases where the utility stakeholder has not responded to emergency repair requests and DPW must take corrective action, DPW will not be held responsible for any damage to the underground utility as a result of DPW remediation.

### **5.2 REPAIR BY THE CITY**

- (a) In the event that the responsible party fails, neglects or refuses to repair or restore any subsurface material or pavement failure as previously notified, the City may repair or restore such condition or cause such condition to be remedied in such manner as the Director deems expedient and appropriate.
- (b) The responsible party shall compensate and be liable to the City for all costs



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associated with administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration, or any other actual costs incurred by the City that were made necessary by reason of the repair or restoration undertaken by the City. The Director may use any financial guaranty furnished by the responsible party to pay for such costs.

- (c) Remediation by the City shall not relieve the responsible party from the requirements to repair or restore subsurface material or pavement failures that occur after remediation by the City.
- (d) In addition, the responsible party may be subject to those enforcement actions set forth in Section 6.

### **5.3 EMERGENCY REMEDIATION**

If the Director determines that the site of excavation constitutes a hazard, a public nuisance, a public emergency or some other imminent threat to the public health, safety or welfare that requires immediate repair or restoration, the Director may order the condition repaired or restored by written, electronic or facsimile notice to the responsible party.

If the responsible party fails, neglects or refuses to take immediate action to remedy the condition by the deadline specified in the notification, the Director may remedy the condition or cause the condition to be remedied in such manner as the Director deems expedient and appropriate.

The responsible party shall compensate and be liable to the City for all costs associated with administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration, or any other actual costs incurred by the City that were



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made necessary by reason of the emergency remediation undertaken by the City. The Director may use any financial guaranty furnished by the responsible party to pay for such costs.

Remediation by the City shall not relieve the responsible party from the requirements to repair or restore subsurface material or pavement failures that occur after remediation by the City.

In addition, the responsible party may be subject to those enforcement actions set forth in Section 6.



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## **6. VIOLATIONS AND ENFORCEMENT**

The Director shall serve notice on the permittee to promptly abate any violation of the provisions contained in this Manual. Further, the permittee may be subject to any or all of the enforcement mechanisms as hereinafter specified. DPW is in the process of developing a violation, penalty and fine schedule for work in the right-of-way that does not conform to this Manual and/or the Right-of-Way Design and Construction Standards. See Attachment 25.

### **6.1 REJECTION OF WORK**

The inspector may notify the permittee that the work is rejected in place as a result of unsatisfactory, nonconforming work or that the means, materials and/or methods are not sufficient to meet conformance standards.

Failure to make changes or to comply with notification of rejection will lead to issuance of a stop work order.

### **6.2 STOP WORK ORDER**

Continuing work without correction of the activities noted in the previous rejection(s) of work may result in a stop work order for the entire project activities.

If the Director determines that a person has violated the provisions of the City Code or this Manual or that an ongoing excavation at a site constitutes a hazard, a public nuisance, a public emergency, or some other imminent threat to the public health, safety or welfare that requires immediate repair or restoration, the Director may issue a stop work order. It shall be unlawful for a person to continue any excavation activity at a site



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after the Director has issued a stop work order for that site.

### **6.3 SUSPENSION, MODIFICATION AND REVOCATION**

After the Director has issued a stop work order, the Director shall review the violation or hazard, public nuisance, public emergency or other imminent threat to the public health, safety or welfare and may thereafter suspend for a definite or indefinite time period, modify the conditions of or revoke the permit for the excavation at the site.

In cases where the permit has been revoked, the applicant must reapply for permit including resubmittal of required information, design review, and permit application and approval.

### **6.4 DEBARMENT**

The Director shall not issue a permit to any person who is in default or breach of any obligation to the City on a prior permit obligation. Further, the Director may debar from obtaining a permit any person when that person has:

- (a) Performed an excavation in the public right-of-way without a valid permit, or
- (b) Failed, neglected or refused to comply with the requirements of the permit, this manual, and/or the City Code.

Depending on the severity or number of incidents causing such debarment action, debarment will be instituted for a period of 90 days or more. In instituting the debarment, the Director shall provide the applicant with the specific reason(s) for the debarment, citing the specific incidents that lead to the Director's determination.



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### **6.5 VIOLATION**

It shall be unlawful for any person to violate or to fail, refuse or neglect to comply with the requirements of this policy. Upon conviction, such person shall be punished for a Class 3 misdemeanor. The Permits Engineer or any of his/her Permit Inspectors will have the authority to issue citations.





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**ATTACHMENTS**

<b>Title</b>	<b>Number</b>
Ordinance 2005-113-55 .....	1
Ordinance 2005-205-173 .....	1A
DPW Guidelines for the Restoration of Trench Cuts .....	2
Three-year Excavation Plan – Specifications for GIS Submittal.....	3
Work in the Streets – Plan Review Process Flow Chart.....	4
Application to Work in Streets and Alleys .....	5
“ <i>Work in the Streets Permit</i> ” Application Review Process Flow Chart.....	6
Encroachment Permits .....	7
- Procedure Outline for Initiating an Encroachment Approval Process in the Public Right-of-Way	
- Review & Approval Workflow for Administrative Approval Process Encroachment Applications	
- Encroachment Application-Administrative Approval Process Flow Chart	
Attachment to Driveway Entrance Permit .....	8
Application for Hauling or Moving Permit .....	9
Installation Guidelines and Specifications for placement of Sheet piling & Shoring Systems beneath the Right-of-Way .....	10
Plan of Development Application Review Process Flow Chart .....	11
DPW-Traffic Engineering Permit Review Form .....	12
DPW-Right-of-Way Management Review Form .....	13
Traffic Control Specifications for Street and Sidewalk Construction .....	14
Special Provisions – Streets & Drainage .....	15



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**ATTACHMENTS**

<b>Title</b>	<b>Number</b>
Trench Backfill & Control Fill – Geotechnical Brief .....	16
Fiber Optic/Telecommunication Encroachments .....	17
Policy for Installation of Telecommunications Facilities in the Public Right-of-Way .....	18
Advanced Engineering Requirements for New Underground Utilities .....	19
Application as Certified Contractor for Trench Line Construction .....	20
 A Policy for Temporary Steel Plate Bridging for General Utility Street Work.....	21
Preconstruction Guidelines (Example) .....	22
Inspection Fees and Implementation Process .....	23
Specification for As-Built Drawings .....	24
Violation, Penalty and Fine Schedule .....	25
Annual Permit for Repetitive Work in the Public Right-of-Way .....	26



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***ATTACHMENT 1***

INTRODUCED: **APR 11 2005**

AN ORDINANCE No. 2005- **113-55**

To amend and reordain Chapter 90 of the City Code by adding therein a new Article VII concerning excavation in the public right-of-way and to repeal Divisions 6 (concerning excavation and restoration) and 7 (concerning installation and construction of facilities in public ways) of Article II of Chapter 90 of the City Code.

\_\_\_\_\_  
Patron – Mayor Wilder

\_\_\_\_\_  
Approved as to form and legality  
by the City Attorney  
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PUBLIC HEARING: **APR 25 2005** AT 6 P.M.

THE CITY OF RICHMOND HEREBY ORDAINS:

§ 1. That Chapter 90 of the Code of the City of Richmond (2004) be and is hereby amended and reordained by adding therein a new Article VII, consisting of divisions numbered 1 through 6 and sections numbered 90-436 through 90-579, as follows:

**ARTICLE VII. EXCAVATION IN PUBLIC RIGHT-OF-WAY.**

**DIVISION 1. IN GENERAL.**

**Sec. 90-436. Purpose and applicability.**

(a) *Purpose.* The City owns and maintains public rights-of-way within the city for the benefit of its citizens, and the Director of Public Works is responsible for managing use of

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ADOPTED: **APR 25 2005** REJECTED: \_\_\_\_\_ STRICKEN: \_\_\_\_\_

the public rights-of-way. The purpose and intent of this article is to establish a framework for the Director's regulation of excavation in public rights-of-way to minimize the adverse impact of such excavation on the City's investment in its system of public rights-of-way.

(b) *Applicability.* \* This article applies to all excavation in the public right-of-way, whether the excavator is private or public. This article applies in addition to all other requirements of this Code and other laws, regulations, existing permits and franchises. Section 1-7 shall apply to this article, and this article shall be interpreted and construed to conform with applicable federal or state law to the maximum extent possible.

#### **Sec. 90-437. Definitions.**

For purposes of this article, the following words and phrases shall have the meanings ascribed to them below, unless the context clearly indicates that a different meaning is intended:

*"Applicant"* means a person or duly authorized agent thereof who submits an application for a permit.

*"As-built drawing"* means a drawing or plan that shows the horizontal and vertical alignment, facility dimensions, type of encasement, and any other information required by the director of public works to help identify and protect the facility installed in the right-of-way.

*"Director"* means the Director of Public Works or a designee thereof.

*"Downtown Richmond Coordination Zone"* means the area bounded by Interstate 95, the Interstate 95 / Interstate 64 corridor, 1<sup>st</sup> Street and the Interstate 195 / Downtown Expressway corridor.

*"Emergency excavation"* means operations or repairs of facilities to prevent imminent harm to the health or safety of persons or property.

*“Excavation”* means any work in the public right-of-way that removes, fills or otherwise disturbs soil, pavement, driveways, curbs, or sidewalks, including, but not limited to, installing, servicing, repairing, or modifying any facility or facilities in or under the surface and the restoration of the subsurface or surface, including pavement markings.

*“Excavation sequence”* means a document describing the order, estimated start dates and estimated completion dates of all excavation projects approved during a six-month period.

*“Facility”* means property or equipment permanently located or proposed to be permanently located in the public right-of-way and includes, but is not limited to, any and all cables, cabinets, ducts, conduits, equipment, drains, manholes, pipes, pipelines, splice boxes, tracks, tunnels, utilities, vaults, and other appurtenances or tangible things owned, leased, operated, or licensed by an owner or person.

*“Owner”* means a person who owns a facility that is installed or maintained or is proposed to be installed or maintained in the public right-of-way.

*“Permit”* means a document issued by the Director pursuant to this article, as may be amended or extended by the Director from time to time, that permits a person to perform an excavation in the public right-of-way.

*“Permittee”* means a person to whom a permit is issued pursuant to this article or an agent thereof.

*“Person”* means any natural person, corporation, partnership, or other legal entity and includes any federal, state or local governmental entity and any authority.

*“Public right-of-way”* means the area across, along, beneath, in, on, over, under, upon, and within any street or other public way (as section 90-1 defines those terms) within the city.

**Sec. 90-438. Prohibitions.**

(a) It shall be unlawful for any person to excavate or cause an excavation within any public right-of-way unless the Director has issued a permit for such excavation to the person.

(b) It shall be unlawful for any permittee to fail to show a permit upon request. Failure to show a permit upon request of an officer or employee of the City shall constitute prima facie evidence that no permit has been issued.

(c) It shall be unlawful for any permittee to violate any condition of the permit issued to that permittee.

(d) It shall be unlawful for any permittee to perform any work or cause any work to be performed on an excavation either (i) in violation of rules or regulations promulgated pursuant to section 90-439 or (ii) after the permit for such excavation has been revoked or otherwise ceases to be in force and effect.

(e) It shall be unlawful for any permittee to make, to cause, or permit to be made any excavation in the public right-of-way outside the boundaries, times, and description set forth in the permit.

(f) It shall be unlawful to use a rock wheel or trenchless technology to excavate in the public right-of-way without prior written approval of the Director.

**Sec. 90-439. Rules and regulations.**

The Director shall promulgate such rules and regulations he deems necessary in order to give effect to this article. Such rules and regulations shall be consistent with all applicable federal, state and local laws and with sound engineering practices. The Director shall (i) make such rules and regulations available for inspection in its offices, (ii) publish all such rules and

regulations in a form for sale to the public and (iii) to the maximum extent practicable, make such rules and regulations available electronically and through the Internet.

## **DIVISION 2. COORDINATION AND CONTROL OF EXCAVATIONS.**

### **Sec. 90-461. Submission of work plans and coordination of work.**

(a) *Submission of owners' work plans.* On the first City working day of each April and October, each owner shall submit to the Director, in a format prescribed by the Director, a plan detailing all work involving excavation that such owner anticipates performing or causing to be performed in any public rights-of-way during the three-year period immediately following such submission. An owner may add, change or delete any item of work in its three-year plan but shall notify the Director of such addition, change or deletion upon doing so. Any owner that does not propose work during the three-year period shall submit in lieu of the plan of work required by this section a statement in a form prescribed by the Director that no work is anticipated. Once he has filed such a statement, the owner shall immediately notify the Director of any planned work, along with other information on street condition and use, as soon as such work becomes reasonably foreseeable.

(b) *Composite list of owners' planned work.* As soon as practicable following receipt and compilation of the owners' plans of work, the Director shall make available for review a composite list of all such work designated in the plans submitted. The Director shall cause the composite list to be maintained in a computerized database or similar computerized system to the maximum extent practicable. Owners shall keep themselves apprised of the current status of the composite list. Prior to issuing a permit, the Director shall check each application against the composite list and may require applicants to:

- (1) Coordinate their excavations with one another;



(2) . Coordinate excavations with ongoing or scheduled construction and maintenance work by the City; and

(3) Complete excavations before the City begins construction and maintenance work.

(c) *Street construction plan.* The Director shall prepare a three-year street construction plan showing all proposed reconstruction, repaving and resurfacing of the public rights-of-way for which it is responsible for maintaining. The Director shall revise and update this street construction plan on a semiannual basis within three months of the receipt date for three-year plans from owners. In order to facilitate coordination and minimize the cost of excavation, the Director shall make the street construction plan available for public inspection.

(d) *Notice of City work.* At least 120 calendar days prior to undertaking the repaving or reconstruction of any block, the Director shall send a written notice by first-class mail of the proposed repaving and reconstruction to each owner with facilities in that block.

(e) *Waiver of requirements.* The Director may, for good cause shown, waive in writing the coordination requirements of subsection (b) of this section. The Director shall consider the following criteria before granting a waiver and shall document his consideration of these criteria in writing:

(1) The effect of the owner's proposed excavations on the movement of traffic in the surrounding area;

(2) The owner's need for the facility;

(3) The need to facilitate the deployment of new technology; and

(4) The public health and safety.

**Sec. 90-462. Postponement and regulation of excavation.**

The Director may postpone excavation or related work under a permit when the City is already performing or is about to perform, or another permittee is already performing or is scheduled to perform, any work in the public right-of-way in which the excavation is proposed and when, in the Director's judgment, allowing any further obstruction of such public right-of-way would have the effect of substantially impeding the traffic flow on such public right-of-way or otherwise inconveniencing the public in its use of such public right-of-way until such time as such impediment or inconvenience is removed. In addition, the Director may regulate the manner of excavation or related work under a permit in order to minimize such impediment or inconvenience. In all cases, excavation by or on behalf of the City shall take precedence over excavation of every other kind.

**Sec. 90-463. Utility Coordination Committee.**

(a) *Establishment, composition and meetings.* There shall be a Utility Coordination Committee composed of the following:

(1) One management-level representative of the Department of Public Works appointed annually by the Director;

(2) One management-level representative of the Department of Public Utilities appointed annually by the Director of Public Utilities; and

(3) One management-level representative of the Department of Community Development appointed annually by the Director of Community Development; and

In addition, the Director shall annually invite one representative of each owner that was a permittee in the preceding calendar year to serve in an advisory capacity to the Committee. The

Committee shall meet at least once every six months as scheduled by the Director to perform the duties assigned to it by subsection (b) of this section.

(b) *Purpose and duties.* The purpose of the Committee shall be to coordinate street and utility projects with the goal of minimizing the frequency of pavement cuts and openings. To perform this duty, the Committee shall review the plans of work submitted by each owner on a semiannual basis pursuant to section 90-461(a) and shall consider the following criteria in recommending which of the submitted excavations should be scheduled for the next twelve months:

- (1) The identification of facilities in the public way;
- (2) The resolution of conflicts in the location of utilities;
- (3) The maximization of efficiencies;
- (4) The reduction of inconvenience to the public;
- (5) The prevention of pavement cuts within three years after the resurfacing or reconstruction of a public right-of-way.

In addition, the Committee shall advise the Director concerning other matters as requested by the Director.

**Sec. 90-464. Excavation in newly constructed, reconstructed, repaved or resurfaced streets.**

(a) *Prohibition.* Except as provided in subsection (b) below, the Director shall not issue a permit for an excavation in any public right-of-way that has been constructed, reconstructed, repaved, or resurfaced in the preceding three years, as measured from the date of acceptance by the City. Owners shall determine alternative methods of making necessary repairs and facility installations to avoid excavations that are prohibited by this section.

(b) *Waiver.* The Director, for good cause, shall grant a waiver of the prohibition set forth in subsection (a) of this section to an owner for excavation (i) for which the City's denial of a permit would violate federal law, (ii) to respond to emergencies or (iii) to afford an owner the means to provide service to buildings that the owner has no other reasonable means of serving. The Director shall set forth the reasons for granting or denying the waiver in writing. The Director shall grant a waiver pursuant to this subsection only subject to such special conditions that the Director determines to be appropriate to the circumstances and shall set forth such conditions and the reasoning therefor in writing. In addition to any other information required of an owner for a permit under this article, the owner shall provide the following information to support its request for a waiver under this subsection:

- (1) The reason why the excavation was not performed before or when public right-of-way was paved;
- (2) The reason why the excavation cannot be delayed until after the three-year period set forth in subsection (a) of this section expires; and
- (3) The reason why the excavation cannot be performed at another location or the owner's need cannot be accomplished by a method that does not require excavation.

**Sec. 90-465. Downtown Richmond Coordination Zone.**

(a) *Application deadlines.* A person who seeks to excavate in the downtown Richmond coordination zone must submit a permit application to the Director:

- (1) No later than November 25 for an excavation to begin between January 3 and before July 1 of the next calendar year; or
- (2) No later than June 1 for an excavation to begin after July 1 and before November 25 of that calendar year.

No person shall begin an excavation between November 25 of any calendar year and January 3 of the next calendar year.

(b) *Review and excavation sequence.* Within 30 calendar days of each deadline described in subdivisions (1) and (2) of subsection (a) of this section, the Director shall:

(1) Review all applications submitted in accordance with subsection (a) of this section;

(2) Identify opportunities for joint excavation or other coordinated excavation activity between applicants; and

(3) Publish an excavation sequence.

(c) *Permit and time for excavation.* No person shall perform any excavation unless the Director has issued that person a permit for that excavation. The permit shall be valid only during the time period set forth on the permit. Such time period shall correspond to the schedule allotted for that excavation in the excavation sequence. If the permittee does not begin excavation in accordance with the excavation sequence, the Director may reschedule or cancel the permittee's excavation. The Director may extend the time period on the permit if such extension does not interfere with the coordination of other excavation work within the excavation sequence.

(d) *Waiver.* The Director, for good cause, shall grant a waiver of the requirements of this section to a permittee for excavation (i) for which the City's imposition of these requirements would violate federal law, (ii) to respond to emergencies or (iii) to afford an owner the means to provide service to buildings that the owner has no other reasonable means of serving. The Director shall set forth the reasons for granting or denying the waiver in writing. The Director shall grant a waiver pursuant to this subsection only subject to such special

conditions that the Director determines to be appropriate to the circumstances and shall set forth such conditions and the reasoning therefor in writing. In addition to any other information required of an owner for a permit under this article, the owner shall provide the following information to support its request for a waiver under this subsection:

- (1) The reason why the excavation was not performed before or when public right-of-way was paved;
- (2) The reason why the excavation cannot be subject to the requirements of this section; and
- (3) The reason why the excavation cannot be performed at another location or the owner's need cannot be accomplished by a method that does not require excavation.

**Sec. 90-466. Joint excavation.**

(a) *Requirements.* Whenever two or more owners propose excavations in the same block within a three-year period, one owner shall perform such excavation or cause such excavation to be performed. Unless otherwise agreed in writing between the owners, the owner proposing the excavation with the highest cost shall perform the excavation or cause such excavation to be performed, and the other owner or owners shall pay such owner for the portion of the excavation attributable to them. Owners to whom this subsection applies shall submit a joint application and may receive only a single permit.

(b) *Waiver.* The Director may, for good cause shown, waive in writing the requirements of subsection (a) of this section after consideration of the criteria and documentation in the manner set forth in section 90-461(e). However, the Director may place special conditions on permits granted after a waiver of the requirements of subsection (a) of this section.

### **DIVISION 3. PERMITS.**

#### **Sec. 90-486. Application.**

(a) *In general.* The owner of the facility for which an excavation is performed shall apply for a permit for the excavation. If the owner will not perform the excavation with its own forces, the owner's contractor shall join the owner's application as an applicant in seeking the permit. If two or more excavations are to be performed as part of the same project, the application and any permit issued may cover the related work in accordance with applicable regulations.

(b) *Form of application.* The Director shall prescribe by regulation a form for permit applications containing such information as the Director deems necessary for the objective review of the excavation. The Director shall also prescribe by regulation a procedure for the submission of such applications.

#### **Sec. 90-487. Issuance or denial.**

(a) *Issuance.* The Director shall issue a permit within 30 calendar days to every applicant unless he finds one or more of the reasons for denial of a permit set forth in subsection (b) of this section present. Such permit shall be in the form of a document including the following information:

- (1) The location and a brief description of the excavation authorized.
- (2) The name and contact information of the permittee.
- (3) The date of issuance.
- (4) The time period allowed for the excavation expressed with commencement and completion dates and as a number of calendar days. Where the

permit authorizes two or more excavations, the permit may indicate different time periods for each excavation.

(5) Any special conditions applicable to the permit.

(6) Such other information as the Director prescribes by rule or regulation or otherwise deems appropriate to further the purpose and intent of this article.

(b) *Grounds for denial.* The Director may deny in writing a permit to an applicant if one or more of the following conditions are present:

(1) Proposed traffic control procedures or equipment do not comply with the requirements of the Manual on Uniform Traffic Control Devices or the applicable rules and regulations promulgated pursuant to this Code.

(2) The Director determines that the applicant can perform the excavation without blocking or closing the street or without excavation in a public right-of-way.

(3) The proposed excavation violates applicable law.

(4) Any applicant set forth in the application fails to furnish any information required by this article or by rules or regulations promulgated pursuant thereto.

(5) The application contains misleading or false information.

(6) The proposed excavation conflicts with a permit previously issued by the Director.

(7) The proposed excavation would cause a safety hazard or impede traffic flow and the application does not indicate that adequate protection for pedestrian or vehicular traffic at the location of the proposed excavation will be provided.

(8) The owner does not possess any necessary legal right to place facilities in the public right-of-way.



(9) Any applicant set forth in the application does not possess any of the licenses or permits that this Code requires such applicant to possess.

(10) The applicant's proposed restoration method and schedule do not meet the requirements of the rules and regulations promulgated pursuant to this article.

(11) Any applicant set forth in the application has failed to restore an excavation site in accordance with applicable requirements of this article or any rules and regulations promulgated or permit issued pursuant thereto within the twelve months prior to the Director's receipt of the application.

(12) Any applicant set forth in the application owes the City delinquent taxes.

(13) Any applicant set forth in the application has been debarred.

**Sec. 90-488. Conditions.**

(a) *Conditions for issuance.* Every permit issued pursuant to this article shall be subject to the following terms and conditions, unless the permit expressly provides otherwise:

(1) *Bond.* Prior to the issuance of a permit the applicant shall post a surety bond (i) naming the City as the obligee (ii) in an amount prescribed by the Director pursuant to rules and regulations promulgated by the Director and (iii) in a form prescribed or approved by the City Attorney or his designee. Such surety bond shall guarantee the completion of the excavation and the maintenance thereof for two years from the date of such completion in accordance with this article or any other applicable law, any rules or regulations promulgated pursuant thereto, the permit, and any drawings and specifications specified in the permit.

(2) *Indemnity.* Prior to the issuance of a permit, the applicant shall execute an indemnity agreement under which the applicant agrees to indemnify, hold harmless and

defend the City against any claims or suits arising out of or relating to the excavation. Such indemnity agreement shall be in a form prescribed or approved by the City Attorney or his designee.

(3) *Insurance.* With the approval of the City Attorney and the Director of Finance, or their designees, the Director shall promulgate rules and regulations setting forth a requirements for insurance policies, coverages and limits to be maintained by permittees based on the location, size, complexity or other relevant aspects of the excavation. Prior to the issuance of a permit, the applicant shall furnish the Director with evidence of such insurance policies, coverages and limits with endorsements indicating that the City is an additional insured on such policies and that no fewer than 45 days' notice of any cancellation, modification or non-renewal will be mailed to the Director.

(4) *Warranty.* Prior to the issuance of a permit, the applicant shall execute a written warranty for the benefit of the City in a form prescribed or approved by the City Attorney or his designee. Such warranty shall guarantee that (i) the permittee will timely perform the excavation in accordance with this article or any other applicable law, any rules or regulations promulgated pursuant thereto, the permit, and any drawings and specifications specified in the permit and (ii) the excavation will comply with this article or any other applicable law, any rules or regulations promulgated pursuant thereto, the permit, and any drawings and specifications specified in the permit for a period of two years from completion.

The requirements of this subsection shall not apply to federal, state or local governmental entities performing excavation work with their own forces but shall apply to all contractors or

other persons that perform the excavation work on behalf of such federal, state or local governmental entities.

(b) *Other conditions of the permit.* The following additional conditions shall apply to all permits issued pursuant to this article:

(1) *Not transferable.* A permit issued under this article is personal to the permittee and may not be transferred to another person or used by any other person to perform the excavation authorized in the permit.

(2) *Only valid for location described.* A permit is only valid for the location or locations described on the application, depicted on any drawings or specifications, and expressly authorized in the permit. No excavation at any other location shall be authorized without the issuance of a separate permit.

(3) *Void if excavation not timely commenced.* Unless extended by the Director upon written request and for good cause shown, a permit will become void if the excavation authorized thereby is not commenced within 60 days from the permit's issuance.

(4) *Amendments.* A permit shall no longer be valid if there are material changes to the excavation, including, but not limited to, a change in the scope of the work or the method of performing the work of such consequence that the drawings and specifications no longer accurately depict the work. Should a permit become invalid for this reason, the permittee must obtain an amendment to the permit in order to continue the excavation. To obtain an amendment, the permittee must submit an application therefore, including amended drawings and specifications, indicating all changes. A permit shall not be amended to include an

excavation that is not related to the original permit or to extend the excavation into any geographical area not included in original permit.

(5) *Extensions.* For good cause shown not relating to any failure of the permittee to diligently prosecute the excavation, the Director may extend the number of days set forth in the permit in accordance with section 90-487(a)(4) for the completion of the excavation. Extensions of time under this subdivision shall not be regarded as amendments, but shall be noted on the records regarding the permit.

(c) *Conditions not exclusive.* Except as expressly provided otherwise in the permit, the conditions for issuance of a permit in subsection (a) of this section shall apply in addition to any specific conditions established under or pursuant to this article or rules and regulations of the Director promulgated in accordance therewith..

**Sec. 90-489. Reserved.**

**Sec. 90-490. Emergencies.**

This article shall not be interpreted or construed to prevent any person from performing an emergency excavation so long as such person ensures compliance with the following requirements:

(a) Before the emergency excavation is initiated, the owner shall notify the Director by telephone at a 24-hour telephone number set forth by the Director in a rule or regulation promulgated to administer this section. The owner shall also notify all other federal, state or local authority that the owner is required by applicable law to notify.

(b) Within 24 hours after the initiation of the emergency excavation, or within 24 hours after the City's offices first open following the initiation of the emergency excavation, the

owner shall apply for a permit for the emergency excavation in accordance with all other requirements of this article.

**Sec. 90-491. Annual permit.**

At any time after promulgating rules and regulations establishing a program for the issuance of annual permits, the Director may issue annual permits to owners upon receipt of a complete and appropriate application therefor. Such annual permits shall authorize the performance of routine or small-scale excavations outside of the Downtown Richmond Coordination Zone for a period of one year from the annual permit's date of issuance. The purpose and intent of this section is to authorize the Director to establish a streamlined procedure to enable owners to perform frequent routine or small-scale excavations in accordance with the conditions and requirements of this article related to the performance of excavations.

**DIVISION 4. CONDUCT OF EXCAVATIONS.**

**Sec. 90-516. Standards.**

Permittees shall perform all excavation work to the complete satisfaction of the Director. The Director shall promulgate rules and regulations setting forth such standards for excavation work as he deems appropriate. The determination of the Director as to the compliance of any excavation work with such standards shall be final.

**Sec. 90-517. Inspections--basic requirement.**

All excavations shall be inspected as specified in the permit. Based upon the complexity and nature of the excavation, inspections may be required during the performance of the excavation, immediately upon completion of the excavation, or both. An inspector approved by the Director shall perform all inspections at the permittee's expense pursuant to rules and

regulations promulgated by the Director. The permittee shall arrange for each required inspection, notify the Director of the date and time when each inspection will occur, and direct the inspector to furnish the Director with the written inspection results within the time limits set forth in the permit. Excavation work performed under the permit will not be considered complete until it has passed the final inspection required by the permit.

**Sec. 90-518. Same--additional requirements.**

Consistent with applicable laws, sound engineering practices, and the nature of the excavation, the Director may, in addition to or in lieu of the inspections called for under section 90-517, require that a permittee, at the permittee's expense, retain a professional engineer licensed in Virginia to observe the excavation and, based upon the engineer's observations, to provide written certification upon completion of the excavation stating that the public right-of-way has been restored in accordance with the drawings and specifications and all other applicable technical requirements.

**Sec. 90-519. Reserved.**

**Sec. 90-520. Same--correction of defects.**

(a) *Notification of Director.* The Director shall be notified prior to the time that the surfacing of the public right-of-way is replaced so that the work done preparatory to such surfacing may be inspected. The Director shall further be notified after the surfacing has been completed in order that the surfacing may be inspected.

(b) *Requirement to correct defect.* If any work performed pursuant to a permit issued under this article is not in accordance with the terms and conditions upon which the permit was issued or if a public right-of-way is not left in satisfactory condition, notice of such defect shall

be given to the permittee. Such permittee shall be required to correct the condition within the time specified in the notice.

(c) *Failure to correct defect.* Upon receipt of a notice given under this section, should any permittee refuse or fail to correct the condition referred to in such notice within the specified time, the Director may cancel the permit in question and cause the necessary work to be done, deducting the cost thereof from any financial guaranty required pursuant to section 90-488(a) or otherwise as a condition for issuance of the permit.

**Sec. 90-521. Damage to facility.**

A permittee who, in connection with an excavation, damages another owner's facility shall immediately notify the Director and, to the extent that the owner's identity is reasonably determinable, the owner of the damaged facility.

**Sec. 90-522. As-built drawings and specifications.**

Upon final completion of an excavation, the permittee shall furnish the Director with a set of as-built drawings and specifications for the excavation, which shall be in a form prescribed by the rules and regulations promulgated by the Director under this article. If the excavation work was performed exactly in accordance with the drawings and specifications provided with the permit application, then the permittee may so advise the Director, and the previously supplied drawings and specifications will be regarded as the as-built drawings and specifications.

**Sec. 90-523. Notice.**

(a) *In general.* The permittee shall comply with all notice requirements for the excavation set forth in the rules and regulations promulgated by the Director.

(b) *Miss Utility.* The permittee shall comply with the requirements of utilities regarding notification of excavation and marking of subsurface facilities. Such permittee shall provide Miss Utility with the assigned number for the permit to excavate or other information as may be necessary to properly identify the proposed excavation.

**Sec. 90-524. Restoration.**

The Director shall promulgate rules and regulations setting forth technical requirements for the restoration of pavements following all excavations in the public right-of-way. All permittees shall comply with all such technical requirements to the complete satisfaction of the Director.

**DIVISION 5. POST-EXCAVATION REQUIREMENTS.**

**Sec. 90-546. Obligation to maintain, repair or reconstruct.**

Each owner that performs an excavation or causes an excavation to be performed in the public right-of-way shall maintain, repair or reconstruct the site of the excavation as necessary to maintain a condition satisfactory to the Director until such time as City reconstructs, repaves or resurfaces the public right-of-way.

**Sec. 90-547. Subsurface material or pavement failures.**

In the event that subsurface material or pavement over or immediately adjacent to any excavation should become depressed or broken or should fail in any way at any time after the excavation has been completed, the Director shall reasonably determine the person or persons responsible, if any, for the failure in the subsurface material or pavement of the public right-of-way and shall designate such person or persons as the responsible party. The Director shall notify the responsible party in writing of the condition, its location, and the required remedy.



The responsible party shall repair or restore such condition or cause such condition to be repaired or restored to the satisfaction of the director within 72 hours of the Director's issuance of written notification. For good cause shown, the Director may extend the time for the responsible party to repair or restore the affected public right-of-way.

**Sec. 90-548. Same--repair by City.**

In the event that the responsible party fails, neglects, or refuses to repair or restore any condition pursuant to the Director's notice as described in section 90-547, the Director may repair or restore such condition or cause such condition to be repaired or restored in such manner as the Director deems expedient and appropriate. The responsible party designated pursuant to section 90-547 shall compensate and be liable to the City for all costs associated with the administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration or any other actual costs incurred by the City that were made necessary by reason of the repair or restoration undertaken by the City. The Director may use any financial guaranty furnished by the responsible party pursuant to section 90-488(a) to pay for such costs. Repair or restoration by the City shall not relieve the responsible party from the requirements of sections 90-547 for subsurface material or pavement failures that occur after such repair or restoration by the City. Action taken by the City pursuant this section shall be in addition to any action that the City may take pursuant to Division 6 of this article.

**Sec. 90-549. Emergency remediation.**

(a) *Notice.* If the Director determines that the site of an excavation constitutes a hazard, a public nuisance, a public emergency or some other imminent threat to the public health, safety or welfare that requires immediate repair or restoration, the Director may order the

condition repaired or restored by a written, electronic or facsimile notice to the responsible party designated pursuant to section 90-547.

(b) *Failure or responsible party to act.* If the responsible party fails, neglects or refuses to take immediate action to remedy the condition by the deadline specified in such communication, the director may remedy the condition or cause the condition to be remedied in such manner as the Director deems expedient and appropriate. The responsible party shall compensate and be liable to the City for all costs associated with the administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration or any other actual costs incurred by the City that were made necessary by reason of the emergency remediation undertaken by the City pursuant to this subsection. The Director may use any financial guaranty furnished by the responsible party pursuant to section 90-488(a) to pay for such costs.

(c) *Remedy cumulative.* Remedy of the condition by the City in accordance with this subsection (b) of this section shall not relieve the responsible party from the requirements of sections 90-547 for subsurface material or pavement failures that occur after such repair or restoration by the City. Action taken by the City pursuant this section shall be in addition to any action that the City may take pursuant to Division 6 of this article.

**Sec. 90-550. Removal, relocation, or alteration of facilities.**

(a) This section applies to all facilities located in any public right-of-way and to all owners who possess such facilities.

(b) An owner shall remove, relocate or alter a facility if the Director reasonably determines that removal, relocation, or alteration of the facility is necessary for the construction, operation, repair, maintenance, or installation of a City or other governmental entity's facility.

(c) Subject to the requirements of this article, an owner shall remove, relocate or alter its facility within 120 days following the Director's issuance of written notice that removal, relocation, or alteration of the facility is necessary, unless the notice specifies a different length of time for the removal, relocation or alteration of the facility pursuant to subsection (d) of this section.

(d) An owner shall remove, relocate or alter its facility by the deadline specified in the Director's written notice that such removal, relocation or alteration is required (i) if the facility is located outside of its approved public right-of-way assignment or (ii) the Director determines the action is reasonably necessary to abate an obstruction that poses an unreasonable risk to public health, safety or welfare.

(e) If an owner fails to remove, relocate or alter a facility by the deadline described in subsections (c) or (d) of this section, the City may remove, relocate or alter the facility at the owner's expense, and owner shall pay all relocation and alteration expenses, including consequential damages, that result from locating a facility outside the assigned area.

(f) The owner shall furnish the Director with documentation of all removals, relocations and alterations of facilities pursuant to this section in a form prescribed by rules and regulations promulgated by the Director.

## **DIVISION 6. ENFORCEMENT.**

### **Sec. 90-576. Stop work order.**

If the Director determines that a person has violated this article or that an ongoing excavation at a site constitutes a hazard, a public nuisance, a public emergency or some other imminent threat to the public health, safety or welfare that requires immediate repair or restoration, the Director may issue a stop work order for the excavation at the site. It shall be

unlawful for a person to continue any excavation activity at a site after the Director has issued a stop work order for that site.

**Sec. 90-577. Suspension, modification and revocation.**

After the Director has issued a stop work order, the Director shall review the violation or hazard, public nuisance, public emergency or other imminent threat to the public health, safety or welfare and may thereafter suspend for a definite or indefinite time period, modify the conditions of or revoke the permit for the excavation at the site for which the Director issued the stop work order.

**Sec. 90-578. Debarment.**

The Director shall not issue a permit to any person who is in default or breach of any obligation to the city under this article on a prior permit obligation arising therefrom. Further, the Director may, pursuant to rules and regulations promulgated by him setting forth debarment procedures, debar from obtaining a permit any person when that person (i) has performed an excavation in the public right-of-way not authorized pursuant to this article or to a valid permit issued thereunder, (ii) on more than three occasions failed, neglected or refused to comply with quality requirements set forth in any rules or regulations promulgated pursuant to this article, or (iii) caused or allowed either (i) or (ii) above. Any such debarment shall be for a reasonable period of time calculated according to a method set forth in the rules and regulations the Director has promulgated to set forth debarment procedures. The Director shall furnish any person to be so debarred with written notice of such debarment.

**Sec. 90-579. Compliance with article.**

It shall be unlawful for any person to violate or to fail, refuse or neglect to comply with any section of this article. Except as otherwise provided in any section of this article, upon conviction, such person shall be punished for a class 3 misdemeanor.

§ 2. That Divisions 6 and 7 of Article II of Chapter 90 of the Code of the City of Richmond (2004), consisting of sections numbered 90-171 through 90-205, be and are hereby repealed as follows:

**DIVISION 6. EXCAVATION AND RESTORATION.**

**Sec. 90-171. Permit required; emergency excavations.**

(a) Any person desiring to dig up, break, excavate, tunnel, undermine, open, pave, repave or restore the surface or subsurface of any sidewalk, curb, gutter or street shall first obtain a permit in accordance with section 90-69 and shall thereafter be authorized to use the street, sidewalk or other public way for the purpose specified. This grant of authorization for use of the street, sidewalk or other public way is subject to any and all applicable limitations, terms and conditions imposed or provided for under this article and to any other applicable provision having the force of law. No further work shall be performed after the permit for such work has been revoked or has otherwise ceased to be in force and effect.

(b) If an excavation is required in order to make emergency repairs and the existing emergency requires that excavation operations commence within 72 hours from the discovery of such emergency, a permit shall not be required to commence the excavation. Any person commencing an emergency excavation without a permit must:

(1) Give notice of the nature of the emergency and the need for an excavation

by telephone or other means to the director of public works immediately following discovery of the emergency; and

(2) File an application, permit fee and bond, as required by this article, as soon as practicable following commencement of the excavation.

(c) Any person commencing an emergency excavation without a permit as allowed in this section thereby implies acceptance of all requirements and conditions as set forth in this article.

**Sec. 90-172. Duty to prosecute work without delay.**

It shall be the duty of every person to whom a permit has been issued pursuant to this division to commence at once and complete without delay the work for which such permit was obtained and, promptly on its completion, give written notice thereof to the director of public works.

**Sec. 90-173. Standards.**

The director of public works shall adopt and maintain for public inspection comprehensive cutting, excavating, backfilling, compacting and patching standards for all repair and restoration work done in public ways. All work performed pursuant to a permit issued under this division shall be in compliance with all applicable standards.

**Sec. 90-174. Lights and barriers; responsibilities for damages caused by excavation.**

Any person to whom a permit is granted under this division shall place guards or barriers around such excavation and shall protect it by warning lights at night and shall be responsible for damages to persons or property caused by such excavations.

**Sec. 90-175. Notice and inspection; correction of defects.**

(a) The director of public works shall be notified prior to the time that the surfacing of the public way is replaced so that the work done preparatory to such surfacing may be inspected. The director of public works shall further be notified after the surfacing has been completed in order that the surfacing may be inspected.

(b) If any work performed pursuant to a permit issued under this division is not in accordance with the terms and conditions upon which the permit was issued or if a street, sidewalk or public way is not left in satisfactory condition, notice of such defect shall be given to the person who obtained the permit. Such person shall be required to correct the condition within the time specified in the notice.

(c) Upon receipt of a notice given under this section, should any person granted a permit refuse or fail to correct the condition referred to in such notice within the specified time, the director of public works may cancel the permit in question and cause the necessary work to be done, deducting the cost thereof from any bond, letter of credit, or other financial guaranty required as a condition for issuance of the permit.

**Sec. 90-176. Cleanup activities.**

At the conclusion of the work in the public way, the work area shall be thoroughly cleaned of all rubbish, excess earth, rock and other debris resulting from such work. All cleanup operations at such site shall be accomplished at the expense of the person who obtained the permit and shall be completed to the satisfaction of the director of public works.

**Sec. 90-177. Construction with franchises.**

Nothing in this article shall be deemed to relieve any person of the obligation to obtain a

franchise for the use of city streets when such franchise is required under other applicable provisions of city or state law. Neither shall the fact that a person has previously been granted a franchise relieve such person of the responsibility of complying with this article.

## **DIVISION 7. INSTALLATION AND CONSTRUCTION OF FACILITIES IN PUBLIC WAYS.**

### **Sec. 90-201. Definitions.**

The following words, terms and phrases, when used in this division, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

*Facility* means a gas or water main or pipe; a sanitary, stormwater, or combined sewer; a culvert or drain; a conduit, cable, pole, wire, appliance and appurtenance, and a connection thereto or extension thereof; or a curb, gutter, sidewalk or driveway, other than a sidewalk crossing specifically provided for in this article.

### **Sec. 90-202. Permit required for installation, construction, or removal of facilities.**

Every person who desires to install, construct, remove, repair or replace a facility in any street, sidewalk or other public way shall first obtain a permit in accordance with section 90-69 and shall thereafter be authorized to use the street, sidewalk or other public way for the purpose specified. This grant of authorization for use of the street, sidewalk or other public way is subject to any and all applicable limitations, terms and conditions imposed or provided for under this article and to any other applicable provision having the force of law. No further work shall be performed after the permit for such work has been revoked or has otherwise ceased to be in force and effect.



**Sec. 90-203. Work to comply with approved plans and specifications.**

All work done in connection with the installation, construction, removal, repair or replacement of a facility in any street, sidewalk or other public way, pursuant to a permit issued under this article, shall be in accordance with plans and specifications prescribed or approved by the director of public works.

