City of MOUNT VERNON

ENGINEERING STANDARDS

2nd Edition May 2016

Photo Courtesy of Landed Gentry Development

PUBLIC WORKS

COMMUNITY AND ECONOMIC DEVELOPMENT

Engineering Standards

2nd Edition May 2016

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We thank Mayor Boudreau and City Council for their support in the accomplishment of this tremendous task.

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FOREWORD

The City of Mount Vernon Engineering Standards is a technical document intended to provide a practical and uniform approach to the design, construction and maintenance of the City's public and private infrastructure. These standards are meant to establish consistency, quality control and predictability for development projects. The Standards also serve as a communication tool between City Staff, Design Engineers, Developers, Contractors, Builders and Utility Companies and Districts.

Ultimately, these Engineering Standards have been designed with flexibility and common sense thinking, but are also meant to encourage creative and affordable designs while keeping with the theme of preserving the safety, maintainability and aesthetics of both public and private infrastructures.

As a fluid document, these Engineering Standards will require frequent updates to keep up with the pace of technology in the construction industry. A process for requests for deviation from the Standards has also been included.

We encourage our stakeholders to submit proposals for suggested revisions to the Engineering Standards utilizing the form provided in Appendix B.

The most recent versions of this document can be found on the City of Mount Vernon website www.mountvernonwa.gov

Engineering Standards

Chapter 1
General Considerations

Section	Description
1-01	Applicability
1-02	References
1-03	Primary Design and Construction References
1-04	Materials
1-05	Permits
1-06	Plan Review
1-07	Record Drawings
1-08	Inspection
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1-11	Site Maintenance
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1-01 Applicability

These standards shall govern all new road construction and upgrade of facilities located within the City right-of-way, including, storm drainage systems, sanitary sewer facilities, transportation facilities, telecommunications and other development improvements required by the Mount Vernon Municipal Code.

1-02 References

These standards are intended to be consistent with the most currently adopted Mount Vernon Municipal Code. In some cases, code updates are in-progress. Any discrepancies between the two will be resolved by the Public Works Director and Community and Economic Development Director.

1-03 Primary Design and Construction References

Except where these Standards provide otherwise, design detail, construction workmanship and materials shall be in accordance with the most current edition of the following publications produced by the Washington State Department of Transportation (WSDOT) or jointly by WSDOT and the Washington State Chapter of the American Public Works Association (APWA), or American Society of Civil Engineers (ASCE), or National Association of Home Builders and Urban Land Institute:

a. WSDOT Standard Specifications for Road, Bridge and Municipal Construction. These will be referred to in these Standards as the “WSDOT Specifications”.

b. WSDOT Standard Plans for Road, Bridge and Municipal Construction. These will be referred to in these Standards as the “WSDOT Plans”.

c. WSDOT Design Manual.

d. Department of Ecology (DOE) Storm Water Manual for Western Washington.

e. Manual Uniform Traffic Control Devices (MUTCD).

f. WSDOT Construction Manual.

g. Criteria for Sewage Works Design (State Washington Dept. of Ecology) Manual.

h. A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO).

i. Low Impact Development Technical Guidance Manual For Puget Sound.

1-04 Materials

All materials shall be new and undamaged and as approved by the City of Mount Vernon.

All materials shall comply with applicable sections of the American Standard Test Method (ASTM), the American Water Works Association (AWWA) and the APWA/WSDOT Standard Specifications.

When specific manufacturers or models are approved, no substitutions will be allowed without prior approval.

1-05 Permits

Permits, approvals or agreements are required by the City and/or other agencies, prior to initiating any construction activity, including clearing/grading and/or other site disturbance activities. For specific requirements please contact the Community and Economic Development Department at (360)336-6214.

A pre-construction meeting is required with the Engineer of Record, Contractor, and Applicant before the issuance of a Fill and Grade permits.

1-06 Plan Review

Civil construction plans and profiles are required for proposed road improvements, storm drainage facilities, sanitary sewer facilities, potable water facilities, stream channel improvements and other improvements as determined by the Public Works Director.

An engineering as-built or record drawing shall be required for review and approval prior to project acceptance. In some cases, these drawings will be required before the next phase of construction may proceed.

All construction plan sheets approved by the Community and Economic Development Department shall have the following approval block. See Appendix A.

This plan sheet is approved for construction in accordance with the City of Mount Vernon ordinances and policies. Actual conformance of the design with applicable laws is the sole responsibility of the professional engineer, whose name and stamp appear on this sheet. Acquiring, complying with and providing mitigation for all Federal, State, County and Local laws, permits and mandates, including but not limited to the Endangered Species Act, Federal Wetland Permit, State Department of Fisheries Hydraulics Permit, Federal Flood Plain Permits, National Pollutant Discharge Elimination System Permits is the responsibility of the Developer, Landowner and their Engineer. The issuance of this permit shall not be construed as proof of compliance with applicable laws and permit requirements.

Approved By: _____ Date: _____

This approval will expire in one year from the date noted above.

1-07 Record Drawings

Engineering as-built drawings shall be submitted to the Community and Economic Development Department for review and approval prior to project acceptance.

The as-built drawings will be referenced during the final site inspection and a punch list will be generated identifying any deficiencies which arise during the inspection.

Upon approval of the as-built drawings the Engineer of Record shall provide the following:

- One clear and complete set of quality reproducible Mylar as-built drawings, stamped and signed by the Engineer of Record licensed in the State of Washington.
- One electronic record in TIFF and PDF-A format.

1-08 Inspection

a. Call (360)336-6243 at least 24 hours in advance to schedule inspections.

b. The City will appoint project engineers and inspectors as necessary to inspect the work.

c. It is the responsibility of the developer, contractor or their agents to have an approved set of plans and permits on the job site at all times.

d. The City reserves the right to require the developer to retain third-party testing to verify compliance with the Engineering Standards and approved plans.

e. It is the responsibility of the developer, contractor, or their agents to notify the City in advance of the commencement of any work.
f. Failure to comply with the provisions of these Standards and other lawful directives may result in stop work orders, removal or correction of work, or other penalties as established by the Mount Vernon Municipal Code.

1-09 Securities

Under certain circumstances or as required by City code, securities may be required to guarantee the performance, completion, and correction of permitted work.

Types of securities include but are not limited to cash deposits, assigned savings and bonds. Final project approvals and final occupancy permits are approved only after the completion of all required onsite and offsite improvements. Securities shall be released by the Community and Economic Development Department Director upon completion and successful final inspection of the required work and any previously specified stipulations related to the work being performed.

1-10 Errors and Omissions

At the discretion of the City, any errors or omissions in the approved plans or information used as a basis for such approvals may constitute grounds for withdrawal of any approvals and/or stoppage of any or all permitted work. It shall be the responsibility of the Developer to show cause why such work should resume and make such changes in plans that may be required by the City prior to re-approval of the plans.

1-11 Site Maintenance

a. The Developer or Contractor shall schedule and control their work so as to comply with all applicable provisions of the Mount Vernon Municipal Code and applicable state and federal codes to prevent any hazards to public safety, health, welfare, and public or private property.

b. On existing roads or streets, two-way traffic shall be maintained at all times unless traffic control plans have been approved in advance.

c. The Developer or Contractor shall keep roads, streets and pedestrian facilities free of dirt and debris at all times.

d. The Developer or Contractor shall keep pedestrian facilities open and free of obstructions.

e. The Developer or Contractor shall maintain pedestrian and vehicular access to occupied buildings at all times, except where written approval has been obtained from the City.

1-12 Deviation from Standards

The City of Mount Vernon, in evaluating requests for deviations from these Standards, will utilize the following guidelines and criteria:

- Provide a formal written request to the Community and Economic Development Department. See form in Appendix B.

- The applicant shall present supporting information to justify the deviation being requested.

- The change requested shall achieve the intended results through comparable or superior design and materials.

- The proposed change shall not adversely affect long-term reliability, function, operation or maintenance.

1-13 Plan Revisions

a. Subsequent to approval of the construction drawings for the development, all requested revisions must be accompanied by a transmittal form.

b. Plan revision requests must be sequentially numbered and signed by the design engineer and the project owner or their representative.

c. Revisions must be submitted on revised plan sheets, in narrative form or both for approval signatures.

d. An electronic copy of the approved plans is required for City files.