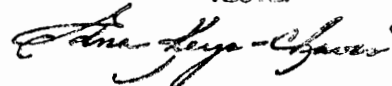
**Sec. 90-204. Separate permit required for excavation and restoration activities.**

Every person who desires to remove any earth, gravel, paving, or other surface covering from a street, sidewalk or other public way shall, before any work is begun in connection therewith, obtain a separate permit for the purpose in accordance with the sections of this article governing excavation and restoration activities.

**Sec. 90-205. Applicability to city departments and agencies.**

This division shall apply to work done in any street, sidewalk or other public way by a department or agency of the city government. However, such department or agency shall not be required to comply with general permit conditions relating to indemnification, insurance, and bonding, and it shall not be required to pay a fee for issuance of any permit.

§ 3. This ordinance shall be in force and effect on August 1, 2005.

A TRUE COPY:  
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CITY CLERK



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 1A***

INTRODUCED: JUL 11 2005

AN ORDINANCE No. 2005- **205 -173**

To amend and reordain Chapter 90 of the City Code by amending sections 90-439 (rules and regulations), 90-520 (correction of defects), 90-548 (repair by City) and 90-549 (emergency remediation) by adding new sections 90-2 (design and construction standards), 90-489 (fees and deposits) and 90-519 (fees) and by establishing a fee in Appendix A for section 90-519, to provide for the Department of Public Works to maintain and enforce a Right-of-Way Design and Construction Standards Manual and to charge fees and deposits associated with its enforcement of Chapter 90, Article VII (excavation in public right-of-way).

\_\_\_\_\_  
Patron – Mayor Wilder

\_\_\_\_\_  
Approved as to form and legality  
by the City Attorney  
\_\_\_\_\_

PUBLIC HEARING: JUL 25 2005 AT 6 P.M.

THE CITY OF RICHMOND HEREBY ORDAINS:

§ 1. That sections 90-439, 90-520, 90-548 and 90-549 of the Code of the City of Richmond (2004) be and are hereby amended and reordained as follows:

**Sec. 90-439. Rules and regulations.**

The Director shall promulgate such rules and regulations as he deems necessary in order to give effect to this article and may include such rules and regulations as part of the City's Right-of-Way Design and Construction Standards Manual. Such rules and regulations shall be consistent with all applicable federal, state and local laws and with sound engineering practices.

AYES: 9 NOES: 0 ABSTAIN: \_\_\_\_\_

ADOPTED: JUL 25 2005 REJECTED: \_\_\_\_\_ STRICKEN: \_\_\_\_\_

The Director shall (i) make such rules and regulations available for inspection in its offices, (ii) publish all such rules and regulations in a form for sale to the public and (iii) to the maximum extent practicable, make such rules and regulations available electronically and through the Internet.

**Sec. 90-520. Same--correction of defects.**

(a) *Notification of Director.* The Director shall be notified prior to the time that the surfacing of the public right-of-way is replaced so that the work done preparatory to such surfacing may be inspected. The Director shall further be notified after the surfacing has been completed in order that the surfacing may be inspected.

(b) *Requirement to correct defect.* If any work performed pursuant to a permit issued under this article is not in accordance with the terms and conditions upon which the permit was issued or if a public right-of-way is not left in satisfactory condition, notice of such defect shall be given to the permittee. Such permittee shall be required to correct the condition within the time specified in the notice.

(c) *Failure to correct defect.* Upon receipt of a notice given under this section, should any permittee refuse or fail to correct the condition referred to in such notice within the specified time, the Director may cancel the permit in question and cause the necessary work to be done, deducting the cost thereof from any financial guaranty required pursuant to section 90-488(a), section 90-489(b) or otherwise as a condition for issuance of the permit.

**Sec. 90-548. Same--repair by City.**

In the event that the responsible party fails, neglects, or refuses to repair or restore any condition pursuant to the Director's notice as described in section 90-547, the Director may

repair or restore such condition or cause such condition to be repaired or restored in such manner as the Director deems expedient and appropriate. The responsible party designated pursuant to section 90-547 shall compensate and be liable to the City for all costs associated with the administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration or any other actual costs incurred by the City that were made necessary by reason of the repair or restoration undertaken by the City. The Director may use any financial guaranty furnished by the responsible party pursuant to section 90-488(a), section 90-489(b) or otherwise to pay for such costs. Repair or restoration by the City shall not relieve the responsible party from the requirements of sections 90-547 for subsurface material or pavement failures that occur after such repair or restoration by the City. Action taken by the City pursuant this section shall be in addition to any action that the City may take pursuant to Division 6 of this article.

**Sec. 90-549. Emergency remediation.**

(a) *Notice.* If the Director determines that the site of an excavation constitutes a hazard, a public nuisance, a public emergency or some other imminent threat to the public health, safety or welfare that requires immediate repair or restoration, the Director may order the condition repaired or restored by a written, electronic or facsimile notice to the responsible party designated pursuant to section 90-547.

(b) *Failure or responsible party to act.* If the responsible party fails, neglects or refuses to take immediate action to remedy the condition by the deadline specified in such communication, the director may remedy the condition or cause the condition to be remedied in such manner as the Director deems expedient and appropriate. The responsible party shall compensate and be liable to the City for all costs associated with the administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration or

any other actual costs incurred by the City that were made necessary by reason of the emergency remediation undertaken by the City pursuant to this subsection. The Director may use any financial guaranty furnished by the responsible party pursuant to section 90-488(a), section 489(b) or otherwise to pay for such costs.

(c) *Remedy cumulative.* Remedy of the condition by the City in accordance with this subsection (b) of this section shall not relieve the responsible party from the requirements of sections 90-547 for subsurface material or pavement failures that occur after such repair or restoration by the City. Action taken by the City pursuant this section shall be in addition to any action that the City may take pursuant to Division 6 of this article.

§ 2. That Chapter 90, Article I of the Code of the City of Richmond (2004) be and is hereby amended and reordained by adding therein a new section numbered 90-2 as follows:

**Sec. 90-2. Design and construction standards.**

The Director shall establish and, from time to time, modify a manual entitled “Right-of-Way Design and Construction Standards Manual” consisting of general and specific right-of-way design and construction standards that the Director shall enforce for all design and construction that occurs in streets, sidewalks and public ways as defined in section 90-1 and in public rights-of-way as defined in section 90-437. Such standards shall be consistent with all applicable federal, state and local laws and with sound engineering practices. The Director shall (i) make the manual available for inspection in its offices, (ii) publish the manual in a form for sale to the public and (iii) to the maximum extent practicable, make the manual available electronically and through the Internet.

§ 3. That Chapter 90, Article VII, Division 3 of the Code of the City of Richmond (2004) be and is hereby amended and reordained by adding therein a new section numbered 90-489 as follows:

**Sec. 90-489. Fees and deposits.**

(a) *Fees.* Upon submission of its application for a permit, an extension thereof or an amendment thereto, each applicant shall pay to the City the permit fee in accordance with section 90-70 in order to compensate the City for the cost incurred in administering the provisions of this division.

(b) *Deposits.* Upon submission of its application for a permit, an extension thereof or an amendment thereto, each applicant shall deposit with the City a sum sufficient to pay the estimated cost of restoring the public right-of-way in a manner satisfactory to the Director in accordance with sections 50-520, 50-548 or 50-549 or any other requirement of this article. Such deposit shall be in accordance with a schedule of costs prepared and modified by the Director from time to time or such other rules and regulations setting forth objective standards for determining such costs as the Director may promulgate from time to time. Should the cost of the work of restoring the public right-of-way exceed the amount of the deposit, the applicant shall pay the difference within ten days from the date of notice thereof. Any excess of the deposit over the cost of such work shall be refunded to the applicant.

§ 4. That Chapter 90, Article VII, Division 4 of the Code of the City of Richmond (2004) be and is hereby amended and reordained by adding therein a new section numbered 90-519 as follows:

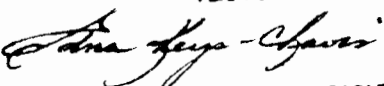
**Sec. 90-519. Same--fees.**

Each permittee shall pay to the City the minimum inspection fee as set forth in appendix A to this Code for each opening in the public-right-of-way allowed under the permit in order to compensate the City for the cost incurred in administering the inspection requirements of this division. In addition, each permittee shall pay to the City that portion of the actual cost of such inspection that exceeds the amount of such inspection fee. No inspection fees shall be collected from a permittee when (i) the permittee pays the City under a separate agreement pursuant to which the Department of Public Works manages and inspects the excavation work or (ii) the excavation is to construct, replace, or repair a City-owned utility.

§ 5. That Appendix A of the Code of the City of Richmond (2004) be and is hereby amended by establishing a fee for section 90-519 of the Code of the City of Richmond (2004) as follows:

<i>Code Section</i>	<i>Description</i>	<i>Fee</i>
90-519	Minimum fee for inspection of each opening in the public right-of-way	\$50.00

§ 6. This ordinance shall be in force and effect upon adoption.

A TRUE COPY:  
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CITY CLERK





***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 2***



## ***CITY OF RICHMOND***

### ***Department of Public Works***

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**Subject: DPW Guidelines for the Restoration of Trench Cuts Based on the “Age of Pavement (Sec. 90-524 and 90-439 {Attachments 1 and 2})**

1. **3-YEARS OR LESS** – Full lane width overlay for the length of the cut and entire width of any and all lanes affected, as per the TCR-5A Longitudinal Detail (see Appendix C) and the Transverse Cut trench restoration ratios indicated in Section 1 (a) (i). The lane width is considered: as marked; as traveled; and/or to center line. The minimum over-milling/overlay width shall not be less than 8 feet wide. Any affected curb lanes are to be taken all the way to the curb face or nose of gutter pan.

According to City’s Street Excavation Ordinance adopted April 25, 2005, trench cut work proposed on any pavement Section less than 3-years old must be granted an exception waiver by the Director of Public Works or his/her designee. The work must be deemed an emergency repair or determined as unavoidable circumstances. (Sec. 90-464)

2. **3-YEARS TO 6-YEARS** -- The minimum over-milling/overlay width shall not be less than 7 feet wide. The over-milling/overlay shall always extend a minimum of one foot beyond the trench wall line. On continuous runs where the restoration outline is less than 6 feet from the curbing, the overlay shall extend to the curb face or nose of gutter. On Single Holes this requirement is reduced to 2 feet from the curbing.

If the destructive work has impacted more than 1/3 of the lane as defined, then a full lane width overlay for the length of the cut is required (refer to the TCR-5A Longitudinal Detail in Appendix C). This will be referred to in general terms as “The 1/3 Rule”. The lane width is considered: as marked; as traveled; and/or to center line.

On Transverse Cuts, the width of overlay restoration will be according to the ratios indicated in Section 1 (A) (i) .

3. **6-YEARS OR MORE** – The Minimum “One Foot Rule” Applies

The “One Foot Rule” requires the over-milling of trench width/walls along the entire length and around the entire width of all affected areas (See DPW Illustration TCR-1 or TCR -2 in Appendix C, whichever is applicable). The notes in the TCR-1 & 2 details required the entire restoration area to be blocked-out, square-pointed, saw cut, well tacked, and completely enveloped in an overlay. (Sec. 90-516)

On Transverse Cuts, the width of restoration ratios indicated in Section 1 (A) (i) shall be applied accordingly.

4. Regardless of age, over-milling may not be an option on many Residential/Local Streets. This is due to Thin Pavement Sections of asphalt, chip seals or cape seals. Thin is defined as less than three inches of pavement structure thickness. In these situations, the surrounding pavement is to be fully overlaid according to the age of pavement tables, the appropriate TCR-6 Thin Section Detail (6"21A base stone / 3"SM-9.5A base course asphalt / 1"SM-9.0A surface coat asphalt) in Appendix C, and the defined trench classification requirements in Section 1. The overlay area must first be tacked per the instructions of the Right-Of-Way Inspector. Once properly tacked the overlay shall be taken to a feathered-edge with the existing pavement surface. The feathered-edge is to be protected around the entire border of the patch with a 4" wide treatment of hot rubberized crack seal material. The crack seal treatment shall be done within 30 days of completing the patch.

See Section 1 (Part 1) (a) (i) of the City Of Richmond's, Department of Public Works – "RIGHT-OF-WAY EXCAVATION & RESTORATION STANDARDS MANUAL" for the comprehensive guideline.

**DPW Guidelines for the Restoration of Trench Cuts when Dealing with Longitudinal, Intermediate Length, Transverse, Multiple, Sequential and/or Single Hole Cuts**

1. RESTORATION STANDARDS / RESTORATION OF THE PUBLIC RIGHT-OF-WAY.

Each Permittee who excavates or is responsible for an excavation in the Public Right-of-Way shall be responsible to maintain, repair, or restore the site of the excavation to a condition acceptable to the Director of Public Works. All restoration shall result in a work site condition equal to or better than that which existed prior to construction. The following provisions will serve as guidelines for work in the City of Richmond:

PAVEMENT

Pavement restoration shall match the existing street cross section and pavement type. On arterials, downtown, collectors, residential or local streets regardless of the existing type or depth of pavement, the minimum cross section shall meet the requirements as stated in the *Age of Pavement Tables*, applicable Trench Cut Restoration (TCR) details in Appendix C, and/or DPW Construction Notes in Appendix B. No reductions will be considered beyond these guidelines. The limits of restoration required for any pavement type shall be dependent on the size and location of the excavation. Any variance on the limits of restoration required is at the discretion of the City Right-of-Way Inspector(s). In all cases the work site must be cleaned up each day.

1. Limits of Restoration:

(a) Asphalt Pavement:

- (i) Transverse excavations crossing six feet (6') or more into a travel or curb lane, shall require the entire lane width (as marked, as traveled or to center line) to be paved according to the age of pavement tables, TCR-1 or TCR-2 or TCR-6 trench restoration details, and the *over-milling/overlay formulas for transverse trenches*. The over-

milling/overlay formulas are ratios based on the trench width measure at the widest area of the cut. The over-milling/overlay limits are determined by multiplying the trench width measurement by the multiplier then applying the result to both sides of the excavation. The ratios will be the following based on age of pavement table: 4:1 for less than 3-years; 3:1 for 3-6 years; and 2:1 for over 6-years. Apply the multiplier results to the TCR-1, TCR-2 or TCR-6 details found in Appendix C.

- (ii) Multiple excavations that are located less than or equal to twenty feet (20') from one another, longitudinally, and within a lane, shall be considered and restored as a single patch.

For any excavation that disturbs more than 30% of an Intersection, the Right-Of-Way Manager may require the restoration limits to be larger than the work area to ensure a smooth, riding surface. The age of pavement tables will be applied in a broader sense.

(b) Concrete Pavement:

- (i) Any excavation in a concrete pavement shall require a slab replacement from the nearest transverse joint longitudinally, or according to the VDOT Road and Bridge Specifications PR-2 detail for the entire width of the trench. (See VDOT PR-2 Detail in Appendix C)

(c) Composite Pavements

The permittee shall have his contractor test pit and measure the previous overlay of asphalt. If it is found to be: 1) one inch or more; and 2) if the concrete is at least 5" thick or greater; and 3) where the concrete integrity is considered sound, then 4) doweling and re-establishment of the former platform base section of concrete shall be done according to the PR -2

details provided in the approved plans, and/or the VDOT Road and Bridge Standards, and/or Appendix C of the DPW Standards Manual. The asphalt overlay must meet the existing/adjoining surface in whatever asphalt thickness that matches, or as required by the Right-Of Way Permit Inspector.

Conversely, in areas where: 1) the asphalt overlay is measured at 5" or more, and 2) the concrete base is less than 5" thick and crumbled back to an aggregate condition, then 3) skip the doweling, 4) skip the concrete, and 5) match the total pavement thickness in full depth asphalt (no less than 12 inches of BM-25) to the surface. The BM-25 is to be placed in 3 equal lifts not to exceed 4 inches in compacted height each. The described *alternate equivalent treatment*, as-well-as the standard treatment, are both to be over-milled a minimum distance prescribed by the Age of Pavement Tables, or The One Foot Rule, or the Transverse Cut ratios, or some combination, then apply the asphalt surface course material SM-9.5D to the finish detail required.

(d) Alleys

See the Typical Alley restoration details in Appendix C for the restoration requirements on various alleys. (Asphalt / Stone / Composite)

Broader Definitions:

1. Multiple and/or Sequential cuts are further defined as 2 or more trench cuts, greater than 2 square feet each, and less than or equal to 20 feet apart (cut to cut). Repairs to these areas will be based on the *Age of Pavement* tables and Limits of Restoration in Section 1(a) (ii).
2. Investigative Potholing and/or minor utility repair cuts, each of which is less than 2 square feet (SF), and each is greater than 10 feet apart edge to edge in any direction, do not constitute a *multiple cut* restoration requirements. Therefore, the age of pavement requirements and corresponding details for the same, do not apply. These are considered Single Hole trench restoration cases. See DPW definitions and guidelines for Single Hole restorations and use the TCR-1 & TCR-2 & TCR-6 details in Appendix C.

3. On “Multiple Cut Cases” involving asphalt pavement sections, a new surface course is required to properly outline the length and width of the affected area. The restoration guidelines shall follow the Age of Pavement narrative and as summarized on the TCR-5A table. Multiple cut conditions are declared by DPW when:
  - a. more than 2 cuts are performed in a lane as described in item # 1 above, and/or
  - b. when the separation distance, dimensions or allowable square footage of any single cut exceeds the maximums described in item # 1 above, and/or
  - c. when the distance between the single cuts on opposite sides of the street are below the minimum separation guidelines described in item # 1 above, Limits of restoration Section 1 (a) (ii) and/or
4. Longitudinal Trench cuts are to be defined as any continuous excavation running a length of 50 feet or more having a lengthwise dimensional relationship with the road section. The restoration shall follow the aforementioned age of pavement designation and the applicable TCR guidelines in Appendix C.
5. Trench cuts running lengthwise with the road section, the run being less than 50 feet long and less than 125 square feet in disturbed area, are considered Intermediate Length Trenches. Restoration requirements are based on the age of pavement tables and the applicable TCR details in Appendix C.
6. Excavations lying perpendicular, defined as a range of 45 to 135 degrees to the lengthwise road section, are considered Transverse Cuts. No other trenching designation applies. All requirements shall follow Section 1 (a) (i) and the applicable restoration ratios indicated.
7. The restoration requirements for Multiple, Sequential, Longitudinal, Intermediate Length, Single Hole or Transverse Trenches are based on the Age of Pavement Guidelines. In all cases the TCR-5A detail, or TCR-1 detail, or TCR-2 detail, or TCR-6 detail in conjunction with the Age of Pavement Tables, and where applicable, the over-milling/overlay ratios shall be used to determine the correct restoration guidelines.
8. Single Hole Trench Cuts where: no single cut line dimension exceeds 12 feet; it has been determined not to be a multiple cut or sequential cut; and the total square footage of the excavation is less than 30 square feet; and where the age of pavement is beyond 6-Years; and it has been determined by the City Right-of-Way Inspector that no adjoining pavement damage has occurred; will have the option to wave the “TCR One Foot Rule” for over-milling / overlay.

Follow-up cuts performed in the same general area within 12 months of the first, where the newer cut encroaches into the defined Multiple Cut minimum separation zone, may require the permittee to meet the applicable age of pavement requirements for over-milling /overlay regardless of the utility stakeholder ownership.

Whenever the “One Foot Rule” is waived due to the age, dimensions, square footage, and conditions described, the trench cut outline shall be sealed at the surface joint along the entire perimeter with a hot rubberized crack seal material. The joint of the trench cut must be properly prepared in advance, then approved by the City Right-Of Way Inspector. This is to include a squared pointed outline, clean line saw cuts, and well tacked. A minimum 3” wide spread of hot rubberized crack seal shall run with and envelope the entire cut line. The crack sealing shall be done within 30 days of laying the asphalt patch.

9. Where the age of pavement is beyond 6-years, all single-hole trench cut restorations that have any one dimension of 12 linear feet or more, and/or is greater than 30 square feet total, and not a thin section detail, shall follow all the restoration requirements of the TCR-1 or TCR-2 detail. The “One Foot Rule” applies.

## 2. Backfilling and Compaction:

- (a) Select fill material shall be as defined in the current edition of the VDOT Road and Bridge Specifications. The City’s TCR-1 & TCR-2 detail (see Appendix C) will be the issuance guidelines for permits and plan approval and future conformance inspections. The Permittee may request to use controlled density (flowable) fill in lieu of select fill, subject to prior approval of the Department. Controlled density fill material may not be used as a riding surface. VDOT classified dense graded stone (VDOT Class 21A) is the standard requirement. Select soil fill or recycled material may be approved as a substitution at the discretion of the City Right-of-Way Permits Inspector.

Unless granted an extension of time by the Right-Of-Way Inspector each excavation shall be backfilled, fully compacted and permanently restored within seventy-two (72) hours.



- (b) The Permittee shall use a moisture meter to test backfill moisture content ([See Attachment 7](#) for procedure). Select fill material shall be placed in eight-inch (8") lifts and compacted after each lift with appropriate compaction equipment. Compaction by backhoe bucket and/or vehicle tires is not acceptable. A minimum of twelve inches (12") of backfill should be placed over any utility pipe before compaction over the pipe. As part of the Permittee's quality control plan, written verification of compaction is required. The Permittee shall have a geotechnical technician examine the soils and pre-approve the materials and methods. The use of a Dynamic Cone Penetrometer (DCP) (or comparable equipment) is suggested. The backfill material must be continuously tested to determine the range of compaction being achieved. A density rate of 95% must be achieved for adequate compaction ([See Attachment 8](#) for DCP procedure). A minimum density of 95% must be achieved based on the materials' proctors. The Permittee shall submit written compaction test results ([See Attachment 9](#) for sample form) to the Right-of-Way Manager's Office or the City's Right-of-Way Permits Inspector. When controlled density flow fill type material is used, steel plates must be placed over the work area to allow sufficient time for the material to set properly. All material must be designed to "set" within 72 hours of placement. The anticipated use of Flow Fill must be submitted for approval prior to any use in the right-of-way subsurface.
- (c) Backfilling must meet the minimum guidelines for Geotechnical Notes in Appendix A
- (d) On projects in some partial phase of completion, the contractor shall perform a daily site inspection visit. The inspection is to evaluate: 1) the pavement conditions, 2) traffic controls measures, and 3) traffic safety issues. All corrections, adjustments and repairs shall be undertaken to ensure the safe efficient use of the public facilities.

3. Permanent Patch:

- (a) Patches will be approved based on general appearance as well as "rideability." Rideability is defined as a leveling tolerance to within one-quarter inch (1/4") at any point across the patch as it relates to the surrounding street surface.
- (b) Asphalt Pavement:
  - (i) New hot mix asphalt will be placed in lifts (maximums of 4" BM-25 and 2" SM-9.5A) and compacted using a vibratory plate compactor or properly sized static roller. See the VDOT Road & Bridge Specifications for the drum roller guidelines. Asphalt depths will be governed by the existing cross section of the street, or according to the DPW Construction Notes item 5 or the requirements for residential and non residential streets, whichever is deemed applicable by the Right-Of-Way Permits Inspector (See Construction Notes in Appendix B of this manual). When it is necessary to use cold patch in an opening due to the unavailability of hot mix material, the cold patch will be applied in one lift, approximately 2 inches thick or greater. Temporary patch material must not remain in place for more than 10 days unless the location is being continually worked. The restoration will not be considered complete until the cold patch is completely removed and replaced with required hot mix asphalt.
- (c) Concrete Pavement:
  - (i) Once the compacted backfill has been placed to subgrade, insert No. 5 dowel bars, a minimum of 16" long, installed 8" into the existing concrete slabs. The bars shall be placed on 18" centers and grouted with an approved epoxy adhesive or high strength non-shrink grout. Welded wire fabric may be required in the deck slab. A "high early"

strength (3,500-psi minimum strength within 7 days) concrete mix is required for concrete pavements and all gutters. Place, finish, and protect new concrete with adequate protection during its curing period. Concrete is required to reach "set" within 4 hours of placement. Before the pavement is opened to traffic, it shall be determined by the testing of break cylinders that the concrete pavement has reached 80% of the ACI design strength. The joints must be cleaned and properly sealed. (See Appendix C for the VDOT - PR-2 Detail)

#### 4. Adjustments to Castings, Frames & Covers, Boxes, Utility Vaults, Etc.

(a) In a 360-degree direction around the affected utility, the permittee / contractor will be responsible to make adjustments to meet the finish grade of the existing or proposed pavement and/or gutter line. Prior to a paving course being placed, a string-line inspection of the adjustments is to be made by the City's Right-of-Way Inspector.

### 1.2 TRANSPORTATION.

(a) Signalized Intersections: The Permittee, or the Permittee's subcontractor, must not cut into the pavement of a signalized intersection without contacting Miss Utility (1-800-552-7001). Once getting a location ticket started no work is to begin until the ticket has been cleared as "marked in the field". To check the *ticket status* the contractor is to call 1-800-552-3120. Public Works Traffic Operations technicians mark their system based upon the Miss Utility Communications. All requests must be made a minimum of 48 hours in advance. Traffic Operations will attempt to locate and mark buried loop detection devices. Any Permittee, or Permittee's subcontractor, who damages a loop detector must replace the damaged loop detector within 48 hours of such damage. To meet this

requirement and before starting work, the contractor must have a traffic signal contractor on stand-by to perform the repairs. This must be shown at the pre-construction meeting.

- (b) Pavement Markings: Lane striping or other painted and affixed delineators, which are removed or damaged, must be replaced by the Permittee before restoration will be considered complete. Replacement materials for lane striping and other affixed delineators shall be furnished as specified and approved by Traffic Operations. To meet this requirement and before starting work, the contractor must have a traffic pavement marking contractor on stand-by to perform the repairs. This must be shown at the pre-construction meeting

### 1.3 SIDEWALKS.

Damaged sidewalks shall be removed and replaced in full sections to the nearest joint. Replacement sidewalk material shall match the existing sidewalk to the greatest extent practical. This includes brick sidewalk as well as concrete. Brick sidewalks have either a concrete base, sand base or granular soil base. The permittee shall match the existing sidewalk according to the latest DPW conformance installation detail. All concrete edges must be saw-cut from construction joint to construction joint. Section size and required removal limits will be determined by the adjacent sections, existing joint layout or by the City's Right-of-Way Inspector.

- (a) Any sections of sidewalk that have been undermined must be cut out and replaced. Suitable backfill must be installed and compacted prior to replacement. Any undermining or voids must be repaired by dry-packing with select material, underpinning techniques or injected flow fill.
- (b) The Permittee, or the Permittee's subcontractors, must not park any vehicles and/or equipment on City sidewalks or beneath the drip-line (crown spread) of any tree, shrub, or within a landscaped bed on City property. Any damage observed after the work has been completed will be

the Permittee's responsibility. The Permittee will be required to make the necessary repairs before the work will be accepted.

#### 1.4 CURB RAMPS FOR PEOPLE WITH MOBILITY IMPAIRMENTS.

Any work which requires the disturbance of the curb, and/or sidewalk, touching the back of the curb located within a street intersection return, must be removed and replaced with a curb cut ramp, at the Permittee's sole expense. The ramp landing shall be constructed of exposed aggregate concrete or truncated domes in accordance with current Virginia Department of Transportation and City of Richmond standards and specifications for a VDOT CG-12. Ramps located on arterial or collector street intersections must be installed perpendicularly (90°) to the street, and ramps located along residential streets may be installed at 45° to the intersection of the street (see CG-12 variations in the latest VDOT Road Design & Bridge Standards). When the work disturbs an existing curb ramp, the ramp will be removed and replaced in its entirety and installed in accordance with current standards and specifications.

#### 1.5 DRIVEWAY APRONS.

Driveway aprons shall not be "patched" following any utility work until the Permittee or the Permittee's subcontractor has notified the Right-of-Way Permit Office for an inspection. The materials and method of restoration or replacement must be done in accordance with the Department's design standards, and as specified by the Director. All edges of concrete restoration shall be saw-cut. Partial patches must be taken to the edge of the wing, edge of gutter nose, to the back of apron and /or nearest saw-cut joint, as determined by the Right-of-Way Inspector.

#### 1.6 CURB AND GUTTER.

When curb and gutter is disturbed or damaged, it must be replaced in full ten-foot (10') sections and match existing curb and gutter materials to the extent practicable. Existing curb elevations must match and a constant grade ensured to

provide positive drainage. Curb and gutter must be installed with a minimum of six inches of VDOT rated dense graded aggregate 21A, compacted in-place to 95% density, the stone base extending under the curb a distance of 12" past the back of curb, and matching the adjacent curb sections and materials (i.e., concrete, exposed aggregate). Expansion material must be used at all confined joints. If the work includes removal of a section which was finished with a control joint, the Permittee must saw cut the joint prior to removing the existing section, or as directed by the City Right-of-Way inspector. The city has many areas where Granite Curb is the typical. See the DPW detail in Appendix C for installation of granite curb.

#### 1.7 STREET/ROAD CROSSING METHODS

(See Advanced Engineering Requirements for New Underground Utilities in Attachment 19)

- A. One method of crossing a street in the City of Richmond will be by boring or jacking the new pipe, service line, conduit or system extension under the street crossed. Horizontal Directional Drilling (HDD) may also be used within the Public Right-of-Way. All permittees should take special note that the City of Richmond has comprehensive guidelines, restrictions, and limitations on all open excavations or directional boring activities, see the Attachment 19 and 20 for details. The following conditions will apply:
  - (a) Horizontal Directional Drilling equipment operators must be trained, preferably by the equipment manufacturer, in the safe and proper operation of the equipment. Written proof of proper training shall be furnished to the City's Right-of-Way Inspector upon request. Failure to furnish training documentation could result in a Stop Work-Order being issued. All additional costs incurred by the Permittee, as result of the issuance of a "Stop Work Order", shall be the Permittee's responsibility. In addition to the required operator training credentials, DPW has

certification requirements on those directing the work. (See Attachment 20)

- (ii) For all underground utility construction, the Permittee shall thoroughly investigate the location of all known Public or Municipal Utilities paralleling or crossing the proposed path of the proposed utility facilities. (See Attachment 20)
- (iii) All Public Utility Facilities which are to be located underground shall, after the effective date of this Manual, be installed to a minimum depth of twenty-four (24) inches below the surface of the Public Right-of-Way. Any reductions in depth must first be granted an exception by the DPW Right-of-Way Manager.
- (iv) The Permittee is encouraged to use observation pits (pot-holes) to verify the location of existing underground utility facilities. (See specific guidelines in Attachment 19)
- (v) HDD equipment operator shall prove to the City Right-of-Way Inspector he has directional control of the boring head. The HDD equipment will have up-to-date electronics specific to the boring tool location detection system. During boring operations, the operator shall be able to determine and provide visual proof on the location of the boring head and back reamer both horizontally and vertically.
- (vi) The Permittee or the Permittee's subcontractor must be in direct charge and control of the HDD operation at all times. (See Attachment 19 & 20)
- (vii) The City's Right-of-Way Inspector shall be notified 48 hours in advance of starting HDD operations. HDD operations must be

performed in the presence of a City Right-of-Way Inspector unless otherwise directed by the Department.

- (b) A street may also be crossed with an open cut in the pavement if approved by the Department. Note: The City of Richmond encourages the use of steel plates. The Department of Public Works has comprehensive engineering guidelines for the use of steel plates. Therefore, any permittee wishing to use plates must be fully prepared to meet all the stated guidelines for “Temporary Steel Plate Bridging” (See Attachment 21).

The following conditions will apply.

- (i) The use of steel road plating and a controlled density fill material will be required to ensure uniform compaction in order to reopen the street to traffic at the earliest possible time.

Concrete roadways will be repaired to the nearest expansion joint, and doveled (steel dowel rods) into the adjacent existing concrete.

#### 1.8 UTILITY MARKING - REMOVAL.

The Permittee is responsible for ensuring that all utility markings are removed within twenty (20) days after the completion of work. If the utility marks are not removed by the time specified herein, the City will consider the marks as graffiti. The City, in accordance with existing City ordinances, may remove graffiti, and the costs associated with such removal will be the responsibility of the contractor or Permittee. The City shall have the right to suspend further permits to contractor or Permittee until the utility marks removed.

#### 1.9 LANDSCAPING.

The Department of Recreation, Urban Forestry Division, is responsible for managing and maintaining trees, shrubbery, grass and other vegetation in the Public Right-of-Way and road median landscapes. All landscape restoration shall



be performed as specified in the Permittee's tree work permit and in accordance with Chapter 90 of the Richmond City Code. The Permittee is advised that violations of Chapter 90 of the Richmond City Code could result in the issuance of a summons, which will be a class one misdemeanor.

## 2.0 VIOLATIONS.

- (a) The Director has the authority to enforce the regulations and standards specified in the Right-of-Way Excavation & Restoration Manual against violations thereof. Upon the Director's determination that a Person or Permittee has violated any provision of this Manual, the standard details and specifications, notices, ordinances, or regulations of the Department; or any term, condition, or limitation of any permit; or is subject to any outstanding fees, deposits, or other charges, the Director shall serve notice on said Person or Permittee to promptly abate the violation. Any Person or Permittee whom the Director determines to be responsible for violating the provisions contained in this Manual may be subject to any or all of the enforcement mechanisms as hereinafter specified. (Sec. 90-579)
- (b) Violations by Municipal Utilities are not subject to the penalties and fines specified in Sections 2.4. The Director is empowered to abate violations by Municipal Utilities and may charge the cost of such abatement to the expense budget of the Municipal Utility, take other appropriate action against such agency within the Director's authority, or both.

### 2.1 STOP WORK ORDER, PERMIT MODIFICATION, AND PERMIT REVOCATION.

When the Director or his/her designee has determined that a Permittee has violated the provisions of this Manual or that an excavation poses a hazardous situation or constitutes a public nuisance, public emergency, or other threat to the public health, safety, or welfare, the Director is authorized to issue a Stop Work Order. The Director may impose new conditions upon a permit, or suspend or revoke a permit

by notifying the Permittee of such action in a written, electronic, or facsimile communication. (Sec. 90-576)

## 2.2 SUBSURFACE OR PAVEMENT FAILURES - WARRANTY.

In the event that: subsurface material; or pavement; or areas immediately adjacent to any excavation, become depressed, broken, or fail in any way within two (2) years after the excavation and/or acceptance by the City, the Permittee and Permittee's subcontractor remain responsible for the failure. They shall make repairs to both the subsurface and surface as directed by the City Right-Of-Way Manager. The Right-Of-Way Manager shall notify the Permittee or subcontractor of the condition, location, and the required remedy, and such Permittee or subcontractor shall repair or restore, or cause to be repaired or restored, such condition to the satisfaction of the Right-Of-Way Manager within seventy-two (72) hours of the notification. The Right-Of-Way Manager may extend the time for the responsible party to repair or restore the affected Public Right-of-Way.

## 2.3 REPAIR BY THE DEPARTMENT.

- (a) In the event that any Permittee or subcontractor fails, neglects, or refuses to repair or restore any condition pursuant to the Director's notice as set forth in Section 2.2, the Director may repair or restore, or cause to be repaired or restored, such condition in such manner as the Director deems expedient and appropriate. The Permittee or subcontractor identified by the Director as the responsible party shall compensate the Department for any costs associated with administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration, or any other actual costs incurred by the City that were made necessary by reason of the repair or restoration undertaken by the Department. The Director's determination as to the cost of the repair or restoration performed shall be final. In addition, the responsible party may be subject to those enforcement actions as set forth in Section 2.4 and 3.0.

- (b) Subject to the limitation set forth in Section 2.2 and 3.0, repair or restoration by the Department in accordance with this Section shall not relieve the Person(s) from liability for future pavement failures at the site of the repair or restoration. (Sec. 90-488 (A) (4))

## 2.4 PENALTIES AND FEES.

- (a) Any Person or Permittee occupying or using any of the public ways of any description of the City in a manner not permitted to the general public, without having first legally obtained the consent of the City in accordance with the requirements contained herein or occupying or using such public ways inconsistent with the requirements of this Manual, shall be guilty of a Class 2 misdemeanor which provides for fines of up to \$500 (five hundred dollars). A separate and distinct offense shall be deemed committed each day on which a violation occurs or continues. (Sec. 90-486-488)
- (b) Any Person or Permittee who fails to comply with the requirements as set forth in this Manual will not be allowed to continue to work in the Public Right-of-Way and all future permit requests will be denied. (Sec. 90-487 (A) (B))

## 3.0 EMERGENCY REMEDIATION BY THE DEPARTMENT. (Sec. 90-548-549)

- (a) If, in the judgment of the Director, the site of an excavation is considered hazardous or if it constitutes a public nuisance, public emergency, or other imminent threat to the public health, safety, or welfare that requires immediate action, the Director may order the condition remedied by a written, electronic, or facsimile communication to the Permittee or subcontractor responsible for remedying the condition. (Sec. 90-549)
- (b) If the Permittee or subcontractor responsible is inaccessible or fails, neglects, or refuses to take immediate action to remedy the condition as specified in said communication, the Director may remedy the condition

or cause the condition to be remedied in such manner as the Director deems expedient and appropriate (Sec. 90-549). The Permittee or subcontractor identified by the Director as the responsible party shall compensate the Department for any reasonable costs associated with administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration, or any other actual costs incurred by the Department or other agencies, boards, commissions, or departments of the City that were made necessary by reason of the emergency remediation undertaken by the Department. In addition, the responsible party may be subject to those enforcement actions set forth in Section 2.4.

- (c) Subject to the limitation set forth in Section 2.2, remediation by the Department in accordance with this Section shall not relieve the Permittee from liability for future pavement failures at the site of the remediation

#### Notice for emergency excavation.

For emergency excavation, the Permittee, or the Applicant, if a permit has not been issued, shall post and maintain a notice at the site of the excavation during the construction period. The notice shall include the name, telephone number, and address of the owner and Permittee, a description of the excavation to be performed, and the duration of the excavation. The notice shall be posted at least every 100' along any Block where the excavation is to take place. The Permittee or Applicant shall also notify, as soon as possible, the Department, or if after normal business hours, the Police non-emergency number (804-646-5123) and advise of the emergency excavation and any potential impacts on traffic flow or traffic or pedestrian safety. (Sec. 90-490)

#### 4.0 Managing the Scope of Work

It is unlawful for any Permittee to make, to cause, or permit to be made, any excavation in the Public Right-of-Way outside the boundaries, times, and description set forth in the permit.

- (a) Single excavation maximum of 350 feet. No single excavation site shall be longer than 350 feet in length at any time except with the prior written approval of the City's Right-Of-Way Manager.
- (b) No work will be permitted (except for emergencies) on certain streets during special City events, holiday moratoriums, designated work restriction moratoriums or other events so designated by the Director.
- (c) In accordance with the provisions of Chapter 90 of the Richmond City Code, the permittee must contact and get permission from the Division of Urban Forestry, Arborist office, before cutting or pruning limbs or roots of road section trees.
- (d) DPW has a noise pollution policy. The permittee shall be aware of the restrictions and specific measurements placed on night time activities which generate noise. (See Attachment 15)

## 5.0 WORK WITHIN THE STREETS.

- (a) Arterial Streets: These are streets functionally classified by VDOT as principal arterials or minor arterials ([See Attachment 5](#)). No work will be permitted on arterial streets, or any downtown streets, or other so designated commuter sensitive routes, during the peak traffic hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. (Monday through Friday only), except where emergency work is needed to restore services, or such times as authorized by the City's Right-Of-Way Manager or The City Traffic Engineer. Lane closures will be restricted to the working lane only and two-way traffic must be maintained at all times, unless otherwise authorized and granted an exception by the City Traffic Engineer.
  - (i) Arterials must be opened to traffic each night. All utility cuts must be covered by a steel plate or a temporary asphalt patch, before leaving the site. The permanent asphalt patch must be placed the same day the work is completed for minor projects and within fifteen

(15) calendar days of completion for Major Projects, unless otherwise directed by the Department. When notified by the Department of an unsafe opening, the Permittee must respond and repair such opening within four (4) hours.

- (ii) The Department reserves the right to effect any and all required repairs, necessitated by emergency conditions, and warrant for the collection of all associated costs from the Permittee.

(b) Collector Streets: These are streets functionally classified by VDOT as urban collectors ([See Attachment 6](#)). No work will be permitted on collector streets during the peak traffic hours, 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. (Monday through Friday only), except emergency work to restore services, or such times as authorized by the Director. Two-way traffic must be maintained at all times, unless otherwise authorized and granted an exception by the City Traffic Engineer.

- (i) Collectors must be opened to traffic each night. All utility cuts must be covered by a steel plate or a temporary asphalt patch before leaving the site. The permanent asphalt patch shall be placed as soon as possible but no later than fourteen (14) days after work completion for minor projects, and within thirty (30) calendar days for Major Projects, unless granted an extension of time by the Right-Of Way Inspector.

## 6. Inclement and Seasonal Weather Requirements

- (a) See the “Temporary Steel Plate Bridging” requirements for Winter Weather use of steel plates. (Attachment 21)



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 4***

# Work in the Streets

DPW portion of the Plan Review & Permit Review Tracking

## CITY HALL

DPW Room 600/603

DPW - T/E , Storm  
Sewer Design, Drainage  
Studies, Encroachments,  
GIS Information, Survey  
Data, Mapping, Land  
Records, Preliminary  
Engineering, Design  
Review, Public Facilities  
Managements, Bonds &  
Agreements, P & I

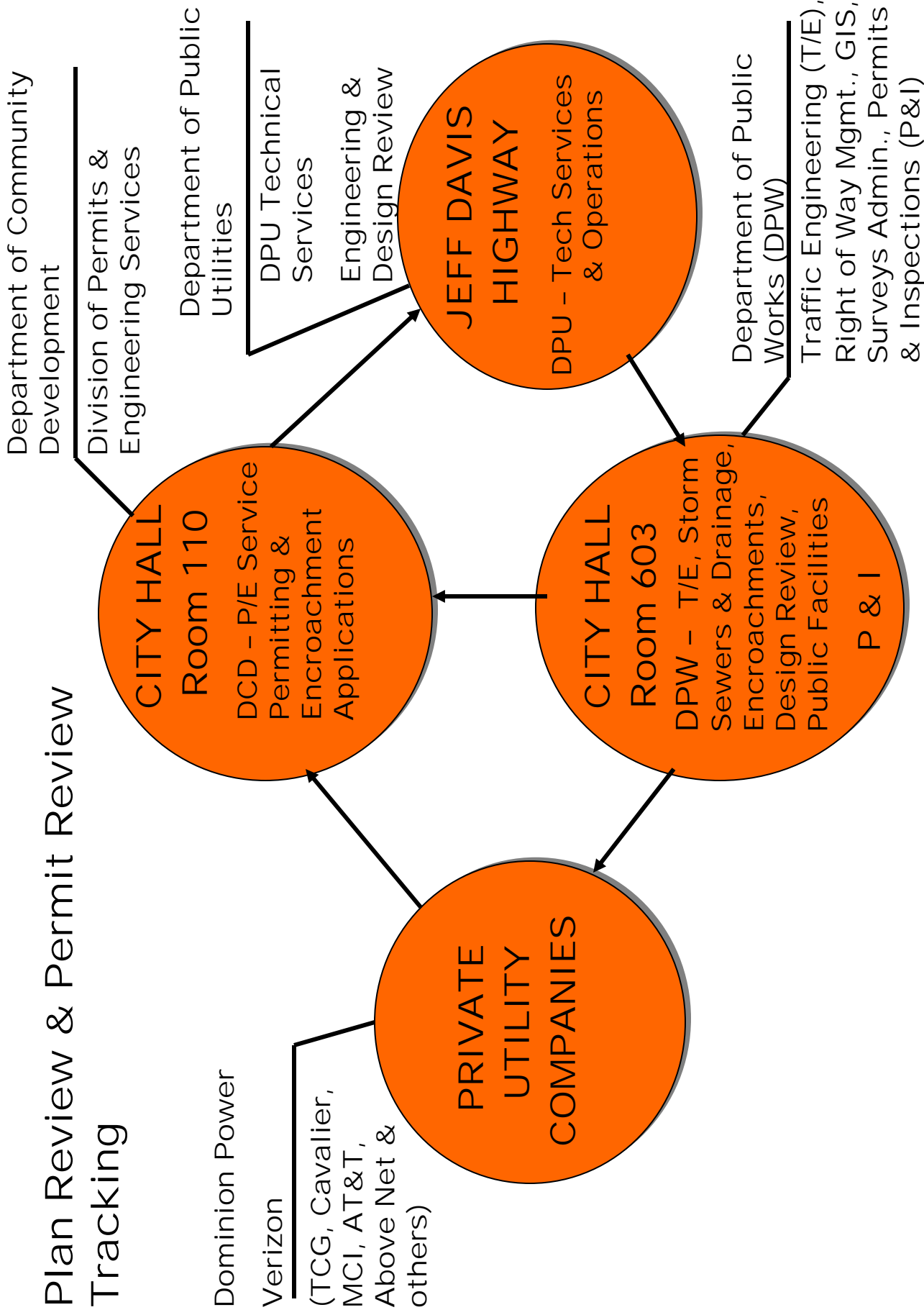
Department of Public  
Works (DPW)

Traffic Engineering (T/E),  
Right of Way Mgmt., GIS,  
Surveys Admin., Permits  
& Inspections (P&I)



# Work in the Streets

## Plan Review & Permit Review Tracking





***CITY OF RICHMOND***  
***Department of Public Works***

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## ***ATTACHMENT 5***

## WHEN SHOULD I APPLY?

- Work in streets & alleys application can take approximately 7-10 business days or more to review by outside agencies. Apply for your permit as far in advance of the need as possible. Please verify that your Certificate of Insurance meets the required criteria as noted in this brochure. **NOTE:** Permit cannot be issued unless your insurance is correct and current.

## TYPICAL REVIEW AGENCIES

- Department of Public Utilities (water, gas, electric, and sanitary sewer)
- Department of Public Works (traffic engineering, and right-of-way management)
- For sheeting & shoring and test boring projects within the City public right-of-way pre-application approval letters are needed from:
  - ☐ AT & T Broadband (804) 915-5363
  - ☐ Dominion VA Power (804) 257-4879  
Alt. (804) 257-4937
  - ☐ MCI (804) 230-2950
  - ☐ Verizon (804) 772-4284.

## NOTE:

Work associated with this permit must be completed/approved before Certificate of Occupancy can be issued.

With more complex projects, we suggest that you have a pre-application meeting with Public Works.

## WORK IN STREET PERMIT

(WISP)

*What You Should Know*



*"One City, Our City"*

Application to Work in

Streets and Alleys

Prepared by Permits & Engineering Services

City of Richmond

900 East Broad Street, Room 110

Richmond, Virginia 23219

Phone: 804-646-6440



**Permits & Engineering Services**

900 East Broad Street, Room 110  
Richmond, Virginia 23219  
Phone (804) 646-6440  
Fax (804) 646-6948

## WHAT IS A WISP?

### WORK IN STREETS & ALLEYS

A permit to work in streets and alleys is required when you work; "within the City public right-of-way; make connections to existing, underground utilities; erect construction or demolition barricades, scaffolds, etc.; construct driveways or entrances; or store materials within the City public right-of-way." There are five (5) classes of permits:

- Class I: permits to occupy, encumber, or work in the streets, sidewalks, and public ways other than for uses listed in Classes II, III, IV and V (Fee \$20.00)
- Class II: permits for work and associated obstructions of short duration (period not in excess of 60 days), including construction barricades, temporary walls or fences, scaffolds, covered walkways, swinging stages, trash dumpsters and storage or stockpiling of materials; permits for the construction of approved encroachments; and permits for new railroad crossings, alley entrance paving and commercial, industrial and institutional driveways (Fee \$40.00)
- Class III: permits for developer sewer connections, permits for track type cranes, and permits for house moving activities (Fee \$60.00)

- Class IV: permits for work and associated obstructions of long duration (any period in excess of 60 days), including construction barricades, scaffolds, covered walkways, temporary walls or fences, lift elevators, construction offices and storage or stockpiling of materials (Fee \$80.00)
- Class V: permits for sheeting and shoring and related restorations of damaged areas, and permits for developer street, sewer, water and alley construction and extensions (Fee \$100.00)

### WHAT IS NEEDED TO APPLY FOR AN APPLICATION?

- Fee amount as specified in the form of cash, check (payable to City of Richmond), or Master Card, Visa, and Discover charge card.
- Certificate of Insurance displaying a minimum \$1,000,000 combined single limit for commercial general liability (or \$300,000 combined single limit for equivalent homeowner's or renter's liability insurance), City of Richmond (not certificate holder) named as additional insured and 45 days cancellation, (or 30 days for homeowner's or renter's insurance). Certificate of Insurance is not required for sewer connections or driveway permits.

- Three (3) copies of sketch/plan showing area of City right-of-way to be used for project.

- Crane permits require photographs documenting the existing site conditions. Damage not shown in the photographs will be assumed to have occurred during work and applicant will be responsible to restore. Good quality Polaroid photos are acceptable.

### HOW CAN I OBTAIN AN APPLICATION?

- Applications may be obtained in our office # 110 of City Hall, by fax or email request.

### HOW TO FILL OUT APPLICATION

- The applicant must fill out the application. The contractor & property owners' information must be filled in completely on the work in streets & alleys application. Property owners' name and signature only required for driveway permits and to have council approved encroachments. Staff personnel in office # 110 of City Hall will review and assist with application if needed.
- Details of location and description of work for which the application is made must be submitted at time of application.

V

## Before you dig call

Miss Utility of Central Virginia  
1-800-552-7001 (Toll Free)

**Applicant's attention is especially called to provisions below**

# Application to Work in Streets and Alleys

**PERMIT MUST BE POSTED ON JOB SITE**

TO DIRECTOR OF PUBLIC WORKS:

**The undersigned applicant hereby requests permission to work at:**

Receipt #

for the purpose of

The applicant agrees to protect all city property, including sewers, conduits, gas and water pipes. Also any other public utilities which might be in the line of this construction. The applicant hereby agrees for himself or itself, his or its heirs and assigns to indemnify and

The applicant further assumes for himself or itself, his or its heirs and assigns, all persons, firms, corporations, partnerships, associations, trusts, and estates, and all persons, firms, corporations, partnerships, associations, trusts, and estates, who or which may be or become interested in the property, to indemnify and save harmless the City of Richmond from any and all damages to persons or property (public or private) directly or indirectly resulting from the exercise of the privileges granted in this permit, either during the progress of the work or after its completion.

It is further agreed that the applicant will comply with all conditions of the permit, and will be liable for any expense necessary in connection with repairing or replacing of the work at any time, regardless of the reason for such repairing or replacing.

The applicant agrees to restore all earth removed and thoroughly consolidate any backfilling in the trenches by tanning or muddling and in case of settlement or subsidence of the trench bottom the excavation is to be refilled with earth to the original depth.

All trenches dug in the streets are to be restored in a manner so as to leave the surface of the street in a safe condition. Where granite curb is removed for entrances this curb is to be replaced with granite curb.

It is further agreed by the applicant to close up openings in curbs and restore sidewalk to grade at his or its expense where entrances crossing sidewalks into property are discontinued, abandoned or unused. The applicant further agrees to shift the location or change the width of driveways when ordered to do so by the Director of Public Works.

The work done under this permit is to be entirely in accordance with the plans and specifications submitted by the applicant and approved by the City Engineer. The applicant assumes all responsibility for any sidewalk work done under this permit; and agrees for himself or itself, his or its heirs and assigns, that such work is temporary and that he or it will construct sidewalk to grade at his or its expense when the City makes permanent improvements.

[illegible]

City will have this work replaced at the applicant's expense. If this work is not removed within 10 days the work will be removed immediately, and the work replaced in accordance with the specifications, ordinances or instructions of the Director of Public Works or his agents. If this work is not removed within 10 days the City will have this work replaced at the applicant's expense.

**In all concrete construction, the applicant agrees to use Portland Cement and only other materials as may be approved by the Director of Public Works. The applicant will notify the Department of Public Works at least twenty-four (24) hours in advance of the use of any other materials.**

are affected by the work, covered by this permit. Where other departments of the city are affected by the work, covered by this permit, the applicant agrees to notify the proper department at sufficient time in advance in order that it may be informed of the work covered by this permit. During the progress of the work, covered by this permit, the applicant agrees to keep the work covered by this permit at all times in accordance with the provisions of the permit.

and maintain at all times sufficient barricades, and shall display sufficient lights at night, and provide a watchman for the protection of the public. Specifications and details of the construction and location of the same shall be submitted to the city engineer for his approval. The applicant will erect

Public Works, and all work executed in accordance therewith and in a manner satisfactory to the Director of Public Works, and drawings are to be furnished when required by the Director of Public Works against accidents if necessary.

Where heavy equipment passes over bituminous, oil or vitrified brick streets, boards of a sufficient width and thickness must be placed on the surface of the street for the protection of the surface from injury by the equipment.

The work to be completed within permit immediately and a new permit must be obtained within 10 days from date of permit. If the work is not completed within the given time such failure shall constitute a violation of the provisions of the act.

The city reserves the right to relay all paving disturbed by reasons of the exercise of the privileges granted in this permit with its own forces at the expense of the applicant who agrees to pay all costs thereof.

When deemed necessary the city reserves the right to require a deposit based on the estimated cost of replacing the work before issuing the permits.

THE APPLICANT RECOGNIZES THE RIGHT OF THE DIRECTOR OF PUBLIC WORKS TO REVOKE THIS PERMIT AT ANY TIME,

1

Contractor \_\_\_\_\_ Signature of Property Owner \_\_\_\_\_

By:	Address
<div></div>	<div></div>

Phone Number of Applicant \_\_\_\_\_

By \_\_\_\_\_

DEPARTMENT OF PUBLIC WORKS

The privileges requested in the foregoing are as follows:

any person requesting a permit shall be granted upon the conditions and with the restrictions as herein above stated, and the Director of Public Works reserves the right to revoke this permit at any time.

**ATTENTION  
CALL PERMIT ENGINEER**

**CIVIL ENGINEER**

24 hours in advance of starting work under this permit.

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

CS290429

[illegible]



## **How to complete the "Application to Work in Streets and Alleys"** (commonly known as a "Work in Street Permit" or "WiSP")

**There is homework that you, the applicant, must do before completing the "Work in Street Permit" application:**

1. Visit the site. This will enable you to find the correct address, to measure sidewalk and pavement widths, and to locate facilities in the area proposed to be blocked in the Public right-of-way. This is information needed on your submission in order for City agencies to provide a timely review,
2. Prepare a well thought-out plan and submit three copies of it with the "Work in Street Permit" application. The plan must:
  - ☐ fully describe the work to be done in the Public right-of-way (includes Public easements),
  - ☐ provide a brief description of why the Public right-of-way must be used (examples: "place ladders in sidewalk area while painting a single-family dwelling" or "place dumpster in curb lane while renovating a commercial building" or "install new sanitary lateral in Public sewer easement for a new single-family dwelling"),
  - ☐ show the area(s) of the Public right-of-way to be blocked (be realistic as to your needs),
  - ☐ show sidewalk and pavement widths,
  - ☐ show details, dimensions, and locations of any proposed construction in the Public right-of-way,
  - ☐ show how interference to pedestrian and vehicular traffic will be minimized and safety provided,
  - ☐ show how any adverse impacts on Public and private facilities (drain inlets, drainage ways, manholes, fire hydrants, water meters, gas valves, water valves, bus stops, mail boxes, access to adjacent properties, etc.) will be avoided,
  - ☐ provide a realistic estimate of the length of time the Public right-of-way will be occupied,
  - ☐ note the days and hours the Public right-of-way will be occupied (if specific dates/times are required) and raindates (if needed),
  - ☐ provide, if desired, photographs depicting existing conditions of any damaged Public facilities so you won't be assessed for their repair, and
  - ☐ provide any additional information that will assist in the review process.

**Now you should have enough information to fill out the "Work in Street Permit" application.**

**At the top of the application fill in the required information:**

1. Complete the "permission to work at" section of the "Work in Street Permit" with the address of the site where the work will be done; for those projects covering a number

of blocks enter the block number(s) (e.g. - 900 block of East Broad Street and 300 block of North 9<sup>th</sup> Street),

2. Complete the "purpose of the work" section of the "Work in Street Permit" application summarizing the information provided on the plan described above,
3. As a check, have the plan and the "purpose of work" reviewed by someone unfamiliar with what you plan to do. If they can correctly explain it to you without asking any questions or making any assumptions, then your submission is probably complete.

**Next, on the bottom of the application fill in the required information:**

Left side

1. **Print** the contractor's company name on the "contractor" line,
2. On the line below print the contractor's mailing address,
3. On the "by" line the contractor or applicant must sign, and
4. Enter the applicant's telephone number.

Right side

1. **Print** the property owner's name on the "signature of property owner" line,
2. On the line below print the property owner's mailing address, and
3. On the "by" line the property owner must sign (only if for a driveway or a Council-approved encroachment) otherwise the contractor or applicant must sign.

**Finally, on the left edge of the application fill in the required information:**

1. The Contractor's License number (or, if you are applying as the owner then enter "owner", if you are applying as the tenant then enter "tenant"),
2. The Contractor's License class (A, B, or C), *[leave blank if "owner" or "tenant"]*,
3. The Contractor's License classification (H/H, PLB, etc.), *[leave blank if "owner" or "tenant"]*,
4. The estimated cost of the work covered by the "Work in Street Permit" (not the on-site portion of the work), and
5. The project number (if you know it), which will be the active building permit number associated with this "Work in Street" permit application.

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*Your goal* is a submission that clearly demonstrates that your use of the Public right-of-way will have as little adverse impact on the Public as possible.

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**Contractors are required to have a current business license on file or to provide us with a copy at time of application.**

**Direct any questions concerning the above process to the Permits & Engineering Services Office located at City Hall, 900 East Broad Street, Room 110, Richmond VA 23219, or call us at 804-646-6440.**



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 6***





**PERMIT APPLICATION** is filed in Room 110 of City Hall. Permit is referred as a "Work in Streets Permit" (WIS)

DCD plan review technician performs over-the-counter reviews of permit applications. The proposed work is scoped, defined and written-up on the front page of the permit application. During the counter review the request is examined for typical requirements, any special conditions and other necessary approvals. Notification and/or examination of the necessary Certificate of Insurance and other risk management documents must be provided before the permit can be issued.

#### Routing

**BUSINESS DAY ONE**

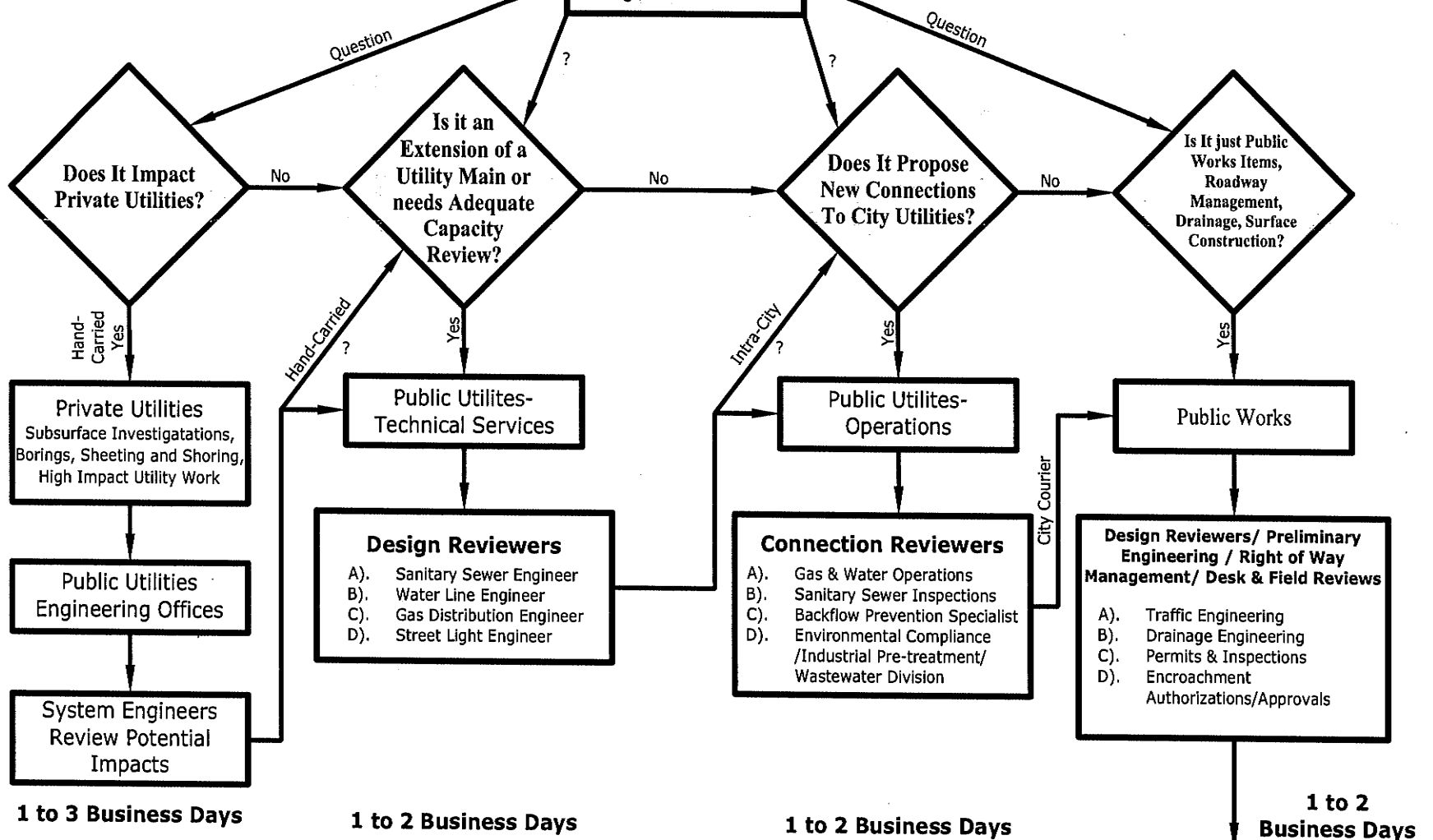
Based on the description of working a routing sequence is decided. This determines which City departments or private utility needs to review the proposed work. A tracking slip is attached to the permit package to indicate those departments and individuals who need to comment-on, approve and sign off on the permit application

#### Distribution

Permit Package (3) are picked up by staff review inspectors (DPW) or sent to the appropriate departments.

**BUSINESS DAY TWO**

#### DCD ROUTE QUESTIONS



**BUSINESS DAY SEVEN**

**DPW Processing Inspector**

DPW Processing Inspector returns Permit Package to Department of Community Development

**BUSINESS DAY EIGHT**

At Business Day Eight, the Permit is Returned to the Counter for Potential Permit Issuance.



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 7***



**Subject: Procedure Outline for Initiating an Encroachment Approval Process in the Public Right-of-Way**

**SURVEYS ♦ RIGHT OF WAY MANAGEMENT ♦ DEPARTMENT OF PUBLIC WORKS**

Note: As these guidelines and/or requirements must be revised and updated on occasion, the applicant will be responsible for the requirements as outlined on the City's most current version of this outline, in addition to any City Administration and City Code requirements.

**Encroachments Requiring Council Approval:**

In order to initiate the right-of-way encroachment process requiring City Council approval, the applicant must submit the following:

- A. a letter of request to the Director of Public Works; (Address: Director of Public Works, City Hall, Room 701, 900 E. Broad Street, Richmond, Virginia, 23219.)
  - B. a drawing showing the exact dimensions of the encroachments, including: 1) length, 2) height, 3) width, 4) extent into right-of-way, 5) a dimension to the closest side-street right-of-way, 6) width of sidewalk.
  - C. A \$1000 non-refundable application and processing fee (as required by City Code Section 90-123).
  - D. The applicant (i.e. the City is not the applicant) is responsible for making arrangements and submitting applications to the Community Development staff for any necessary reviews by the Urban Design Committee (UDC Secretary /646-6314) or the Commission on Architectural Review (CAR Secretary /646-7550). Their final review and recommendations are required before Public Works can submit a final drawing or complete the preliminary Council papers.
- We can proceed with the City administration's review and consideration of an encroachment request once we receive the required fee and information. The review includes various departments such as Community Development, Public Works, Fire, Police, Public Utilities, Law, etc. The applicant should also make arrangements with Community Development staff (UDC Secretary/646-6314) for any necessary review by the Urban Design Committee or the Commission on Architectural Review.

- Once the preliminary reviews and approvals have taken place, Public Works will prepare a drawing and the preliminary Council papers. The Law Department will process the final ordinance for Council approval. The ordinance will be introduced (2<sup>nd</sup> or 4<sup>th</sup> Monday) at one Council meeting (i.e. read into the minutes), go to the Planning Commission the following Monday and then back to Council the following Monday for final action.
- The Law Department's cut-off date for a Department's preliminary ordinance submittal to qualify for an upcoming Council meeting introduction is 11 business days prior to the desired Council meeting introduction. To give the administration the opportunity to satisfy this cut-off date after receiving the initial letter of request, Public Works will need to receive (at a minimum) the following information by the Friday that is 16 business days prior to the desired Council meeting introduction: the requested information from the applicant, completed research material, and the consideration responses from all the reviewing departments. Also, the complexity of the research of record information needed may extend the introduction date.

Encroachment ordinances are subject to various conditions that include, but are not limited to the following:

- All cost incident to the encroachment to be borne by the applicant, including, but not limited to, realignment of utilities, replacement of street signs, etc., as directed by City Agencies;
- Liability insurance, naming the City as being insured, shall be maintained in effect for the life of the encroachment.
- Applicant shall furnish removal bond.
- An annual Assessor area tax be charged [\$0.25 per sq./lin. foot] (ref. City Code Sec. 90-71); A twelve month expiration clause be included
- The applicant/owner shall bear all costs for repair, relocation, or replacement of the encroachments in the event of damage or movement due to, but not limited to, vehicular travel, alterations or failure of City utilities, or due to the public's use of the right-of-way
- Applicant to secure proper permits, and the work shall be performed in a manner satisfactory to the Directors of Public Works and Planning and Community Development.

An adopted ordinance does not give the applicant the authorization to build a new encroachment or refurbish an existing encroachment. A Work in the Streets (WiSP) permit must first be obtained in Room 110 city Hall, Permits and Services, Community Development (ref. Sec. 90-69); The applicant/owner shall provide written notification to the Assessor, Director of Finance and the Director of Public Works of the new owner's name and mailing address immediately upon transferring ownership or encroachment rights to another party; It shall be the sole responsibility of the applicant to provide the Department of Community Development, Division of Permits and Services, Law Department and the City Clerk's office with written evidence that all conditions of the ordinance have been satisfied. Should this written evidence not be submitted to the said

offices prior to the expiration date, twelve months after final approval of ordinance, the ordinance will become void automatically.

**Discouraged Encroachments:**

In general, these can be encroachments that are: hampering or obtrusive to pedestrian or vehicular traffic; considered unsightly or obtrusive to the existing environment or provide a negative impact to the aesthetic quality of the City's streetscape; considered offensive; do not conform with the City's master plan; excessively extending into or across improved or unimproved (street or alley) right-of-way, where such an approved encroachment would serve as evidence that no potential use for the right-of-way is desired by the City and the City would prefer the applicant to pursue a closing request; contrary to the administration's practices and policies for encroachment approvals; does not conform with desired "location, character, and extent" of reviewing bodies (i.e. overhead cables/wires per Planning Commission resolution of September 18, 2000; etc. While an applicant would be permitted to pursue Council action for such a discouraged encroachment, the administration would be recommending to Council that the request be denied.

Issues concerning the encroachment process may be addressed to the Surveys and Acquisitions Administrator, Surveys Superintendent, or Drafting Technician Supervisor at 646-0436. On the average, the process takes approximately four to eight weeks.

**Encroachments Requiring Administrative Approval ONLY:**

The Division of Permits and Services of Community Development coordinate this effort in Room 110 on the first floor of City Hall (corner of 10<sup>th</sup> and Broad). The applicant should:

- A. Acquire an administrative approval form (Administrative Approval Process Encroachment Application) from Room 110
- B. Fill out the application and attach a drawing showing the exact dimensions of the encroachments, including: 1) length, 2) height, 3) width, 4) extent into right-of-way, 5) a dimension to the closest side-street right-of-way, 6) width of sidewalk.
- C. Submit four (4) copies of the applications, plans, and all attachments to Room 110 with a \$300 non-refundable application and processing fee (ref.. City Code Sec. 90-123). The application must be submitted and signed by the licensee (an officer in the company with title included). Four copies of the plans fully dimensioned as to encroachment locations, lengths, extent, area, ties to right-of-ways (bordering street and side street), etc. must be submitted with the encroachment application.
- D. The required licensee insurance, after submittal of the application and prior to any approvals going into effect, shall remain in effect for the life of the encroachment to protect the City of Richmond from any liability resulting from the existence of the encroachment. Minimum requirements for the insurance are: for commercial at least \$1,000,000 coverage and at least a 45-day cancellation notice, for homeowner's or renter's at least \$300,000 coverage and at least a 30-day cancellation notice (See Ord.

2005-49-122), name the City of Richmond as an additional insured, and reference the application number. [Do not provide the insurance at the time of application because the application number has not been assigned. The insurance must be provided to Room 110 as soon as you know the application number]. The application number must be a permanent part of the insurance certificate so that it appears on all renewals.

E. The applicant must provide the required liability insurance certificate prior to any considerations for approval. Items that are to be illustrated on the certificate include, but not limited to, the following: 1) the amount of coverage; 2) explicitly naming the City of Richmond as being covered; 3) the owner (i.e. has to be the owner's insurance), name and contact numbers; 4) the encroachment application number as assigned by Community Development in Room 110.

F. Also prior to any considerations for an approval, a code modification form must be completed, approved by Community Development, and attached to the application for any encroachment items that are not in compliance with the building code (i.e. swinging doors, etc.).

G. The approved encroachment may require a removal bond, letter of credit, etc., as approved by the City, that may be established at the time of the application (i.e. minimum of \$5000 for telecommunication encroachments) or, for proposed encroachments, may be established at the time of Public Works' "Work in Street Permit" review by the Construction and Inspection office (6<sup>th</sup> Floor City Hall).

H. The applicant is responsible for making arrangements to be placed on a review schedule for and submitting applications, materials, plans, dimensions, information, etc. with and as required by the Community Development staff for any necessary reviews by the Urban Design Committee (UDC Secretary /646-6314) or the Commission on Architectural Review (CAR Secretary /646-7550). Final reviews and recommendations, as required for a particular encroachment, must be completed before Public Works can consider an approval of the encroachment request.

I. The City is not the applicant for any encroachment improvements within the public right-of-way.

(Questions on the administrative approval process may be directed to Room 110 at 646-6440 or Room 600 at 646-0436)

**Conditions of Administrative Approval:** (similar to ordinance conditions)

1. Applicant/owner shall satisfy all requirements for survey plat or plan and insurance as stated on the back of this form.
2. The Licensee, on the Licensee's own behalf and on behalf of any successor or assign, shall acknowledge and assume all responsibility for the permitted use of the right of way and the installation, construction, maintenance, repair, operation and removal of the encroachments, which shall be undertaken without risk or liability to the City.

Upon approval and/or authorization for the encroachment, the owner, his heirs, devisees, successors and assigns shall agree to indemnify, keep and hold the City free and harmless from liability (i.e. liability insurance in City's name) on account of injury or damage to persons or property growing out of or directly or indirectly resulting from such encroachment or other use for which the permit is sought, and the maintenance, operation, construction, and removal thereof: and if any suit or proceeding shall be brought against the City, at law or in equity, either independently or jointly with such owner on account thereof, the owner will defend the City in any such suit or proceedings without expense to the City; and in the event of a final judgment or decree being obtained against the City, either independently or jointly with the owner, then the owner will pay such judgment or comply with such decree with all costs and expenses of whatsoever nature and hold the City harmless.

3. The Director of Public Works may issue a written notice at any time requesting the encroachment to be removed, thereby revoking the authorization for the encroachment. Upon such notice, the Licensee, or any successor or assign: shall be responsible for the removal of the encroachment; shall bear all costs directly or indirectly associated with the removal; and, shall be responsible for reimbursing the City for all associated removal costs in the event the Licensee, or any successor or assign, fails to remove the encroachment by the notice deadline and the City chooses to remove the encroachment with City forces. Removal bonds shall be required in accordance with the City Code.
4. All cost incident to the encroachment to be borne by the applicant, including, but not limited to, realignment of utilities, replacement of street signs, etc., as directed by City Agencies.
5. It shall be the sole responsibility of the applicant to provide the Department of Community Development, Division of Permits and Services (Room 110 City Hall) with written evidence that all conditions of the Administrative Approval Process Encroachment Application have been satisfied. Conditions and requirements are to be satisfied within a 6-month period from Director's signature, or the application/approval becomes null and void.
6. The applicant/owner shall bear all costs for repair, relocation, or replacement of the encroachments in the event of damage or movement due to, but not limited to, vehicular travel, alterations or failure of City utilities, or due to the public's use of the right-of-way.
7. Applicant shall secure proper permits (i.e. Work in Streets permit required prior to any installation of encroachment), and the work shall be performed in a manner satisfactory to the Directors of Public Works and Community Development.
8. Applicant shall satisfy all other conditions as attached to this application, as contained in the City Charter, and as recommended by the City administration. Upon signing this permit application, the applicant agrees to abide by all applicable provisions of Chapter 90, et. seq. of the City of Richmond, Va. Code and/or as authorized by the building code (VSUBC).
9. Underground fiber optic cable (associated conduit, etc.) or telecommunication encroachments must meet and satisfy fiber optic cable installation policies and requirements of the Division of Permits and Inspections (646-3905) in Pubic Works.

**Other Guidelines or Conditions Considered in the Review Process for Sidewalk Encroachments:**

1. Where there is ample sidewalk width, Public Works does not want to reduce the pedestrian travel sidewalk width to less than five feet of clear, open, and relatively straight path, which shall be free of, but not limited to, tree grates, utility infrastructure, bus shelters, other inanimate objects, etc.)
2. Encroachments may not extend onto or over the curbing, street travel, or needed pedestrian-travel areas where such travel is hampered or potential safety issues are involved.
3. Encroachments or associated objects cannot obstruct an opening door of a car parked next to the curb (i.e. encroachments should be a minimum of 2 feet behind the curb)
4. Existing brick, concrete, sidewalks, property/right-of-way monuments, or any other infrastructure may not be removed or displaced. Applicant responsible for all replacement costs.
5. Handicap ramps may not be obstructed.
6. Encroachments should not be permitted within 20 feet of a corner curbing intersection (extended) or at an uncurbed street corner.
7. Encroachments cannot cause visual or safety impacts on vehicular or pedestrian traffic and applicant/owner is responsible for monitoring and preventing any potential safety issues.
8. Applicant/owner may be required to provide a plan and illustration verifying how they plan to satisfy any of the above guidelines or conditions.
9. Encroachments shall not hinder or restrict permitted or authorized vehicular or pedestrian traffic.
10. Applicant/owner/successor(s) shall be responsible for protecting pedestrians or clients from injury or potential injury from the encroachments, to include but not limited to, the following:
  - a) Applicant/owner/successor(s) shall take necessary/required measures and practices so as to not allow the encroachments to strike, impact, or create a hazard for anyone walking or standing on the sidewalk area.
  - b) Applicant/owner/successor(s) shall provide any necessary/required barricades to or around the open or covered areas as related to the encroachments, and provide the necessary on-going maintenance, so as to protect pedestrian and vehicular traffic from falling into or around the encroachments or being injured by the encroachments or as a result of related parts thereof.
11. ADA requirements for all portions of the sidewalk surface or contiguous with the sidewalk area must be satisfied at all times.
12. Applicant/owner/successor(s) shall satisfy all building and zoning codes, obtain necessary permits, and maintain

**Telecommunication Service, Access Line, & Fiber Optic Encroachments:**

1. The required first step for any encroachments associated with telecommunication services or equipment, is the applicant must submit a written description/analysis identifying which category their encroachment (equipment, lines, etc.) falls into



regarding "access lines" as it pertains to City Code Section 90-73 (i.e. A written explanation will be requested answering how you conform with or not conform to City Code and State Code [section 56-468.1(A)] sections, and are you (the applicant) providing telecommunication services?) This written description or analysis will be evaluated by the City to determine the applicability of entering into a franchise agreement or an administrative encroachment process.

2. The City of Richmond now requires *all* telecommunication access line encroachments (as per City Code 90-73), including any existing/authorized and proposed telecommunication (access) service encroachments, to be under the franchise agreement with the City. (i.e. All upcoming and former service/access provider applicants must obtain a franchise before continuing existing telecommunication services or providing additional services if they have existing or provide new access lines in accordance with code.). The franchise agreement is approved through Council actions.
3. In the event the applicant is not a telecommunications service/access provider and is permitted to utilize an encroachment application permit for (underground) approval considerations, then subject to the general requirements of City Code Section 90-69, the Licensee shall furnish the City a bond with corporate surety, an irrevocable letter of credit or other type of financial guaranty, payable to the City and approved by the City Attorney, in the minimum amount of \$5000. The required liability insurance must name the City of Richmond as being insured and is at a minimum of \$500,000 with at least a 60-day cancellation notice. The required bond/surety and insurance must remain in effect for the life of the encroachment.
4. An encroachment application permit applicant must provide and make available an additional 4" conduit for excess capacity, that may be utilized by the applicant or another entity at a future date with the City's approval, and a 4" diameter duct for the City's Department of Public Works or its designee, both running to the applicant's manholes or by other terminus as agreed upon by Public Works. In some instances, the City may require separate manholes for its conduit.
5. The applicant (i.e. not the City) is responsible for the ownership and maintenance of the excess capacity and the additional conduit for the City.
6. In the event the applicant is not a telecommunications service/access provider and wished to provide visible/overhead equipment, then they must send a letter of request to the Director of Public Works to initiate the Council Approval Process.

**Other Notes:**

- A. An administrative approval to authorize a location for a specified encroachment does not give the applicant the authorization to actually build the encroachment. A Work

in the Streets permit must first be obtained in Room 110 City Hall, Permits and Services, Community Development (ref. Sec. 90-69), along with satisfying any other City or Code requirements.

- B. The “Work in Street Permit” allows the applicant to block or hinder travel in the City right-of-way , as outlined in the permit and per safety requirements, while the applicant performs the necessary encroachment work. The “Permit” application requires the submittal of three copies of the plan(s) that depict the area(s) to be blocked and the work to be done. The fee is \$40.00 for 60 days work duration or less, otherwise it is \$80.00. The contractor's insurance must meet the criteria noted above, except the application number does not need to be referenced. The “Work in Street Permit” does not require any bond, letter of credit, etc., as the encroachment application (approval) does.

**Issue Date:** 7/28/00 - BCJ Initial Document

**Revision Date:** 6/29/05 - JAH

# ADMINISTRATIVE APPROVAL PROCESS ENCROACHMENT APPLICATION

Departments of Public Works and Community Development, City of Richmond, VA

APPLY TO: DIVISION OF PERMITS AND SERVICES

APPLICATION FEE: \$300 NON-REFUNDABLE

Room 110 City Hall 646-6440

CIRCLE OR FILL BLANKS AS APPROPRIATE

**TOTAL # OF PAGES** \_\_\_\_\_ **and TOTAL # OF ENCROACHMENTS** \_\_\_\_\_ **per this application?**

Date: \_\_\_\_\_

**APPLICATION NO.** \_\_\_\_\_

Address of Encroachment \_\_\_\_\_

**UDC/CAR Required?:** Yes No **Planning Commission Required?:** Yes No

NOTE: See "Encroachment Approval Conditions" on page 2

**Project No.** \_\_\_\_\_

**Encroachment No. 1:** Existing, Proposed Meets BOCA Code Requirement? Yes No  
**Type:** Awning, Canopy, Conduit, Cornice, Door, Downspout, Eaves, Façade, Fence, Fiber Optic, Footing, Gutter, Landscaping, Lights, Overhang, Sign, Trim, Wall, *Other (and/or more description):* \_\_\_\_\_

**Encroachment is:** Exposed, Overhead, Underground, Sidewalk, Other \_\_\_\_\_

Encroachment located along the North, South, East, West line of \_\_\_\_\_  
\_\_\_\_\_ St., Ave., Rd., Dr., Cir. and being \_\_\_\_\_ feet from the North, South, East, West line of  
of \_\_\_\_\_ St., Ave., Rd., Dr., Cir. and extends \_\_\_\_\_ feet into the right of way:  
Length: \_\_\_\_\_ ft. Encroachment Area: \_\_\_\_\_ sq. ft.

**Encroachment No. 2:** Existing, Proposed Meets BOCA Code Requirement? Yes No  
**Type:** Awning, Canopy, Conduit, Cornice, Door, Downspout, Eaves, Façade, Fence, Fiber Optic, Footing, Gutter, Landscaping, Lights, Overhang, Sign, Trim, Wall, *Other (and/or more description):* \_\_\_\_\_

**Encroachment is:** Exposed, Overhead, Underground, Sidewalk, Other \_\_\_\_\_

Encroachment located along the North, South, East, West line of \_\_\_\_\_  
\_\_\_\_\_ St., Ave., Rd., Dr., Cir. and being \_\_\_\_\_ feet from the North, South, East, West line of  
of \_\_\_\_\_ St., Ave., Rd., Dr., Cir. and extends \_\_\_\_\_ feet into the right of way:  
Length: \_\_\_\_\_ ft. Encroachment Area: \_\_\_\_\_ sq. ft.

**(CONTINUED – i.e. page 2 must be a part of application)**

**Page 1 of** \_\_\_\_\_

## FOR CITY USE ONLY

### Community Development Approvals:

Permits: \_\_\_\_\_ Date: \_\_\_\_\_  
Zoning: \_\_\_\_\_ Date: \_\_\_\_\_  
Urban Design/ C.A.R.: \_\_\_\_\_ Date: \_\_\_\_\_  
Planning Commission: \_\_\_\_\_ Date: \_\_\_\_\_  
Comments: \_\_\_\_\_

### Public Works Approvals:

Application No.: \_\_\_\_\_ Block/Project No.: \_\_\_\_\_  
Date Received: \_\_\_\_\_  
Surveys/Eng.: \_\_\_\_\_ Date: \_\_\_\_\_  
Comments: \_\_\_\_\_

**Special Conditions Attached:** YES \_\_\_\_\_ pages NO (circle one)  
(i.e. in addition to conditions and requirements noted on application)

Permission to encroach is granted subject to all provisions and conditions stated above and/or contained in the City Charter. Required)

**APPROVAL GRANTED:** YES NO (Council Approval Process

COPY TO: Public Works, Comm. Dev., Assessor, Applicant

Amended last on 09.21.05

Director of Public Works

Date

**\* You must attach a survey plat or plan illustrating all details of encroachment items. For awning/canopy encroachments, fabric samples and a photo of the building elevation showing where the awning/canopy will be placed are required with this application.\***

\*Survey Plat or Plan Provided: (to scale) Entitled: \_\_\_\_\_

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

☞ **Encroachment No. 3:** Existing, Proposed \_\_\_\_\_ Meets BOCA Code Requirement? Yes No  
**Type:** Awning, Canopy, Conduit, Cornice, Door, Downspout, Eaves, Façade, Fence, Fiber Optic, Footing, Gutter, Landscaping, Lights, Overhang, Sign, Trim, Wall, *Other (and/or more description):* \_\_\_\_\_

**Encroachment is:** Exposed, Overhead, Underground, Sidewalk, Other \_\_\_\_\_

Encroachment located along the North, South, East, West line of \_\_\_\_\_  
\_\_\_\_\_ St., Ave., Rd., Dr., Cir. and being \_\_\_\_\_ feet from the North, South, East, West line  
of \_\_\_\_\_ St., Ave., Rd., Dr., Cir. and extends \_\_\_\_\_ feet into the right of way:  
Length: \_\_\_\_\_ ft. Encroachment Area: \_\_\_\_\_ sq. ft.

☞ **Encroachment No. 4:** Existing, Proposed \_\_\_\_\_ Meets BOCA Code Requirement? Yes No  
**Type:** Awning, Canopy, Conduit, Cornice, Door, Downspout, Eaves, Façade, Fence, Fiber Optic, Footing, Gutter, Landscaping, Lights, Overhang, Sign, Trim, Wall, *Other (and/or more description):* \_\_\_\_\_

**Encroachment is:** Exposed, Overhead, Underground, Sidewalk, Other \_\_\_\_\_

Encroachment located along the North, South, East, West line of \_\_\_\_\_  
\_\_\_\_\_ St., Ave., Rd., Dr., Cir. and being \_\_\_\_\_ feet from the North, South, East, West line  
of \_\_\_\_\_ St., Ave., Rd., Dr., Cir. and extends \_\_\_\_\_ feet into the right of way:  
Length: \_\_\_\_\_ ft. Encroachment Area: \_\_\_\_\_ sq. ft.