Engineering Standards

Chapter 2
Erosion and Sedimentation Control (ESC)

Section	Description
2-01	Erosion and Sediment Control (ESC)
2-02	Property Owner Responsibilities
2-03	Certified Erosion Control Lead (CESL)
2-04	Wet Season Special Provisions/Requirements
2-05	Final Stabilization
2-06	NPDES Requirements
2-07	Standard ESC Plan Notes

ESC Notes, Forms and Worksheets

ESC-1	Erosion and Sediment Control Notes (2 of 2)
ESC-2	Construction Sequence

2-01 Erosion and Sediment Control (ESC)

The Mount Vernon Municipal Code has adopted the 2005 Storm Water Management Manual for Western Washington, published by the Washington State Department of Ecology, Water Quality Program. Volume II of this manual regulates Construction Storm Water Pollution Prevention.

Volume II as amended herein will serve as the erosion control standard for the City of Mount Vernon.

Real world circumstances vary, and compliance with these guidelines does not guarantee results that meet water quality regulations. The City will require additional measures when necessary to ensure water quality compliance.

2-02 Property Owner Responsibilities

The property owner is responsible for the lawful discharge of water from his/her property.

2-03 Wet Season Special Provisions/Requirements

Any site with exposed soils during the wet season (October 1 to April 30) shall be subject to the Wet Season Special Provisions. See Department of Ecology Storm Water Manual for Western Washington Volume II.

2-04 Certified Erosion Control Lead (CESL)

Volume II Chapter 4 BMP C160 sets forth the requirements for a Certified Erosion Control Lead (CESL).

The construction plans and the Stormwater Pollution Prevention Plan (SWPPP) shall include the name and contact information of the designated CESCL.

The contractor must designate a CESL to:

1. Be available for rapid response to ESC problems.
2. Ensure compliance with all Stormwater permit conditions.
3. Maintain and review each BMP.
4. Keep a copy of all required reports on site and forward a copy to the City Inspector within 48 hours of completion.

2-05 Final Stabilization

Prior to obtaining final construction approval, the site shall be stabilized, the structural ESC measures, such as silt fences and sediment traps removed, and drainage facilities cleaned. The removal of ESC measures is not required for those projects, such as plats, that will be followed by additional construction under a different permit. In these circumstances, the need for removing or retaining the measures must be evaluated on a site-specific basis.

To obtain final construction approval, the following conditions must be met:

1. All disturbed areas of the site shall be vegetated or otherwise permanently stabilized. At a minimum, disturbed areas shall be seeded and mulched with a high likelihood that sufficient cover will develop shortly after final approval. Mulch without seeding is not adequate to allow final approval of the permit, except for small areas of mulch used for landscaping.

2. Structural measures such as, but not limited to, silt fences, pipe slope drains, construction entrances, storm drain inlet protection, and sediment traps and temporary ponds shall be removed from the site. Measures that will quickly decompose, such as brush barriers and organic mulches, may be left in place. An applicant's proposal to remove fencing prior to the establishment of vegetation shall require inspection and approval from the City. In some cases, such as residential building following plat development, it may be appropriate to leave some or all ESC measures for use during subsequent development. This shall be determined on a site-specific basis.

3. All permanent surface water facilities, including catch basins, manholes, pipes, ditches, channels, R/D facilities, and water quality facilities, shall be cleaned. Any offsite catch basin that required protection during construction shall also be cleaned.

4. If only the infrastructure of the site has been developed (e.g. subdivisions) with building construction to occur under a different permit, then the Critical Area buffer and /or boundary shall be clearly marked.

2-06 NPDES Requirements

As part of the implementation of the National Pollutant Discharge Elimination System (NPDES), projects that will disturb one acre or more of total area and will discharge to a surfacewater body must receive coverage under the Washington State Department of Ecology's Construction Stormwater General Permit. The DOE Construction Stormwater General Permit application requires the filing of a Notice of Intent (NOI) at least 30 days prior to the start of construction. Contact the Department of Ecology for complete information on permit thresholds, applications, and requirements.

2-07 Standard ESC Plan Notes

The following notes must be shown on Civil plans approved by the City, as applicable to the project. Additional notes at the discretion of the Engineer of records may be included. For Wet Season notes also reference DOE Volume II.

ESC-1 Standard ESC NOTES

APPROVAL OF THIS EROSION AND SEDIMENT CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).

1. PRIOR TO COMMENCING CONSTRUCTION, ALL CRITICAL AREAS, INCLUDING WETLAND BUFFERS, STREAM BUFFER, LANDFILL AREAS, AND CONDITIONS AS DETERMINED BY THE CITY ONSPECTOR SHALL BE CONTINUOUSLY DEMARCATED IN THE FIELD USING FLAGGING TAPE OR FENCING. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CITY OF MOUNT VERNON STANDARDS AND SPECIFICATIONS.

2. EROSION CONTROL METHODS AND MATERIALS SHALL MEET REQUIREMENTS OF THE APWA/WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION(CURRENT EDITION) AND REQUIREMENTS SET FORTH IN VOLUME II OF THE “STORMWATER MANAGEMENT MANUAL FOR THE PUGET SOUND BASIN (THE TECHNICAL MANUAL)”, BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, EDITION CURRENTLY ADOPTED BY THE CITY OF MOUNT VERNON. THE CONTRACTOR SHALL FOLLOW RECOMMENDATIONS MADE BY SUPPLIERS AND MANUFACTURERS OF MATERIALS AND EQUIPMENT USED.

3. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE INSTALLED AND IN OPERTAION IN ADVANCE OF ALL CLEARING AND GRADING ACTIVITIES IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS. WHEREVER POSSIBLE, MAINTAIN NATURAL VEGETATION FOR SILT CONTROL.

4. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS. ADDITIONALLY, MORE ESC FACILITIES MAY BE REQUIRED TO ENSURE COMPLETE SILTATION

CONTROL. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE CONTRACTOR TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY CONSTRUCTION ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE NEEDED.

5. ANY PERMANENT RETENTION/DETENTION FACILITY USED AS A TEMPORARY SETTLING BASIN SHALL BE MODIFIED WITH THE NECESSARY EROSION CONTROL MEASURES AND SHALL PROVIDE ADEQUATE STORAGE CAPACITY.

6. A COPY OF THE APPROVED EROSION CONTROL PLANS MUST BE KEPT ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.

7. A CLEARING CONTROL FENCE SHALL BE INSTALLED AT THE DRIP LINE OF TREES TO BE SAVED WHEREVER THE TREE CANOPIES EXTEND INTO THE AREA TO BE CLEARED.

8. OFF-SITE STREETS MUST BE KEPT CLEAN AT ALL TIMES. IF DIRT IS DEPOSITED ON THE PUBLIC STREET SYSTEM, THE STREET SHALL BE IMMEDIATELY CLEANED WITH POWER SWEEPER OR OTHER APPROVED EQUIPMENT. ALL ADJACENT OFF-SITE PROPERTIES AND DRAINAGE FACILITIES SHALL BE PROTECTED FROM DAMAGE. ALL VEHICLES SHALL LEAVE THE SITE BY WAY OF THE CONSTRUCTION ENTRANCE AND SHALL BE CLEANED OF ALL DIRT THAT WOULD BE DEPOSITED ON THE PUBLIC STREETS.

9. ALL PROPERTIES ADJACENT TO THE PROJECT SITE SHALL BE PROTECTED FROM SEDIMENT DEPOSITION AND RUNOFF.DO NOT FLUSH SEDIMENT OR CONCRETE BY-PRODUCTS OR CLEAN TRUCKS NEAR OR INTO THE STORM DRAINAGE OR SEWER SYSTEMS.

10. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE FACILITIES IS THE RESPONSIBILITY OF THE OWNER/APPLICANT/ESC SUPERVISOR UNTIL ALL CONSTRUCTION IS APPROVED.