**Encroachment Approval Conditions** (including, but not limited to, the following)

1. Applicant/owner shall satisfy all requirements for survey plat or plan and insurance as stated on the back of this form.
2. The Licensee, on the Licensee's own behalf and on behalf of any successor or assign, shall acknowledge and assume all responsibility for the permitted use of the right of way and the installation, construction, maintenance, repair, operation and removal of the encroachments, which shall be undertaken without risk or liability to the City. Upon approval and/or authorization for the encroachment, the owner, his heirs, devisees, successors and assigns shall agree to indemnify, keep and hold the City free and harmless from liability (i.e. liability insurance in City's name) on account of injury or damage to persons or property growing out of or directly or indirectly resulting from such encroachment or other use for which the permit is sought, and the maintenance, operation, construction, and removal thereof; and if any suit or proceeding shall be brought against the City, at law or in equity, either independently or jointly with such owner on account thereof, the owner will defend the City in any such suit or proceedings without expense to the City; and in the event of a final judgment or decree being obtained against the City, either independently or jointly with the owner, then the owner will pay such judgment or comply with such decree with all costs and expenses of whatsoever nature and hold the City harmless.
3. The Director of Public Works may issue a written notice at any time requesting the encroachment to be removed, thereby revoking the authorization for the encroachment. Upon such notice, the Licensee, or any successor or assign: shall be responsible for the removal of the encroachment; shall bear all costs directly or indirectly associated with the removal; and, shall be responsible for reimbursing the City for all associated removal costs in the event the Licensee, or any successor or assign, fails to remove the encroachment by the notice deadline and the City chooses to remove the encroachment with City forces. Removal bonds shall be required in accordance with the City Code.
4. All cost incident to the encroachment to be borne by the applicant, including, but not limited to, realignment of utilities, replacement of street signs, etc., as directed by City Agencies.
5. It shall be the sole responsibility of the applicant to provide the Department of Community Development, Division of Permits and Services (Room 110 City Hall) with written evidence that all conditions of the Administrative Approval Process Encroachment Application have been satisfied. Conditions and requirements are to be satisfied within a 6-month period from Director's signature, or the application/approval becomes null and void.
6. The applicant/owner shall bear all costs for repair, relocation, or replacement of the encroachments in the event of damage or movement due to, but not limited to, vehicular travel, alterations or failure of City utilities, or due to the public's use of the right-of-way.
7. Applicant shall secure proper permits (i.e. Work in Streets permit required prior to any installation of encroachment), and the work shall be performed in a manner satisfactory to the Directors of Public Works and Community Development.
8. Applicant shall satisfy all other conditions as attached to this application, as contained in the City Charter, and as recommended by the City administration. Upon signing this permit application, the applicant agrees to abide by all applicable provisions of Chapter 90, et. seq. of the City of Richmond, Va. Code and/or as authorized by the building code.
9. Underground fiber optic cable (associated conduit, etc.) or telecommunication encroachments must meet and satisfy fiber optic cable installation policies and requirements of the Division of Permits and Inspections in Pubic Works.

Owner's Signature: \_\_\_\_\_ Address: \_\_\_\_\_ Tel. No.: \_\_\_\_\_

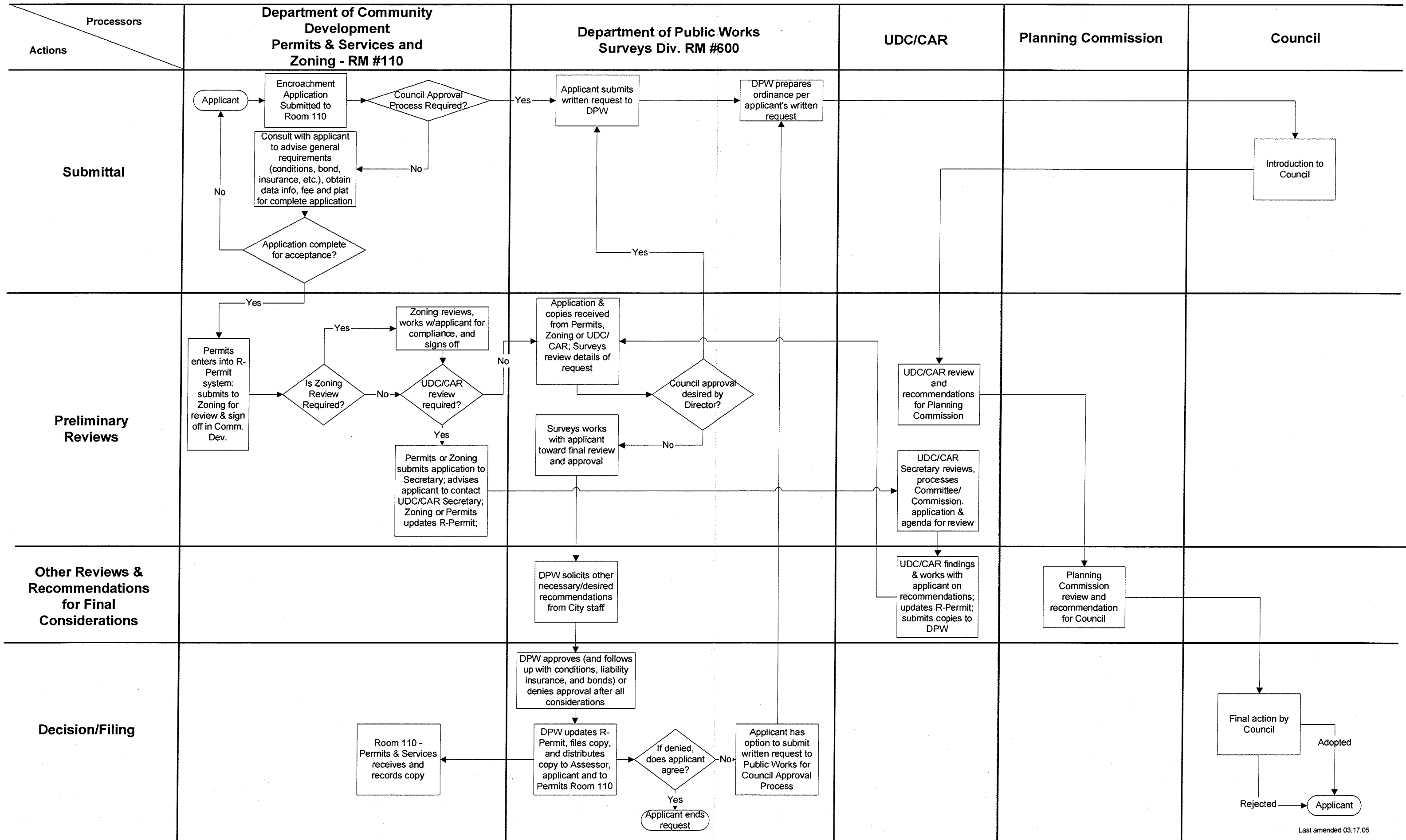
Owner's Name: \_\_\_\_\_ Date: \_\_\_\_\_  
( type or print )

\* Your copy of the approved encroachment will be available once the review by other agencies has been completed and an approval has been  
grated Page 2 of \_\_\_\_\_

# Administrative Approval Process Encroachment Application

Work Process Formulated by Public Works & Community Development

c/o Bruce C. Jenkins





***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 8***

City of Richmond  
DIVISION OF TRAFFIC ENGINEERING  
900 East Broad Street, 7th Floor  
Richmond, Virginia 23219

Permit No. \_\_\_\_\_

DATE: \_\_\_\_\_

TO:           Permits & Services  
              Department of Community Development

FROM:         Division of Traffic Engineering

SUBJECT:      Proposed Driveway at \_\_\_\_\_

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This Division recommends that the subject driveway be approved with the following provisions checked below:

1.     The width of the driveway shall be \_\_\_\_\_ feet.
2.     The driveway shall be temporary until such time as curbs and gutters are installed.
3.     The distance between existing and proposed driveways, intersecting streets, and alley property lines, when less than 100 feet, shall be multiples of 22 feet.
4.     The driveway shall begin no less than five (5) feet from the abutting property line.
5.     A turn-around area shall be provided on the owner's property to eliminate the necessity of backing into the street.
6.     In accordance with Section 28-71, Article II, Chapter 28, Code of the City of Richmond, 1993, the \_\_\_\_\_ driveway shall be signed and used as an "Entrance Only" and the \_\_\_\_\_ driveway shall be signed and used as an "Exit Only."
7.     Driveway to be installed as shown on the attached sketch.
8.     Driveway to be installed same as at present location.
9.     Semi-circular driveways shall be constructed wide enough to allow vehicles to pass, to prevent the backing of vehicles into the public roadway.
10.    Applicant shall provide a safe pedestrian walkway (no in the public roadway) while this construction is in progress.

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TRAFFIC ENGINEER



***CITY OF RICHMOND***  
***Department of Public Works***

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## ***ATTACHMENT 9***





## APPLICATION FOR HAULING OR MOVING PERMIT

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Date: \_\_\_\_\_

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

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

Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

Travel From: \_\_\_\_\_

Travel To: \_\_\_\_\_

Hauling What: \_\_\_\_\_

Preferred Route of Travel:

License Num. of Truck: \_\_\_\_\_ Overall Length: \_\_\_\_\_

License Num. of Trailer: \_\_\_\_\_ Overall Height: \_\_\_\_\_

Gross Weight: \_\_\_\_\_ Overall Width: \_\_\_\_\_

Number of axles not lying in same vertical plane: \_\_\_\_\_

Axle spacing: ☐ 1-2 ☐ 2-3 ☐ 3-4 ☐ 4-5

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### RESTRICTIONS

1. Flagmen required on truck.
2. Red flags displayed on load.
3. Pilot car ahead. Pilot car in rear.
4. Daylight hours only. No movement if vision obscured by fog or inclement weather.
5. Maximum speed of legal miles per hour.
6. Blade of machine to be removed in transit.

7. Wide load signs ahead. Wide load signs in rear.
8. No peak period movement. (7-9AM and 4-6PM)
9. SPECIAL RESTRICTIONS.

Anticipated Date to Move: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

## USAGE FEE \$25.00

Form of Payment: (check one): ☐ Cash ☐ Check ☐ Bill me.

Send permit via (check one): ☐ Mail ☐ FAX No. \_\_\_\_\_ ☐ pickup.

Inquiries to:

**Department of Public Works**  
**900 East Broad Street (Room 701)**  
**Richmond, Virginia 23219**  
**Phone: 698-3840/FAX: 780-6629**

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***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 10***



**Subject: Installation Guidelines & Specifications for Placement of Sheeting & Shoring Systems Beneath the Right-Of-Way**

1. All component parts of any shoring system, whose total members are all less than 10 feet deep, should be removed in their entirety.
2. Shoring systems greater than 10 feet in depth can have components that remain in-place, if proven to be made up of non-rotting materials and removed down to the indicated levels.
3. No parts of **any** remaining shoring system shall be left in top four foot stratum of surrounding sub-soils.
4. All shoring beams must be cut off a minimum 4 feet below the subgrade and/or subsoil elevations.
5. All cross ties (i.e. lagging boards) and any other components of the shoring system must be completely removed from the top stratum zone, which is identified as the 4 foot zone below finished "subgrade".
6. Lagging boards to be left in place must be of a natural non-rotting timber or adequately treated non-rotting timbers. The treated lumber rating must signify the timbers are approved for buried use (i.e. FDN rated, or at a minimum Chromated Copper Arsenate pressure treatment rating of .60 to .80 {CCA}).
7. The backfilling of shoring systems is considered critical fill. The deepest strata of this critical fill should be done according to the City Engineer's approved "Geotechnical Notes" and other geotechnical guidelines involving materials, methods and verifications. The combination and proper use of open graded aggregates, geotextile fabrics and approved methods of placement for confined deep fills must be indicated on the plans in the construction notes & details outlining this scope of work.
8. The change over from aggregate to soil backfill can begin once the soil material can be safely, adequately and consistently compacted in the required "maximum lift limits" of 8-inches. The geotextile drainage fabric rated liner must completely envelope and separate the aggregate fill from the soil backfill & trench wall materials.
9. Soil quality must fit within these basic guidelines: free draining, non-plastic, low shrinkage, low expansion and be highly compactable within pre-determined X moisture range. The proposed soils must be proven to meet all of these guidelines.

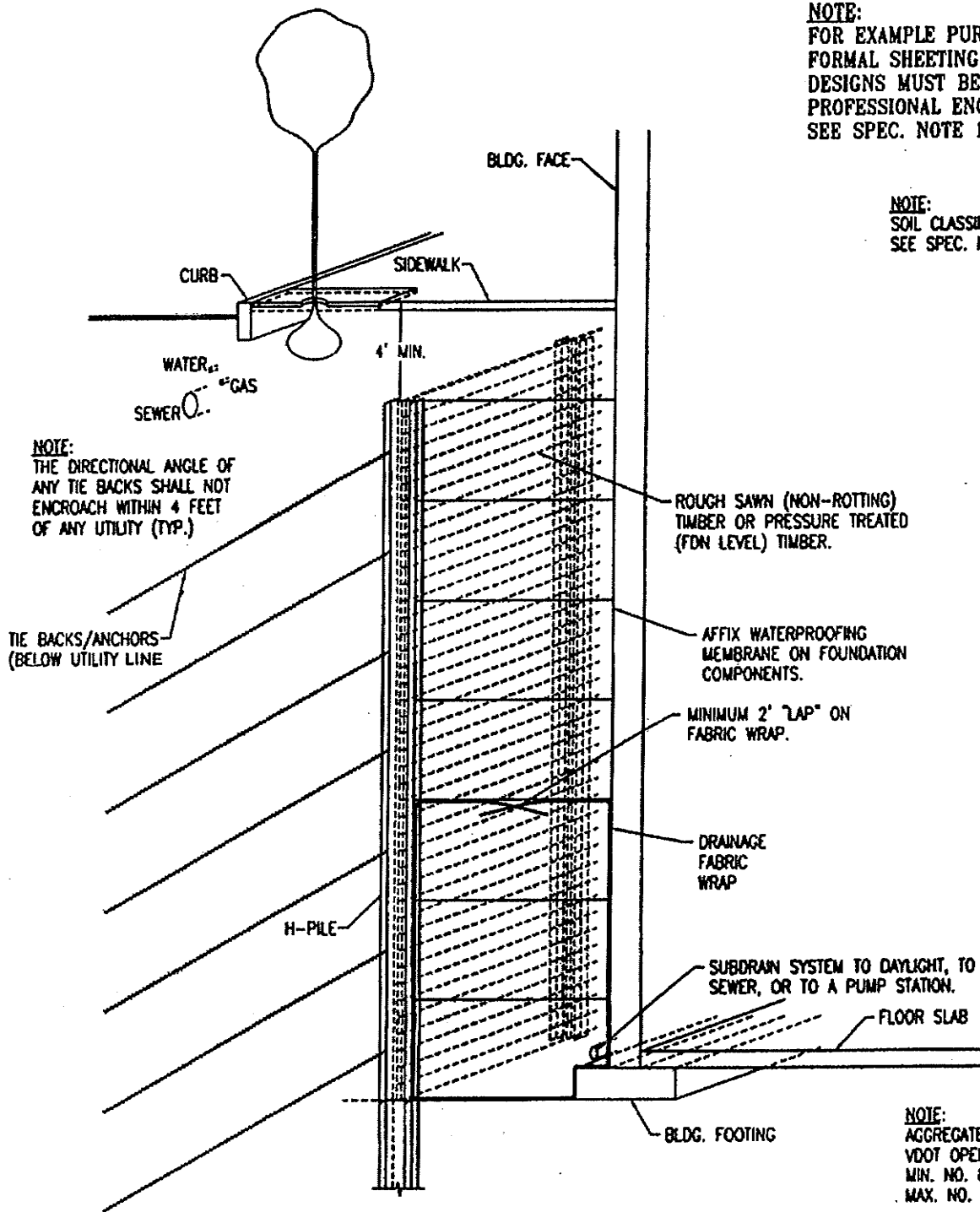
10. The sponsor's Geotechnical Engineer must submit to the City Engineer the verifying *Atterberg* limit tests on the proposed soils prior to starting the soil backfill operations. *Proctor curves* indicating the soil's moisture density relationship must also be provided prior to starting the soil backfill operations. An adequate source of the tested and approved materials must be shown.
11. Random test in the top 4-foot stratum will be run to determine if the theoretical maximum density goals of 95% compaction are being met. Other compaction tests such as proof-rolling visuals must be continually conducted during lift placements to adequately determine if the material can be considered consolidated and unyielding. Deep fill compaction requirements may vary slightly depending on the overall depth of fill and eventual surface facilities. At no time does the compaction requirements beneath the top 4 foot stratum reduce below DPW's definition of visually tested and proven to be firm (see TCR-2). Compaction testing and proof rolling are required to advance in the progressive levels of a controlled fill operation. The "2-Foot Rule" is a maximum vertical feet limit on fill progression before additional conformance testing must be performed. The horizontal length of a fill lift is unlimited within reason. Allowable lift distance is based on proven consistency and the actual achievement of the desired test results.
12. These specifications apply for both sides (inside/outside) of the sheeting & shoring system.
13. Building and/or structure *water proofing* guidelines must be shown as part of the overall materials, methods and placement practices.
14. Subsurface *drainage systems* must be indicated as deemed necessary to de-water the infiltrated fill zone. The drainage system should be shown on the detail sheets and depicted as part of the overall design and backfilling operations.
15. Two reproducible copies of shoring system *as-built* drawings must be submitted Department of Public Works upon completion of the work. One copy will be sent to the Department of Public Utilities.
16. These general guidelines are intended to review the basic components, highlight the minimum practices and illustrate the subject by examples.
17. All sheeting and shoring systems must follow the proper engineering standards in terms of structural design, material use and final installation. The system must meet all the VSOHA guidelines. The final plans must be submitted under the ***stamp*** of a professional engineer (PE).
18. The subsurface layout and remnants of the sheeting & shoring system must be indicated as well as listed as an encroachment item on the sponsor's final encroachment drawing submission. Encroachment terms, conditions and

responsibilities established by the City must be accepted. Encroachments requirements may be waived on a *case by case basis* as determined by the City Engineer. Encroachment applications will follow the established DPW/DCD *administrative encroachment* approval processes.

# SHEETING AND SHORING SYSTEMS TYPICAL VISUAL ILLUSTRATION

**NOTE:**  
FOR EXAMPLE PURPOSES ONLY.  
FORMAL SHEETING & SHORING SYSTEM  
DESIGNS MUST BE SUBMITTED BY A  
PROFESSIONAL ENGINEER.  
SEE SPEC. NOTE 16 & 17.

**NOTE:**  
SOIL CLASSIFICATION  
SEE SPEC. NOTE 9.



JOB NO.	STANDARD DETAIL	SCALE	DATE	REVISION DESCRIPTION
DETAIL	RICHMOND, VA	N.T.S.	08/00	
SHEET NO.	SHEETING AND SHORING SYSTEM			
SSS-1				



***CITY OF RICHMOND***  
***Department of Public Works***

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## ***ATTACHMENT 11***





Plan of Development **APPLICATIONS** (POD's) are submitted to Room 501 of City Hall.

DCD planners conduct the intake of POD's and perform the initial over-the-counter reviews. The Proposed development case is evaluated in land administration terms (land use, zoning, impacts). During the counter review the request is examined for typical requirements, any special conditions and other necessary approvals.

**BUSINESS DAY ONE**

**Routing of Plans**

**BUSINESS DAY TWO**

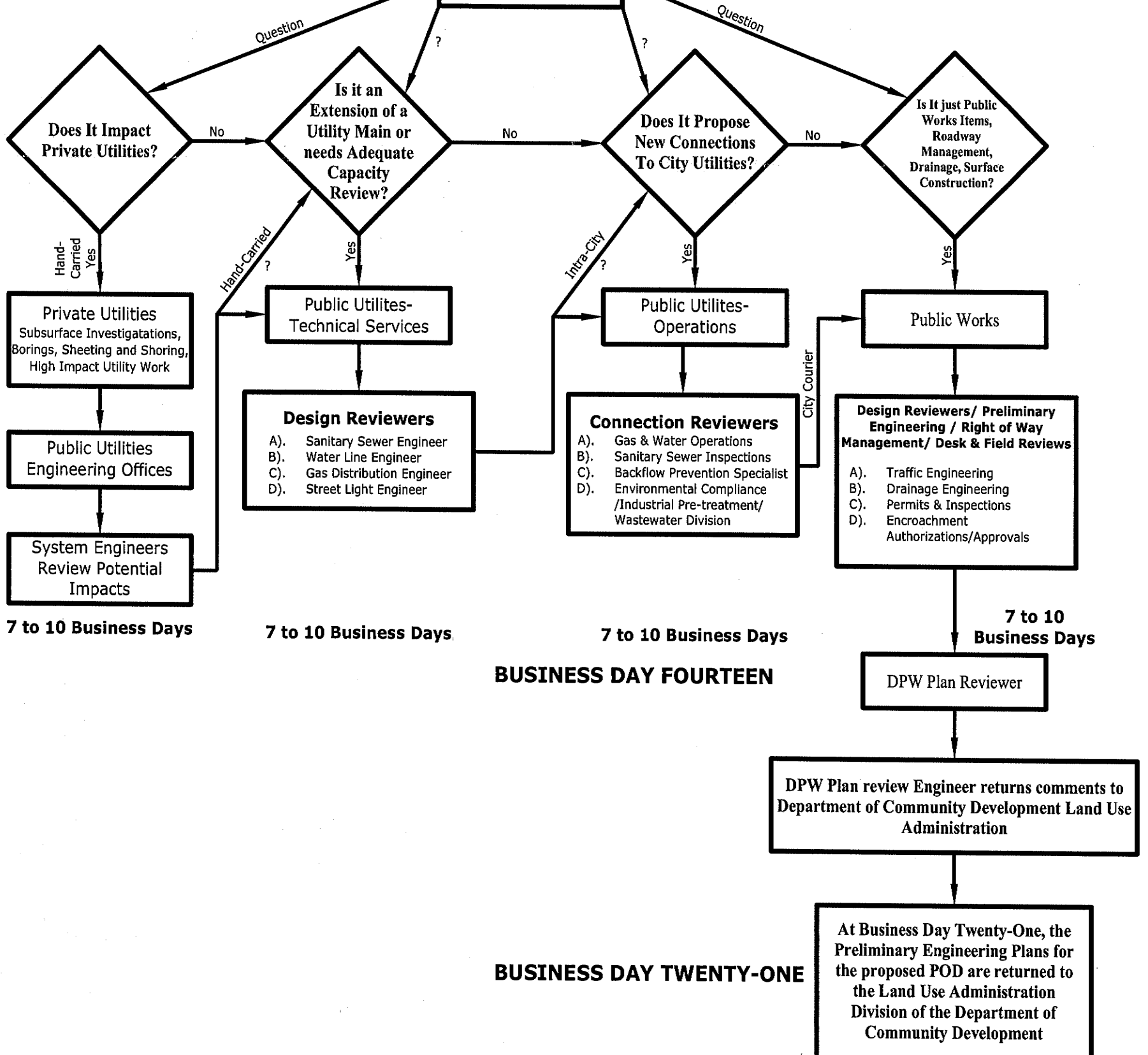
Based on the magnitude of the development case a routing sequence is decided to determine what City departments need to review the proposed work. A tracking letter is sent out establishing certain deadlines for comments to be returned by each affected department

**Distribution**

Multiple copies of the PRELIMINARY PLANS are sent out to ALL of the stakeholders for staff review & comments. A simultaneous review process begins.

**BUSINESS DAY FOUR**

**DCD ROUTE QUESTIONS**





***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 12***

DIVISION OF TRAFFIC ENGINEERING  
900 East Broad Street, 7<sup>th</sup> Floor  
Richmond, Virginia 23219  
(804) 646-0442

Permit No. \_\_\_\_\_

TO: Permits & Inspection  
Department of Community Development

DATE: \_\_\_\_\_

FROM: Division of Traffic Engineering

SUBJECT: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The Division of Traffic Engineering has no objections to the attached permit, providing that the following traffic safety control measures, as indicated, are adhered to:

1. That the Division of Traffic Engineering shall be notified not less than 48 hours in advance of the proposed construction. If the work requires changes in bus routes, bus stops or traffic detours, an advance notice of 72 hours is required. These notifications shall be made in addition to notifying Miss Utility.
2. That **Traffic Order #2844**, dated August 12, 1998 be adhered to, as specified in the Richmond, Virginia Manual of Traffic Control Specifications for Street and Sidewalk Construction. Copy available from the Bureau of Traffic Engineering.
3. That all warning and regulatory signs are in accordance with the size, shape, and color specifications' standards as outlined in the Manual on Uniform Traffic Control Devices for Streets and Highways.
4. That suitable rope stanchions and/or barricades be installed to prevent pedestrian injury while the work is in progress.
5. That the signs, stanchions and/or barricades and/or the construction materials and excavation be properly lighted at night.
6. Flagman with proper flag and vest shall be used for pedestrian and traffic control.
7. That this work shall begin \_\_\_\_\_  
and end no later than \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
TRAFFIC OPERATIONS ENGINEER



***CITY OF RICHMOND***  
***Department of Public Works***

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## ***ATTACHMENT 13***



## ***CITY OF RICHMOND***

### ***Department of Public Works***

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**Subject: Work in City Right-Of-Way (as checked below)**

**The Permit Holder is responsible for arranging a meeting with the Construction Inspector prior to beginning work. To schedule inspections, call (804) \_\_\_\_\_ between 8:00 AM and 4:00 PM 24 hours prior to beginning work. Work is to be completed within \_\_\_\_\_ from the date the permit is issued.**

- ☐ **BACKFILL** shall be suitable material compacted to 95% maximum theoretical density. See attached detail illustrations and construction notes.
- ☐ **UNIMPROVED AREAS** shall be seeded and mulched or covered with an approved seed mat fabric.
- ☐ **DROP HAMMERS** are not permitted for cutting pavement without approval.
- ☐ **PAVEMENT CUTS** – Cuts in flexible pavement surfaces shall be made with an asphalt spade or its equivalent in a straight and true manner, at right angles or parallel to the centerline of the pavement. Rigid pavement surfaces shall be saw cut in the same manner. If the normal cut comes within eighteen inches (18”) of the curb, gutter line, or edge of the pavement, the cut shall be made to the curb, gutter line, or edge of the pavement.
- ☐ **POLE INSTALLATIONS** – Poles and guy wires shall be placed to minimize impediments to vehicular and pedestrian traffic. The Permit Holder must consult with the Construction Inspector and / or Permits Engineer prior to placement of poles and guy wires.
- ☐ **SIDEWALKS** – The holder of the permit is responsible for arranging a meeting with the Construction Inspector prior to beginning work and / or to providing “before” photographs of the sidewalk and adjacent street in question. Otherwise, any damage to the street and sidewalk will be the responsibility of the Permit Holder. (See standard DPW detail for sidewalk replacement.)
- ☐ **BORING UNDER STREET RIGHT-OF-WAY** – All boring pits must be appropriately backfilled and surrounding area restored to original condition. If boring is oversized for the conduit placed in it, appropriate steps must be taken to prevent future settlement in the right-of-way. All boring is to follow the advanced engineering guidelines established by DPW (attached). All boring project managers, supervisors, and supervisory personnel must be certified according to the DPW Advanced Engineering and Construction Practice Guidelines.

- ❑ **SPECIAL PAVERS** – All pavers (cobblestone, duxex block, etc.) not used in the site restoration will be salvaged, segregated from other debris, and returned to the DPW storage area as directed by the Construction Inspector. Salvage of brick and asphalt pavers will be at the direction of the Construction Inspector, based on conditions.
- ❑ **ALL PAVEMENTS** – All restoration (i.e. trench restoration) must meet the DPW guidelines attached. The Permit Holder must replace in kind all materials damaged or removed. Where rigid pavement (concrete) underlies flexible pavement (asphalt) steel dowels will be required in restoration as directed by the Construction Inspector.
- ❑ The submitted plans attached to this permit package do not provide enough advanced engineering to construct this utility run. The DPW Advanced Engineering and Construction Practice Guidelines are attached to this comment sheet for further direction. These requirements must be followed where applicable.
- ❑ See DPW attachment regarding construction inspection requirements and certification program.
- ❑ Where the use of outriggers is required on cranes, backhoes, delivery trucks, etc., appropriate blocking or mats must be placed between the outrigger feet and contact surface to prevent damage to the public facilities.
- ❑ The Construction Inspector must approve dumpster locations. Dumpsters that are allowed in parking lanes on streets or in alleys will be appropriately marked with cones, barricades, etc. Dumpsters must be of earth tone colors (i.e. dark green, dark brown, reddish brown, etc.). Dumpsters must be covered during non-working periods. Covers must be dark black or brown. Dumpsters must be kept in a reasonably clean condition and serviced as often as necessary to prevent overflow upon the City right-of-way. **The Construction Inspector may revoke your permit for failing to follow the above requirements.**
- ❑ DPW Construction Inspector may require specific City restoration details where determined necessary.
- ❑ **Under absolutely no conditions will a permit holder be allowed to take down, dismantle, move, replace, or disturb in any way, guardrail, street signage, street markings, or any other device placed by the City to ensure the orderly and safe movement of vehicular and pedestrian traffic on, above, or below any City Right-of-Way.**
- ❑ **Under absolutely no conditions will a permit holder be allowed to alter, remove, replace or in any way disturb a natural or pre-engineered drainage device or system without prior submission and approval of a plan to perform such an activity.**

- The following named person, \_\_\_\_\_, is designated as the **Responsible Land Disturber** for this project, pursuant to the provisions of Section 10.1 – 563 (B) of the “Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations dated July 2001.

- **Call Miss Utility of Virginia at 1-800-552-7001 48 hours prior to planned excavation in any City Right-of-Way. Do not excavate until a Miss Utility Permit # has been assigned and underground utilities have been located. Marking Color Codes are as follows:**

**WHITE** – Proposed Excavation

**PINK** – Temporary Survey Markings

**RED** – Electric Power Lines, Cables, Conduit and Lighting Cables

**YELLOW** – Gas, Oil, Steam, Petroleum or Gaseous Materials

**ORANGE** – Communications, Alarm or Signal Lines, Cables or Conduit

**BLUE** – Potable Water

**PURPLE** – Reclaimed Water, Irrigation and Slurry Lines

**GREEN** – Sewer and Drain Lines

- **OTHER COMMENTS:**

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**Permits Engineer -----Troy Linville**

**646-1564 (voice mail)**

**THE ASSIGNED CONSTRUCTION INSPECTOR OR ENGINEER IS:**

- **Thomas Cannon, Jr.** **646-1556 (voice mail)**
- **Willie McMillan** **646-1562 (voice mail)**
- **George Thompson** **646-1238 (voice mail)**
- **Gary Clifford** **646-1554 (voice mail)**
- **Jimmy Johnson** **646-1552 (voice mail)**
- **Andre’ Williams** **646-5171 (voice mail)**

**Make initial contact at the number listed above. All DPW inspectors are equipped with cell phones and pagers for expanded communications.**

**Revision Date: 8/1/05 - jeb**



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 14***



# TRAFFIC CONTROL SPECIFICATIONS FOR STREET AND SIDEWALK CONSTRUCTION



CITY OF RICHMOND, VIRGINIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF TRAFFIC ENGINEERING

**Traffic Control Specifications  
For  
Street and Sidewalk Construction**

**City of Richmond, Virginia**

This Manual outlines proper traffic control methods to be followed by all public and private organizations in the City of Richmond when temporary disruption of traffic is required for street and sidewalk repairs or work on utility lines under the street.

The purpose of barricading, signing and channelization is to:

1. Provide for the orderly flow of traffic.
2. Insure safety for motorists, pedestrians and workers.
3. Reduce overall job costs.
4. Maintain good public relations.

By using advance warning signs, traffic cones, delineators and barricades, an orderly flow of traffic may be maintained.

Good signing, barricading and channelization around work areas in the streets are deterrents to accidents.

## City of Richmond

### Department of Public Works

#### Division of Traffic Engineering

The following procedure shall be followed for all street and sidewalk construction projects which may create obstructions to traffic movements in accordance with Traffic Order #2844, dated August 12, 1998 - Traffic Control Procedure for Street and Sidewalk Construction.

#### I. General

- A. The Division of Traffic Engineering shall be notified not less than 48 hours prior to beginning street, utility or sidewalk construction. If work requires changes in bus routes, bus stops or traffic detours, an advance notice of 72 hours is required. Under no circumstances shall a roadway be closed for routine construction without the approval of the City Traffic Engineer or his agent, and prior notification to the Division of Emergency Communications, telephone 646-5100.
- B. In case of EMERGENCY WORK during normal working hours (8:00 a.m. to 5:00 p.m., Monday through Friday), notify the Division of Traffic Engineering, telephone, 646-0442, as soon as possible. At all other times notify the Division of Emergency Communications, telephone 646-5100, who in turn will notify the Fire Department.
- C. Except for emergencies, no work shall be performed in the Central Business District (an area bounded by and including: Jackson Street on the north, Byrd Street on the south, Belvidere Street on the west and Fourteenth Street on the east), or on major arterial streets between the hours of 7-9 a.m. and 4-6 p.m. without specific consent of the Division of Traffic Engineering.
- D. Metal plates may be required over street openings to maintain adequate traffic movement in order to reopen travel lanes during peak traffic periods.
- E. No vehicles shall be parked on the street or in alleys at construction sites in violation of "No Parking" regulations unless the vehicle is essential to the completion of the job. Whenever one traffic lane is blocked by construction work, all vehicles, equipment and materials shall be parked or stored in the same lane.

- F. No vehicle shall be parked on the streets nor on the sidewalks behind fences and/or barricades on construction and demolition projects. The area behind fences and barricades, whether in the street or on the sidewalk area, is for either loading and unloading, or storage of necessary materials. Materials shall not be stored where they may cause a safety hazard by obstructing the vision of drivers and pedestrians.
- G. Any traffic signs, signals, or pavement markings removed as a result of the construction shall be replaced by the contractor. Before removing any traffic control device, the Division of Traffic Engineering shall be notified in order that temporary safety arrangements can be made. Any signs removed shall be delivered to the Sign Shop, 2800 Hermitage Road by the person removing same or his agent.

## II. Traffic Control Devices

All traffic control devices shall be in conformance with the Federal Highway Administration's Manual on Uniform Traffic Control Devices For Streets and Highways and the Virginia Department of Transportation's Work Area Protection Manual.

- A. The contractor shall furnish, erect and maintain all signs, barricades, warning lights and other traffic control devices. All signs and barricades shall be in place before any work is started by the contractor.
- B. In the event that a construction site in the opinion of the Department of Police, Division of Permits and Inspections, or the Division of Traffic Engineering is improperly signed, barricaded, or lighted, the contractor will be so notified. If the contractor cannot be reached immediately or fails to take necessary measures, the permit to work in the street may be revoked.
- C. On streets with unlimited parking, "No Parking" signs shall be erected a minimum of 24 hours in advance of the beginning of any street construction, tree spraying, tree trimming or street cleaning. Such signs shall bear the effective day and time. Signs prohibiting parking shall be placed not more than 100 feet apart. All existing regulatory signs which do not apply during construction shall be covered. Parking meters shall be covered with bags or temporary No Parking signs approved by the Division of Traffic Engineering.

- D. All construction signing, barricades and traffic control devices shall be removed promptly when the construction is completed.
- E. The contractor shall maintain all signs and barricades in the roadway in the manner prescribed. All traffic control devices shall be kept in proper position, clean and legible at all times. Damaged traffic control devices shall be repaired or replaced immediately. Paper parking regulation signs are to be affixed so they will remain legible at all times, especially during inclement weather. In the event that work is halted, all unnecessary signs will be removed.

III. Single Lane Traffic Control

- A. Where traffic in both directions must use a single lane for a limited distance, provisions must be made for alternate one-way movement to pass vehicles through the constructed section. At a "spot" obstruction, such as an isolated pavement patch, the movement may be self-regulating. However, where the one-lane movement section is of sufficient length, there must be some means of coordinating movements at each end so that vehicles are not simultaneously moving in opposite directions in the section and delays are not excessive at either end. Control points at each end of the route must be chosen to permit easy passing of opposing lines of vehicles.
- B. The following minimum lane widths should be maintained at all times:

One Lane	10 Feet Wide
Two Lanes	20 Feet Wide



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 15***



## ***CITY OF RICHMOND***

### ***Department of Public Works***

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#### **Subject: Streets and Drainage**

- A. GENERAL - The basic specifications for this project shall be the latest issue of the Virginia Department of Transportation Road and Bridge Specifications in effect, except for those Sections that may be in conflict with the City Standards or the Contract documents, in which case the City Standards or Contract documents shall govern; and wherein the above specifications the word "State" appears the word "City" is substituted and where the word "Department" appears, it shall mean Department of Public Works for the City.

These special provisions are intended to add to and more fully describe the requirements for this particular project not otherwise detailed or set forth on the plans and specifications and to amplify or modify the character of workmanship and materials.

Copies of all forms, releases, standards, drawings, specifications, handbooks, orders and codes referred to in this proposal are available in the offices of the Department of Public Works.

- B. STANDARDS & REVISIONS TO THE GENERAL CONDITIONS OF THE CONTRACT - In addition to the requirements stated in the Virginia Department of Transportation Specifications, the following requirements supplement, add to or modify those Specifications and shall govern in all conflicting cases.
1. Applicable Standards - The work shall be done in accordance with the latest editions of the following in effect on the date of the invitation to bid :
    - a. City of Richmond, Departmental Standards Drawing N-14000 (Sheets 1-26).
    - b. City of Richmond Sewer Specifications Issue of 1988.
    - c. City of Richmond Standard Specifications for Gas, Water System, Construction and Maintenance DPU No. 1-92.
    - d. Division of Traffic Citying, Traffic Order #2844, dated August 12, 1998  
Traffic Control  
Specifications for street and sidewalk construction.
    - e. Virginia Department of Transportation Work Area Protection Manual dated January 2003

- f. Latest rules and regulations governing construction, demolition and excavation as adopted by the Safety Codes Commission of the Commonwealth of Virginia.
- g. Erosion and Sediment Control Handbook, Virginia Department of Conservation and Recreation and Division of Soil and Water Conservation.
- h. Federal Highway Administration, USDOT, Manual on Uniform Traffic Control Devices
- i. OSHA Regulations (Standards – 29 CFR)

C. ADDITIONAL REQUIREMENTS

1. Sequence of Work- On street and sewer projects involving more than one street or block, the work shall be so scheduled as to provide a continuous and uninterrupted flow of all work items in a logical sequence in each street or block. If, in the opinion of the City, the flow of all work items is not being followed in accordance with the approved schedule on a block-by-block and street-by-street basis, the City may suspend all work or on portions thereof until such time as those items not being prosecuted sequentially are completed or on schedule.
2. Holidays - The Contractor shall not permit work to be done on Sundays and the following holidays without written consent of the City: July 4, Thanksgiving Day, Christmas Day, New Years Day, Labor Day, and Memorial Day. A moratorium on non-emergency work involving streets, sidewalks, or alleys in the Christmas shopping and festival areas will be in effect from the Wednesday prior to Thanksgiving until the Monday after New Years Day unless written permission to proceed is given by the City. A complete list of the affected areas is available from the Permit Office.
3. Existing Facilities - The location of existing sewer, water or gas lines, conduits, underground cables or other structures across or along the line of the proposed work may vary from the locations shown on the drawings and, where shown, the locations depth and dimensions of such structures are approximately correct and may vary. The Contractor shall be responsible for determining the exact location of the lines or structures and will be liable for repairs in the event of damage.
  - a. It is the Contractor's responsibility to notify and coordinate with "Miss Utility" (1-800-552-7001) prior to the beginning of construction.
  - b. The Contractor must notify the proper City agencies and coordinate with all private utilities at least 72 hours prior to the time set for work involving



their facilities or equipment. Furthermore, this responsibility shall extend to coordinating all contract work with existing utility Citys to avert or minimize any conflicts whether apparent or unforeseen.

- (1) Department of Public Utilities: Actual adjustment of fire hydrants, gas or water lines will be made, unless otherwise noted, by City personnel, in which case the Contractor's responsibility will consist of uncovering and properly backfilling the lines.
  - (2) Traffic Signal Equipment: An inspector from the Division of Traffic Engineering must be present before beginning any work involving their equipment.
4. Protection of Trees - The Contractor shall use extra care with his equipment when working on a street where there are trees. Any tree limbs or roots that are cut in the course of work will not be coated with any type of paint. Where equipment is working close to trees the Contractor may be required to protect the trees by acceptable methods to the City.
5. Use of City Water - Any connections to City fire hydrants shall be made in accordance with Plan M-646. Connections made to fire hydrants without yellow caps shall be by special permission from the Department of Public Utilities, and shall be governed by all rules and requirements of that Department.
6. Erosion and Sediment Control:
  - a. The Contractor will be required to obtain a Land Disturbing Activity Permit from the Department of Community Development when applicable. Policies, procedures, guidelines, etc. are contained in the Virginia Erosion and Sediment Control Handbook, which is available for a fee from the Virginia Soil and Water Conservation Commission. The contractor must have a person certified by the erosion control authority assigned to this project.

The plans have been approved as conforming to the Erosion and Sediment Control Ordinance and the guaranty of the City required by the ordinance will be included in the Contractor's Performance Bond. The Land Disturbing Activity Permit will be issued upon payment of the necessary fees by the contractor.
  - b. The Contractor shall not allow any area to remain unprotected from erosion and sedimentation control. Methods most suitable to the site and soil conditions shall be employed to intercept sediment carrying runoff from the site and remove the maximum practical amount of sediment from the storm runoff. These methods shall consist of either diversion dikes, interceptor dikes, diversion channels, sediment traps, straw or hay bale barriers, or

other methods suitable to the topography, soil conditions and nature of the disturbance as outlined in the latest edition of E&S Control Handbook.

- c. Only the smallest practical area shall be exposed or disturbed at any one time for the shortest practical period of time. Permanent vegetation shall be established at the earliest practical date. No disturbed area to remain denuded for more than 7 days.
  - d. On occasions, unforeseen erosion or sedimentation situations or circumstances may arise and should some method of erosion and sediment control be ordered by the City, the Contractor must commence making these corrections within two (2) working days after the order is given.
  - e. The disposal of excess excavation off site, the disposal of waste materials removed from erosion and sediment control facilities, and the disposal of erosion and sediment control facilities shall be in accordance with the Virginia Erosion and Sediment Control Handbook.
7. Permanent Driveways - The Contractor is advised that all existing permanent driveways on the project are to be removed and replaced with new concrete driveway crossings when so designated or when new curb and gutter is to be installed as part of this project. A permanent driveway shall be defined both as a curb cut on a street which has existing curb or curb and gutter or as an existing culvert located in a ditch overtop of which has been built up with an improved surface such as stone, concrete, or asphalt. All other driveways shall be considered temporary driveways and the property owner will be required to obtain a permit from the City for a permanent driveway which shall be installed during construction of the project.
8. Site Maintenance - Throughout all phases of construction, the Contractor shall keep the work site clean and free from rubbish, debris, and dust. Dust nuisance shall be abated by cleaning, sweeping, sprinkling with water or calcium chloride at no additional cost to the City. Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the route cleaned. If the use of water results in mud tracking on adjacent streets, the project will be shut down until streets are cleaned by the Contractor at his expense. Materials and equipment shall be removed from the site as soon as they are no longer needed. If the Contractor does not respond to the requests to clean the streets, they shall be cleaned by the City and the cost shall be assessed to the Contractor.
9. Construction Staging Area - The contractor shall be responsible for selecting his staging and laydown areas and any needed storage yard in the vicinity of the project. Areas used by the contractor within the public right-of-way require the prior approval of the City. All costs associated with the use maintenance and final restoration of areas needed shall be at the sole

expense of the contractor. In addition, the Contractor shall do the following:

- a. Arrange for and maintain the staging area at his expense
- b. Locate trailers and equipment as far as possible from nearby occupied dwellings.
- c. Keep the site neat and policed so that debris will not be transported to neighboring properties by wind or other means.
- d. Start construction equipment only when necessary in the mornings.
- e. Do not leave construction equipment running needlessly.
- f. Caution workmen to speak quietly and to use language that would not offend citizens in the area.
- g. Locate portable sanitary facilities on a secluded or concealed portion of the site.
- h. Where appropriate, provide lighting and/or fencing to make access to the site during non-working hours more difficult.
- i. When storing construction materials ensure that they do not have a tendency to become unstable.
- j. Where dust may become a nuisance, provide means for dust control.
- k. Backfill adjacent to and behind sidewalk and curb and gutter immediately after stripping forms.
- l. Access to all properties shall be maintained by the Contractor.

10. SALVAGE OF SIDEWALK BRICK, GRANITE SPALL, COBBLESTONE, GRANITE CURB, DURAX BLOCK, AND ANY OTHER BUILDING MATERIALS - Specific materials are to be salvaged and removed to designated City storage areas. All salvaged materials are to be handled with due care to avoid breakage and chipping. Granite curb is to be carefully stacked with wooden strips between layers.

D. VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD & BRIDGE SPECIFICATIONS - MODIFICATIONS: ADDITIONAL PROJECT REQUIREMENTS

In the event of a conflict between the referenced VDOT Road and Bridge Specifications and the modifications thereto listed below, the below listed modifications shall govern.

1. Section **303** is amended as follows:

Excavation

Side slopes shall be trimmed to neat lines and even surfaces with tops hand raked to a rounded edge and slopes on a 2:1 where practical or as shown on the drawings.

Where embankment or backfill is required, it shall be made with suitable material obtained from the project excavation if available or from suitable material as directed by the City. All fill areas shall be compacted to the appropriate density per the latest Virginia Department of Transportation specifications or as specified by the City.

2. Section **315** is amended as follows:

The Contractor shall lay bituminous concrete on one-half of the roadway at a time. When laying the first half of the roadway, traffic will be maintained on the opposite side of the street. Traffic will not be allowed on the newly laid surface until it has cooled and been rolled sufficiently in the opinion of the City.

Flagmen or off-duty Police Officers shall be provided, if requested by the City. If Flagmen are requested by the City and not provided, the work will be suspended until they are placed on the job.

Before the laying of the base is started in any block, the Contractor shall verify that all castings are to the proper grade. Manhole and valve box frames shall meet or be not more than a quarter of an inch below a sixteen (16') foot straightedge laid on the finished pavement parallel to the center of the street.

After the surface has been laid, the Contractor shall pour cutback asphalt around the top of the adapter and tops if necessary. All the cost of cleaning, pointing and sealing with cutback asphalt shall be included in the price bid per ton for bituminous concrete topping. Asphalt paint applied to the curb lines shall not show more than one (1") inch above the finished pavement grade. Any curbs marred by excess asphalt shall be cleaned by the Contractor at his expense. Curbs marred or broken by the Contractor's equipment shall be repaired or replaced at the Contractor's expense.

When padding driveways, a one (1") inch board shall be laid in the flow line of the gutter, and the padding shall be rolled before removing the boards. These boards shall be held in a straight line while rolling the ramp.

3. Stripping - The Contractor shall strip old asphalt paving where directed by the City, either to investigate the base or make the desired tie-in at intersecting streets. In cutting tie-ins only one-half of the street can be cut out at a time and padding placed on that half before cutting the other half of each side of the intersection.
4. Cold Planing
  - a. General - This item shall include all work involved in the removal of the top surface of asphalt streets by means of a cold planer.

It is the City's intent that all streets which are to be cold planed, shall have a continuous operation of cold planing, clean-up and asphalt placement. In the event that breakdowns, malfunctions, or other situations occur during the prosecution of work on any street, the City may prohibit any further cold planing until a suitable continuous operation can be resumed.
  - b. Equipment - The cold planer shall be a single self-propelled unit with a series of carbide teeth on a rapidly-rotating drum which can be precisely positioned by an operator for the purpose of removing the top surface of an asphalt street to a depth of 1" or more. The cold planer shall be capable of removing an asphalt surface in widths of 30" minimum with the final surface having longitudinal grooves approximately 1/8" to 1/4" in depth. The cold planer shall be similar to that made by G. L. Payne Company, CMI, or an approved equal and shall be so designed that it can remove irregularities from asphalt road surfaces.
  - c. Application - The cold planer shall be used to remove various specified depths of asphalt surface from specified streets so that the planed surface conforms to a desirable, grooved, cross sloped street profile. All areas adjacent to castings or curb or gutter which cannot be cut with the cold planer will be cut by hand. Any castings which must be set or reset or any concrete work deemed necessary by the City, will be performed after the specified depth has been planed from the roadway surface. The final asphalt top will be placed on the roadway after all casting and concrete work has been completed.
  - d. Removal of Material - All asphalt surface material which is cut from the asphalt road surface by the cold planer shall be removed by the Contractor.
  - e. Cold Planing and Bituminous Pavers - When the final asphalt top is to be placed on roadways which have been cold planed, it is mandatory that

electronically controlled screeds be used on the bituminous pavers to insure a smooth riding surface.

5. Section **502** is amended to include the following:

a. Realigning/Setting Granite Curb

(1) Realigning - Granite curb to be realigned shall be carefully removed from its present bed. The curb trench shall be graded and compacted so as to provide the realigned curb minimum clearances of 4" under the curb and 6" in front of and behind the curb. The curb shall then be placed back in the trench and shimmed to correct line and grade with brick. After the curb has been realigned, the curb trench shall be backfilled with concrete to a minimum depth of 12". Special care shall be taken to ensure that the concrete completely fills the space under the granite curb.

(2) Setting - This item includes the replacement of existing curb in bad condition, filling in where curb is missing or setting a new granite curb line.

The curb trench shall be excavated, graded, and compacted so as to provide the new/replacement curb minimum clearances of 4" under the curb and 6" in front of and behind the curb. The curb shall be placed in the trench and shimmed to correct line and grade with brick. After the curb has been set, the curb trench shall be backfilled with concrete to a minimum depth of 12". Special care shall be taken to ensure that the concrete completely fills the space under the granite curb.

(3) Joints - Joints between the sections of granite curb above the gutter line wider than one-quarter (1/4) of an inch will not be accepted, and any rough ends of the sections will have to be chiseled or saw cut to reduce the joint width to less than one-quarter (1/4) inch. The joints shall be filled with 1:3 cement-sand mortar.

b. Curb & Gutter, Valley Gutter

(1) For typical Monolithic Curb and Gutter section see Plan N-14000, Sheet #16. For typical Valley Gutter section see plan N-14000, Sheet #26. Use plan design specified.

(2) Four (4") inch holes shall be left in the curb opposite each downspout to each house. The cost of forming these holes shall be included in the price bid per linear foot for concrete curb and gutter. Valley gutter shall not require holes.

6. Section **502** is also amended to include as follows:

- A. Wheel Chair Ramps - This item shall include all work involved in the construction of ADA approved wheel chair ramps. All existing curb and sidewalk shall be removed without damage to curb and sidewalk designated to remain and shall be satisfactorily disposed of by the Contractor. The Contractor shall then perform all required excavation or furnish and place an approved fill material so as to obtain a proper subgrade. The subgrade shall then be compacted to a theoretical density of 95% at optimum moisture for a depth of 6 inches. A 6 inch thick wheel chair ramp shall then be constructed per Standard CG-12 (latest revision).

The Contractor shall provide a sample of the truncated dome (detectable warning strip) finish for approval by the City prior to beginning work. The sample shall be at least 12 inches by 12 inches and approximately 2 inches in depth, and the truncated domes shall be of a Federal Yellow color. The approved sample shall be kept at the work site for comparison to completed work. The total depth for the detectable warning strip including concrete base, setting bed, truncated dome paver, geosynthetic fabric, weep holes, and base material shall be approximately 12”.

- B. Concrete Sidewalk - The concrete shall be screeded to a true surface, free from depressions and other irregularities and shall be floated with a magnesium alloy float. After it has taken its original set, it shall be floated again with a magnesium alloy float to produce a hard smooth finish free from water. The surface shall be given a light broom finish acceptable to the City.

Should the sidewalk be too wide to properly finish from each side, it shall be bridged so that the concrete will not be disturbed after it is screeded.

Wherever full width sidewalk is placed from the curb to the property line, the sidewalk shall be placed in alternate blocks. The size of these blocks shall be determined by the City. Every effort shall be made to maintain color and texture.

Where there are soil pipes draining into the streets at a lower elevation than the proposed gutter grade, the Contractor will relay these pipes under the sidewalk before paving, provided the property City furnishes the necessary soil pipe.

Entrance walks connecting with the city sidewalk that have to be cut off shall be cut with a concrete saw and all exposed ends faced up with concrete, leaving a neat appearing surface.

7. Section **601** is amended as follows:

Tree Removal - This item shall include the removal and satisfactory disposal, in the area provided by the Contractor, of all trees over 6" in diameter, measured 36" above ground, designated on the drawings for removal. Removal of trees shall include the removal of their stumps to a minimum of two (2) feet below finished grade, unless otherwise noted. Existing stumps shall also be removed to a minimum of two (2) feet below finished grade, unless otherwise noted. The cost of removing trees smaller than 6" in diameter and brush shall be included in the price bid for cleaning and grubbing. Felled trees or felled portions shall be removed the same day felled. The Contractor shall take all precautions to protect trees, shrubs or other vegetation scheduled to remain and shall repair or replace all trees, shrubs or seeded areas negligently destroyed at no cost to the City.

8. Sections **602** and **603** are amended as follows:

Topsoil, Grass Seed and Fertilizer

- a. The area indicated by note on plans shall be graded to three (3") inches below finished grade and covered with a minimum of three (3") inches of topsoil, hand raked to a level finish. The topsoil shall be free of subsoil, seeds, rocks, or any other foreign matter. Top soil shall be subject to the approval of the Department of Recreation and Parks before being moved from the source of supply.

The seed applied to areas noted shall consist of 40% Red Fescue, 30% Red Top, and 30% Kentucky 31 Fescue or approved equal. This mixture shall be applied at the rate of five (5) pounds per 1,000 sq.ft. Agricultural lime shall be applied at the rate of 3,000 pounds per acre. 10-20-10 fertilizer shall be applied at the rate of 2,000 pounds per acre. The entire area shall be rolled with a roller not to weigh less than 500 pounds, where practical.

The lime and fertilizer shall be worked into the top soil prior to seeding.

Where seed and fertilizer only are to be used, the existing ground is to be broken up, rocks and unsuitable material raked out and the fertilizer and seed applied at the same rate and method as explained above.

Where there is a build up of unsuitable soil between the existing or proposed curb and the existing or proposed sidewalk, or where there is insufficient or unsightly grass cover, the area will be excavated to 3" below grade and filled with 3" of top soil, seeded and fertilized. Any area close to grade and well turfed should not be disturbed.

Permanent seeding shall take place only during the regular sowing period in the spring or fall. Temporary seeding will be in accordance with the Virginia Erosion & Sediment Control Handbook. If a suitable stand of grass



is not obtained during the first seeding, the Contractor will be required to return once and resow those areas in which a suitable stand of grass is not obtained.

- b. Hydroseeding - The areas outlined for seeding shall be properly shaped, all wash areas shall be filled to provide a smooth, uniform surface and shall be scratched to a depth of at least two (2") inches to provide a satisfactory seed bed.

- (1) Liming - An approved limestone or approved equal shall be spread uniformly over the area to be seeded at the rate of 2 tons per acre.
- (2) Fertilizing - At the time of seeding, fertilizer shall be applied uniformly at the rate of 1,500 pounds of 10-20-10 per acre.
- (3) Mulching - Mulch shall be wood cellulose fiber applied at the rate of 1,500 pounds per acre (dry weight) and in such a manner that uniform distribution is obtained. Five pounds of annual rye grass seed shall be added to the seed mix for each acre. Such seed is to be furnished by the Contractor and the cost included in the lump sum bid.
- (4) Sowing Seed - A seed mixture of 83 pounds Kentucky 31 Fescue and 2 pounds Red Top or approved equal shall be sown per acre. Hydroseeding will be permitted provided equipment approved by the City is used and all mixtures are constantly agitated from the time they are mixed to the time they are applied to the seed bed. All such mixtures shall be used within 8 hours of mixing. Nozzles or sprays shall not be directed toward the ground in such a manner as to cause erosion or runoff.

- c. Out-of-Season Seeding - The Contractor will be permitted to seed at times other than during the regular seeding season provided that he furnishes the Director of Public Works a letter that he will:

- (1) Re-establish the original condition and grade prior to supplementary seeding.
- (2) The area shall have 85% cover to be acceptable.
- (3) Bare areas over 5 square feet will not be acceptable.
- (4) Acceptability will be determined by an inspection approximately 60 days after the beginning of the following seeding season.
- (5) Supplemental seeding, if performed during a regular seeding season, will only be required once.

9. Section **605** is amended as follows:

Tree Planting - This item shall cover all work involved in the supplying and planting of trees.

Trees to be planted shall be balled and burlapped stock. All trees shall be moved with a compact natural ball of earth so firmly wrapped in burlap that upon delivery the soil in the ball is still firm and compact about the small feeding roots. Each ball shall be of sufficient size to encompass all the fibrous feeding roots necessary to insure successful recovery and development of the plant. The minimum sizes of balls, ball depth and diameters, and increased ball sizes for collected stock shall be in accordance with recommended balling and burlapping specifications as set forth in the current edition of American Standards of Nursery Stock, sponsored by the American Association of Nurserymen, Inc.

Trees will not be accepted if the ball is cracked or broken before or during planting operations or if there is any damage to the bark or branches before or during planting operations. Tree trunks shall be single stem and free from trunk wounds.

The plant hole, should be centered at the location noted on the plan and be three-to five times wider than the root ball if possible. The depth of the planting hole must be no greater than the height from the bottom of the root ball to the root flare of the tree. The root flare (trunk flare, crown flare) is the area of the tree where roots join the trunk: this may actually be buried 6 inches below the top of the root ball. If the trunk flare is not visible, remove soil or media from the top of the ball until it is visible. The root flare shall be slightly above the surface of the surrounding soil at all times. Determine the desired depth of each hole prior to digging.

Whenever trees are to be placed in a concrete sidewalk area, a 5' by 5' tree box will be cut in the existing sidewalk and the concrete which is within the tree box shall be removed as part of the excavation for the tree ball.

Whenever trees are to be placed in a brick sidewalk, a 5' by 5' tree box will be formed around the tree as described in Item "e. Tree Boxes" under Brick Sidewalk in the Special Provisions of this contract and all brick which is within the tree box shall be removed as part of the excavation for the tree ball.

Tree selections shall be approved by the City Arborist prior to planting. Planting of trees shall be performed under the supervision of an experienced nurseryman. Whenever conditions are such, by reason of drought, high winds, excessive moisture, frozen earth, or other similar factors, that satisfactory results are not likely to be obtained, work shall be stopped. It may not be resumed until desired

results can be obtained or until approved alternate or corrective measures and procedures are adopted. Trees will be set in the planting hole in a straight and plumb fashion, with the top of the root flare at the proposed finish grade, so that a normal or true relationship of the crown of the plant with the ground surface will be established. Before backfilling, someone must view the tree from two directions perpendicular to each other to confirm the tree is straight. Fill in with some more backfill soil to secure the tree in the upright position. Attempts must be made to break up clayey soil clumps as much as possible. Do NOT step firmly on the backfill soil because this could compact the soil and restrict root growth, especially in clayey soil. Begin to fill the hole around the root ball with soil. When the hole is filled approximately two-thirds with soil, the root ball should remain 6 to 8 inches above the backfill soil. Slice the shovel 20 to 30 times into the backfill to settle the soil. Add 10 to 20 gallons of water to the root ball and backfill. Fill in any holes or depressions with additional backfill soil. The water infiltrating the soil will eliminate large air pockets. The burlap and wire basket will then be cut away or folded back from at least the top one-third of the root ball and the plant hole shall be filled to grade with topsoil. All synthetic materials from around the tree trunk and root ball shall be removed and not evident within the backfill soil mix. String, rope, synthetic burlap, plastic, strapping, and other materials that will not decompose in the soil shall be removed at planting

Cover the entire tree planting box with mulch, or at least a 6-foot diameter circle around the tree. Construct a berm of mulch at the edge of the root ball only if the tree will be watered with a hose, bucket, or other high volume means. A minimum depth of two inches and a maximum depth of four inches of mulch over the root zone is required. Mulch should not be placed against the trunk of the tree. Leave an unmulched area about 6 inches in radius around the tree trunk. If mulch is found against the base of the trunk, carefully remove it and the soil at the base of the tree to expose the root collar, which needs adequate air circulation. Use non-metallic hand tools when working near the root collar to prevent damaging the trunk and roots.

Trees shall be supported immediately after planting with guy wires as shown on the contract drawings. Guy wires shall be loose enough to allow the tree to be able to move freely in the wind, but shall be tight enough to keep the tree from overturning. Cut or damaged surfaces will not be coated with tree paint.

Each tree will be inspected by the City Arborist for any disease or insect pest infestations. Upon the discovery of any disease or insect pest infestation, the nature or species shall be identified and a proposed method of control shall be submitted to the Chief of Parks for approval prior to application of control measures. Should the disease or insect pest infestation be such that it could cause the death of the tree during the guarantee period, said tree shall be replaced at the Contractor's expense. The Contractor shall be responsible for

control of disease and insect pest infestation plus proper watering and weeding during the Guarantee Period.

Contractor's Guarantee - The Contractor shall guarantee all trees, which have been planted as part of this contract, against any defects or loss of plant life for a period of one year following the date of final acceptance of the work by the City. Under this guarantee, the Contractor, hereby, agrees to make good without delay, at his own expense, any defects or loss of plant life.

#### 10. Adjusting Utilities and Castings

- a. Resetting Castings - The Contractor shall be required to adjust sewer manhole castings, gas, water valve and drip boxes to new grades. For large valve and drip boxes the vertical adjustment shall be made with brick and concrete. The entire base of the box shall be placed on brick when set to new grade. For small valve boxes the vertical adjustment is made by screwing the top section and/or by installing a new mid-section.

Sewer manhole castings shall be reset to grade on brick with concrete or precast concrete adjustment rings. Virginia Power and telephone manhole castings will be reset by the respective utility. Old pavement removed to adjust gas, water valve and drip boxes and sewer manhole castings shall be replaced with concrete on graded streets.

The Contractor shall properly place and fit the sewer rings and adapters. Rings and adapters improperly placed shall be cut out and replaced at the Contractor's expense.

The Contractor shall remove all materials which he causes to fall in the sewer manholes and basins and reset all castings the day the castings are disturbed. Work shall not be resumed the next day on any new work if the Contractor has failed to clean out any sewer manhole or basin or reset the castings of previous day's work until such time as previous day's work is complete.

Concrete collars around sewer manhole castings and valve boxes shall be Class "A3" Type I or II cement and shall be protected from traffic for three (3) days. Backfill for valve boxes set to grade shall be compacted with a pneumatic tamp to a minimum of ninety-five (95%) percent density (Proctor).

- Sewer castings, gas, water valve and drip boxes where the final surface shall be concrete, shall be set to grade without concrete collar.

- b. Adjusting Utilities - In the event that any existing gas, water lines, fire hydrants or services have to be adjusted, the Contractor will be required to notify the Department of Public Utilities (DPU) seventy-two (72) hours prior to the time set for uncovering the existing lines, adjusting hydrants, or adjusting service boxes. Any adjustment to gas-water lines or fire hydrants will be done by the Department of Public Utilities' forces. Uncovering lines will be done by the Contractor.

11. Adjusting or Constructing Basin Slabs

- a. Drop inlet throat sections where specified on the plans will be either cast in place or a pre-cast unit. Before placement of the throat section, the barrel will be either cast in place, prefabricated or a modified existing structure. The throat section will either be mortared to the barrel or will be sealed with an asphaltic seal. Existing drop inlet barrels will be re-mortared to repair weak mortar joints. The base for the pre-cast throat units will be of concrete either dry or wet at a thickness of 3 inches minimum. Specific detail references will be made in the plan or per VDOT standards.

12. Brick Sidewalk on Concrete Base

- a. General - The work of this section shall comprise the furnishing, installing and restoration of brick sidewalk as noted on the contract drawings.

Brick for new sidewalks and sidewalks that replace existing concrete sidewalks shall be a North Carolina Common, Lawrenceville Common, or an approved equal.

Bricks for reconstructed brick sidewalks shall consist of the existing bricks within the area or areas of brick sidewalk designated on the contract drawing as brick sidewalk improvement.

- b. Preparation of Subgrade - The subgrade for new brick sidewalks, reconstructed brick sidewalks, and sidewalks that replace existing concrete sidewalks shall be prepared by the removal and satisfactory disposal of all unsuitable material above the normal subgrade. All unsuitable material shall include existing concrete sidewalk. Any material removed above normal subgrade shall be disposed of by the contractor in an area approved by the City. No tree roots encountered above normal subgrade will be cut unless approved by the City.

Wherever the existing ground surface is below normal subgrade, the ground surface shall be brought up to normal subgrade with 21A stone followed by fine grading.

Subgrade shall be compacted to a theoretical density of 95% at optimum moisture and shall be graded off to a surface that will not vary more than 1/2" at any one point from normal subgrade. Wherever tree roots prevent excavation of existing ground surface to normal subgrade, subgrade will be determined by the City.

- c. Concrete Base - Upon compaction and grading of subgrade, the subgrade shall be cleaned of all loose and foreign material before the concrete bedding is poured. After this has been done, a 4" concrete slab shall be placed on the compacted subgrade.
- d. Laying Brick - Bricks shall be stored in areas designated by the City. All bricks shall be carefully laid with the best face up in the pattern noted on the contract drawings or designated by the City. Bricks shall be cut, not broken, using a high-speed masonry saw producing clean, sharp edges.

The bricks shall be laid on a 1/2" mortar bed with 1/8" joints between bricks. A 1:3 cement-sand mixture shall be swept into the joints between bricks and lightly sprayed with water. The contractor is responsible for removing all excess cement-sand mixture from surface of sidewalk prior to spraying water.

### 13. Brick Sidewalk on Cement-Sand Bedding

- a. Description - The term Brick Sidewalk shall refer to the removal and replacement of existing concrete sidewalks and brick sidewalks with all new brick set on a sand cement bed.
- b. Brands of Brick - Brick for new sidewalks and sidewalks that replace existing concrete sidewalks shall be a North Carolina Common, Lawrenceville Common, or an approved equal.
- c. Preparation of Subgrade - The subgrade for new brick sidewalks and sidewalks that replace existing concrete sidewalks shall be prepared by the removal and satisfactory disposal of all unsuitable material above the normal subgrade. Unsuitable material shall include existing broken concrete sidewalk and existing brick sidewalk. Any material removed above normal subgrade shall be disposed of by the contractor in an area approved by the City. Tree roots encountered above normal subgrade shall not be cut unless approved by the City.

Wherever the existing ground surface is below normal subgrade, and a property wall exists as shown on the drawings, the ground surface shall be brought up to normal subgrade with a suitable material approved by the City. In addition, if any area adjacent to the brick sidewalk, on the property line side of the sidewalk, shall be lower than the proposed sidewalk, the

area between the property line and the sidewalk edge shall be filled in and compacted with an approved material and seeded

Subgrade shall be compacted to a theoretical density of 95% at optimum moisture and shall be graded off to a surface that will not vary more than 1/2" at any one point from normal subgrade. Wherever tree roots prevent excavation of existing ground surface to normal subgrade, subgrade will be determined by the City.

- d. Back Face of Sidewalk - Wherever curb or an adjoining property wall do not exist on the property line of a new brick sidewalk or sidewalks that replace existing concrete or existing brick sidewalks, a retaining row of bricks shall be set for the purpose of preventing the new brick sidewalk from sloughing off. This retaining row of bricks shall be formed by setting new sidewalk brick on end, side to side, in a row along the back edge of the sidewalk. The lower portions of the retaining row of bricks shall be embedded in 2" of a 1:3 cement mortar.

In the event the adjoining property is more than 10" above or below grade at the property line, a concrete retaining wall in accordance with RW-2 or RW-3 shall be constructed for the purpose of retaining the back face edge of the proposed brick sidewalk.

- e. Tree Boxes - Wherever trees exist within the brick sidewalk area or wherever trees are to be placed in the brick sidewalk area, a tree box shall be formed with the bricks which are to be used in the brick sidewalk. The tree box shall be 5' by 5' (unless otherwise noted on the drawings) and shall be formed by embedding bricks on side, end to end, in 2" of a 1:3 cement mortar. The City will determine in the field the exact location and size of any required tree boxes.
- f. Cement-Sand Bedding - Upon completion of compaction and grading of the subgrade, the subgrade shall be cleaned of all loose and foreign material. A uniform layer of a 1:3 cement-sand mixture, 4" thick, shall be placed upon the subgrade. This cement-sand bedding shall be screeded off and densified by tamping or rolling so that the top surface of the cement-sand bedding will be smooth with no more than 1/4" variation from a flat plane and shall be densified to 95% of theoretical density, at optimum moisture. Sand used for sand bedding shall be uniform in gradation and free from foreign material. Cement shall be Portland Cement and conform to ASTM C150. The cement-sand mixture shall be mixed in a mechanical mixer by the contractor.

- g. Laying Brick - Bricks will be stored in areas designated by the City. All bricks shall be carefully laid with the best face up in the pattern noted on the contract drawings or designated by the City. Bricks shall be cut, not broken, using a high-speed masonry saw producing clean, sharp edges.

The bricks shall be laid with a uniform 1/8" joint between each brick and joints shall be filled with a 1:3 cement-sand mixture. Sand used for filling joints shall be very fine in gradation and cement shall be Portland Cement which conforms to ASTM C150. Wooden mallets or the wooden end of a brick mason's hammer will be used to strike each brick to ensure a proper set during placement of the bricks and after sweeping the cement-sand mixture into the joints.

- h. Wetting Sequence - Once the cement-sand bedding is in place and the bricks have been set upon the bedding, water shall be applied to the bricks in a sufficient amount to insure hydration of the cement-sand bedding material. After the brick sidewalk surface has completely dried from the initial wetting for hydration of the bedding, the joints shall be filled with a dry cement-sand joint filler and wet a second time for hydration of the joint filler. Wooden mallets or the wooden end of a brick mason's hammer will be used to strike each brick to ensure a proper set during placement of the bricks and after sweeping the cement-sand mixture into the joints. The contractor will be responsible for cleaning the brick surface of any cement-sand material.
- i. Special Brick Sidewalk Condition - Whenever an existing brick sidewalk is to be replaced with all new brick and existing brick sidewalk restoration is a part of the contract, the existing brick sidewalk to be replaced shall be removed by hand, by the contractor, culled and cleaned and used for the brick sidewalk restoration.

14. Restore Brick Sidewalk - Restoration - Spot Replacement

- a. This item shall cover all work involved in spot replacement of missing brick and the restoration to proper grade of existing brick sidewalk.
- b. Bricks in existing sidewalks where designated for restoration shall be removed by hand and the subgrade shall be cut or filled, as required, until a proper subgrade is obtained. Sand which is uniform in gradation and free of foreign material shall be used as a fill material. The bricks removed and replacement brick shall then be placed back in the sidewalk in such a manner as to conform to the pattern of the sidewalk adjacent to the area restored. Bricks shall be cut, not broken, using a high-speed masonry saw producing clean, sharp edges. Once the existing bricks have been placed back in the sidewalk, joints shall be filled with a 1:3 cement-sand mixture. Sand used for filling joints shall be clean and very fine in gradation and cement shall be



Portland cement which conforms to ASTM C150. Wooden mallets or the wooden end of a brick mason's hammer will be used to strike each brick to ensure a proper set during placement of the bricks and after sweeping the cement-sand mixture into the joints. After the joints have been filled with the cement-sand mixture, the brick sidewalk surface shall be cleaned of all residue cement or sand by means of sweeping, washing or cleaning with an acid solution.

Once the brick sidewalk surface has been cleaned to the satisfaction of the City, a light coat of clean fine graded sand shall be placed on the brick sidewalk surface for the purpose of producing a non-skid surface and to insure complete filling of the joints. This light coat of sand will be removed by the contractor at the end of the job.

Whenever there is a deficiency of existing brick in an area designated for brick sidewalk restoration, the deficiency shall be corrected by obtaining bricks from areas designated for removal of existing brick sidewalk and replacement with new brick or concrete. The existing brick sidewalk shall be removed by hand, by the contractor, culled and cleaned and used for the existing brick sidewalk restoration.

15. Section **107.11** is amended as follows:

Blasting - If rock or hardpan excavation is encountered and blasting is necessary, the City will accept, subject to the conditions of the City Code and approval of the Director of Public Works and the City Attorney, coverage in the form of a Rider to Certificate of Insurance in the amount equal to the Personal Liability and Property Damage Insurance of this contract. In addition, before any blasting operations may be performed, the Contractor must first obtain a blasting permit from the Fire Prevention Bureau of the City.

No blasting shall be done on any job until the City has seen the Contractor's blasting permit.

16. Solid Concrete Paving Units

Paving units shall be installed in accordance with manufacturer's specifications.

17. Restore Durax Block Pavement

- a. Description - Work shall consist of restoring damaged areas of Durax Granite Paving Block as indicated on the plans.
- b. Durax Block – Durax Block shall be granite cubes approximately 3.5” in all direction.

- c. Mortar Bedding - The mortar bedding shall comply with the requirements for nonshrink mortar.

The sand used shall conform to VDOT Specifications, sec. 202, for Grading C. The mortar bedding shall be not less than one-half inch nor more than one and one-quarter inches in thickness after blocks have been laid.

- d. Laying Durax Block - The Durax block shall be laid on the mortar bedding in concentric, interlocking segments of about three (3) foot radius, with broken joints, or to meet existing. The upper or wearing surface of each block shall be flush with the general surface of the pavement, and four (4) inches above the concrete base, if used, when the pavement is completed. No joints between the blocks shall be more than one-half nor less than one-quarter of an inch wide at the surface.
- e. At this time the pavement shall be checked with a ten (10) foot straight edge laid parallel with the center of the street and all irregularities greater than one-quarter inch shall be corrected.
- f. The joints shall then be filled with grout (EMACO S77 CI) or approved equal, around all Durax Block to within 1/4" of the top.
- h. Obligation of Contractor at End of Warranty Period - In addition to the proper maintenance of the pavement during the period of warranty, the Contractor shall at his expense, just before the expiration of the warranty period, make such repairs as are necessary to the pavement where it shows indication of having been defectively constructed.

18. RESTORE GRANITE SPALL PAVEMENT -- This work shall consist of restoring or installing new Granite Spall.

- a. Description - This pavement is a roughly cut granite block wearing surface as hereinafter described and locally known as "Spall". These Spall are to be laid in a mortar bed with grout joint filler.
- b. Granite Spall - Granite Spall shall be from four (4) to seven and one-half ( 7 1/2) inches deep, from three (3) to six (6) inches wide and from three (3) to ten (10) inches long. The sides shall permit laying with joints not over three-quarters (3/4) of an inch in width and joints of that width shall be exceptional. The upper face shall be uniform to permit laying to the general surface of the pavement.
- c. Mortar Bedding - the mortar bedding shall comply with the requirements for Nonshrink Mortar. The sand used shall conform to VDOT specifications, Sec. 202, grading C. The mortar bedding shall be maximum two (2) inches thick.

- d. Laying Spall - On this mortar Bedding the Granite Spall shall be laid at right angles to the center of the street. Each course of Spall shall be approximately of uniform width and depth, and so laid that all longitudinal joints shall be broken by a lap of at least two (2) inches. As each course is laid the Cement Sand Bedding will fill the joints to within three (3) inches of the surface of the pavement. Irregular shaped and odd sized Spall shall be culled by the pavers.

After the Spall has been placed in the mortar bedding the pavement shall be tested with a ten (10) foot straight edge laid parallel with the center line of the pavement and any irregularities exceeding one-quarter (1/4) of an inch must be corrected as directed by re-laying of the Spall.

- e. The joints shall then be filled with grout (EMACO S77 CI) or approved equal, around all Granite Spall to within 1/4" of the top.
- f.. Obligation of Contractor at End of Guarantee Period - In addition to the proper maintenance of the pavement during the period of guarantee, which will include refilling grout filled joints if they become open, the Contractor shall at his expense, just before the expiration of the guarantee period, make such repairs as necessary to the pavement where it shows indication of having been defectively constructed.

19. SAW CUTTING - Saw cutting is considered incidental to any asphalt tie-in including that required to install curbing, creating joints, installing driveway aprons, or other curb cuts. Existing asphalt and concrete pavements must be saw cut in order to create a neat line. No other methods such as Jack Hammer will be allowed to cut the asphalt & concrete pavements.

20. Maintenance of Traffic:

Contractor shall submit a Maintenance of Traffic plan to the City Traffic Engineer for review & approval prior to the start of any construction.



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 16***



**Subject: Trench Backfill & Control Fill Geotechnical Brief**

When development plans are submitted, the strongest specification, either the City DPW or the plan design engineer's, should always take precedent as the conformance requirements. Field conditions of acceptance will be based on the geotechnical consultant's review. The geotechnical engineer should conduct a classification on the requested soils to determine if the subject sample meets the basic requirements for select fill. The geotechnical engineer should further test the material by performing advanced laboratory proctor analysis to develop a moisture density relationship. Pre-approval should be secured on the proposed select material before any use. An adequate source of the soils or aggregate material must be available and determined as sufficient to meet the backfill quantity needs.

*Typical* select porous material could be any one of the following:

1. VDOT 21A or 21B (A Blended Dense Aggregate)
2. Crusher Run (A Blended Dense Aggregate)
3. A qualified controlled fill or trench backfill soil, meeting the select material *classification* requirements described below:

Soils classified as Fine Grain aggregates, such as pure sands, are not acceptable in road trench restoration or subgrade fills in their pure state unless approved by the Director of Public Works. The best soils would be a mixture of course and fine grain materials, which are determine through Atterburg Testing, to have a low liquid limit and be considered non-plastic. Most materials with a CBR value of 10 or better would meet the select material requirements.

The dense aggregate blends indicated above are proven materials that will meet the desired compaction if placed at their optimum moisture range in no more than 6"-8" lifts. *Consolidation* of any of the above materials requires suitable compaction equipment. The select soils and aggregate blends must be proctored to determine their optimum moisture range. *Select soils* must be proven as compactable in the trench line under the same methods of placement as the aggregates. The select soils must be consistent, in other words a mix bag of constantly changing material classifications will not be acceptable under the select soil definition. A mix bag material can be compactable when proven to be reasonably consistent and in it's optimum moisture range.

The wording on the cross section detail illustrations, when referencing the percent of compaction, should declare 95% as the minimum acceptable density. References to 100% Compaction Density as indicated in specifications should be treated as the desired level of compaction and the 95% used as the minimum tolerance for passing. A compaction test (sand cone or nuclear) must be run at a minimum elevation separation of every two feet on rising backfill or control fill stratum. At least one passing test, which

is generally representative of each 2 foot stratum, is required in the fill section. A failing compaction tests requires the removal, remolding and retesting of the failed maximum stratum lift section as described on the following page:

When randomly testing a stratum on any run along the trench zone or lift on a controlled fill, any zones which fall below 95% relative density will be rejected. This trench/fill zone must be declared as failing and rejected in-place. The stratum in the failed trench/fill zone should be cutdown a minimum of one foot. At this level the fill material should be determined as unyielding or remolded as necessary. Once the undercut is approved, a new *replacement lift* is applied then retested for proof of passing material. If any of the test above still fail, the one foot cutdown procedure must be repeated until an unyielding level in the trench backfill or controlled fill lifts are found. Choice and selection of materials and methods *must be re-examined* to determine if both are suitable to achieve full compaction. The contractor must rigidly adhere to the foregoing requirements so as to eliminate lost time.

If lower level stratum are allowed to remain when they don't meet density and/or unyielding requirements, the upper stratum, even the final pavement, may suffer future settlement. It does no good what-so-ever, to fully compact, the top crust levels of a fill section, if the bottom levels were unconsolidated or unstable. In these cases it's simply a *matter of time* before the inevitable settlement occurs.

If substitute methods, designs or materials are requested, the aforementioned requirements and good placement methods must still be followed to be successful.

Generally the biggest question on the pipe or road contractor's mind involves the excavated trench soils. Does this material meet all the definitions of select material? If not, it's a *spoil material* and must be disposed of by the contractor. There are no certainties ahead of time that the excavated material will be good or bad. It may have been thoroughly consolidated and unyielding when undisturbed, but once disturbed it's not unusual to find the material nearly impossible or impractical to spend time remolding into a compacted state. The excavated material may not meet the aforementioned qualifications in regards to Consistency, Optimum Moisture, Liquid Limit, Plasticity, and CBR values. Some of these conditions can be affected or lost due to handling and exposure. It can be very costly as well as frustrating to waste time on a *marginal material* or one that is out of the above tests specification ranges for suitable materials.

**Revision Date: 2/27/98 - JEButler**



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 17***



## ***CITY OF RICHMOND***

### ***Department of Public Works***

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#### **Subject: Fiber Optic/Telecommunication Encroachments**

The Department of Public Works' conditions and details regarding protection, installation, and restoration requirements must be satisfied for the encroachment approval to become effective. The Division of Permits and Inspections will monitor and give final approval to the installment and construction operations. You may contact Division of Permits & Inspections office at 646-3905 for questions regarding the requirements and inspections.

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**APPLICATION NO:** \_\_\_\_\_

Depending upon the location and extent of the proposed underground installations, the applicant will be required to install excess or additional conduits for use by the City or other communication entities as chosen by the City and directed by one of the conduit requirements illustrated below, or as directed by the City's Department of Public Works, Division of Permits & Inspections, to direct a more appropriate plan of action for a particular location or situation including, but not limited to, utilizing a combination of the requirements below:

#### **Conduit Requirement I:**

- A. The applicant shall agree to provide and install an additional 4" conduit for "excess capacity", of approved material and in the same trench, for future cable encroachments as approved by the City Administration and for use by licensee, other public service corporations or companies for communication purposes as approved by the City Administration, and compatible so as not to threaten the integrity of licensee's facilities or the effective operation of the existing cables.
- B. The applicant shall agree to provide and install an additional 4" diameter duct to be *reserved* for the City's Department of Public Works or its future designee.

#### **Conduit Requirement II:**

Any Duct Bank or Directional Boring Conduit Systems, placed beneath the City's right of way/public facilities, must be considered an extension of the City's Master Duct System (MDS) when placed in any of the *downtown* district, *business* districts, the *Shockoe Bottom* or other established or newly designated *underground districts*. In addition to the available conduit space that is designed to accommodate the initial system (generally 4), the applicant shall provide eight additional 1-1/4" HDPE conduits. If found necessary and at no cost, the City of Richmond will have full access and use of some or perhaps all of the excess conduit space. Separate manhole structures are to be placed: 1) to route the sponsors 4 new service conduits into, and 2) a separate structure to accommodate the 8 additional conduits (1-1/4" HDPE), which are designated for "*future use by others*". The second structure as well as the conduit systems in them are all considered for use by



others including but not limited to the City of Richmond's use. Rights and privileges on the future disposition, approved use, perpetual maintenance, etc., will remain with the original sponsors unless the City has reason to take over the system for their full and sole use. In that case and at such time, the City will take full ownership of the conduits and the structures by the process of dedication from the owner(s). Otherwise requests, communications and approved use other than City use of the available conduit systems, must be approved by the owner. Where required, each of these cases will be considered an extension of the City's Master Duct System.

**Other Condition Requirements:**

Other conditions for fiber optic/telecommunication cable encroachments that must be satisfied prior to authorization for the encroachments becoming effective include:

1. Within the edge of pavement, conduit shall be schedule 40 PVC or schedule 80 PVC or other rigid non-corrosive metal material and concrete encased. The conduit shall be encased with a suitable concrete mixture as approved by the Director of Public Works. Outside of pavement, no encasement required.
2. Applicant agrees to replace or install handicap ramps should corners be disturbed during construction, with appropriate ADA certified ramps as approved by the Director of Public Works.
3. Subsequent to the original encroachment approval, new encroachment forms will be required for individual "feeder" optic lines off the main optic line, provided they satisfy the feeder line criteria for administrative approval.
4. The applicant shall apply to "Miss Utility" underground utility prevention program per Virginia Code Sec. 56-265.14 et. seq.
5. Applicant to provide as-built drawings to include dimensions showing the exact location of all encroachments as referenced to the right-of-way lines, including:
  - a) length, b) depth, c) encroachment area width when appropriate, d) extent into right-of-way, and e) a dimension to the closest side-street right-of-way at intersections.
6. Applicant shall be responsible for replacing any sidewalks with the specified materials and as requested and approved by the Director of Public Works.
7. Applicant shall be responsible for the disturbance of any right-of-way markers and for the costs (\$375 minimum per marker) for the replacement or repositioning of right-of-way markers by or as directed by Public Works.
8. This encroachment approval is valid for three years or until a franchise agreement is adopted, allowing the City and the applicant time to negotiate a franchise agreement, yet allowing the applicant to continue construction of its network.
9. Applicant shall furnish and irrevocable bond.
10. Applicant shall secure proper permits, and the work shall be performed in a manner satisfactory to the Directors of Public Works and Planning & Community Development.
11. The applicant/owner shall provide written notification to the Assessor, with copies to the Director of Finance and the Director of Public Works, of the new owner's name and mailing address immediately upon transferring ownership or encroachment rights to another party. The applicant/owner shall also be responsible for completing any legal responsibilities required for an effective transfer of title and ownership.

12. It shall be the sole responsibility of the applicant to provide the Department of Community Development, Division of Permits and Services, Law Department and the City Clerk's office with written evidence that all conditions of the ordinance have been satisfied. Should this written evidence not be submitted to the said offices prior to the expiration date of the encroachment authorization (i.e. six months after Director's signature), the administrative encroachment approval will become void automatically.

13. The applicant or successors of the applicant may install additional conduit within any authorized conduit encroachment area with approval of the Director of Public Works, provided such conduit is for a similar use as established in the encroachment area.