11. ANY AREAS OF EXPOSED SOILS, INCLUDING ROADWAY EMBANKMENTS, THAT WILL NOT BE DISTURBED FOR TWO DAYS DURING THE WET SEASON OR SEVEN DAYS DURING THE DRY SEASON SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC METHODS.

12. ANY AREA NEEDING ESC MEASURES NOT REQUIRING IMMEDIATE ATTENTION SHALL BE ADDRESSED WITHIN FIFTEEN (15) CALENDAR DAYS.

13. THE ESC FACILITIES ON ACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH AND WITHIN FORTY-EIGHT (48) HOURS FOLLOWING A STORM EVENT.

14. AT NO TIME SHALL MORE THAN ONE (1) FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT –LADEN WATER INTO THE DOWNSTREAM SYSTEM.

15. STABILIZED CONSTRUCTION ENTRANCES AND ROADS SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL OFF-SITE PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

16. PRIOR TO THE BEGINNING OF THE WET SEASON THE CONTRACTOR SHALL DETERMINE BMP MEASURES. ALL DISTURBED AREAS SHALL BE INSPECTED BY THE CONTRACTOR TO IDENTIFY WHICH AREAS SHALLBE STABILIZED IN PREPARATION FOR THE WINTER RAINS. DISTURBED AREAS SHALL BE STABILIZED WITHIN ONE WEEK OF THE BEGINNING OF THE WET SEASON.

ESC-2 CONSTRUCTION SEQUENCE

Construction Sequence is required for all applicable projects.

Engineering Standards

Chapter 3
Streets

Section	Description
3-01	Super Elevation on Horizontal Curves
3-02	Grades
3-03	Side Slopes
3-04	Intersections
3-05	Road Width Transition Tapers
3-06	Sight Distance
3-07	Private Street Access
3-08	Street Ends
3-09	Survey Monuments
3-10	Curb Details
3-11	Sidewalks
3-12	Non-motorized Bike/Pedestrian Paths
3-13	Public Access Easements
3-14	Surfacing Requirements
3-15	Bollards
3-16	Roadway Barricades
3-17	Mail Boxes
3-18	Guardrails
3-19	Roadside Obstacles
3-20	Rock Walls (Rockeries)
3-21	Asphalt Acceptance
3-22	Signs
3-23	Street Cuts
3-24	Telecommunications Standards – Fiber Optics
3-25	Street Lights
3-26	Access Management
3-27	Crosswalk Policy

3-01 Super Elevation on Horizontal Curves

Minimum Horizontal Curve Design Criteria for low speed curves (design speed 40 MPH or less) are shown on Table 3-1 for different rates of super elevation (*e*). For design speeds above 40 mph, horizontal curve design must conform to Chapter 6 of the WSDOT Design Manual, current edition.

TABLE 3-1
MINIMUM HORIZONTAL CURVE RADII
For low speed curves

Design Speed	Max. Super	Minimum Radius for		
MPH	e	e =.06	e =.04	e =.02
20	N.A.	N.A.	N.A.	N.A.
25	N.A.	N.A.	N.A.	N.A.
30	0.04	N.A.	230	250
35	0.06	320	345	375
40	0.06	450	490	540

Notes for Table 3-1:

1. Additional pavement width may be required on horizontal curves to provide for vehicle maneuvers where no superelevation is provided and the minimum horizontal curve design criteria in Table 3-1 or the WSDOT Design Manual has not been met. The method of calculation for widening will be described in Chapter III, Elements of Design in the AASHTO Policy on Geometric Design of Highways & Streets or Chapter 6, Geometrics, of the WSDOT Design Manual.

2. All horizontal curve designs must provide at least the minimum stopping sight distance for the design speed at all portions of the road.

3. Maximum super elevation rates for arterial roads of up to 0.06 feet/foot should be used on City roads with design speeds of 35 mph or greater.

4. Super elevation is not recommended for use on non-arterials in urbanized areas with design speeds of less than 30 mph.

5. All roadway designs utilizing superelevation are subject to review by the Public Works Director.

6. Chapter 640 of the WSDOT Design Manual should be consulted for all super elevation designs.

3-02 Grades

Grades and vertical sight distance are subject to approval by the Public Works Director to ensure proper drainage and/or safety for vehicles and pedestrians. Grades of roads shall not be less than 0.5%. The maximum gradient on any new or reconstructed road shall not exceed the following:

Major Arterials Secondary Arterial, Collector Arterials	6% 8%
Neighborhood Streets *(Over 10% approved by Fire Marshal)* Cul-de-sac bulb areas	15% 6%

3-03 Side Slopes

a. Side slopes shall generally be constructed no steeper than 3:1 for fill slopes and 2:1 for cut slopes. For neighborhood streets, fill slopes may be 2:1. Steeper slopes may be approved by the Public Works Director upon showing that the steeper slopes, based on geotechnical analyses, will be stable. A guardrail is only needed with steep fore slopes. (Fore slope: the edge of the shoulder to the bottom of the ditch or to the bottom of the roadway fil).

b. Side slopes shall be stabilized with grass sod or seeding or by other planting or surfacing materials acceptable to the Public Works Director.

3-04 Intersections

1. Angles

Proposed public streets must intersect one another at as close to 90 degrees as topography permits (no less than 75 degrees).

2. Minimum Corner Curb Radii

At public road intersections, the following ranges of curb line radii are permitted:

Neighborhood-Neighborhood Intersection	25 feet inside
Neighborhood-Collector Intersection	30 feet inside
Arterial-Arterial Intersection	35 feet inside

Larger radii may be required to accommodate turning movements for larger design vehicles.

3. Cross Access Alignment

Minimum Center Offset for Adjacent Streets (either same side or opposite sides of primary street).

Neighborhood streets intersecting each other	125 feet
Collectors/neighborhood intersecting arterials	250 feet
Arterials intersecting arterials	300 feet

When high volume or commercial type driveways are sited across from each other, they shall be in alignment unless otherwise approved by the Public Works Director.

3-05 Road Width Transition Tapers

The need for road width transition tapers in conjunction with development proposals will be determined by the Public Works Director on a case-by-case basis.

Minimum 8:1 ratio required on Approach
Minimum 20:1 ratio required on Exit

See the WSDOT Design Manual for road width transition requirements.

3-06 Sight Distance

a. General

All street designs will be required to meet minimum sight distance criteria established in A Policy on Geometric Design of Highways and Streets, AASHTO.

For determining the adequacy of a particular road's vertical alignment to meet sight distance requirements, sight distance is always measured parallel to the horizontal alignment of the road.

b. Line of Sight at Intersections

At any intersection of a Private Road/Access Point with a City Road or a City Road with a City Road, there must be a sight distance triangle which provides an unobstructed line of sight from a point on the minor road 15 feet behind the edge of the traveled way (driver's eye location) to a point in the traveled way on the major road at least equal to the required site distance. For purposes of line of sight calculations, the driver's eye is assumed to be 3.5 feet above the minor road pavement and the height of object is assumed to be 4.25 feet above the major road pavement.

The driver's eye location may be reduced to a minimum of 10 feet behind the traveled way, at the discretion of the Public Works Director, where the reduction in driver's eye location will not adversely affect safety and/or operation. Some examples of situations where this discretion may be used are: an intersection on the outside of a horizontal curve; an intersection where one approach is in a cut or fill section; or where a bridge railing or abutment would obscure the line of sight from 20 feet back but not from 10 feet back.

The area within the sight distance triangle must be free from any sight obscuring objects with the line of sight at least 36 inches above the ground and/or the top of any proposed vegetation along the line of sight.

The sight distance triangle must be located completely within the right-of-way in order to ensure proper maintenance. The Public Works Director may require additional Right-of-Way as a condition of development approval to ensure the sight distance triangle is contained completely within the City Right-of-Way.

c. Special Circumstances

In circumstances that are different than those as presented in these Standards, the Public Works Director may establish sight distance standards and requirements, which generally conform with the intent of the sight distance guidelines as presented in the latest edition of AASHTO.

d. Documentation of Sight Distance

In order to verify acceptable sight distance including entering sight distance, the Public Works Director may require a developer to evaluate and document an existing site distance condition.