## ***FEEDER LINE DEFINITION & POLICIES***

### **Feeder Line Definition:**

General: A feeder line usually extends perpendicular from a main line (backbone), running for a relatively short distance, toward the right-of-way line to service one building or one business.

Specific: A line is **not** considered to be a "feeder" line when it:

- extends the main line, and
- runs along, within, or parallel to the right-of-way, and
- passes more than one building or business while running to its designated termini, and
- has the possibility of providing an opportunity for another business (or building) to connect to that line for service.

Such a line that provides a service connection opportunity indicated above will require encroachment authorization through the appropriate approval process due to the Non-Feeder status of the proposed work.

A. For underground feeder lines (i.e. individual service laterals), the applicant may as part of the active permit package install a feeder line going away from the existing main-line encroachment given the following conditions: 1) Meets the feeder definition qualifiers outlined above 2) Gains approval through the revision submission and approval process for inclusion the active permit package 3) Must be included on the main line and feeder line final as-built drawings (i.e. one plan illustrating all encroachments).

Once installation work on the main lines and feeder lines have terminated for a reasonable length of time (30 days) or as determined by Public Works, all future feeder lines will require the applicant to go through the Administrative Approval Process and Permit Approval Process for each subsequent case.

B. All overhead lines must gain authorization through the Council Approval Process.

**Other Feeder Line Approval Issues:**

A feeder line that extends from an *underground* main line must be an *underground* feeder line to qualify for consideration of approval by the Director of Public Works through the administrative approval process.

An *overhead* feeder line that extends from an *underground* main line must seek approval through the Council approval process.

An *underground* feeder line that extends from an *overhead* main line may seek approval through the administrative approval process or Council approval process at the discretion of the Director of Public Works.

Any overhead line in a designated area that prohibits overhead lines (i.e. the underground district) must seek approval through the Council approval process. Staff will recommend disapproval.



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 18***



**Subject: Policy for Installation of Telecommunications Facilities in the Public Right-Of-Way**

History – In September 1998, we formally established this policy for the use of the City’s right-of-way (ROW) by telecommunication providers. We were consistent in the application of the policy prior to September 1998, but decided it was important to formalize it. Since then the policy has been revised once. This document is the second revision and is intended to better represent the methods of construction that are being used to install facilities today.

**Discussion**

The policy is important in our ability to manage the ROW. It has been our goal to have providers install facilities for future use by other telecommunication providers, as well as the future use of the City, when the provider is installing underground facilities. This minimizes the disruption in the street, the maximization of space, and the preservation of the integrity of the pavement. Providers are required to install their facilities underground in the underground district as well as at the discretion of the Director of Public Works. The underground districts are defined in Section 29-396 of the City Code. For ROW similar to the Underground District, the requirements will be the same. We have defined the characteristics of these areas to include but not limited to,

- Density of the adjacent development
- Density of utilities in the right of way
- Volume of traffic
- Type of pavement
- Availability of ROW

**Policy**

It is policy of the City, that as part of any conduit system installation, the licensee may be required to install additional conduit when installing underground facilities. The requirement and type will depend upon the location, character and extent of the proposed installations. The Licensee will be required to install a single *isolated duct* of 4” diameter, which will be dedicated for use by the City. The City conduit run will share either the same trench or bore zone, but be separated at the designated manhole locations. The Licensee will also be required to place an excess capacity conduit or conduits, equivalent to a 4” conduit, for future use by other telecommunication providers. The Licensee shall maintain ownership of the conduit but shall make this conduit available to providers at reasonable terms and conditions. The future user of the ROW shall be required to get approval from the City for its use of the ROW in addition to the approved use by the Licensee. The Licensee must meet one of the following conduit requirements described in the attached sample conditions. The Director of Public Works or designated representative must approve any modifications of either type of installation.

### **Conduit Requirement Type I:**

- A. The Licensee shall install **one** 4" conduit for excess capacity to be used by others. The conduit system must be made of approved material (HDPE). It will be placed in the same trench or bore zone, access manholes and be available to others. All future users shall obtain an encroachment permit from the City.
- B. The Licensee shall install **one** 4" diameter conduit (HDPE) which is to be separated at the manhole or pull box locations. The separated duct will be placed in its own manhole or pull box (sidewalk zone). This *isolated* conduit and accessibility structures will be dedicated for use by the City and reserved strictly for the governmental uses.

Total excess conduits - **Two** - 4" Conduits

### **Conduit Requirement Type II:**

- A. The Licensee shall install a minimum of six 1-1/2" (HDPE) conduits. The conduit system must be made of approved material (HDPE). It will be placed in the same trench or bore zone, access manholes and be available to others. \*
- B. The Licensee shall install **one** 4" diameter conduit (HDPE) which is to be separated at the manhole or pull box locations. The separated duct will be placed in its own manhole or pull box (sidewalk zone). This *isolated* conduit and accessibility structures will be dedicated for use by the City and reserved strictly for the governmental uses.

Total Additional Conduits: **Six** - 1 1/2" \* & **One** 4" \*\*

\*Special note 1: In directional bore installations, any conduit diameter reduction request must be approved by DPW in advance. Considerations such as reducing the 1 1/2" diameter conduit to 1 1/4" will be reviewed for approval on a case by case basis.

\* \*Special note 2: In directional bore installations, three - 1 1/2 " conduits may be substituted for the specified one 4" conduit to be dedicated for the City's use.

**General Note** for both Type I & Type II conduit installations placed by open cut or directional bore. In all multiple grouping conduit installations a system of color coating must be used to help identify and distinguish each conduit grouping. This becomes very important especially in between access points such as manholes and handholes.

Conduit Fill Space - 4"=12.56 cu. in.  
Conversions 2"= 3.14 cu. in.  
1 1/2"= 1.77 cu. in  
1 1/4"= 1.23 cu. in.

### **General Conditions for Telecommunication Encroachments:**

The following conditions for fiber optic/telecommunication cable or other underground conduit encroachments must be satisfied prior to authorization for the encroachments becoming effective. All encroachments are subject to the annual fee defined in City Code. Additional conditions may be added on a case by case basis.

1. On open cuts the conduit shall be fully encased with an A-3 concrete mixture. See the DPW attachment standard detail for greater clarification
2. Applicant agrees to replace or install handicap ramps should corners be disturbed during construction, with appropriate ADA certified ramps as approved by the Director of Public Works.
3. Subsequent to the original encroachment approval, new encroachment forms will be required for individual “feeder” optic lines off the main optic line, provided they satisfy the feeder line criteria for administrative approval.
4. All network systems must have pre-engineered plans showing the existing public facilities and utilities in both plan and profile.
5. Investigative subsurface engineering will be performed as required prior to encroachment approval, permit plan approval and during the construction process.
6. The applicant shall apply to “Miss Utility” underground utility prevention program per Virginia Code Sec. 56-265.14 et. seq.
7. Applicant to provide as-built drawings and a digitized file or other electronic record to include dimensions showing the exact location of all encroachments as referenced to the right-of-way lines, including: a) length, b) depth, c) encroachment area width when appropriate, d) extent into right-of-way, and e) a dimension to the closest side-street right-of-way at intersections.
8. Applicant shall be responsible for replacing any sidewalks with the specified materials and as requested and approved by the Director of Public Works.
9. Applicant shall be responsible for the disturbance of any right-of-way markers and for the costs (\$375 minimum per marker) for the replacement or repositioning of right-of way markers by or as directed by Public Works.
10. This encroachment approval is valid for three years or until a franchise agreement is adopted, allowing the City and the applicant time to negotiate a franchise agreement, yet allowing the applicant to continue construction of its network.
11. Applicant shall furnish an irrevocable bond.
12. Applicant shall secure proper permits, and the work shall be performed in a manner satisfactory to the Directors of Public Works and Director of Planning & Community Development.
13. The applicant/owner shall provide written notification to the Assessor, with copies to the Director of Finance and the Director of Public Works, of the new owner’s name and mailing address immediately upon transferring ownership or encroachment rights to another party. The applicant/owner shall also be responsible for completing any legal responsibilities required for an effective transfer of title and ownership.

14. It shall be the sole responsibility of the applicant to provide the Department of Community Development, Division of Permits and Services, Law Department and the City Clerk's office with written evidence that all conditions of the ordinance have been satisfied. Should this written evidence not be submitted to the said offices prior to the expiration date of the encroachment authorization (i.e. six months after Director's signature), the administrative encroachment approval will become void automatically.
15. The applicant or successors of the applicant may install additional conduit (interduct) within any authorized conduit encroachment area with approval of the Director of Public Works, provided such conduit is for a similar use as established in the encroachment area.

**16. Conduit Requirement Type I:**

- A. The Licensee shall install **one** 4" conduit for excess capacity to be used by others. The conduit system must be made of approved material (HDPE). It will be placed in the same trench or bore zone, access manholes and be available to others. All future users shall obtain an encroachment permit from the City.
- B. The Licensee shall install **one** 4" conduit, which will be separated at the manholes or pull box locations. The separated duct will be placed in it's own manhole or pull box (sidewalk zone). This isolated conduit and accessibility structures will be dedicated for use by the City and reserved strictly for the governmental uses.

Total excess conduits - **Two - 4"** Conduits

**OR**

**Conduit Requirement Type II:**

- A. The Licensee shall install a minimum of **six** 1-1/2" (HDPE) conduits. The conduit system must be made of approved material (HDPE). It will be placed in the same trench or bore, access manholes and be available to others. \*
- B. The Licensee shall install **one** 4" conduit, which we be separated at the manhole or pull box locations. The separated duct will be placed in it's own manhole or pull box (sidewalk zone). This *isolated* conduit and accessibility structures will be dedicated for use by the City and reserved strictly for the governmental uses.

Total Additional Conduits: **Six** - 1 ½" & **One** 4" \*

\* See special notes 1 & 2 on page 2 of this document regarding changes or substitutions

***FIBER OPTICS FEEDER LINE DEFINITION & POLICIES***

**Feeder Line Definition:**

In general a feeder line extends perpendicular and/or parallel from a main line/main fibers, which are known as the system's backbone. This feeder line generally runs for a relative short distance to service one building or connects another fiber user to this main fiber backbone system.



A line is considered a feeder when:

1. It has a fiber count less than 48 and/or
2. When it doesn't complete a loop tie-in to the backbone network

A fiber line is considered an extension of the mainline or a backbone when:

1. It extends the existing backbone of the SONET Network (*synchronous optical network*) or
2. Stands independent of the existing backbone, which makes it another backbone system or
3. It has fiber counts above 48, (typical fiber counts for backbones range from either a 96 to a 144, to a 216, to a 288, to a 432 or a 864 fiber count)

When either of the described forms above have a line extension which provides a new service connection opportunity, each form will require encroachment authorization through the appropriate approval process.

A. For underground feeder lines (i.e. individual service laterals), the applicant may as part of the *active* permit package install a feeder line going away from the existing main-line encroachment given the following conditions: 1) Meets the feeder definition qualifiers outlined above 2) Gains approval through the revision submission, administrative encroachment authorization and permit approval process for inclusion the *active* permit package 3) Is included on the main line and feeder line final as-built drawings (i.e. one plan illustrating all encroachments).

b. The administrative encroachment requirement is waived for feeder line which serves a building or an individual business if the service connection is along the road frontage zone of the running backbone system and if the work is to be done during the *active* permit stage. All the other aforementioned requirements listed above remain.

Once installation work on the main backbone lines and/or feeder lines has terminated for a reasonable length of time (30 days) or as determined by Public Works, all future construction will require the applicant to go through the Administrative Approval Process and Permit Approval Process for each subsequent case.

## **Overhead Backbone Systems**

All Overhead Backbone Lines must gain authorization through the Council Approval Process. All overhead backbone lines must meet the policy conditions outlined in the last amended City Planning Commission resolution. {See CPC Attachment}

### **Other Feeder Line Approval Issues:**

Any feeder line that extends from an *underground* main line (the backbone) must meet the aforementioned *underground* feeder line definitions and qualifications for consideration of approval by the Director of Public Works through the administrative approval process. An *overhead* feeder line that extends from an *underground* main line must seek approval through the Council approval process.

An *underground* feeder line that extends from an *overhead* main line may seek approval through the administrative approval process or Council approval process at the discretion of the Director of Public Works.

Any *overhead line* in a designated underground area is prohibited (i.e. the underground districts). Requested cases must seek approval through the Council approval process.

*Overhead feeder* lines which branch off of a previous council approved *overhead backbone* systems, can seek approval of the network extension through the administrative encroachment process when the following conditions are satisfied:

1. The line extension meets all the aforementioned feeder line definitions
2. The line is equal to or less than the existing backbone line in terms of cable diameter/size, character and visual impact
3. The line extension does not require any additional poles to carry the run
4. The line extension does not require any pole extensions to carry the run
5. The line extension meets all the necessary national electrical code guidelines
6. The line extension meets all the necessary separation guidelines with other users
7. Individual agreements can be secured with the owners of the pole line

#### **Policy Attachments:**

Detail Illustration TCR-3 Conduit Requirement Type I

Detail Illustration TCR-4 Conduit Requirement Type II

City Planning Commission Resolution for Overhead Line Encroachment



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 19***



## ***CITY OF RICHMOND***

### ***Department of Public Works***

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#### **Subject: Advanced Engineering Requirements for New Underground Utilities**

The City Department of Public Works (DPW) has established the following checklist of pre-engineering requirements, that shall be satisfied prior to issuing a construction permit. The following general trenching guidelines are intended for both open cut and directional boring methods or any combination of methods regarding the installation of conduits and pipelines.

#### **General Guidelines:**

1. A thorough investigation shall be performed to compile all information on the known utility systems paralleling or crossing the proposed path on the new utility.
2. This information is to be placed on a set of engineered construction plans, which indicate both the plan view and profile view of all the existing utilities.
3. The plans shall indicate the proposed route of the new or extended underground utility and its relationship with all other known utilities in the shared corridor.
4. Advanced subsurface investigations may be required to accurately depict the exact location of each utility.
5. The plans shall have detail sheets that indicate the various types of trench line cross sections required. The trench line cross section(s) must:
  - a. Be stationed on the City's baseline as monumented and illustrated in the City's Atlas Books.
  - b. Reference the proposed trench centerline and it's offset relationship to either the face-of-curb or the right-of-way line.
  - c. Meet the minimum standards of restoration, as established by the City.
  - d. Indicate the total number and diameter of conduits that are to be placed in the duct bank system.
  - e. Identify the proposed users of each conduit in the duct bank system.
  - f. Be color coated/pigmented for user distinction.
  - g. Identify the duct(s) to be dedicated to the City.
  - h. Identify the conduits required to meet the City's Excess Conduct Policy.

***Note: See the City policy statements regarding Excess Duct Systems.***

6. *Record atlas* research, initial subsurface investigations, and plans development must be completed prior to beginning the permit approval process. ***Note: More comprehensive subsurface investigations and shop drawings will be required during the construction phase.***

7. All utility main separation guidelines must be honored. The horizontal separation between a new utility and any existing utility should be designed at 8 feet or more, when achievable. Requested reductions in this horizontal separation guideline will be reviewed on a case-by-case basis.

***Note: DPW recognizes that major intersection crossings can present difficult or exceptional utility separation problems. These cases often require special open cut designs to satisfy the separation guidelines. Request for exceptions to the aforementioned guidelines must be submitted with a detailed explanation and sound engineering methodology to overcome the reduced separation.***

8. All utility main easements must be honored. Permission to encroach within the limits of existing easements must be obtained, prior to issuing a construction permit.
9. Special design concrete encapsulation shall not have a depth, from the top of concrete to the finished pavement surface, of less than 18 inches. All separation reductions must be requested and approved by DPW, in advance.
10. In open cut situations, all new conduit systems that parallel existing trunk lines or outfall lines, where service laterals crossover the proposed new utility run, must maintain a minimum of 2 feet vertical separation below the lowest known utility service lateral. ***Note: Typically this applies to all gas & water service laterals. Sanitary service laterals and storm sewer connections may be exempt from this requirement when known to be at a much greater depth than the invert of the water/gas main minus 2 feet. See the following “Specific Guidelines for Directional Boring” for further requirements when using this method to place conduit.***
11. The original drawings should continuously reflect the proposed elevations of the new utility, in relationship with the interpolated or known elevations of the existing systems. At the time of construction, shop drawings shall be continuously submitted to further support the plans. ***Note: Item 9 Specific Guidelines for Directional Boring” further explains how this is to be performed and complied.***
12. *Subsurface investigation* and *pre-engineering* must be verified, in the field, as part of the *Final Engineering Check*. All utilities must be marked and all known utilities accounted for prior to beginning any trench line construction. “*Potholing*” will be required when no other accurate information is available to verify the actual location of an existing utility. The City requires the contractor to provide modern vacuum type test pit equipment and employ *modern day methods* to minimize the destructive nature of potholing and test pitting for utilities. Pothole (test pit) size should be in the range of 6-inches to no more than 2-feet square, unless approved by the DPW or Department of Public Utilities (DPU) inspector. The expected size and shape of these potholes, as well as the equipment used for such subsurface investigation purposes must be declared and pre-approved by the DPW or DPU inspector prior to beginning work. In advance of any work, the inspector will make a determination whether the contractor is ready to employ the least destructive methods available for accurately

locating the subject utility. In each proposed corridor and until these final engineering steps have satisfactorily proven the proposed route of the new utility, no trench line work is to begin.

### **Specific Guidelines for Directional Boring:**

1. All general guidelines for subsurface investigations and pre-engineering must be verified in the field as part of the *Final Engineering Check* in the proposed work.
2. Prior to beginning work and as part of the Final Engineering Check, the contractor is required to contact each appropriate utility company and hold a field meeting to discuss any concerns or discrepancies.
3. The Contractor shall contact the appropriate utility company and determine whether there are any requirements for *observation pits* (typically 2' x 2' wide or less). Observation pits shall reveal a minimum of 4 feet below the invert elevation of the utility of concern, unless a reduction is allowed by the appropriate utility inspector. In large diameter bores, where bundles of multiple conduits will be pulled back, once the original pilot bore is completed and after the enlargement back reaming efforts have sufficiently opened up the boreline path, consideration may be given to reducing the observation pit reveal depth to help prevent unwanted frac-outs. Adequate coverage, precise control on the boreline path and comfortable separation depths will be examined and determined before any reduction in observation pit reveal depths are considered. The on-site utility inspector is the only person who can grant this reduction. At no time shall the observation pit have less than two feet of full reveal below the utility of concern. In some locations, requirements for observation pits may be waived, if the subsurface utility engineering and subsurface investigations indicate the existing utility is at a separation of significant safety and no risk. In all cases the appropriate utility inspector shall be contacted, in advance and given the opportunity to monitor the sonar and depth scanning device, while the contractor's operations cross or parallel a given utility line.
4. All utility main separation guidelines must be honored. The horizontal separation path between a new utility and existing utility should be both designed and targeted at a minimum distance of 8 feet or more, when practical. Reductions in this guideline may be considered on a case-by-case basis. At no time shall there be horizontal separation, shown on the plans or targeted in the field, less than a minimum of 5 feet between any existing utility main and the new utility. This separation is to be measured from the outside diameter of the known utility to the outside edge of the conduit bundle.
5. In Directional Boring operations, the 2 feet vertical separation stated in the Open Trench specifications of Item 10, under the general guidelines, is increase to 3 feet. Three (3) feet is to be interpreted as the minimum separation requirement. The

designed target depth of separation should always be greater than this depth by at least one foot or more. This depth is measured to the outside edge of the conduit bundle being pulled through by the back reaming device.

6. All new conduit systems that parallel an existing trunk or outfall line, where service laterals crossover the proposed new utility run, must maintain a subsurface elevation that is less than or equal to the profile grade of the lowest known utility sharing the corridor. This typically will be the sanitary, storm or combined sewer main. ***Note: This guideline is different than the open cut specifications mentioned in Item 10, under the general guidelines.***
7. The maximum bore depth beneath the City's right-of-way shall be a threshold of 16 feet below the surface elevation to the utility or conduit run. Special approval is needed to go beyond this depth. ***Note: The City will not allow any future point repairs to a conduit or cable system installed below the established "threshold depth" described above.***
8. The design engineer must pre-determine where *relief pits* are to be provided in the directional bore runs. Relief pits are defined as mid points in the length of the bore run, which allow spoils and/or injection material to be discharged. Proper vacuum equipment must be available at relief pits to handle the spoils. Typically, it is expected that relief pits are no more than one (1) foot square.
9. The design engineer must calculate the *descending angle* and *ascending angle* for each proposed bore staging location or bore pit location. This information must be shown on the original plans or submitted as a *shop drawing* for final review and approval prior to commencing work. The design engineer must calculate the exact location and/or set back of each bore pit. This is necessary to establish a pre-determined location based on the equipment limitations, the aforementioned utility separation and in particular the minimum clearance guidelines. No boring operations are to begin until the project manager or design engineer has submitted the geometric calculations to the DPW Permit Inspector and received approval.
10. No directional boring operations shall begin until adequate equipment is in-place that will capture, contain and remove the generated spoils.
11. No directional boring operations shall begin until all these aforementioned *guidelines*, plus those specified in the *general guidelines*, have been completed to the City's satisfaction and approval.
12. No directional boring will be allowed in certain zones of the City determined to have a higher risk factor of utility clutter. In addition, undocumented substructures, such as old sheeting and shoring systems, old foundations, rubble fills or other conflicts creating possible navigational problems have proven to be problematic in directional boring operations. These conditions are known to exist at street intersections in the Downtown area, the Shockoe Bottom, and numerous other locations within the City.

Therefore, without special approval by the DPW, directional boring will not (normally) be allowed in these areas or any other designated zones determined to have risk factors. Limited runs and/or localized zones of directional boring may be approved, on a case-by-case submission basis, for these same designated areas. These restrictions apply mainly to continuous run corridor-type bore plans, not individual boring runs designed to cross from one side of the street to the other side (single shots).

13. As deemed necessary, the City will require the contractor to *TV Investigate* any sewer, gas, or water line, that has been crossed or paralleled, to prove no damage has resulted from the boring operations.
14. As a final submission requirement the contractor/sponsor/engineer must submit a set of as-built drawings, with field notes, that reflect the actual new utility layout and exact depths. Final plans must show all changes in brackets, highlighted notes, or delineated references concerning the as-built information. Two reproducible drawings and one (or more) hard copies must be submitted with field sketch notes.
15. The City of Richmond is a **GIS City**, therefore all as-builts must also be submitted in a digital file format. This, along with GPS coordinates provided on certain City monumentation, adjacent fixtures, and manhole structures, enable DPW to conveniently update records on new utility network files now being maintained on our GIS system.





***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 20***



***CITY OF RICHMOND***  
***Department of Public Works***

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**Subject: Contractor's Certification**

**General Note:**

As of January 1, 2001, the City of Richmond, Department of Public Works will require all contractors who wish to do trench line construction (open cut or directional boring), to be Certified. Completion of this certification must be done prior to beginning any work *under permit* within the City's Right-Of-Way. This certification, which is a step-by-step overview of the aforementioned guidelines, will be a *supplemental part* of the required Pre-Construction conference. Project managers, project superintendents, site foreman, and/or anyone who will be supervising the trenching equipment operators must obtain this certification prior to commencing work in the City's Right-Of-Way. Those persons receiving this information are asked to acknowledge this fact by signing in the space provided below. A list of certified contractor personnel or other individuals, involved in the aforementioned processes, will be maintained by DPW. Re-certification will be required yearly or at any other time DPW Engineering & Inspections deems necessary.

***Certification Applicant***

(Print Full Name)\_\_\_\_\_ - Date\_\_\_\_\_

(Signature)\_\_\_\_\_ - Date\_\_\_\_\_

Affiliation \_\_\_\_\_

Job Title\_\_\_\_\_

Current Project\_\_\_\_\_

Prime Contractor\_\_\_\_\_ or Subcontractor \_\_\_\_\_ (check)

Location\_\_\_\_\_

"Work in the Streets" Permit No. \_\_\_\_\_ Issued Date\_\_\_\_\_

First Certification \_\_\_\_ Previously Certified \_\_\_\_ (check one)

**Revision Date: 5/5/04 - jebutler, dpw, row-mgmt**



***CITY OF RICHMOND***  
***Department of Public Works***

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***ATTACHMENT 21***

**City of Richmond**  
**Department of Public Works**

**A Policy for Temporary Steel Plate Bridging**  
**for General Utility Street Work**

1. Temporary steel plate bridging shall have a minimum thickness as listed in the following tables:

TABLE 1 – SINGLE PLATE WITH 4 SIDES BEARING		
Size of Opening (inches)	Yield Strength of Steel Plate	
	36 ksi	50 ksi
	Minimum Plate Thickness Required (inches)	
36 x 36	3/4	11/16
36 x 48	13/16	3/4
36 x 72	7/8	3/4
36 x 108*	7/8	3/4
48 x 48	13/16	3/4
48 x 66	7/8	13/16
48 x 96	15/16	7/8
48 x 144*	1	7/8
60 x 60	7/8	3/4
60 x 84	15/16	7/8
60 x 120	1	7/8
60 x 180	1	7/8

- \* For longer trenches of the same width, the same minimum plate thickness may be used, except when multiple plates are used, in which case Table 2 shall apply.

TABLE 2 – PLATES WITH 2 OR 3 SIDES BEARING		
Width of Trench (inches)	Yield Strength of Steel Plate	
	36 ksi	50 ksi
	Minimum Plate Thickness Required (inches)	
36	1	7/8
48	1-1/4	1
60	1-3/8	1-1/4

**Note:** when a plate is not available in the thickness indicated in the table, a larger thickness may be substituted.

The preceding tables are based on the following design criteria for AASHTO H 20-44 loading, positioned to produce the maximum value for each criterion:

Allowable stress       = 23.76 ksi for 36 ksi yield strength  
                              = 33.00 ksi for 50 ksi yield strength

Allowable deflection at midspan =  $L / 120$ ,  
where L = clear opening width (short direction)

Abbreviations:       ksi = 1,000 pounds per square inch

2. Temporary steel plate bridging shall meet the requirements of ASTM A 36; or ASTM A 572, Grade 50; or ASTM A 588; or ASTM A 709, Grades 36, 50, or 50W. The Contractor shall submit a Certificate of Compliance (mill analysis report or test report from an approved independent testing laboratory) for each steel plate being installed, attesting that each plate meets the specified requirements. Each plate shall bear an individual identifying mark that matches the same mark on the corresponding Certificate of Compliance. Steel plates shall also be marked with the grade of steel (see attached drawing). Steel plates without a Certificate of Compliance will not be allowed, unless individually reviewed and approved in writing by the Department of Public Works. The contractor shall provide written documentation attesting that all the bolts being furnished meet the minimum requirements of ASTM A 307.
3. Temporary steel plates shall be free from heavy rust, corrosion and pitting, and bends and kinks. Light surface rust or weathering steel patina are acceptable. Bolts shall be clean and free from heavy corrosion. The maximum camber from level at any point in an unloaded steel plate shall be 1 inch per 10 feet of length.
4. Any temporary steel plate that spans a trench width greater than 60 inches in the shorter direction is required to have a structural design bearing the seal of a Professional Engineer licensed in the Commonwealth of Virginia. The plate shall be designed to support an AASHTO H 20-44 loading in any position on the plate span, and shall meet all other requirements of this policy.
5. Any steel plate used for temporary bridging shall be rectangular in plan, with a minimum plan dimension of 48 inches.
6. Meeting the requirements for temporary steel plate bridging does not absolve the contractor of responsibility to properly shore or support the trench excavation.
7. Temporary steel plate bridging shall bear on solid pavement for a minimum distance of 18 inches at each end of the span. Sloughed off or broken up pavement will not be considered a suitable bearing surface. If a single plate is installed, the minimum bearing distance will be required on all 4 sides. Where multiple plates are installed, each end plate will be required to have the minimum bearing distance on 3 sides, and intermediate plates must have the minimum bearing distance on 2 opposite sides.

8. Temporary steel plate bridging shall be anchored to the pavement in a positive manner, which shall prevent horizontal movement of the plates under traffic or other loadings. Steel spikes driven into the pavement around the perimeter of the plating at approximately 2-foot centers may be necessary to provide sufficient anchorage against horizontal movement. Steel spikes used for this purpose shall have rounded or countersunk heads to prevent damage to vehicle tires. Spikes shall be driven into sound pavement and/or sub-grade material. In-place plate bridging that exhibits horizontal movement under traffic loads shall be required to be anchored to the satisfaction of the Department of Public Works.
9. Temporary steel plate bridging shall be placed level or in such a manner as to provide a smooth transition between the steel plate and existing roadway grades and cross-slopes. Asphalt concrete bedding should be used to level plates on uneven pavement surfaces. Temporary steel plates shall not be placed greater than 3 inches above the existing pavement surface. If the temporary steel plate requires more than 3 inches of asphalt concrete bedding, approval from the Department of Public Works is required.
10. An asphalt concrete ramp is required to provide for a smooth transition to steel plate edges that protrude above the pavement surface. This ramp must extend horizontally a minimum of one foot from the edge of the steel plate to provide a suitable taper and transition between the plate and the pavement, with a maximum slope of 8.5% (1 inch vertical per 12 inches horizontal). If the temporary steel plate will be in place for more than 24 hours, then hot mix asphalt shall be used for the asphalt concrete ramp.
11. Where the roadway speed limit exceeds 35 miles per hour, or where travel speeds regularly exceed 35 miles per hour, temporary steel plate bridging may be permitted to be installed in accordance with Paragraphs 9 and 10 provided that no portion of the temporary steel plate extends more than 1 inch above the existing pavement surface (with the exception of bolt heads at splices). If any portion of the temporary steel plate extends more than 1 inch above the existing pavement surface, the pavement shall be milled down such that no portion of the temporary steel plate extends more than 1 inch above the surrounding pavement surface, and the milling shall allow for the required plate bearing distance of 18 inches.
12. Steel plate bridging shall be installed in such a manner that vertical deflection of the plate under traffic loads is kept to a minimum. Measurable deflections shall be limited to 1/120 of the span length of the plate. Bouncing or vertical movement of the plates at the bearing areas when subjected to traffic loads will not be permitted. The contractor will be required to re-set or re-bed any plate that exhibits bouncing or vertical movement that is deemed excessive by the Department of Public Works. If re-setting or re-bedding the plate or plates does not reduce the vertical movements to acceptable levels, the Department of Public Works may prohibit the use of temporary plate bridging for the specific location.

13. Where multiple plates are installed side-by-side over a trench, the joints between plates shall be spliced together by bolting (see attached drawing) or a similar approved attachment method in a manner that prevents separation of the plates under traffic loading. Splices between adjacent plates will be permitted parallel to the span direction of the plates only.
14. All temporary steel plate bridging shall be coated with a durable epoxy grit non-skid surface on the side exposed to traffic. The epoxy-resin system shall conform to the requirements of Section 243 of the Virginia Department of Transportation *Road and Bridge Specifications 2002*, Type EP-5, with aggregate applied to the epoxy surface.
15. Temporary steel plate bridging installations shall be clearly marked with 4-inch wide white retroreflective adhesive-backed traffic tape that meets the requirements of Section 246 of the Virginia Department of Transportation *Road and Bridge Specifications 2002* for Plastic-Backed Preformed Tape Pavement Marking Material (Type B, Class IV). The marking pattern shall be as indicated on the attached drawing. In certain situations where it has been determined by the Public Works Inspector that a greater degree of caution needs to be conveyed, yellow retroreflective tape will be required.
16. Advance warning signs shall be used at all temporary steel plate bridging installations in roadways. Advance warning signs shall read "STEEL PLATE AHEAD" (see attached details), and shall be fabricated and placed in accordance with the latest version of the *Virginia Work Area Protection Manual*.
17. The Contractor shall notify the Department of Public Works Call Center (804-646-0999) with the location of any planned temporary steel plate bridging installations no later than 24 hours before installation. The Contractor is required to provide a contact name with 24-hour telephone number for use by the Department in the event the installation becomes disturbed or requires attention.
18. During emergency repairs, the Contractor shall notify the Department of Public Works Call Center (804-646-0999) no later than the close of business on the day of the repair. If the emergency work has occurred after normal business hours, the Contractor shall notify the Department of Public Works Call Center on the next business day. The Contractor is required to provide a contact name with 24-hour telephone number for use by the Department in the event the installation becomes disturbed or requires attention.
19. Unless specifically approved by the Department of Public Works, a temporary steel plate bridging installation shall not exceed 5 days. Any extension after 5 days shall require approval from the Department of Public Works.
20. The name of the plate owner, contact name, and 24-hour telephone number shall be stamped or bead welded in letters 4 inches tall or taller in a prominent location on each plate for ease of observation and identification.

21. Temporary steel plate installations shall be inspected by the Contractor and deficiencies corrected as often as needed to ensure safe traffic conveyance over the plates, but in no case will more than 24 hours elapse between inspections, and no more than 12 hours on bus routes.

22. The use of temporary steel plate bridging is discouraged during the winter season (December 1 – March 30), except in extraordinary cases where it is unavoidable. During the winter season the Contractor will be required to adhere to the following requirements:

- Temporary steel plate installations shall be clearly identified. The location will be marked with an orange traffic drum that conforms to the *Virginia Work Area Protection Manual*. The drum shall be a minimum of 36 inches in height and have at least an 18-inch minimum width. Metal drums shall not be used. The drum shall be stenciled with 5" high letters that say "STEEL PLATE" or a 30-inch by 24-inch sign shall be attached to the barrel with the words "STEEL PLATE".
- The Department of Public Works Snow Program Manager (Phone: (804) 646-5402) shall be notified of the location of any temporary steel plates.

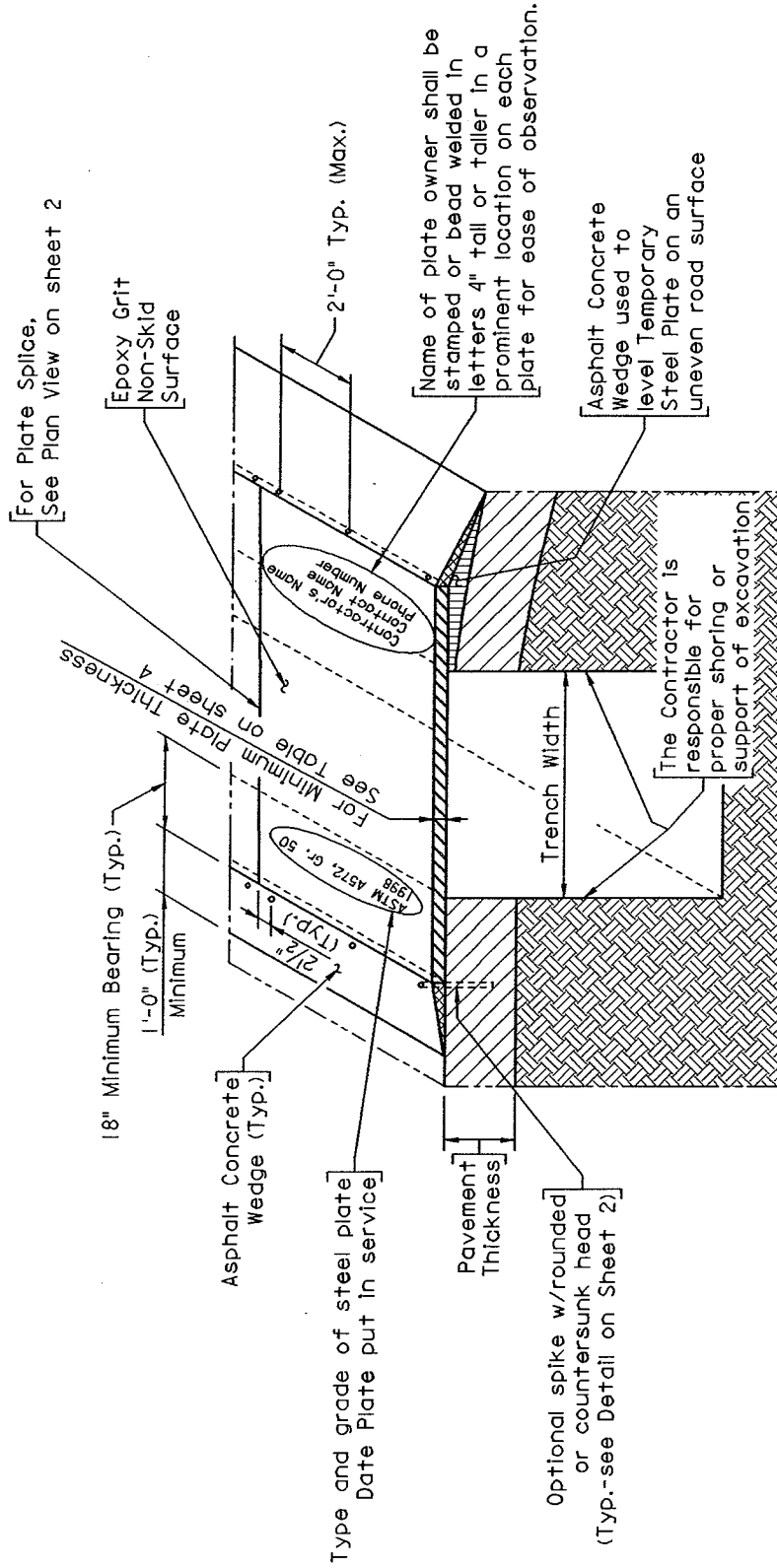
23. Removal of Temporary Steel Plate Bridging

- The trench shall be backfilled and the pavement restored in accordance with the City of Richmond Trench Cut Restoration Policy.
- Anchorage holes in the pavement shall be packed full with graded fines of asphalt concrete mix or concrete slurry.
- The Contractor shall notify the Department of Public Works Customer Service Call Center (804-646-0999) upon the removal of the temporary steel plate bridging installation.

Permits and Inspection Administrator		Deputy Director Transportation
Capital Project Administrator		Director of Public Works
APPROVED DATE		DEPARTMENT OF PUBLIC WORKS RICHMOND, VA



# TEMPORARY STEEL PLATE BRIDGING FOR GENERAL UTILITY STREET WORK



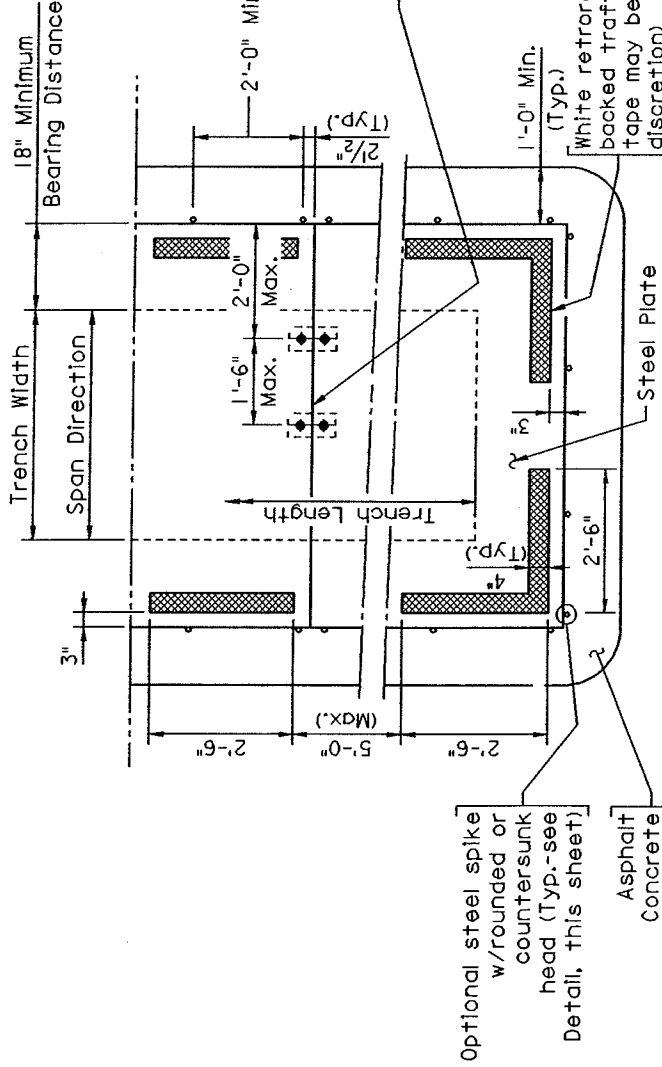
## TYPICAL SECTION - TEMPORARY STEEL PLATE BRIDGING

Roadway Speed Limit 35 mph or less

Note: For speeds greater than 35 mph,  
see Typical Support Detail on sheet 3

Not to Scale

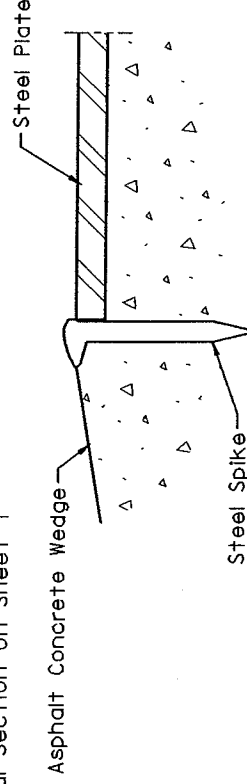
Permits and Inspection Administrator	Deputy Director Transportation
Capital Project Administrator	Director of Public Works
APPROVED DATE	1 of 4
DEPARTMENT OF PUBLIC WORKS RICHMOND, VA	



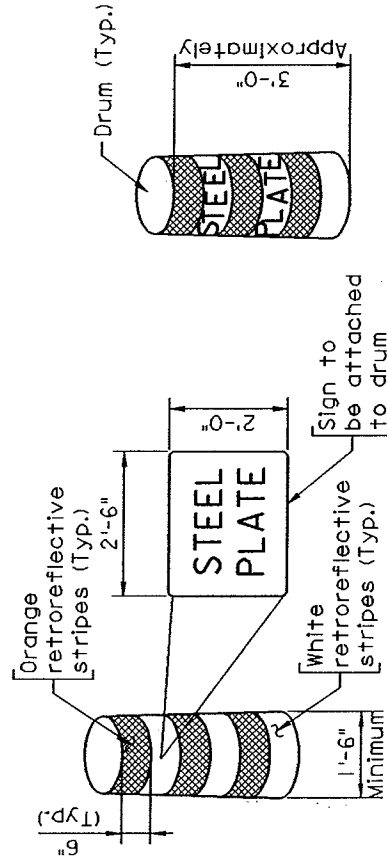
Where multiple plates are installed side-by-side over a trench, the joints between plates shall be spliced together by bolting, or similar attachment method in a manner that prevents separation of the plates under traffic loading. (See plate splice details on Sheet 3). Splices between adjacent plates will be permitted parallel to the span direction only.