The evaluation and documentation of sight distance shall include adequate plan and profile drawings necessary to make a definitive determination. When the Public Works Director determines from the evidence presented that a location has insufficient sight distance, the developer may be required to provide a plan to improve the sight distance to at least the minimum acceptable standard. Photographic Evidence is allowed as approved by the Public Works Director.

3-07 Private Street Access

a. Private streets shall be built to City subdivision standards (Title 16 MVMC), including without limitation, width, sidewalk, curbs and gutters, drainage, street lighting, etc.

b. The minimum width of the access easement shall be 26-feet wide with a 20-foot wide paved surface.

c. Curbs, gutters and sidewalks are required when more than four lots are being accessed, or as deemed necessary by the Public Works director.

d. Streets providing fire hydrant access shall provide an approved driving surface not less than 26-feet wide.

e. No parking shall be allowed within the 26-foot easement. Parking may be allowed in portions of easements exceeding 26-feet in width.

f. Private streets shall be no longer than 150-feet in length and shall not serve more than four lots without an approved turnaround.

g. The grade shall not be more than 10 percent unless approved by the Fire Marshal.

h. Grass pavers on Fire Access roads will be allowed at the discretion of the Fire Department and will be evaluated before or during plan review.

i. Fire access roads shall be capable of supporting the imposed loads of fire equipment and apparatus of at least 75,000 pounds GVW and 45,000 pound point load.

3-08 Street Ends

All streets shall terminate in a cul-de-sac or a hammerhead as approved by the Fire Marshal and the Public Works Director.

Cul-de-sac	90’ diameter pavement width 100’ diameter right-of-way
Hammerhead	120 feet See Appendix A for Standard Detail

Minimum turning radius to allow for maneuvering:

Fire Apparatus	28’ inside 45’ outside
Garbage Truck	32.5’ inside 46.5’outside
Overhead Clearance	25 Feet

3-09 Survey Monuments

Monument, case and cover shall be set for all PC, PT, center of cul-de-sac, and intersection points. The point of intersection (PI) will be acceptable in lieu of a PC and PT for plat road curves, provided that such PI falls within the paved roadway or walkway. Monument case and cover installation shall be in accordance with WSDOT Standard Plans A -10.30-00, with monument and cover lettering approved by the Public Works Director. Surface monuments will not be allowed unless otherwise approved by the Public Works Director.

3-10 Curb Details

Cement concrete traffic curb and gutter, 18 inches wide, shall be used for all curbed roadways except as modified below:

a. Rolled Curb and Gutter, 24 inches wide will be allowed for cul-de-sac bulbs. All sidewalks poured behind rolled curb applications shall be 6 inches thick.

b. Cement Concrete mountable traffic curb as per WSDOT Detail Standard shall be used for edges of islands and medians where required.

c. Extruded Cement Concrete Curb (WSDOT/APWA F10-42-00 Type 6) may be used for parking areas, which will not become part of the public road system.

3-11 Sidewalks

a. Curb Ramps (Wheelchair Ramps)

- Curb ramps shall be provided at all pedestrian crossings and shall meet ADA (Americans with Disability Act) requirements.
- One ramp shall be used on each curb return on residential streets and un-signalized intersections.
- At signalized intersections, a curb ramp shall align with each crosswalk.

- Truncated domes shall be imbedded. Glued truncated domes are NOT allowed.
- Sidewalks will be designed to prevent run-off from flowing over the sidewalk.

See WSDOT Standard Plans Section F (Curbs, Sidewalks and Driveways).

b. Width

All sidewalks shall meet ADA requirements. Sidewalks minimum widths: 6 feet or match existing unless otherwise approved by the City Engineer.

1. Width of Sidewalk is measured from the back of the curb to the back of the sidewalk when the sidewalk is adjacent to the curb.

2. Sidewalks shall be designed and constructed to avoid physical obstructions such as utility poles and fire hydrants. Developer shall coordinate with utility company for pole and other utility relocations.

3. Meandering sidewalks shall maintain the full design width around obstructions. Additional right-of-way may be required to either relocate the obstruction or meander the sidewalk.

4. At bus stops, a landing pad at least 9 feet deep and 15 feet wide shall be provided for wheelchair operations.

5. The developer shall determine the location of all driveway entrances prior to approval of construction plans.

See WSDOT Standard Plans Section F (Curbs, Sidewalks and Driveways).
See Section 3-26 for driveway requirements.

3-12 Non-Motorized Bike/Pedestrian Paths

	Minimum Width	Maximum Grade	Minimum Curb Radii
Non-motorized Pedestrian Path	*10 feet	15%	10 feet
Maintenance Access Road	12 feet	15%	**25 feet
Public Access Easements	15 feet		

a. The City may allow isolated areas of less than 10 feet wide to accommodate topographic constraints.

**Maintenance access roads minimum curb radii shall allow for maintenance equipment turnaround and maneuvering.

b. Surfacing materials shall be as specified in these standards. (See Section 3-14).

3-13 Public Access Easements

a. Where it is necessary to facilitate pedestrian circulation between neighborhoods, schools, shopping areas, transit facilities or other activity centers, the City may require the dedication of a public access easement or tract.

b. Sidewalk, walkway or non-motorized bike/pedestrian path as well as diverters or bollards shall be installed when required.

3-14 Surfacing Requirements

The following are the minimum requirements for surfacing for specific facilities as described elsewhere in these Standards. The Public Works Director may specify additional requirements.

All materials and workmanship shall be in accordance with the WSDOT Specifications, these Standards, and as approved by the Public Works Director.

Facility	Minimum Surfacing Requirements
Arterials with Shoulders	4-inch - ½" HMA PG6422, (2) 2-inch lifts Asphalt Concrete Pavement (ACP) over 2-inch Crushed Surfacing Top Course (CSTC) over 12-inch Gravel Borrow over Geotextile
Non-arterials with Shoulders	4-inch - ½" HMA PG6422, (2) 2-inch lifts Asphalt Concrete Pavement (ACP) over 2-inch Crushed Surfacing Top Course (CSTC) over 12-inch Gravel Borrow over Geotextile
Concrete Sidewalks, Curb and Gutter	4-inch Portland Cement Concrete over 4-inch CSTC, 3000 PSI

Driveways and Behind Rolled Curbs	6-inch Portland Cement Concrete over 6-inch CSBC, 3000 PSI Broom Finished (no smooth troweled)
Alley	2-inch – ½" HMA PG6422, Asphalt Concrete Pavement over 2-inch CSTC 6" Gravel Borrow
Non-motorized Bike/Pedestrian Paths and	2-inch - ½" HMA PG6422 Asphalt Concrete Pavement over 4-inch CSTC
Private Street Access	2-inch - ½" HMA PG6422 Asphalt Concrete Pavement over 4-inch CSTC (or as recommended by Geotechnical Engineer)
Utility Maintenance Access Roads	2-1/2-inch ½" HMA PG6422 Asphalt Concrete Pavement, 2-inch CSTC, Geotextile, 8-inch Gravel Borrow

NOTE: All depths are compacted thicknesses

<u>Commercial Driveway and Parking Lot</u>

Private parking lot surfacing standards in locations and corridors used by public maintenance vehicles such as solid waste collection vehicles, sanitary and/or storm water facility maintenance equipment, and Public transportation equipment must be constructed to support the expected traffic impacts.

- All minimum surfacing requirements assume an acceptable, well-drained, stable, compacted subgrade. See Asphalt Acceptance section 3-22.

- Prior to placement of pavement, the City shall make a determination of sub-grade acceptance based on test results and the observations of a firm and unyielding surface.

- The City shall also establish test area boundaries. Additional measures may be required at the Public Works Director's discretion if evidence exists of unstable subgrade.

Pavement markings shall be hot applied, reflectorized, in accordance with WSDOT Standard Specifications Section 8-22.

3-15 Bollards

a. When necessary to access to an easement, tract, or trail, the point of access shall be closed by a line of bollards.

   This shall include fixed bollards on each side of the traveled way and removable, locking bollards across the traveled way to allow passage of maintenance and emergency vehicles. Pad-locks shall be provided as per City Standards.

b. Spacing shall provide one bollard on the centerline of the trail and other bollards spaced at 5-foot O.C. maximum intervals.

c. The Public Works Director may allow alternative bollard designs.