## PLAN VIEW - TEMPORARY STEEL PLATE BRIDGING

Note: For details not shown, see Typical Section on Sheet 1



## TYPICAL STEEL SPIKE DETAIL (Using Railroad Spike)

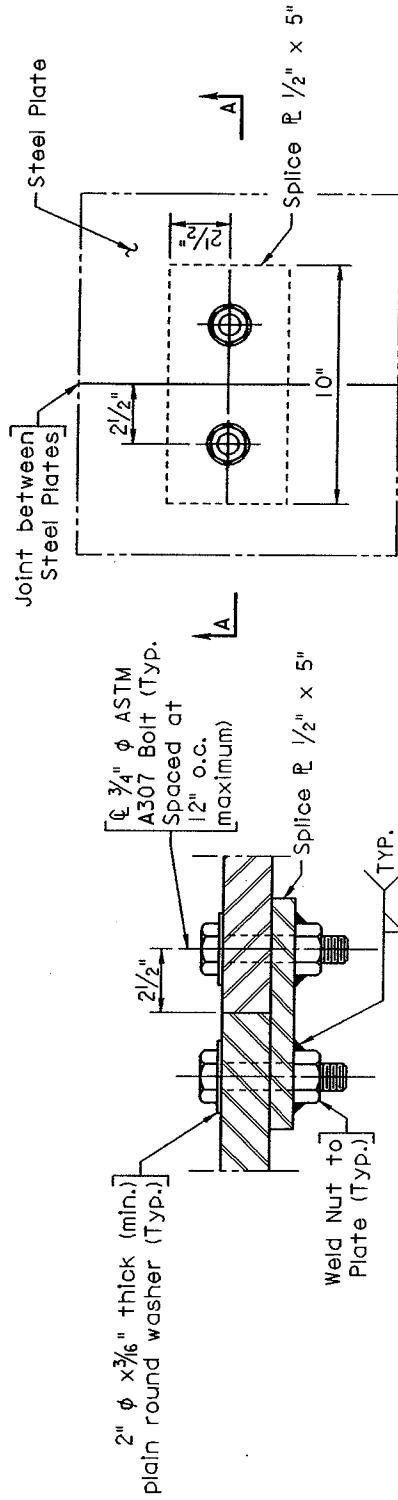


OPTION 2

OPTION 1

**WINTER TEMPORARY  
STEEL PLATE LOCATOR SIGNS**  
Required Dec. 1 - Mar. 30

Permits and Inspection Administrator	Deputy Director Transportation
Capital Project Administrator	Director of Public Works
APPROVED DATE	2 of 4
Not to Scale	DEPARTMENT OF PUBLIC WORKS RICHMOND, VA



PLAN

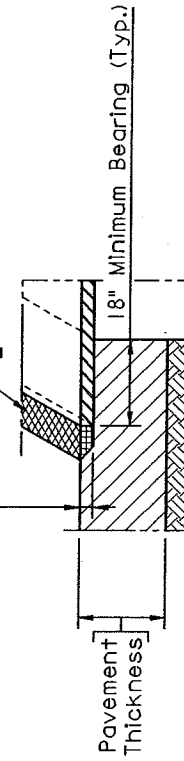
Note: For details not shown, see SECTION View

## PLATE SPLICE DETAIL

Splices are for joints parallel to the span direction only and are intended to prevent separation of the plates under traffic loading. The Contractor is responsible for providing a sufficient number and spacing of splice plates and bolts for satisfactory performance under the design loads.

Mill pavement surface to accommodate the full plate thickness, such that no portion of steel plate is greater than 1" above existing pavement surface

Fill with asphalt concrete to provide smooth transition



## TYPICAL SUPPORT DETAIL

Where milling of the pavement surface is required

Note: For details not shown, see Typical Section and Plan View

Not to Scale

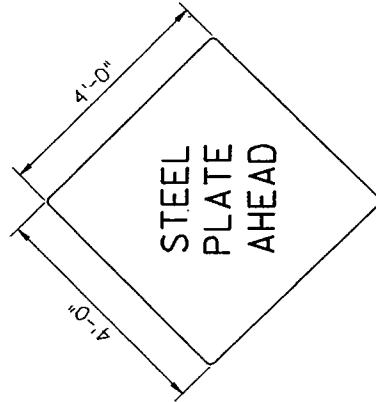
Permits and Inspection Administrator	Deputy Director, Transportation
Capital Project Administrator	Director of Public Works
APPROVED DATE	3 of 4
	DEPARTMENT OF PUBLIC WORKS RICHMOND, VA

TABLE 1		
SINGLE PLATE WITH 4 SIDES BEARING		
SIZE OF OPENING (in.)	YIELD STRENGTH OF STEEL PLATE	
	36 ksi	50 ksi
SIZE OF OPENING (in.)	MINIMUM PLATE THICKNESS REQUIRED (in.)	
	36 ksi	50 ksi
36 x 36	3/4	11/16
36 x 48	13/16	3/4
36 x 72	7/8	3/4
36 x 108*	7/8	3/4
48 x 48	13/16	3/4
48 x 66	7/8	13/16
48 x 96	15/16	7/8
48 x 144*	1	7/8
60 x 60	7/8	3/4
60 x 84	15/16	7/8
60 x 120	1	7/8
60 x 180	1	7/8

\* For longer trenches of the same width, the same minimum plate thickness may be used, except when multiple plates are used, in which case Table 2 shall apply.

LOCATION OF WARNING SIGN FROM WORK ZONE	
SPEED* (Mph)	DISTANCE (Feet)
20	120
25	160
30	200
35	250
40	310
45	360

\* posted Speed Limit of the Temporary Traffic Control Zone



## STEEL PLATE ADVANCE WARNING SIGN (YEAR ROUND USE)

\* Sign placement and material used shall conform to latest Virginia Work Area Protection Manual

TABLE 2		
PLATES WITH 2 OR 3 SIDES BEARING		
SIZE OF OPENING (in.)	YIELD STRENGTH OF STEEL PLATE	
	36 ksi	50 ksi
SIZE OF OPENING (in.)	MINIMUM PLATE THICKNESS REQUIRED (in.)	
	36 ksi	50 ksi
36	1	7/8
48	1 1/4	1
60	1 3/8	1 1/4

### NOTES:

- When a plate is not available in the thickness indicated in the table, a larger thickness may be substituted.
- Tables 1 and 2 are based on the following design criteria for AASHTO H 20-44 loading, positioned to produce the maximum value for each criterion:  
Allowable stress = 23.76 ksi for 36 ksi yield strength  
= 33.00 ksi for 50 ksi yield strength  
Allowable deflection at midspan =  $L / 120$ , where  $L$  = clear opening width (short direction)  
Abbreviations: ksi = 1000 pounds per square inch
- For additional requirements, see "A Policy for Temporary Steel Plate Bridging for General Utility Street Work".

Not to Scale

Permits and Inspection Administrator	Deputy Director Transportation
Capital Project Administrator	Director of Public Works
APPROVED DATE	4 of 4
DEPARTMENT OF PUBLIC WORKS RICHMOND, VA	



***CITY OF RICHMOND***  
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***ATTACHMENT 22***



***CITY OF RICHMOND***  
***Department of Public Works***

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**Subject: Generic Agenda Permit Example Case**

**Downtown Telecom Network** – Engineered and performed by \_\_\_\_\_ Construction  
Sponsor - Verizon / Dominion / State / \_\_\_\_\_  
Pre-Construction Meeting  
Held: Thursday, June 2nd, 2005  
Location: DPW White House Conference Room in the City of Richmond

**Agenda Talking Points & Script**

1. Introduction of attendees
2. Project Orientation/Overview
3. Relationships of the following: Developer / Design Consultant Engineer / Geotechnical Consultant / Prime Contractor / Sub-contractors ( i.e. clearing & grubbing, E & S, excavating, grading, pipe concrete, manholes& other structures, asphalt paving, etc.)
4. Material Suppliers for items #5 below
5. Soils / Stone / Concrete / Pipe / Asphalt
6. Testing requirements / Testing consultant / Testing reports
7. Discussion of City Geotechnical Notes / Construction Notes (See plan notes)
8. Explanation on project phasing and length of disturbance at any one time
9. Construction Entrance (s) / Zones / Housing-keeping requirements
10. E & S plan discussion; The daily requirement to clean the streets & gutter lines of any generated silts, soils or other generated loose materials, such as aggregates or asphalt
11. Advanced Engineering Requirements For Trenching & Boring (See plans and permit attachments fro comprehensive notes)
12. Temporary Steel Plate Bridging Systems (see plans and permit attachments)
13. Maintenance of Traffic (Using the Virginia VDOT Guidelines for Work Area Protection (See VDOT manual for typical signs and layout)

14. Placing official “NO PARKING SIGNS” on corridors - When, Where & Why
15. Maintaining Street & Alley connections
16. Work Hours (Nights, Weekends, Peak Period Restrictions)
17. The Peak Periods are defined as 7AM to 9AM & 4PM to 6PM; Monday thru Friday. The DPW Permit Inspector must be given 24 hours notice on anticipated night or weekend work.
18. Work Hour Restrictions In Residential Areas Due to Noise Pollution:
  1. Work is permitted without restrictions between the hours of 7AM and 7PM.
  2. Work will be permitted between the hours of 7PM to 10PM, but monitoring will begin. During this time period of the evening, the maximum noise threshold measurement will not exceed 70db measured at a distance of 150 feet from the source.
  3. Between the hours of 10PM and 7AM, there shall be no work or the use of any equipment which generates a noise level in excess of 70db decibels, measured at a distance of 50 feet from the source.
  4. The noise levels will apply to both ambient and single source generators.
  5. These noise levels will apply to intermittent activities as well as continuous activities.
19. Traffic management and safety during construction
20. Temporary Restoration (s) {Temporary cold or hot patch restoration materials to be used?}
21. Expect to encounter *cavities* in the sub-surface. When and where found, we can use Flow Fill as a method of filling deep voids which lie beyond and beneath the trench walls & trench bottom
22. Three step pavement restorations (1. temporary materials; 2. permanent base material; 3. final surface)
23. Final Restorations (see details and construction notes)
24. Temporary and permanent pavement markings

25. Discussion on the individual utilities

\* Sanitary Sewer \* Combined Sewer \* Storm Sewer \* Water \* Gas \* Electric  
\* Street Lighting \* Cable Vision \* Telephone

We discussed the need to have a utility stakeholder representative at all main distribution crossing for gas/water/electric/telecommunications/etc., (see plan details and permit attachment regarding “Advanced Engineering Guideline for Trenching and Boring” for a comprehensive briefing on this subject)

26. Road frontage improvements

27. *Critical Phase* inspections requirements (initial layout, utility sub-surface investigation results, blessing the proven path, well drawn sketch notes, trenching/excavation, use and installation of plates, trench restoration, temporary restoration conditions, permanent pavement section repairs, over-milling & final paving, new pavement marking layout, pavement marking installation)

28. Activity Inspection on Non-Critical progress work

29. Limitations on multiple locations of work activities

30. Required approval and qualifying conditions for deploying multiple crews on the same tasks

31. Acceptance of Geotechnical Inspection Services in lieu of DPW Inspections (official test reports required)

32. Responsibility to keep, organize and be ready to show the permit inspector your *As-Built* notebook

33. Contractor Certifications

34. Later Contractor Staff Certifications

35. Future progress meetings will evaluate performance

The following are revised notes and agenda talking points from the pre-construction meeting held June 2, 2005 at the DPW –White House.





***CITY OF RICHMOND***  
***Department of Public Works***

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**Subject:      Example Preconstruction Meeting Agenda for CIP Projects**

**Pre-Construction Meeting**  
**Belvidere/ Broad and Belvidere/ Marshall Intersection**  
**Improvement Project**

Thursday July 28, 2005

10:00 PM to 11:15 PM

Department of Public Works, 7<sup>th</sup> Floor Large Conference Room

**AGENDA**

- 1. Meeting Purpose**
- 2. Introduction**

- I. Owner and Engineer Personnel Involvement**
- II. Contractor Personnel**
- III. Review the Scope of the Project**
- IV. Procurement/ Distribution of Documents/MBE**
- V. Periodic Payment Estimates**
- VI. Changes in Contract**
- VII. Project Schedules and Sequence of Construction**
- VIII. Quality Control**
- IX. Control of Project Site**
- X. Public and Private Contact Numbers**

- 3. Closing Remarks**

## **I. Owner and Engineer Personnel Involvement**

The City of Richmond is the project Owner. The project is administered by the Capital Projects Division of the Dept. of Public Works. The agent of authority is the **Capital Improvements Program Administrator, M.S. Khara, P.E. (646-5413)**

**Moussa Bagate, P.E. (646-6584)** or **Robert Spain** will be the **Construction Manager** for the project and is an authorized agent for the Owner and is authority for periodic payments to the contractor; and, he helps resolve problems during construction.

**Moussa Bagate, P.E. (646-6584)** is the **Project Manager** for the project and is responsible for the day-to-day management of the project. He is the point of contact in the engineer's office for all communications, including requests for information, contract modifications, submittals and payment requests. He is also responsible for monitoring construction progress and resolving problems during construction.

**Rummel, Klepper & Kahl, LLP** is the **Consulting Design Firm** and the **design engineers** for the project are **Owen Peery, P.E.** and **Ken Wagner (782-1903)**.

**Craig Hunter (cel Phone #347-5683)** is DPW's Construction Inspector for the project and will be at the site daily. The Construction Inspector is the first point of contact for the Owner and the Contractor on all field matters. All communications from the field must be through the Construction Inspector. The Inspector will contact the Project Manager to address any design issues or problems in the field that cannot be handled by the inspector.

\_\_\_\_\_ is DPU's Construction Inspector for Gas & Water and \_\_\_\_\_ (-  
-) is DPU's Construction Inspector for sewer on the project. All communications from the field must be through the Construction Inspector. The Inspector will contact the DPU's Project Manager to address any design issues or problems in the field that cannot be handled by the inspector.

## **II. Contractor Personnel**

**Messer Landscape of Virginia** is the contractor for the project.

The Contractor's project organization and agent of authority and Pat Montgomery (752-4900) is the **Contractor's Project Manager**.

Jason Brooks (640- 9478) is the **Project Superintendent** and has full authority to act as agent for the Contractor on all field matters.

The Contractor shall submit a complete construction schedule for review and approval within 10 days after being awarded the contract.

The Contractor shall submit a list of material suppliers, and subcontractors prior to processing the first pay estimate.

Contractor shall address all correspondence to the CPM Program Administrator:

**City of Richmond**  
**Department of Public Works**  
**900 East Broad St., Rm. 603**  
**Richmond, VA 23219**  
**Attn: M.S. Khara, P.E.**

### **III. Review the scope of the project**

#### **a. Overview of project**

Official start day is \_\_\_\_\_ with 365 calendar days for performance. These 365 days include holidays and 65 days for inclement weather.

- b. Special Construction requirements
- c. Shutdowns of existing facilities
- d. Coordination with others
- e. Materials furnished by Owner.
- f. Salvageable and excess material

### **IV. Procurement/ Distribution of Documents/MBE**

#### **V. Periodical payment estimates**

- a. Payment Estimate forms
- b. Schedule of payments
- c. Date for end of payment period is the \_\_\_\_\_ of each month.
- d. Procedures for preparation and submittal of forms for payment.
- e. Payment procedures and anticipated time frame for payment.
- f. Mobilization will be paid on 1<sup>st</sup> and 2<sup>nd</sup> progress payments.

### **VI. Changes in Contract**

- a. Owner/Engineer initiated changes.
- b. Contractor initiated changes/claims.
- c. Procedures for approval of Change Orders.

### **VII. Project Schedules and Sequence of Construction**

- a. Need to submit schedule
- b. Sequence of construction.
- c. Need to update schedule.
- d. Move-in and commencement of work. The date of the Notice to Proceed is to be \_\_\_\_\_. The contract completion dates are shown in the contract and liquidated damages have been established at \$ 1,000 per day.
- e. Schedule for periodic progress meeting schedule. Periodic meetings are to be held on a \_\_\_\_\_ basis on the \_\_\_\_\_ of each month.

### **VIII. Quality Control**

- a. Quality control is the contractor's responsibility.

- b. Owner's quality assurance activities.
- c. Coordination of testing.
- d. Testing and reporting requirements.
- e. Surveying

#### **IX. Control of Project Site**

- a. Safety is the contractor's responsibility.
- b. Subcontractors and suppliers.
- c. Field office and yard storage needs.
- d. Use of public utilities.
- e. Job site cleanliness and disposal of waste.
- f. Barricades and traffic control.
- g. Erosion Control. (Certified E&S control person on site.)
- h. Project Signs.

#### **OTHER CONSTRUCTION NOTES**

##### **Working Days**

No work on Sundays or the following Holidays: July 4<sup>th</sup>, Thanksgiving Day, Christmas Day, New Year's, Memorial Day, and Labor Day without written permission.

##### **Traffic**

City's Transportation Systems Management Division must approve maintenance of traffic plans. Contractor is responsible to notify the Fire Dept, Rescue, Police, and Schools about the construction project.

The Virginia Work Zone Safety dated May 2004 must be utilized.

##### **Safety**

Throughout all phases of construction the Contractor shall keep the work site clean and secure to avoid any possible injuries to the public citizens or his employees.

**Contractor must contact "Miss Utility" at 1-800-552-7001, prior to starting project.**

**X. Contact numbers for Public and Private Utility companies are listed below:**

**DPU Street Lights - Bill Sanders 646-8516**

**DPU Water & Gas - Melvin Lee 646-8523**

**Dominion Virginia Power - Alex George 257-4029 (Cel: 356-8024) or Bruce Arnette 257-4853**

**Verizon - Greer Utley 772-5483**

**AT&T Broadband - Brenda Savage 915-5304**



***CITY OF RICHMOND***  
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***ATTACHMENT 24***



**Subject: Specifications for As-Built (Record) Drawings**

The as-builts are to depict the actual installation layout of these new public facilities and utilities.

**Drawings and GIS**

- (a) DPW requires the permittee to provide two (2) complete sets of reproducible as-built mylar drawings (24 inch x 36 inch), one complete print and a digital version of the **Final As-Builts** no later than 30 days after the project is completed. The as-builts shall include all the public/private facilities and public/private utilities, storm water management improvements, and any and all site improvements. Digital version shall be latest available version of AutoCAD.
- (b) All changes to the proposed design should be indicated in brackets or other forms of delineation on the as-built drawings. Show all changes to proposed in brackets [ ], and explain all other changes, additions, deletions, or whatever needs better explanation in *italic* font wrapped in squiggly lines (i.e. clouded). The plan title sheets should say in bold, "AS-BUILTS".
- (c) Installation cut sheets should be submitted as reference data. The cut sheets for all sanitary & storm sewer work, waterline, SWM Ponds and other utility cuts sheets should be submitted as backup for the as-builts. All sewer, gas and water, both mains and connections, need to be plotted on the record drawings based on the cut sheet information and shown to the property lines where necessary. Using the cut sheets as a source for verification, the profile sheets should show all the changes to proposed in: 1) top of curb, 2) invert profile grade on all pipe work, 3) manhole elevations, etc.
- (d) In addition, the City is a GIS City, therefore a digitized file must also be provided to the Department of Public Works GIS Department Manager as part of the as-built records of the all the Improvements. GPS references will also be required. The final location of the site improvements must also be tied down to GPS coordinates. GPS coordinates on certain off-site fixtures can be used to properly position the development in the City's GIS system. When and if GPS coordinates are not provided and/or unavailable, then site as-builts must furnish a minimum of six control points that will provided accurate reference to properly position the GIS update within our Virginia State Plane guidelines.
- (e) Or as required per the current adopted franchise agreement.



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***ATTACHMENT 26***



## LOCATION SHEET - NORTH

DATE DATE

11/16/2005

EMPLOYEE	CO	EWO	LOCATION	CONTR	COMMENTS
BONHAM,KENNY	gd	8a04491	twin hickory-hickory lake	s&n	vats
HINKLE,DAVID	sq	8a03353	meadow + floyd	s&n	road block
MARX,GARY	sq	8a03347	idlewood + lombardy		
PURYEAR,JEFF	gd	8a04491	twin hickory/hickory lake	s&n	vats
SMALLWOOD,TIM	st	8a03347	idlewood + lombardy	s&n	
ZOOK,GERRY	pm	8a03362	towpath ln	s&n	restoration



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***RIGHT-OF-WAY***  
***EXCAVATION AND RESTORATION MANUAL***

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**APPENDICES**

<b>Title</b>	<b>Number</b>
Standard Notes	
Geotechnical Notes .....	A
Construction Notes.....	B
Standard Details .....	C
Trench Cut Restoration Detail (Aggregate Fill Only) .....	TCR-1
Trench Cut Restoration Detail (Approved Soil Fill).....	TCR-2
Conduit Requirement Type I .....	TCR-3
Conduit Requirement Type I (Concrete Cap).....	TCR-3A
Conduit Requirement Type II .....	TCR-4
Conduit Requirement Type II (Concrete Cap).....	TCR-4A
Pavement Restoration for Longitudinal Trench Runs .....	TCR-5A
Trench Cut Restoration General Utility Street Work .....	TCR-5B
Trench Cut Restoration Detail (Thin Pavement) .....	TCR-6
Plain and Reinforced Concrete Pavement.....	R-PR-2
Plain and Reinforced Concrete Pavement (metric).....	R-PR-2(M)
Asphalt Alley Section.....	AAS
Minimum Gravel Alley Section .....	MGA
Sheeting and Shoring Systems.....	SSS-1



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***APPENDIX A***



## ***CITY OF RICHMOND***

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**Subject: Geotechnical Notes**

#### **ENGINEERED FILL**

1. All controlled fill zones are to be monitored by a full time geotechnical engineering services firm.
2. Engineered fills shall be properly placed according to the recommendations of the geotechnical engineer.
3. All summary reports from the geotechnical engineer representing the project must state his professional opinion on the satisfactorily completed phases of construction, such as; slope cuts, subdrainage systems, preparation of subgrades and compaction of earth fills.
4. No fills shall have zones that exceed two (2) feet in elevation without conducting compaction test and obtaining results of 95% or greater.
5. The geotechnical engineer must submit a detailed analysis, itemizing the field density test results. This report shall be accompanied with a copy of the site plan sheet and indicate the test locations and elevations. The geotechnical engineer must provide enough designated testing in all fill zones to adequately examine and certify the integrity of the fill.
6. The geotechnical engineer must submit a certified building pad report for each fill pad location. This report shall profile the fill material placement and provide the compaction test results. All reports will be accompanied by the site plan, indicating the test locations and elevations.
7. No building pads in fill zones will have stratum exceeding two (2) feet in elevation without test verifying density.
8. These geotechnical notes shall in no way lessen the requirements of the submitted soils report.

#### **ROAD SUBGRADE**

1. Inspection and approval of the subgrade will be required prior to the placement of the approved pavement section material.
2. Any clay deposits in the top two feet of the subgrade must be removed or addressed as recommended by the geotechnical engineer.

3. Subgrade approval shall be accompanied by the supporting documentation verifying density test results of 95% or greater.

The entire subgrade will have been proofrolled in the presence of the site inspector and geotechnical representative. Proofrolling shall be a rubber tire vehicle such as a loaded ten (10) ton truck or approved compaction equipment.

The final subgrade shall be approved by the geotechnical engineer and site inspector before placement of pavement section materials.

## **RESIDENTIAL STREET PAVEMENT SECTIONS**

1. Alternate equivalent pavement sections may be substituted for the City Standard Pavement Section Design when proper methods of subgrade soils analysis are conducted and with the approval of the Director.
2. CBR sampling of the subgrade soils for final pavement design must be coordinated by the owner, through the geotechnical engineer and verified by the assigned site inspector during the construction phase.

Test for Final Pavement design shall be conducted on an approved reveal of the subgrade. These tests shall be made at each intersection, changes in subgrade soils, and at a maximum spacing of 500 feet. A minimum of two (2) CBR samples will be required for any cul-de-sac or dead end street less than 500 in length.

Test spacing and methods must follow the approved guidelines set forth and/or as recommended by the geotechnical engineer.

The Final Alternate Equivalent Pavement design must be submitted to the DPW Right of Way Manager for approval. The submission will be accompanied by the supporting geotechnical report and designed by a pavement engineer.



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***APPENDIX B***



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**Subject: Construction Notes**

ATTACHMENT: UTILITY "WORK IN THE STREETS" permits

FROM: DEPARTMENT OF PUBLIC WORKS-Division of Right of Way Management  
- OFFICE OF THE PERMITS ENGINEER

1. All cuts in the streets and sidewalks shall be performed under a Permit and monitored by the permit inspector.
2. Work shall not commence until the permit inspector has been notified, a pre-construction conference held and Miss Utility clears.
3. Cuts shall be as clean and straight as possible, with no outline dimensions less than 3 feet without special approval of the department's inspector.
4. The details of trenching cuts for utility strips must be shown in a typical section on the drawings or provided in a submittal with construction notes specifying widths, depths, methods, materials, compaction requirements and pavement restoration or abiding by the DPW attachment standard.
5. All asphalt pavement restoration thickness shall be 1 1/2 times the existing section or a minimum of 8-inches whichever is greater. See the DPW trench restoration illustration for the typical conformance standards.
6. The final restoration on open trench cuts requires the disturbed asphalt pavement zone to be a square pointed off and straight line. The area of pavement restoration is to be fully enveloped by the final surface course repairs. The adjoining surface/top course layer is to be over-milled a minimum depth of 1.25 inches or more, a minimum distance of one foot beyond each side of the trench wall. This step out is to occur along the entire trench line run and/or squared pointed area. Cuts involving continuous network runs, which exceed 350 feet in length or typically over one full City block, will be considered multiple block cuts. On multiple block cut zones, the over milling of the trench line and adjoining surface course layer must be done with typical high production roadway cold planning equipment. In multiple block restoration cases, where the high production cold planner is required, final paving shall be done by a high production highway paver.
7. Permittee must provide and coordinate the necessary Geotechnical Services from a qualified firm to insure compaction approval. Approval of in-place material must be followed up with a written summary report. Compaction requirements will be reviewed for approval by the Permits Engineer or his representative.

8. All disturbed sidewalk and curb shall be repaired and replaced in accordance with City Standards.
9. All utility cuts are to be examined and approved by the appropriate utility inspector/representative.
10. All encroachments must be satisfied by ordinance.

## PAVEMENT DESIGN

### Designs for “residential subdivisions” and “non-residential” Road Pavements

1. Residential- The required design thickness of the aggregate base (6”, 21A), base course asphalt (3.5”, BM-25) and surface course asphalt (2”, SM-9.5A) are shown in the street standards illustrations. Pavement section design thickness is based on a CBR value of ten and may be increased or decreased as allowed by the standards. It shall not be decrease below the City of Richmond's minimum design standard of 6 inches of 21A aggregate base, 2 inches of SM-12.5A as the base course asphalt and 1.5 inches of SM-9.5A surface/top course asphalt.
2. *Alternate equivalent* pavement sections may be substituted for those called for in the standards. The approval procedures call for a qualified pavement engineer to reference and follow the established Virginia Department of Transportation guidelines in their pamphlet entitled, “Pavement Design Guide for Subdivision and Secondary Roads”, year 2000 edition, as amended. Alternate pavement sections must be pre-approved by the Department of Public Works, Right of Way Manager. Note the minimum City of Richmond residential pavement section described above.
3. Non-residential street pavement sections must meet the minimum design thickness of 8 inches of 21A base aggregate, 6 inches BM-25 base course asphalt and 2 inches of SM-9.5A surface course asphalt. Any requested reductions in this design must be fully supported by a comprehensive engineering analysis.
4. No reductions in the minimum pavement section design thickness (8 inches 21A base aggregate, 6 inches BM-25 base course asphalt and 2 inches of SM-9.5A surface course asphalt) will be considered in the downtown, arterial streets, major collectors and/or any other major connection streets. This design pavement section is based on a CBR value of 10 or greater. Subgrade soils less than 10 will require a special pavement design.
5. Designated Downtown areas, heavy commercial zones, particularly high volume bus routes, turning lanes, bus bays and major industrial zones will require a *heavy duty* pavement sections. Heavy duty is described as a minimum of 8 inches of 21A aggregate base, with 8 inches of BM-25 base course asphalt and 2 inches of SM-



9.5D surface course asphalt. No reductions of this pavement section will be allowed in so designated zones. This design pavement section is based on a CBR value of 10 or greater.

6. As per direction of the Permits Engineer, Right of Way Manager or the Director, the public works permitting requirements may designate specific *anti-rutting* types of asphalt mix designs requirements (i.e. SM-9.5D or E/ SM-12.5 D or E) that will better suit problem conditions and/or better serve locations with certain types and volumes of traffic.

last amended 09/23/05 jeb

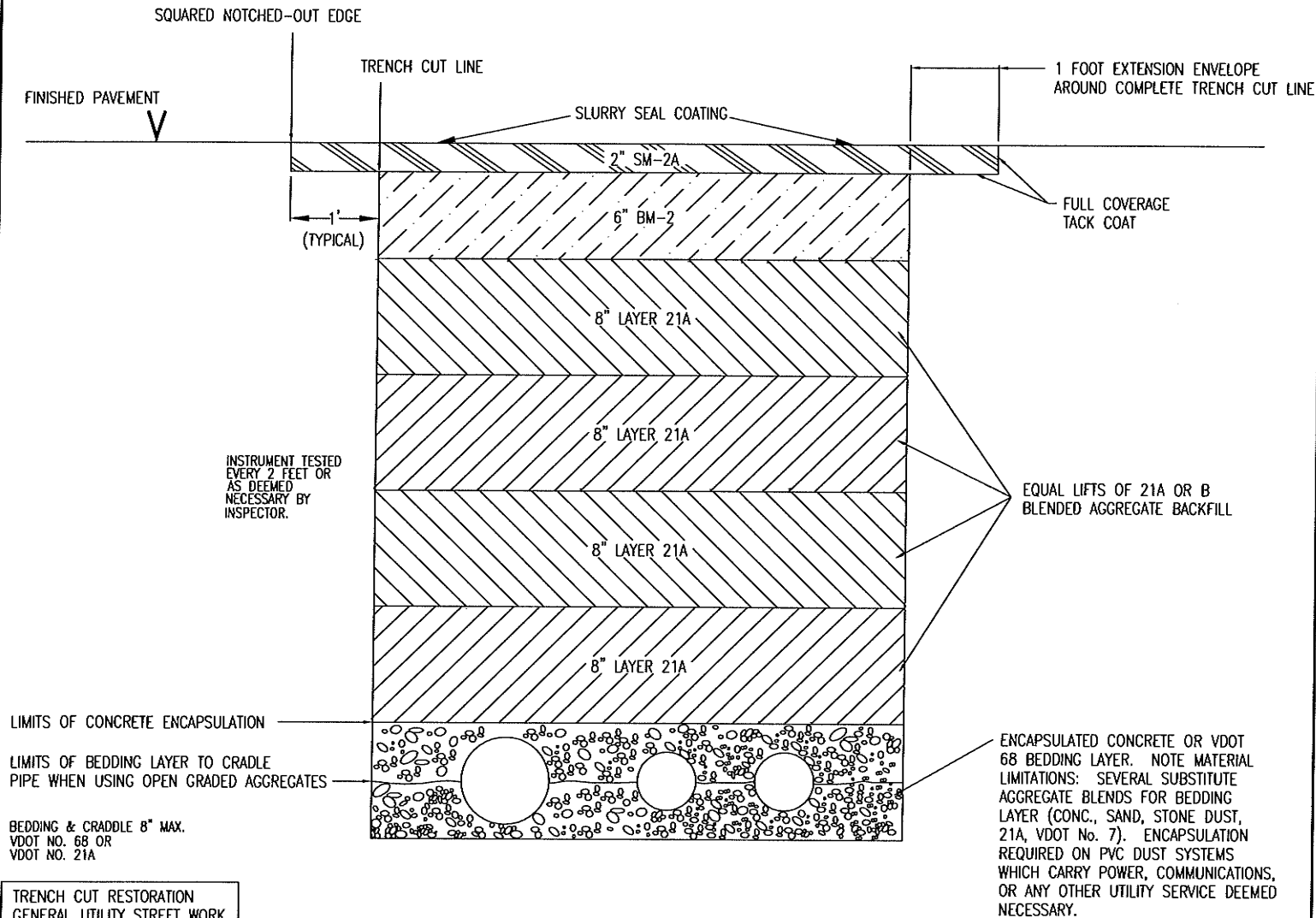


***CITY OF RICHMOND***  
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***APPENDIX C***

# TRENCH CUT RESTORATION GENERAL UTILITY STREET WORK



## FINISH SURFACE COURSE NOTES:

- WHERE A SLURRY SEAL OR OTHER MICROSURFACE COATING IS THE FINISH SURFACE COURSE, A RE-TREATMENT APPLICATION IS REQUIRED.
- SLURRY SEAL TREATMENTS OVER THREE YEARS OLD WILL BE REVIEWED ON A CASE BY CASE BASIS TO DETERMINE THE REQUIRED FINISH DETAIL.
- THE REQUIRED LAYDOWN WIDTH OF SLURRY OR MODIFIED LATEX SEAL TREATMENT IS 8' OR MORE. FULL WIDTH OVERLAYS MAY BE REDUCED TO A MINIMUM WIDTH OF 5' WHEN APPROVED BY THE DPW PERMITS ADMINISTRATOR.

## GENERAL NOTES:

- SQUARE POINT AND BLOCK OUT ALL EDGES OF PAVEMENT DESTRUCTION.
- ENVELOPE ALL FRACTURED AREAS RELATED TO BREAKING INTO PAVEMENT.
- EXTEND LAP AND FINISH SURFACE REPAIR AS DIRECTED BY DPW SITE INSPECTOR.
- ESTIMATES ON THE COST OF THE SLURRY COAT WORK MUST BE SUBMITTED WITH A POSTED SURETY BOND USING THE STANDARD DPW BOND OR LOC FORM.
- REIMBURSEMENT ARRANGEMENTS COVERING THE ESTIMATED COST FOR THE SLURRY SEAL OR OTHER MICROSURFACING TREATMENTS CAN BE MADE WITH THE DEPARTMENT OF PUBLIC WORKS.

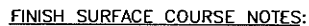
## PROOF TESTING TERMS:

UNYIELDING - NO VISABLE MOVEMENT, DEFLECTIONS OR RUTTING UNDER ROLLER LOADING TEST,  
FIRM - STANDS UP WELL TO LOADING TEST, VERY LITTLE EVIDENCE OF MOVEMENT, DEFLECTION OR RUTTING



JOB NO.	STANDARD DETAIL	DATE	REVISION DESCRIPTION
DETAIL			
SHEET NO.	RICHMOND, VA	SCALE	DATE
TCR-1	TRENCH CUT RESTORATION DETAIL (AGGREGATE FILL ONLY)	N.T.S.	11/99

TRENCH CUT RESTORATION  
GENERAL UTILITY STREET WORK



- GENERAL NOTES:

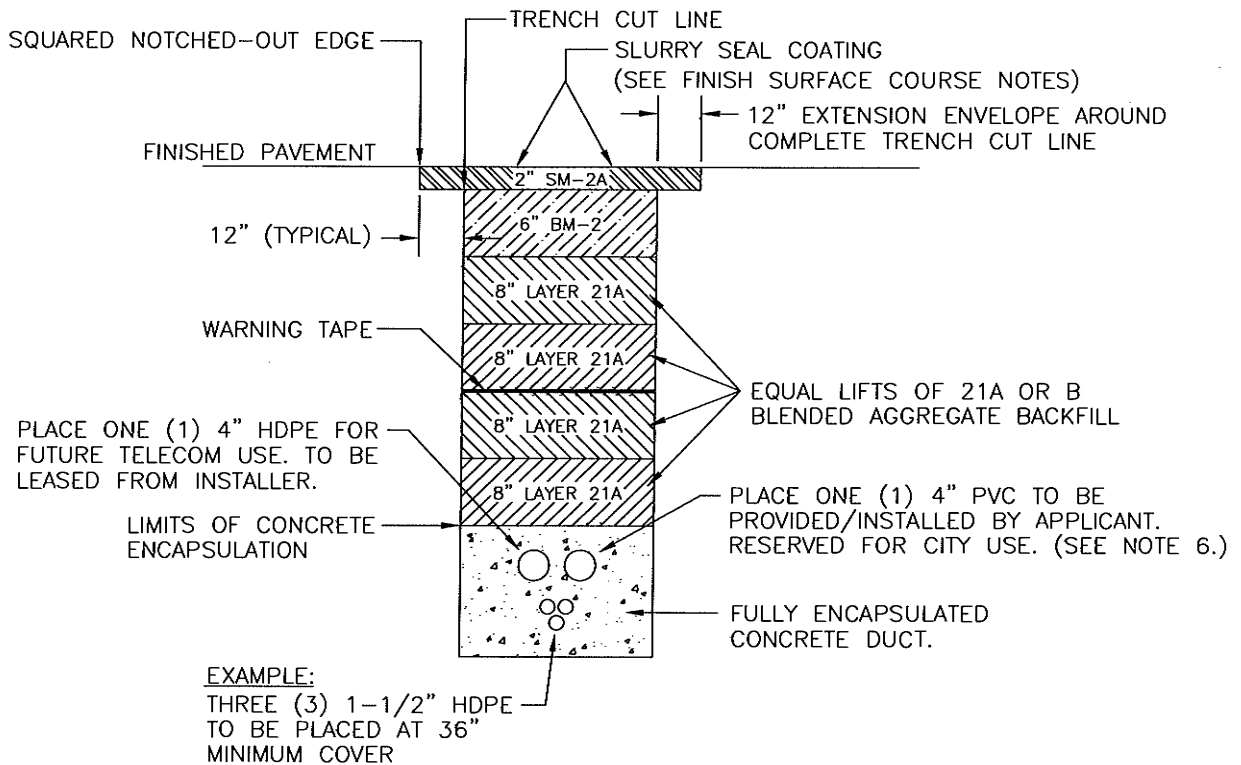
- PROOF TESTING TERMS:

## TRENCH REPAIR CYCLE WITH APPROVED SOILS



JOB NO. DETAIL	STANDARD DETAIL RICHMOND, VA				DATE	REVISION DESCRIPTION
SHEET NO. TCR-2	TRENCH CUT RESTORATION DETAIL (APPROVED SOIL FILL)		SCALE N.T.S	DATE 11/99		

# CONDUIT REQUIREMENT TYPE I



TRENCH CUT RESTORATION  
GENERAL UTILITY STREET WORK

## FINISH SURFACE COURSE NOTES:

1. WHERE A SLURRY SEAL OR OTHER MICROSURFACE COATING IS THE FINISH SURFACE COURSE, A RE-TREATMENT APPLICATION IS REQUIRED.
2. SLURRY SEAL TREATMENTS OVER THREE YEARS OLD WILL BE REVIEWED ON A CASE BY CASE BASIS TO DETERMINE THE REQUIRED FINISH DETAIL.
3. THE REQUIRED LAYDOWN WIDTH OF SLURRY OR MODIFIED LATEX SEAL TREATMENT IS 8' OR MORE. FULL WIDTH OVERLAYS MAY BE REDUCED TO A MINIMUM WIDTH OF 5' WHEN APPROVED BY THE DPW PERMITS AND INSPECTIONS ADMINISTRATOR.

## GENERAL NOTES:

1. SQUARE POINT AND BLOCK OUT ALL EDGES OF PAVEMENT DESTRUCTION.
2. ENVELOPE ALL FRACTURED AREAS RELATED TO BREAKING INTO PAVEMENT.
3. EXTEND LAP AND FINISH SURFACE REPAIR AS DIRECTED BY DPW SITE INSPECTOR.
4. ESTIMATES ON THE COST OF THE SLURRY COAT WORK MUST BE SUBMITTED WITH A POSTED SURETY BOND USING THE STANDARD DPW BOND OR LOC FORM.
5. REIMBURSEMENT ARRANGEMENTS COVERING THE ESTIMATED COST FOR THE SLURRY SEAL OR OTHER MICROSURFACING TREATMENTS CAN BE MADE WITH THE DEPARTMENT OF PUBLIC WORKS.
6. THE 4" DUCT IS TO BE SEPARATED, THEN ISOLATED IN IT'S OWN MANHOLE OR PULL BOX. (SEE CONDUIT TYPE II DETAILS OF THE TELECOMMUNICATIONS POLICY STATEMENT.)
7. MAINTAIN A MINIMUM OF 4" CONCRETE COVER FROM ALL SIDES AROUND THE CONDUITS.

TYPICAL OPEN CUT TRENCH DETAIL  
WITH CONCRETE ENCASEMENT  
FOR CITY OF RICHMOND RIGHT-OF-WAY  
NOT TO SCALE



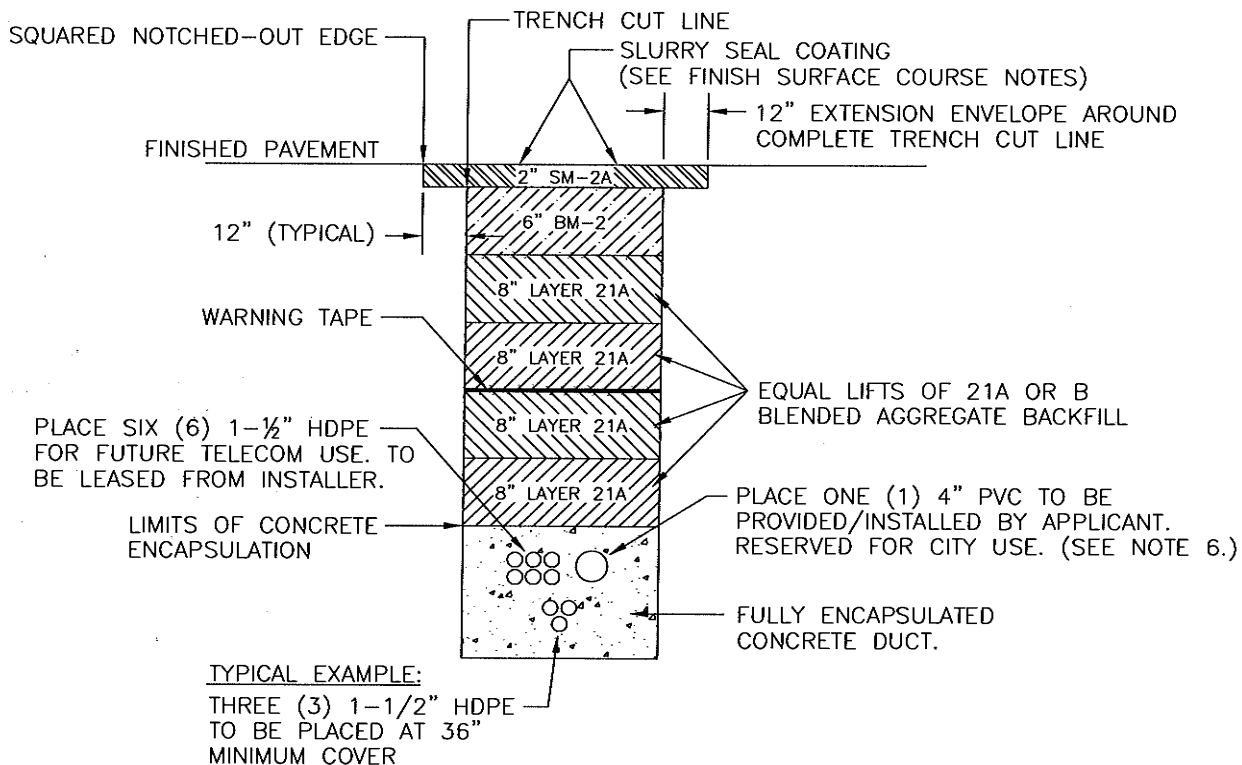
JOB NO. DETAIL	STANDARD DETAIL RICHMOND, VA CONDUIT REQUIREMENT TYPE I	SCALE N.T.S.	DATE 08/00	DATE	REVISION DESCRIPTION
SHEET NO. TCR-3					

1. WHERE A SLURRY SEAL OR OTHER MICROSURFACE COATING IS THE FINISH SURFACE COURSE, A RE-TREATMENT APPLICATION IS REQUIRED.
2. SLURRY SEAL TREATMENTS OVER THREE YEARS OLD WILL BE REVIEWED ON A CASE BY CASE BASIS TO DETERMINE THE REQUIRED FINISH DETAIL.
3. THE REQUIRED LAYDOWN WIDTH OF SLURRY OR MODIFIED LATEX SEAL TREATMENT IS 8' OR MORE. FULL WIDTH OVERLAYS MAY BE REDUCED TO A MINIMUM WIDTH OF 5' WHEN APPROVED BY THE DPW PERMITS AND INSPECTIONS ADMINISTRATOR.