3-16 Roadway Barricades

Temporary and permanent barricades shall conform to the MUTCD, WSDOT Standard Plans.

3-17 Mail Boxes

The responsibilities for location and installation of mailboxes in connection with the construction or reconstruction of City roads are as follows:

1. Require road construction plans, for construction by a private developer to show clearly the designated location or relocation of mailboxes, whether single or in clusters.

2. Require with this information any necessary widening or reconfiguration of sidewalks with suitable knock-outs or open strips for mailbox posts or pedestals.

   The City may also require turnouts and ADA access be provided for roads classified as arterials or neighborhood collectors.

3. Require these plans to bear a statement on the first sheet that mailbox locations as shown on these plans have been coordinated with the appropriate local Postmaster. This will be prerequisite to plan approval.

4. Note on the plans the type of mailbox delivery: NDCBU (Neighborhood Delivery and Collection Box Unit), Wood Structure Cluster or individual type box.

5. When it becomes necessary to remove or otherwise disturb existing mailboxes within the limits of any project, install the boxes temporarily as directed by the

Postmaster. Reinstall boxes at locations in accordance with these Standards or as approved by the Postmaster. Use only existing posts or materials except where in conflict with these Standards.

6. When mailboxes are located in the sidewalk, sidewalks shall be widened to provide a minimum of 4 feet of clearance around the mailboxes.

3-18 Guardrails

Review the most current edition of AASHTO policy on Geometric Design of Highway and Streets.

3-19 Roadside Obstacles

1. WSDOT Clear Zone distances shall be used as a guide for evaluation and replacement of old, and placement of new, roadside features within the city right-of-way.

   For posted speeds greater than 35 mph, clear zone distances are contained within Chapter 710, Traffic Barriers, of the WSDOT Design Manual. The same distances are also included in Appendix 1, entitled “Control Zone Guidelines – Utilities” of the WSDOT Utility Manual.

2. In general, existing or new roadside features which could present a hazard to the public should be placed outside of clear zone areas unless justified to the Public Works Director’s satisfaction by suitable engineering studies considering traffic safety, or where shielded by a barrier, placed in an area normally inaccessible to vehicles or utilize a breakaway design. EXCEPTION: Clustered Mailboxes or NDCBU Mailboxes placed along streets posted at 25 mph or less.

3. Locations of utility poles shall be compatible with driveways, intersections, and other roadway features (i.e. they shall not interfere with sight distance, roadway signing, traffic signals, culverts, etc.). Poles and other above ground appurtenances will not be permitted in sidewalks or walkways. Existing poles must be relocated unless otherwise approved by the Public Works Director.

4. Coordination and cost of relocating poles or obstacles to achieve these Standards are the responsibility of the developer.

3-20 Rock Walls (Rockeries)

Rock walls shall comply with WSDOT Standards Specifications recommendations per IBC and MVMC Title 15.16 Grading, Excavation and Fill. Rock walls are not allowed inside City right-of-way.

3-21 Asphalt Acceptance

1. The following conditions shall apply to all asphalt paving in the public right-of-way or on paved easements:

   a. A City representative shall be notified at least 2 full working days in advance of all paving operations, and shall be on-site during asphalt placement. Lack of proper notification or on-site inspection shall, at the discretion of the Public Works Director, require additional testing or removal, at the Contractor's expense.

   b. The contractor shall supply the City with a WSDOT approved mix design, at least 1 week in advance, including values for the theoretical maximum density of the asphalt being used on the project.

   c. Specification for minimum allowable density for asphalt is 92% of the theoretical maximum density as determined by AASHTO test method T 209. Minimum testing frequency shall be one test per 200 feet per lane. More frequent testing may be required if necessary, as determined by the Public Works Director.

   d. Failure to meet minimum compaction shall result in the removal of asphalt, as determined by the Public Works Director.

   e. The City shall supervise nuclear densometer readings at random locations. Sampling frequency for lab tests shall not exceed 300 tons of asphalt.

   f. Metal utility covers in the asphalt surface shall be raised after the asphalt has cooled sufficiently. The area shall be saw cut in a 45 degree diamond pattern centered on the utility lid. The diamond pattern shall be oriented parallel with the flow of traffic to minimize the effect of surface inundations on vehicular traffic as per standard plan.

See Appendix A for Standard Detail

3-22 Signs

All signs must conform to M.U.T.C.D. specifications and City of Mount Vernon standard details. See Appendix A for Street Sign Detail.

3-23 Street Cuts

1. All materials and workmanship shall be in accordance with the Standard/ Specifications for Road, Bridge and Municipal Construction prepared by the Washington State Chapter of the American Public Works Association and WSDOT and shall comply with the latest edition.

2. Temporary restoration of trenches on arterial streets and intersections, shall be accomplished by using a “cold mix” asphalt treated base or steel plates as approved by the Public Works Director.

3. Controlled Density Backfill may be used in lieu of Gravel Borrow where approved by the Public Works Director.

4. A Tack Coat shall be applied to the existing pavement at the edge of the saw cuts as specified in Section 5-04 of the Standard Specifications. All cold joints shall be sealed with AR 4000W paving asphalt or approved equivalent and sanded.

5. The final trench asphalt restoration shall be completed within 14 days of commencing trench work. The City may allow for time extensions due to weather or other adverse conditions.

6. Street cuts for exploring the location of adjacent utilities are not allowed unless permission is granted on a case by case basis.

7. Trench restoration widths shall be increased to prohibit constructing a patch within a patch. This may require removing and reconstructing existing patches that are adjacent to or contiguous to the proposed trench. Trench restoration widths shall also be increased to prevent the creation of isolated sections of pavement.

8. Asphalt surfaces within the trench restoration area shall comply with surface smoothness stated in Section 5-04.3(13) of the Standards Specifications.

9. The placing of the top or wearing course of the asphalt patch shall be continuous as possible. All joints shall be in compliance with Section 5 04.3(12).

10. Asphalt paving operations shall comply with the City of Mount Vernon’s Asphalt Acceptance Standards section 3-25.

11. Asphalt repair depths shall be a minimum of 4 inches. Asphalt repairs with excess of 4-inch must match existing thickness. Please refer to the Trench Restoration Detail in Appendix A.

TRENCH RESTORATION

1. The Public Works Director shall determine the necessity of a full lane width or full street width asphalt overlay after evaluation of the severity of the street cut.

2. Street cuts that are permitted within a period of 5 years after significant asphalt improvement shall be subject to lane width or full street width asphalt overlays based on the location and length of proposed trench in the roadway cross section.

3. The width of street cut restoration shall be a minimum of 1-foot wider, on each side of the trench. The minimum width of restoration shall be 5 feet. Trench restoration located within a 24" strip of existing curb shall be restored to the lip of the gutter or roadway edge.

4. The Public Works Director may determine, in the field, that wider trench restoration or lane width asphalt overlays are required due to changes in permit conditions such as the following:

    - Trenches need to be relocated in the field due to conflict with existing utilities.

    - Additional damage to the existing asphalt surface has occurred due to contractor's equipment.

    - The trench width was increased or the existing pavement was undermined.

    - There were other significant problems discovered during construction.

3-24 Telecommunication Standards

City Fiber Conduit Installation Standards and Guidelines:

a. General

1. 4" diameter conduit minimum shall be required for all arterial roads,all other conduit installations shall be 2" diameter.
   Note: Some installations may require installation of two 4" conduits or two 2" conduits depending on the needs of the location. All conduits should be a rating of schedule 40 or better.

2. All conduit ends shall terminate in a junction box/vault, unless otherwise approved by the City. Conduit sweeps at poles shall be capped and clearly marked as "MVCF".

3. The maximum allowable length of fiber optic conduit between junction boxes/ vaults shall be 500 feet.

4. All conduit shall require an approved pull string, such as mule tape or a jet line.

b. Typical Fiber Optic Conduit Installation Locations

1. Generally, fiber optic cable conduit will be installed at a minimum depth of 30" and located within and parallel to the right-of-way boundary.

2. Proposed conduit installation and locations within designated city arterials shall be coordinated with the Community and Economic Development Department.

3. Where existing facilities are in place, new facilities shall be compatible with the existing installations and conform to these Standards.

c. As-built Requirements for Typical Fiber Optic Conduit Installation Locations

1. An as-built drawing depicting the location of the fiber optic conduit shall be submitted to the Community and Economic Development Department.

2. As-built drawing should reflect the location of right-of-way line and property corners and show the location and offset dimensions of the fiber optic conduit and junction box/vaults, as well as the depth of installation.

d. Conduit

1. All conduit and pipe fittings used for fiber optic installations shall be solid wall polyvinyl chloride (PVC) pipe schedule 40 or better.

2. Schedule 40 PVC pipe shall be required for installation under roads or other high traffic locations, e.g. commercial parking facilities.

e. Conduit Marking

1. All conduit installations shall be marked with detectable marking tape.

2. Detectable marking tape shall consist of inert polyethylene plastic that is impervious to all known alkalis, acids, chemical reagents, and solvents likely to be encountered in the soil, with a metallic foil core to provide the most positive detection and pipeline locators.

3. The tape shall be color-coded and shall be imprinted continuously over its entire length in permanent black ink. The message shall convey the type of

line buried below and shall also have the word “Caution” prominently shown. Color-code of the tape shall be orange with the message “Fiber Optic”.

f. Vaults and Junction Boxes

1. The ends of conduit shall be terminated in minimum 13”x 24” junction box/vault with minimum interior depth of 24”.

2. Each Junction box/vault shall be of Polymer Concrete (HDPC), High Density Polyethylene (HDPE), or Polymer Composite (hybrid), or other City approved underground vault.

3. Junction box/vault shall meet appropriate traffic rating and lid shall be labelled “MVCF”.

3-25 Street Lights

During civil plan review the developer for the new subdivision will contact Intolight/Puget Sound Energy who will prepare a preliminary design. Intolight will submit a street light layout to the Community and Economic Development Department for review and approval.

Guidance documents: IESNA (Illuminating Engineering Society of North America)
ANSI (American National Standard Institute)
AASHTO Roadway Lighting Design Guide

1. Neighborhood Streets requirements for street lights:
   a. at intersections
   b. at mid-block cross walks
   c. at mailbox locations
   d. at school bus stops
   e. at sags (dips) in the road where vehicle headlights do not adequately illuminate the driving surface
   f. at mid-block when the block is more than 150 feet long
   g. at other locations as deemed necessary per Engineering Services Manager upon review of proposed layout

2. Luminaire type: LED (Light Emitting Diode).

3. Watt minimum: 73 W.

4. Approved Style Heads: Acorn Style or as approved by the Community & Economic Development Department.

5. Poles: Concrete or Fiber glass poles 15-18 feet in height.

6. Arterial Streets requirements for street lights: IES (Illumination Engineering Society):
    a. No further than 200 feet apart.
    b. Arterials require Cobra style heads with flat lens.
    c. Poles: Concrete or Fiber Glass 25'-30' in height.
    d. Approved Bulb type: LED (Light Emitting Diode).
    e. Watt minimum: 133 W (larger arterials might require 200 W).
    f. At intersections (lamp brightness to be 1 ½ times brighter).
    g. At areas with turning movements (i.e. driveways).

3-26 Access Management

a. Entrance Type

Driveway cuts in the sidewalk are required. The Public Works Director may approve street entrance type access at the request of the design engineer if adequate measures are taken to address pedestrian safety.

b. Corner Clearance

To provide adequate corner clearance, the minimum tangent curb length between the nearest edge of a driveway on an intersecting side street and an arterial / collector street, or a driveway on an arterial / collector street and an intersection with a cross street shall be 50 feet.

Where the intersection is signalized or is planned for signalization, driveways shall be limited to right-turn only movements, if located within 250 feet on minor and principal arterials, and 125 feet on collectors.

When the level of service (LOS) at the project location does not meet City standards or there is a safety concern the Public Works Director may restrict access to a right-in, right-out movement.

c. Driveway Standards

1. To maintain vehicular and pedestrian safety, the width of driveway access shall be minimized.

2. Residential driveway width minimum 20 feet as measured along the bottom section, and must be located no closer than 8 feet from the property line.

3. Commercial driveway width minimum 30 feet as measured along the bottom section, and must be located no closer than 8 feet from the property line.

4. To accommodate higher than usual volumes of commercial length traffic and to accommodate site-specific topographic constraints the Public Works Director or his designee may allow wider widths.

5. Multiple driveways are allowed provided they are separated by 30 feet and must be located no closer than 8 feet to the property line.

6. The City encourages parking lot cross access for improved circulation of adjacent commercial properties.

d. Second Access

The necessity of providing emergency response to residential development requires that multiple points of access must be provided for larger developments. The Fire Department in collaboration with the Community and Economic Development Department shall evaluate and condition development on a case by case basis, based on the following guidelines:

1. Development that generates 30 peak hour trips (peak hour of the generator) or more must have at least two accesses.

2. Cul-de-sac type streets (Dead End) have a maximum length of 750 feet.

3-27 Crosswalk Policy

Marked crosswalks shall be installed at all signalized intersections where pedestrian traffic is indicated. Marked crosswalks at other locations shall not be installed unless the Public Works Director determines there is compelling evidence that the crosswalk is in the best interest of public safety and the following conditions are met:

Stop-Controlled Intersections

At least one of the following conditions must be met:

- The intersection has more than four legs.
- Two or more of the intersection legs have three lanes or more.
- The intersection is located in the central business district.

Uncontrolled Intersections, Mid-Block Locations and Trail Crossings

All of the following conditions must be met:

- Average Daily Trip is between 2500 and 9000 and
- The speed limit is 35 miles per hour or less, and
- The crossing is less than four lanes, and
- The peak hour pedestrian count is at least 25, and

- In the case of mid-block crosswalks, the crosswalk is located in the middle of the block or at least 150 feet from the nearest source of traffic turning toward the crosswalk, and
- Additional Pedestrian Activated or Warning Devices as deemed necessary per the Public Works Director may be required

See the MUTCD. All pedestrian facilities shall meet ADA requirements as specified in these Standards.

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Engineering Standards

Chapter 5
Storm Drainage

Section	Description
5-01	Drainage Plan – Design Criteria
5-02	Conveyance Systems/Pipe Systems
5-03	Materials
5-04	Structures
5-05	Frames, Grates and Covers
5-06	Water Quality Design
5-07	Detention Pond Side Slopes
5-08	Low Impact Development (LID)
5-09	S. Mount Vernon Commercial Area Detention Facility Standards

5-01 Drainage Plan – Design Criteria

Title 13.33 MVMC, authorizes the Public Works Director, with the approval of the City Council, to develop and implement administrative procedures to administer and enforce the requirements of this chapter.

Drainage facilities for projects shall conform to Title 13.33 MVMC and the Department of Ecology's 2005 Storm Water Management Manual for Wester Washington, as currently adopted by the City of Mount Vernon. These contain drainage design criteria and computational methods for sizing storm water facilities, as well as erosion and sediment control methods. In accordance with these requirements, drainage plans for development projects must be submitted to the Engineering Division of the City's Community and Economic Development Department for review and approval.

Construction, workmanship and materials for drainage facilities for City streets and roads shall conform to Division 7 of the WSDOT/APWA Specifications unless otherwise stated.

Unless otherwise approved, all new detention facilities and water quality facilities that are to be publicly owned and maintained shall be located on tracts or parcels that are dedicated to the city.

The following sections are intended to clarify, revise, or supplement existing code or existing sections of the above-stated manuals.

5-02 Conveyance Systems/Pipe Systems

Spacing between inlets or catch basins:

Road Grades	Space between Inlets or Catch Basins
Under 1%	150 feet
1% - 3%	200 feet
Greater 3%	300 feet

Note: *additional structures as needed to confine drainage to the gutter to prevent sheet flow across roadways and intersections.*

a. Storm sewer pipes shall be minimum 12-inch diameter, unless otherwise approved.

b. Pipes connecting single inlets to main storm sewer by structure, (i.e., catch basins), shall be 12-inch diameter minimum, and single inlets shall be catch basins with sumps.

c. In general, connections to a pipe system should be made only at catch basins. Wyes or Tees will be allowed on roof/footing/yard drain systems for pipes 8 inches in diameter, or less, with cleanouts upstream of each wye or tee.