1. SQUARE POINT AND BLOCK OUT ALL EDGES OF PAVEMENT DESTRUCTION.
2. ENVELOPE ALL FRACTURED AREAS RELATED TO BREAKING INTO PAVEMENT.
3. EXTEND LAP AND FINISH SURFACE REPAIR AS DIRECTED BY DPW SITE INSPECTOR.
4. ESTIMATES ON THE COST OF THE SLURRY COAT WORK MUST BE SUBMITTED WITH A POSTED SURETY BOND USING THE STANDARD DPW BOND OR LOC FORM.
5. REIMBURSEMENT ARRANGEMENTS COVERING THE ESTIMATED COST FOR THE SLURRY SEAL OR OTHER MICROSURFACING TREATMENTS CAN BE MADE WITH THE DEPARTMENT OF PUBLIC WORKS.
6. THE 4" DUCT IS TO BE SEPARATED, THEN ISOLATED IN IT'S OWN MANHOLE OR PULL BOX. (SEE CONDUIT TYPE II DETAILS OF THE TELECOMMUNICATIONS POLICY STATEMENT.)
7. MAINTAIN A MINIMUM OF 4" CONCRETE COVER AND TURN DOWN AROUND THE CONDUITS.

JOB NO. DETAIL	STANDARD DETAIL			DATE	REVISION DESCRIPTION
	RICHMOND, VA				
SHEET NO. TCR-3A	CONDUIT REQUIREMENT TYPE I (CONCRETE CAP)	SCALE N.T.S	DATE 11/00		

# CONDUIT REQUIREMENT TYPE II



## TRENCH CUT RESTORATION GENERAL UTILITY STREET WORK

### FINISH SURFACE COURSE NOTES:

1. WHERE A SLURRY SEAL OR OTHER MICROSURFACE COATING IS THE FINISH SURFACE COURSE, A RE-TREATMENT APPLICATION IS REQUIRED.
2. SLURRY SEAL TREATMENTS OVER THREE YEARS OLD WILL BE REVIEWED ON A CASE BY CASE BASIS TO DETERMINE THE REQUIRED FINISH DETAIL.
3. THE REQUIRED LAYDOWN WIDTH OF SLURRY OR MODIFIED LATEX SEAL TREATMENT IS 8' OR MORE. FULL WIDTH OVERLAYS MAY BE REDUCED TO A MINIMUM WIDTH OF 5' WHEN APPROVED BY THE DPW PERMITS AND INSPECTIONS ADMINISTRATOR.

### GENERAL NOTES:

1. SQUARE POINT AND BLOCK OUT ALL EDGES OF PAVEMENT DESTRUCTION.
2. ENVELOPE ALL FRACTURED AREAS RELATED TO BREAKING INTO PAVEMENT.
3. EXTEND LAP AND FINISH SURFACE REPAIR AS DIRECTED BY DPW SITE INSPECTOR.
4. ESTIMATES ON THE COST OF THE SLURRY COAT WORK MUST BE SUBMITTED WITH A POSTED SURETY BOND USING THE STANDARD DPW BOND OR LOC FORM.
5. REIMBURSEMENT ARRANGEMENTS COVERING THE ESTIMATED COST FOR THE SLURRY SEAL OR OTHER MICROSURFACING TREATMENTS CAN BE MADE WITH THE DEPARTMENT OF PUBLIC WORKS.
6. THE 4" DUCT IS TO BE SEPARATED, THEN ISOLATED IN IT'S OWN MANHOLE OR PULL BOX. (SEE CONDUIT TYPE II DETAILS OF THE TELECOMMUNICATIONS POLICY STATEMENT.)
7. MAINTAIN A MINIMUM OF 4" CONCRETE COVER FROM ALL SIDES AROUND THE CONDUITS.

### TYPICAL OPEN CUT TRENCH DETAIL WITH CONCRETE ENCASEMENT FOR CITY OF RICHMOND RIGHT-OF-WAY NOT TO SCALE



JOB NO. DETAIL	STANDARD DETAIL		DATE	REVISION DESCRIPTION	
SHEET NO. TCR-4	RICHMOND, VA		SCALE N.T.S	DATE 08/00	
	CONDUIT REQUIREMENT TYPE II				

Diagram illustrating the cross-section of a trench cut restoration, showing the following components and dimensions:

- SQUARED NOTCHED-OUT EDGE**: Indicated at the top left of the trench cut.
- FINISHED PAVEMENT**: The surface layer above the trench cut.
- TRENCH CUT LINE**: The vertical line defining the edge of the restoration.
- SLURRY SEAL COATING (SEE FINISH SURFACE COURSE NOTES)**: Applied to the top surface of the restoration.
- 12" EXTENSION ENVELOPE AROUND COMPLETE TRENCH CUT LINE**: The width of the restoration area.
- 2" SM-2A**: The top layer of the restoration.
- 6" BM-2**: The second layer of the restoration.
- 8" LAYER 21A**: The third layer of the restoration.
- 8" LAYER 21A**: The fourth layer of the restoration.
- 8" LAYER 21A**: The fifth layer of the restoration.
- 8" LAYER 21A**: The sixth layer of the restoration.
- 8" LAYER 21A**: The seventh layer of the restoration.
- 4"**: The thickness of the concrete cap.
- CONCRETE CAP TO EXTEND OVER THE TOP AND TURN DOWN 4" ON EACH SIDE AS SHOWN.**: Description of the concrete cap.
- PLACE ONE (1) 4" PVC TO BE PROVIDED/INSTALLED BY APPLICANT. RESERVED FOR CITY USE. (SEE NOTE 6.)**: Instruction for the PVC pipe.
- PLACE SIX (6) 1-1/2" HDPE FOR FUTURE TELECOM USE. TO BE LEASED FROM INSTALLER.**: Instruction for the HDPE pipes.
- ISOLATE DUCT WITH SAND OR STONE DUST MATERIAL**: Instruction for isolating the duct.
- 4"**: The width of the duct isolation material.
- 16" MIN.**: The minimum width of the restoration area.
- TYPICAL EXAMPLE:**
  - THREE (3) 1-1/2" HDPE TO BE PLACED AT 36" MINIMUM COVER

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2. SLURRY SEAL TREATMENTS OVER THREE YEARS OLD WILL BE REVIEWED ON A CASE BY CASE BASIS TO DETERMINE THE REQUIRED FINISH DETAIL.
3. THE REQUIRED LAYDOWN WIDTH OF SLURRY OR MODIFIED LATEX SEAL TREATMENT IS 8' OR MORE. FULL WIDTH OVERLAYS MAY BE REDUCED TO A MINIMUM WIDTH OF 5' WHEN APPROVED BY THE DPW PERMITS AND INSPECTIONS ADMINISTRATOR.

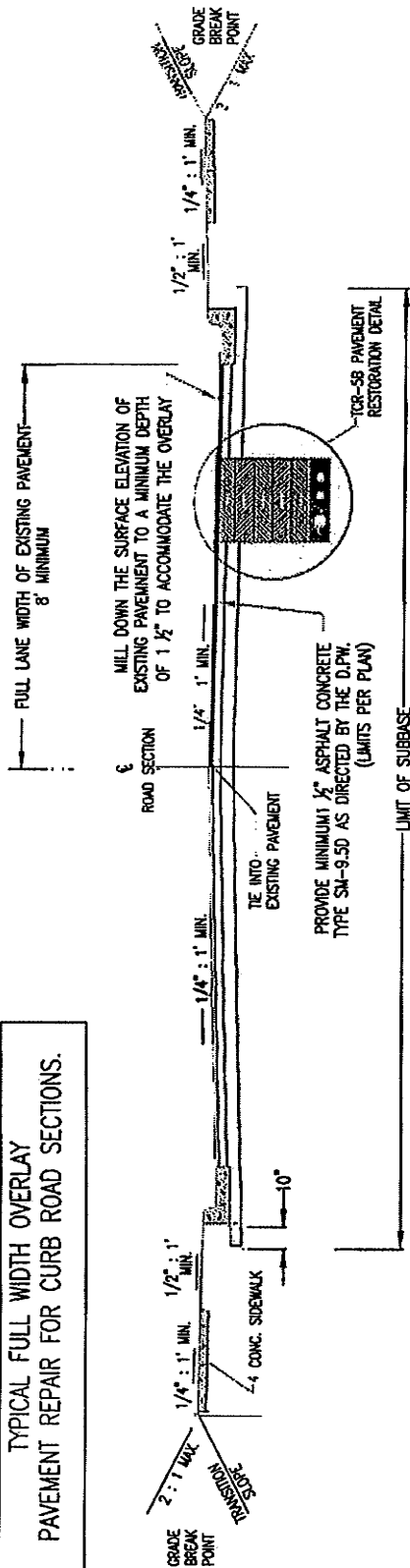
1. SQUARE POINT AND BLOCK OUT ALL EDGES OF PAVEMENT DESTRUCTION.
2. ENVELOPE ALL FRACTURED AREAS RELATED TO BREAKING INTO PAVEMENT.
3. EXTEND LAP AND FINISH SURFACE REPAIR AS DIRECTED BY DPW SITE INSPECTOR.
4. ESTIMATES ON THE COST OF THE SLURRY COAT WORK MUST BE SUBMITTED WITH A POSTED SURETY BOND USING THE STANDARD DPW BOND OR LOC FORM.
5. REIMBURSEMENT ARRANGEMENTS COVERING THE ESTIMATED COST FOR THE SLURRY SEAL OR OTHER MICROSURFACING TREATMENTS CAN BE MADE WITH THE DEPARTMENT OF PUBLIC WORKS.
6. THE 4" DUCT IS TO BE SEPARATED, THEN ISOLATED IN IT'S OWN MANHOLE OR PULL BOX. (SEE CONDUIT TYPE II DETAILS OF THE TELECOMMUNICATIONS POLICY STATEMENT.)
7. MAINTAIN A MINIMUM OF 4" CONCRETE COVER AND TURN DOWN AROUND THE CONDUITS.

JOB NO. DETAIL	STANDARD DETAIL		DATE		REVISION DESCRIPTION	
	RICHMOND, VA					
SHEET NO. TCR-4A	CONDUIT REQUIREMENT TYPE II (CONCRETE CAP)		SCALE N.T.S	DATE 11/99		

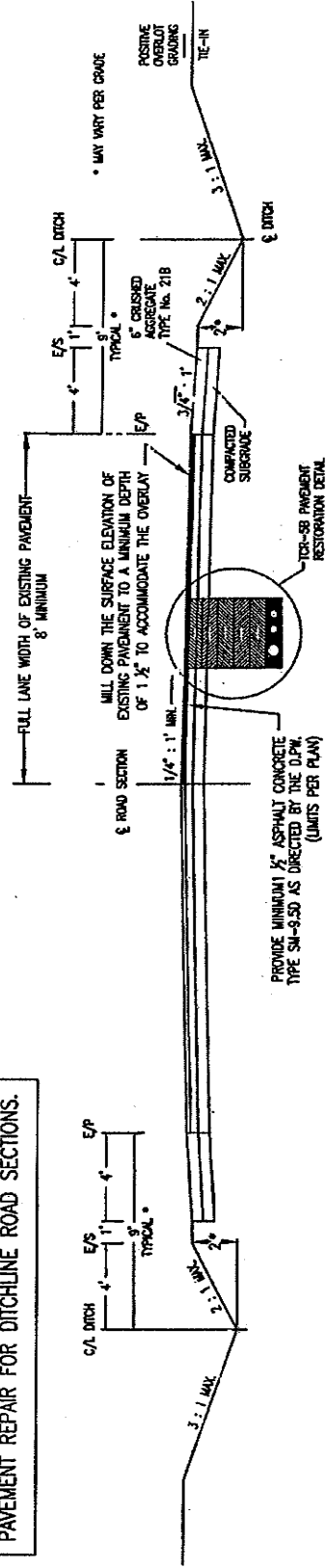


# PAVEMENT RESTORATION FOR LONGITUDINAL TRENCH RUNS

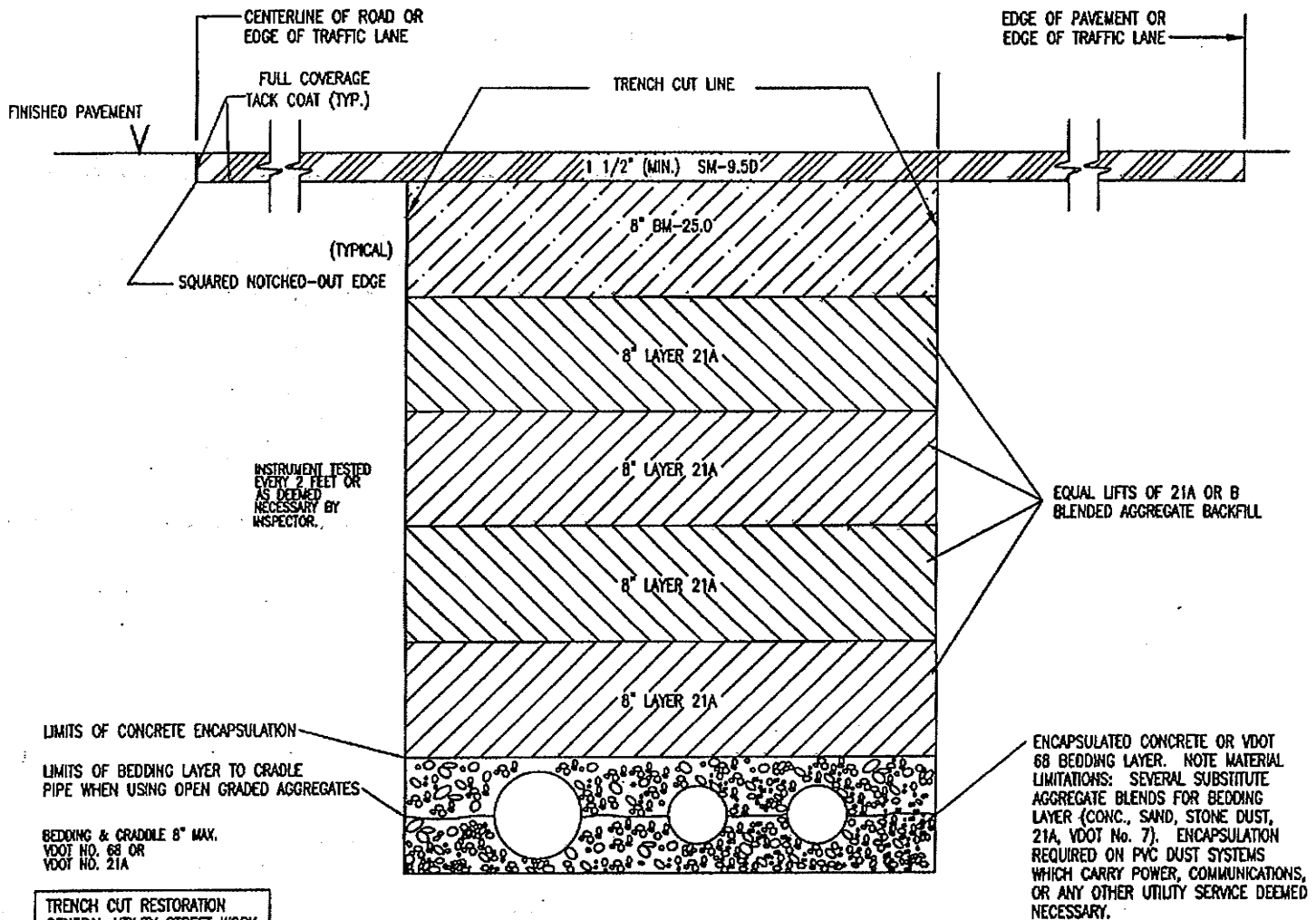
TYPICAL FULL WIDTH OVERLAY  
PAVEMENT REPAIR FOR CURB ROAD SECTIONS.



TYPICAL FULL WIDTH OVERLAY  
PAVEMENT REPAIR FOR DITCHLINE ROAD SECTIONS.



# TRENCH CUT RESTORATION GENERAL UTILITY STREET WORK



TRENCH CUT RESTORATION  
GENERAL UTILITY STREET WORK

## FINISH SURFACE COURSE NOTES:

1. WHERE A SLURRY SEAL OR OTHER MICROSURFACE COATING IS THE FINISH SURFACE COURSE, A RE-TREATMENT APPLICATION IS REQUIRED.
2. SLURRY SEAL TREATMENTS OVER THREE YEARS OLD WILL BE REVIEWED ON A CASE BY CASE BASIS TO DETERMINE THE REQUIRED FINISH DETAIL.
3. THE REQUIRED LAYDOWN WIDTH OF SLURRY OR MODIFIED LATEX SEAL TREATMENT IS 8' OR MORE. FULL WIDTH OVERLAYS MAY BE REDUCED TO A MINIMUM WIDTH OF 5' WHEN APPROVED BY THE DPW PERMITS ADMINISTRATOR.

## GENERAL NOTES:

1. SQUARE POINT AND BLOCK OUT ALL EDGES OF PAVEMENT DESTRUCTION.
2. ENVELOPE ALL FRACTURED AREAS RELATED TO BREAKING INTO PAVEMENT.
3. EXTEND LAP AND FINISH SURFACE REPAIR AS DIRECTED BY DPW SITE INSPECTOR.
4. ESTIMATES ON THE COST OF THE SLURRY COAT WORK MUST BE SUBMITTED WITH A POSTED SURETY BOND USING THE STANDARD DPW BOND OR LOC FORM.
5. REIMBURSEMENT ARRANGEMENTS COVERING THE ESTIMATED COST FOR THE SLURRY SEAL OR OTHER MICROSURFACING TREATMENTS CAN BE MADE WITH THE DEPARTMENT OF PUBLIC WORKS.

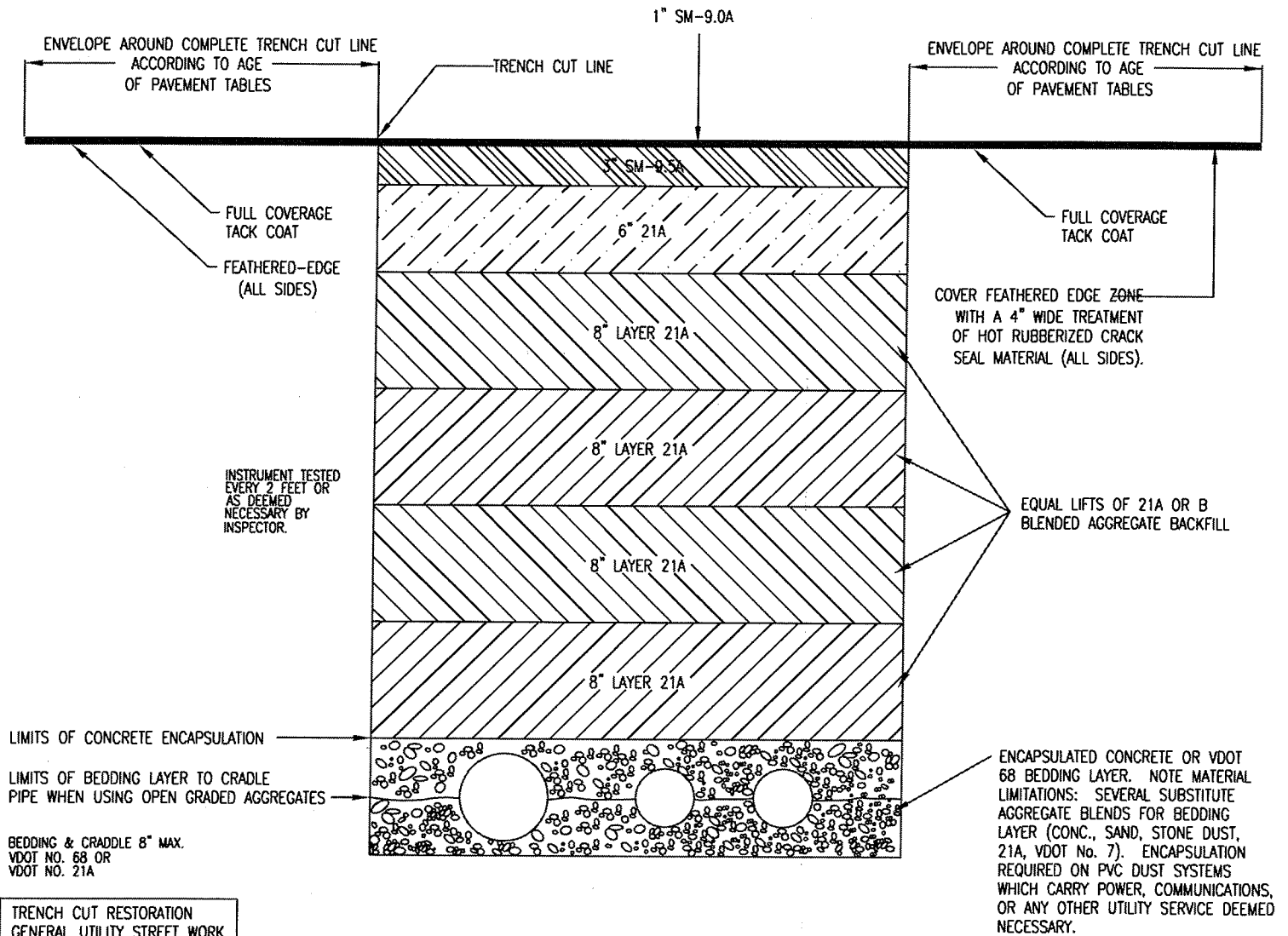
## PROOF TESTING TERMS:

UNYIELDING - NO VISIBLE MOVEMENT, DEFLECTIONS OR RUTTING UNDER ROLLER LOADING TEST,  
FIRM - STANDS UP WELL TO LOADING TEST, VERY LITTLE EVIDENCE OF MOVEMENT, DEFLECTION OR RUTTING



JOB NO. DETAIL	STANDARD DETAIL RICHMOND, VA	SCALE N.T.S.	DATE 11/99	DATE REVISION DESCRIPTION
SHEET NO. TCR-5B				

# TRENCH CUT RESTORATION FOR THIN PAVEMENT SECTIONS GENERAL UTILITY STREET WORK



## TRENCH CUT RESTORATION GENERAL UTILITY STREET WORK

### FINISH SURFACE COURSE NOTES:

1. WHERE A SLURRY SEAL OR OTHER MICROSURFACE COATING IS THE FINISH SURFACE COURSE, A RE-TREATMENT APPLICATION IS REQUIRED.
2. SLURRY SEAL TREATMENTS OVER THREE YEARS OLD WILL BE REVIEWED ON A CASE BY CASE BASIS TO DETERMINE THE REQUIRED FINISH DETAIL.
3. THE REQUIRED LAYDOWN WIDTH OF SLURRY OR MODIFIED LATEX SEAL TREATMENT IS 8' OR MORE. FULL WIDTH OVERLAYS MAY BE REDUCED TO A MINIMUM WIDTH OF 5' WHEN APPROVED BY THE DPW PERMITS ADMINISTRATOR.

### GENERAL NOTES:

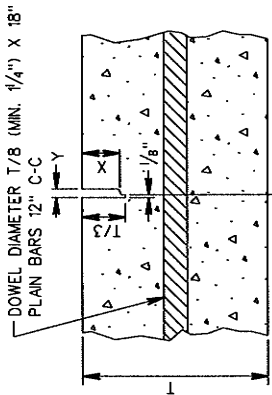
1. SQUARE POINT AND BLOCK OUT ALL EDGES OF PAVEMENT DESTRUCTION.
2. ENVELOPE ALL FRACTURED AREAS RELATED TO BREAKING INTO PAVEMENT.
3. EXTEND LAP AND FINISH SURFACE REPAIR AS DIRECTED BY DPW SITE INSPECTOR.
4. ESTIMATES ON THE COST OF THE SLURRY SEAL WORK MUST BE SUBMITTED WITH A POSTED SURETY BOND USING THE STANDARD DPW BOND OR LOC FORM.
5. REIMBURSEMENT ARRANGEMENTS COVERING THE ESTIMATED COST FOR THE SLURRY SEAL OR OTHER MICROSURFACING TREATMENTS CAN BE MADE WITH THE DEPARTMENT OF PUBLIC WORKS.

### PROOF TESTING TERMS:

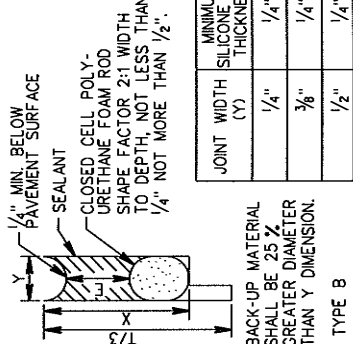
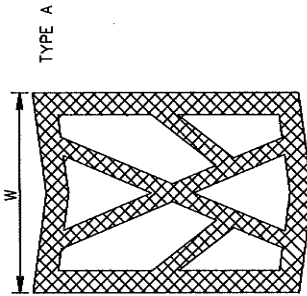
UNYIELDING - NO VISABLE MOVEMENT, DEFLECTIONS OR RUTTING UNDER ROLLER LOADING TEST,  
FIRM - STANDS UP WELL TO LOADING TEST, VERY LITTLE EVIDENCE OF MOVEMENT, DEFLECTION OR RUTTING



FIG. NO.	STANDARD DETAIL	DATE	REVISION DESCRIPTION
DETAIL	RICHMOND, VA		
SHEET NO.	TRENCH CUT RESTORATION DETAIL (THIN PAVEMENT)	SCALE	
TCR-6		N.T.S.	DATE
			11/99



DETAIL OF TRANSVERSE CONTRACTION JOINT  
(BEFORE INSTALLATION OF SEAL)  
PREFORMED CHLOROPRENE ELASTOMERIC JOINT SEALANT

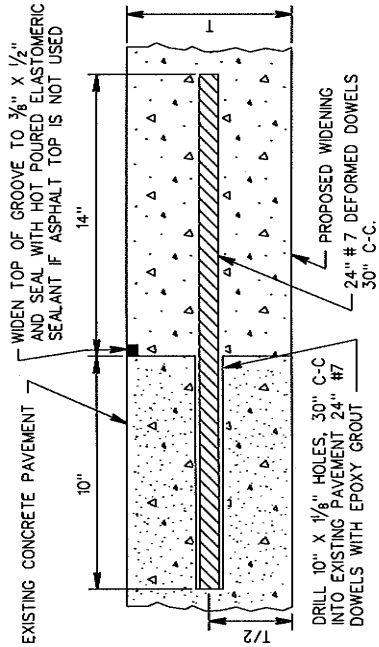


JOINT WIDTH (Y)	MINIMUM SILICONE SEALER THICKNESS(E)
1/4"	1/4"
3/8"	1/4"
1/2"	1/4"

BACK-UP MATERIAL SHALL BE 25% GREATER DIAMETER THAN Y DIMENSION.

TYPE B

### SEALANTS FOR TRANSVERSE CONTRACTION JOINTS



METHODS OF WIDENING CONCRETE PAVEMENT  
(PLAIN AND REINFORCED)

### GENERAL NOTES

ALTERNATE PREFORMED SEALANTS HAVING A CROSS-SECTIONAL AREA COMPARABLE TO TYPE A (CONTRACTION JOINTS) AND TYPE D (EXPANSION JOINTS) AND MEETING THE APPROVAL OF THE ENGINEER MAY BE SUBSTITUTED.

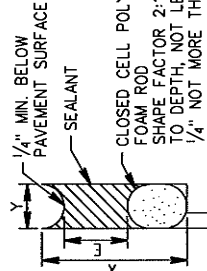
OTHER TYPES OF JOINT MATERIAL ARE TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

ALL DETAILS NOT SHOWN HEREON TO BE IN ACCORDANCE WITH STANDARDS PR-2, SHEET 2 OF 5.

ALL CONTRACTION JOINTS TO BE SAWED IN CONFORMANCE WITH DETAIL TO THE LEFT, EXCEPT THAT WHERE GRAVEL AGGREGATE IS USED IN THE CONCRETE, THE JOINT MAY BE PREPARED BY FORMING 1/4" OR LESS OF THE WIDTH, FOR THE DEPTH SHOWN WITH NON-METALLIC OR REMOVABLE MATERIAL, FOLLOWED BY SAWING TO COMPLETE THE JOINT TO THE REQUIRED WIDTH AND DEPTH.

FOR DETAILS OF TRANSVERSE CONTRACTION JOINT, SEE BELOW.

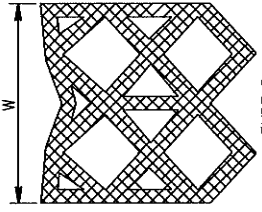
SILICONE JOINT SEALANT  
SILICONE JOINT SEALANT  
SILICONE JOINT SEALANT



JOINT WIDTH (Y)	MINIMUM SILICONE SEALER THICKNESS(E)
3/4"	3/8"
1"	1/2"

BACK-UP MATERIAL SHALL BE 25% GREATER DIAMETER THAN Y DIMENSION.

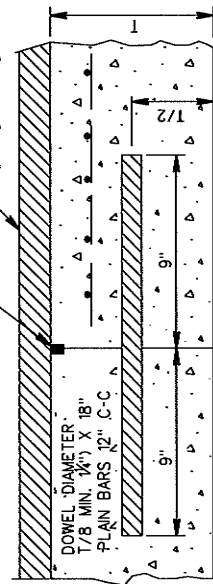
TYPE C



TYPE D

### SEALANTS FOR TRANSVERSE EXPANSION JOINTS

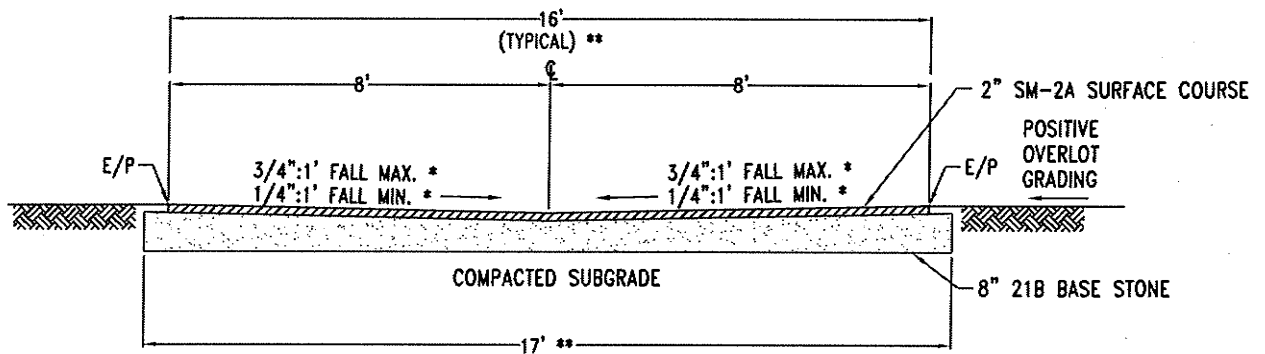
WHEN TOP OF GROOVE TO 3/8" X 3/8" AND SEAL WITH TYPE A OR B, IF ASPHALT OVERLAY IS NOT USED



IF JOINT COINCIDES WITH SPECIFIED JOINT, CONSTRUCT IN ACCORDANCE WITH DETAIL ON SHEET 2 (CONTRACTION OR EXPANSION JOINT).

DETAIL OF TRANSVERSE CONSTRUCTION (BUTT) JOINT  
(FOR USE WITH PLAIN, REINFORCED, AND PLAIN BASE WITH ASPHALT TOP)

# ASPHALT ALLEY SECTION



TYPICAL SECTION

## CONSTRUCTION NOTES:

1. ALLEY LAYOUT IS TO BE VERIFIED BY ESTABLISHED PROPERTY CORNER POINTS IN ADVANCE OF ANY CONSTRUCTION.
2. ALL UNSUITABLE SOILS ARE TO BE STRIPPED.
3. THE ESTABLISHED SUBGRADE MUST BE GRADED TO A DEPTH THAT WILL ALLOW THE INSTALLED PAVEMENT SECTION TO ACCEPT INDIVIDUAL LOT DRAINAGE ALONG THE ALLEY ROAD FRONTAGE.
4. THE ESTABLISHED SUBGRADE MUST BE FULLY COMPACTED AND PROVEN TO BE NON-YIELDING UNDER PROOFROLLED TESTING METHODS.
5. FINAL SHAPING OF THE 21B BASE STONE AND SM-2A SURFACE COURSE MUST MEET THE SECTION PROFILE.
6. BASE STONE SHOULD EXTEND 6" BEYOND THE EDGE OF PROPOSED PAVEMENT.
7. BACKFILLING SHALL OVERLAP INTO LOT CONTOURS TO ESTABLISH A SMOOTH POSITIVE GRADE TRANSITION.
- \* 8. ALLEY ENTRANCE APRONS WILL BE REQUIRED. THESE APRONS SHOULD CONFORM TO THE VDOT STD. CG-9B DETAIL WITH THE BACK INCORPORATING THE RUNNING SIDEWALK PROFILE.
9. BACK OF APRON ELEVATIONS SHOULD BE ESTABLISHED EARLY IN THE DESIGN AND CONSTRUCTION PLANNING.
10. BACK OF APRON SPOT ELEVATIONS ARE BASED ON EXISTING TOP OF CURB OR EDGE OF PAVEMENT ELEVATIONS.
11. POSITIVE DRAINAGE FROM BACK OF APRONS TOWARDS THE CITY ROAD WAY DRAINAGE COURSE IS REQUIRED. TYPICAL PROFILE IS 1/4" PER FOOT.
12. PROTECT ALL CITY MONUMENTATION. CALL SURVEYS DIVISION ON ANY NECESSARY RELOCATION NEEDS WITH CORNER PINS OR MONUMENTS.
13. PRIME COAT BASE STONE PRIOR TO PAVING.
- \*\* 14. ALLEY SECTION IS LIMITED TO RIGHT-OF-WAY WIDTH.



## STANDARD DETAIL

RICHMOND, VA

ASPHALT ALLEY SECTION

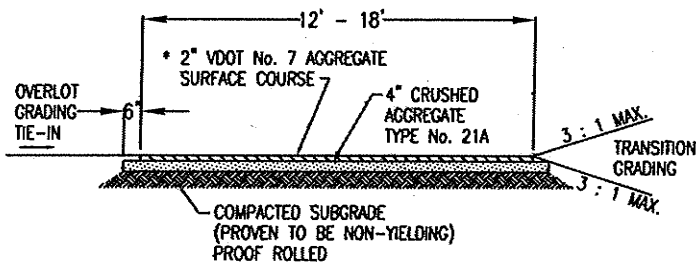
DATE

REVISION DESCRIPTION

SCALE  
N.T.S.

DATE  
11/99

# MINIMUM GRAVEL ALLEY SURFACE



## GENERAL NOTES

ALLEY MUST MAINTAIN POSITIVE DRAINAGE.

ALLEY MUST RECEIVE AND PROPERLY DISPERSE DRAINAGE.

ALLEY SUBGRADE MUST BE CUT OR FILLED TO ACCEPT PAVEMENT SECTION AND BE BROUGHT TO A FINISH SURFACE ELEVATION THAT TRANSITIONS APPROPRIATELY WITH ADJACENT GRADING.

WIND ROWED EDGES OF THE CUT MUST BE RAKED OUT OR REMOVED AS SPOILS.

USE A VALLEY CROSS SECTION WHEN NECESSARY TO ADEQUATELY COLLECT AND DISPERSE DRAINAGE.

SUBGRADE AND 21A LAYER MUST BE THOROUGHLY ROLLED AND COMPACTED BEFORE PLACEMENT OF VDOT No. 7 AGGREGATE SURFACE COURSE.

\* ALLEY SURFACES WHICH HAVE A CONTINUOUS PROFILE GRADE IN EXCESS OF 5% (5 TENTHS PER 10 FOOT RUN), MUST SUBSTITUTE FULL DEPTH BLENDED TREATMENT OF 21A IN LIEU OF No. 7 AND 21A STONE.

AGGREGATE GRADATIONS PER VDOT ROAD AND BRIDGE SPECIFICATIONS DATED JANUARY, 1994.

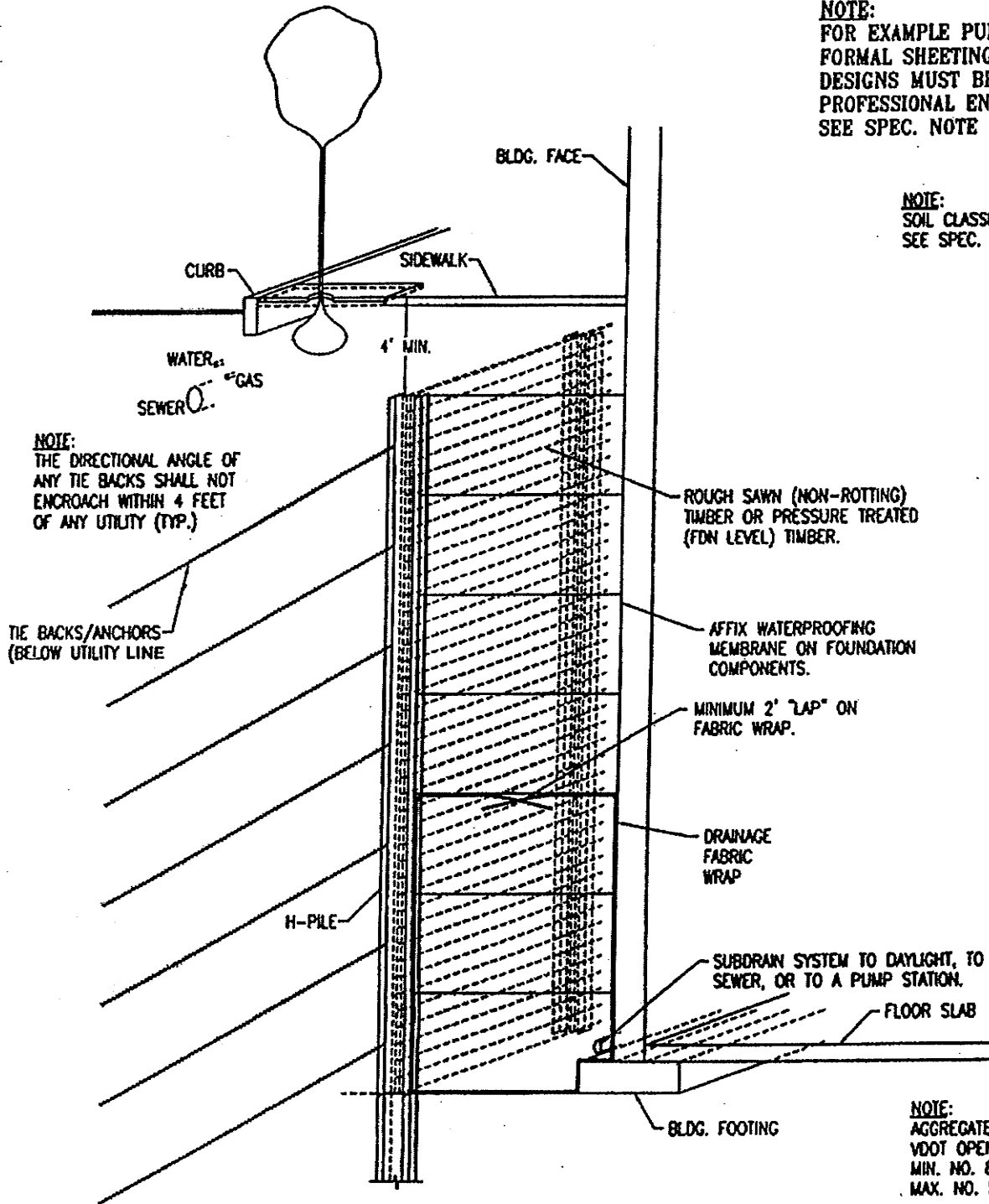


SIZE NO.	DETAIL	DATE	REVISION DESCRIPTION
SHEET NO.	MINIMUM GRAVEL ALLEY SECTION	SCALE	DATE
MGA	RICHMOND, VA	N.T.S.	11/99

# SHEETING AND SHORING SYSTEMS TYPICAL VISUAL ILLUSTRATION

**NOTE:**  
FOR EXAMPLE PURPOSES ONLY.  
FORMAL SHEETING & SHORING SYSTEM  
DESIGNS MUST BE SUBMITTED BY A  
PROFESSIONAL ENGINEER.  
SEE SPEC. NOTE 16 & 17.

**NOTE:**  
SOIL CLASSIFICATION  
SEE SPEC. NOTE 9.



H' STRATUM  
CRUST

G' STRATUM  
SOIL

F' STRATUM  
SOIL

E' STRATUM  
SOIL

D' STRATUM  
SOIL

C' STRATUM  
AGGREGATE

B' STRATUM  
AGGREGATE

A' STRATUM  
AGGREGATE



JOB NO. DETAIL	STANDARD DETAIL		DATE		REVISION DESCRIPTION	
SHEET NO. SSS-1	RICHMOND, VA		SCALE N.T.S.		DATE 09/00	
SHEETING AND SHORING SYSTEM						