5-03 Materials

The following pipe materials are acceptable:

1. Plain concrete pipe (12-inch diameter only for use as driveway culvert) [WSDOT/APWA 9-05.3(1)]
2. Reinforced concrete pipe [WSDOT/APWA 9-05.3, 9-05.7]
3. Ductile iron (water supply, Class 50 or 52) [WSDOT/APWA 9-05.13]
4. Lined corrugated polyethylene pipe (LCPE)2 [WSDOT/APWA 9-05.20]
5. Polyvinyl chloride (PVC)4 sewer pipe [WSDOT/APWA 9-05.12]
6. Solid wall polyethylene pipe (SWPE; also known as HDPE pipe or HDPP)

a. Pipe Cover

Pipe cover, measured from the finished grade elevation to the top of the outside surface of the pipe, shall be 2 feet minimum. If less than 2 feet of cover, reinforced concrete or ductile iron is required, unless otherwise approved.

Under private drainage easements and privately maintained areas subject to vehicular loading, pipe cover may be reduced if the design considers expected vehicle loading and the cover is consistent with pipe manufacturer's recommendations.

b. Storm facility access.

All public catch basins not constructed in the street section, must have an all-weather drivable surface. The all-weather drivable surface must be of adequate grade, width and surfacing to allow access by maintenance vehicles.

5-04 Structures

a. On storm sewers with depths less than five feet to the invert of the lowest pipe, catch basins may be one of the following:

- CB Type 1
- CB Type 1 –L
- CB Type 2 (48”, 54”)
- CB Type 2 (72”, 96”)

b. For public storm sewers with depths five feet and over to invert of the lowest pipe, connecting and/or inlet structures shall be CB Type 2 or 1-L.

c. On new subdivisions with curb and/or sidewalks, adequate measures shall be taken to control surface drainage from yards and roof drains so that sheet flow across roadways and walkways is avoided.

d. Runoff from roofs and footing drains shall be tight lined and connected to the street storm drainage system. Dispersion and infiltration as permissible by Department of Ecology.

5-05 Frames, Grates and Covers

a. When a structure does not function as a surface water receiver, a solid cover shall be used.

b. Where grade is 4% or greater on vertical curb and gutter, an approved vaned grate shall be used.

c. A through-curb inlet frame shall be used on arterial roadways where conditions severely limit the effectiveness of a flat surface inlet and where there is a low point within a sag vertical curve.

d. On new Type 2 catch basins not serving as inlets and access structures, a round locking ring and solid cover shall be used.

e. All solid covers and grates shall be secured with 5/8-inch Stainless Steel Socket Head Cap Screws. A coating of anti-seize thread compound shall be applied to the cap screws at time of installation.

f. Block lettering shall be embossed on the top surfaces of grates and covers as follows:
    1. "DRAIN" – 3-inch letters on all solid covers.
    2. "OUTFALL TO STREAM DUMP NO POLLUTANTS" – ½-inch letters on all grates

5-06 Water Quality Design

Water quality treatment facilities must be provided to remove pollutants from runoff prior to discharge from the subject property as required per MVMC Title 13.33 and Department of Ecology Stormwater Manual, currently adopted by the City.

Water Quality Treatment Exemption (Nutrient Control)
Projects discharging into the greater Nookachamps drainage basin are required to provide nutrient control water quality facilities.
The City will consider nutrient generating surfaces (landscaping), separately from conventional pollution generating surfaces.

5-07 Detention Pond Side Slopes

This section is intended to supplement and clarify the City of Mount Vernon requirements for detention pond side slopes and fencing requirements.

Interior Side Slopes for city maintained storm water facilities must not be steeper than 4H:1V. A perimeter fence is not required for facilities meeting the 4H:1V slopes, however a landscape strip is required. For landscape screening requirements reference MVMC Title 17, Section 93.040

Exemptions from the 4H:1V slope, may be granted for topographic constrains or when large pond volumes are required, provided safety and maintenance issues are addressed and resolved during civil plan review.

- Interior side slopes up to the emergency overflow water surface elevation shall not be steeper than 3H:1V, or where the impoundment is a wall greater than 24 inches in height. A fence need only be constructed for those slopes steeper than 3H:1V
- A perimeter fence is required if more than 10% of the pond side slopes are steeper than 3H:1V
- Pond Walls may be vertical retaining walls, provided:
    a) they are constructed of reinforced concrete;

b) a fence is provided along the top of the wall;
c) at least 25% of the pond perimeter will be a vegetated soil slope not steeper than 3H:1V;
d) the design is stamped by a licensed structural civil engineer

- For private ponds, other retaining walls such as rockeries, masonry unit walls and keystone type wall may be used if designed by an engineer. If the entire pond perimeter is to be retaining walls, ladders should be provided on the walls for safety reasons.

Maintenance for storm water facilities is a priority. As such, during the design and review of these facilities the Development Services Engineering Manager will work very closely with the design Engineer to ensure maintenance concerns such as the following are addressed:

- Minimum 6' setbacks from fences to edge of slopes for mowing of side slopes
- Minimum 6' setbacks from landscape strips to edge of slopes for mowing of side slopes
- Man-gates as necessary for safe and easy access with equipment and maintenance personnel
- Others maintenance concerns as determined by the City's Development Services Engineering Manager in collaboration with the project's design Engineer.

Exterior side slopes shall be no steeper than 2H:1V unless analyzed for stability by a geotechnical engineer.

Fencing shall be 6 feet in height black coated chain link. See WSDOT Standard Plan L-2, Type 1 or Type 3 chain link fence

Fencing Height Exception: The fence may be a minimum of 4 feet in height if the depth of the impoundment (measured from the lowest elevation in the bottom of the impoundment, directly adjacent to the bottom of the fenced slope, up to the emergency overflow water surface) is 5 feet or less.

Wood Fences are allowed in subdivisions where the fence will be maintained by homeowners associations or adjacent lot owners. Fence maintenance requirements shall be a condition of subdivision final approval, and a statement detailing maintenance responsibilities and requirements must be recorded with the plat.

Wood fences shall have pressure treated posts (ground contact rated) either set in 24-inch deep concrete footings or attached to footings by steel brackets. Rails and fence boards shall be cedar.

Split Rail Fence where only short stretches of the pond perimeter (< 10%) have side slopes steeper than 4H:1V, untreated cedar split rail fences, 4-foot minimum height may be used in place of a standard fence when approved by the Development Services Engineering Manager. Fence maintenance requirements shall be the responsibility of the property owners.

Restrictions: On slopes greater that 40%, no open ponds or biofiltration facilities will be approved. Enclosed tanks will be evaluated on a case-by-case basis with a Geotechnical report provided for review.

For Embankments, Access and other requirements not listed above please reference the most current City of Mount Vernon adopted Department of Ecology Storm Water Manual for Western Washington.

5-08 Low Impact Development (LID)

The City encourages the use of low impact development best management practices (BMPs) in the control of storm water. Designs shall be prepared by a professional civil engineer experienced in LID design.

LID designs shall be consistent with the Puget Sound Low Impact Development Technical Guidance Manual for Puget Sound. Or the most currently City of Mount Vernon adopted Department of Ecology Storm Water Manual for Western Washington.

The Engineer is required to coordinate with the Landscape professional to ensure the proposed design meets requirements. During construction, the Engineer of Record is required to provide the soils mix design for LID facilities, for review and approval before installation.

The Engineer of Record is required to certify that the facility has been constructed as approved and as shown on the as-built drawings; meeting City of Mount Vernon standards and specifications.

Maintenance of LID facilities are the responsibility of the property owner or Home Owners Associations. For subdivisions, a statement detailing maintenance responsibilities and requirements must be recorded with the plat.

LID facilities are not allowed inside city right-of-way unless specifically approved by the Public Works Department.

5-09 S. Mount Vernon Commercial Area Detention Facility Standards

Much of the commercial area in the South Mount Vernon UGA, is subject to flooding from the Maddox and Flowers creek drainages. Consequently, detention facilities in this area are allowed to be constructed above ground, with the development runoff being pumped into the facility, while incorporating a gravity release.

Due to the geographic constrains and the unique commercial value of this area, the City may accept detention facilities constructed of vertical cast in place concrete walls or other aesthetically acceptable pre-cast panels.

The following conditions apply:

1. Above ground vertical walls must not exceed 5 feet above the average adjacent developed site grade.
2. The total depth will be site dependent. However maximum depths of 8 feet are anticipated.
3. Design shall allow for natural lighting
4. Aesthetics of these type facilities will play a prominent role in the City's decision to accept a design. In addition, the exterior of these facilities must be landscaped, in compliance with City standards.
5. Operation and maintenance plans must be submitted to and approved by the City of Mount Vernon prior to acceptance.
6. All pump systems must be designed with automatic controls that prevent pumping from receiving streams into detention facilities during high water event, reducing the potential for failure.

Engineering Standards

Chapter 6
Sanitary Sewer

Section	Description
6-01	General Requirements
6-02	Sanitary Sewer Design
6-03	Main Lines
6-04	Manholes
6-05	Pipe Class – Protection – Cover
6-06	Clearances – Other Utilities
6-07	Connections to Existing System
6-08	Fats, Oils, Grease, Separation
6-09	Easements
6-10	Side Sewers
6-11	Sewer Materials
6-12	Sewer Cleaning
6-13	Testing Gravity Sewers
6-14	Video Inspection

6-01 General Requirements

These Engineering Standards set forth minimum standards for the design and construction of public and private sanitary sewer collection facilities.

Reference the Washington State Department of Ecology Criteria for Sewage Works Design and WSDOT Standard Specifications for Road, Bridge and Municipal Construction.

6-02 Sanitary Sewer Design

Type of Collection System

- All sanitary sewer collection systems shall be gravity fed.

Serve to Extreme of Property

- Ensure adjacent properties can be provided sewer service (extend to extreme of developable portion of property and design for the ultimate development of the tributary areas).

Private Sanitary Sewage Pumps

The Public Works Director, in his sole discretion, may allow isolated, topographically constrained areas within specific developments to be served by private, onsite sanitary sewer pump systems. Each system shall be designed and engineered by a qualified professional and shall comply with the Uniform Plumbing Code, Department of Ecology Sewer Design Standards as well as the Department of Labor and Industries (L&I).

If allowed, the system's maintenance and operations standards are subject to City approval and conditions related to the pump system will be place on the development as necessary.

Public Sanitary Sewage Pumps

When approved, Public Sanitary sewer pump stations shall be designed on a case-by-case basis to serve extended areas. All pump stations must be designed by a licensed Engineer to meet City standards.

6-03 Main Lines

Minimum Pipe Size

- Minimum pipe size shall be 8 inches.

Pipe Slope

a. All sewers shall be designed and constructed to provide a design velocity, of not less than 2.0 fps [feet per second], for anticipated maximum flows. For minimum pipe slopes refer to the criteria from Sewage Works Designs – DOE.

b. Maximum main line slope shall not induce velocities greater than 10 fps under daily peak flows.

Table C1-1. Minimum Slope of Sewers, by size (Assuming Full Flow)

Sewer Size (inches)	Minimum Slope (feet per 100 feet)
8	0.40
10	0.28
12	0.22
14	0.17
15	0.15
16	0.14
18	0.12
21	0.10
24	0.08
27	0.07
30	0.06
36	0.05

c. Pipe anchor blocks shall be placed where pipe slope exceeds 20% as per Sewage Works Designs - DOE.

d. Pipe slope tolerance shall be per WSDOT Standard Specifications 7-08.03 Section (2) B - Allowable Variables.

6-04 Manholes

Note: Manholes ring and cover shall conform to WSDOT Standard Plans and the City of Mount Vernon Standards. All manholes shall contain no knockouts.

a. Maximum distance between manholes shall be 400 feet.

b. All manhole covers shall be set flush with ground surface, except where otherwise designated by the City of Mount Vernon. All manholes shall have locking covers.

c. Only approved concrete adjustment rings will be allowed.

d. Existing and Terminal Manholes:

When connecting to an existing manhole, the design shall call-out all necessary revisions to the existing manhole, or if the existing manhole cannot be modified to meet the standards, the manhole shall be removed and replaced with a conforming structure unless otherwise approved. All sewer mains shall terminate with a manhole.

e. Side sewer connections are not allowed into manholes unless otherwise approved.

f. Terminal manholes shall not be channeled. Slope manhole inside bottom to provide positive drainage toward pipe, use 3,000 PSI cement concrete.

g. Maximum allowable drop in invert elevation across the manhole shall be 1.0 ft. The minimum shall be 1/10th of a foot.

h. Manhole Sizing:

<u>48” manhole:</u>

1. 2 connecting pipes, 8” dia. to 12” dia.
2. 3 connecting pipes, 8” dia. to 10” dia.

<u>54” manhole</u>:

1. 2 connecting pipes, 15” dia. to 21” dia.
2. 3 connecting pipes, 10” dia. to 15” dia.
3. 4 connecting pipes, 8” dia. to 12” dia.

<u>72” manhole:</u>

1. 2 connecting pipes, 21” dia. to 24” dia.
2. 3 connecting pipes, 15” dia.
3. 4 connecting pipes, 15” dia.

i. For other pipe configurations, the size of the manhole will be determined on a case-by-case basis.

j. The minimum angle between the incoming and the outgoing pipe shall be 90 degrees; pipe shall be radial with the center of manhole unless otherwise approved.

k. The above configurations shall provide adequate shelves and room for maintenance and performing video inspections.

l. Channels shall be centered in manhole.

m. Ladder rungs shall be placed on side of manhole with largest shelf.

n. All manholes shall be provided with an eccentric cone, unless otherwise approved.

o. Minimum manhole depths (invert to top of rim) shall be 8 ft. unless otherwise approved by the Engineering Services Manager during plan review.

p. Drop Connection:

• Minimum height of drop is 2.5'
• Maximum height of drop is 20'.
• Outside drop structure is required, unless otherwise approved.

q. Pipe Connections to Manholes:

Unless otherwise approved, flexible connectors are required at pipe connections to manhole, in accordance with WSDOT/APWA Specifications Section 7-05.3. The type of connector shall be an A-LOK flexible connector, KOR-N-SEAL by NPC, INC., or suitable equivalent.

6-05 Pipe Class – Protection – Cover

a. Polyvinyl Chloride (PVC) pipe class designation:

- All sewer pipe shall be SDR 35 PVC conforming to ASTM D3034, unless otherwise approved.

- Depth of cover over SDR35 PVC pipe shall be three feet minimum and twenty feet maximum. Pipe depths outside this range will require use of pressure class PVC conforming to AWWA C900 (dimension ratio 18 or less).

b. All buried metal pipe shall be encased in 8-mil polyethylene per AWWA C-105.

c. Building setback requirements for sewer mains:

- 10' minimum from buildings and retaining walls, or equal to depth of pipe, whichever is greater.

- 20' minimum easement shall be provided between buildings, on multi-family and commercial sites.

- When passing between any two existing buildings (residential or commercial, etc.) which are 15' apart or less, the easement width shall extend the full width between the buildings, and the depth of the sewer line shall not exceed 10'.

6-06 Clearances – Other Utilities (Call for Locates)

a. All clearances below are from edge-to-edge of each pipe.

b. Water services and sewer stubs shall have at least 5' horizontal clearance.

c. Check for crossing or parallel utilities. Maintain minimum vertical and horizontal clearances. Avoid crossings at highly acute angles (the smallest angle measure between utilities should be between 45 and 90 degrees).

d. Horizontal clearances from sanitary sewer mains:

Cable TV	5'
Gas	5'
Power	10'
Storm	5'
Telephone, Fiber Optic	10'
Water	10'

e. Vertical clearances from sanitary sewer mains:

Cable TV	1'
Gas	1'
Power	1'
Storm	1'
Telephone, Fiber Optic	1'
Water	2'

f. Where sewer crosses water main, one full length of sewer pipe shall be used with the pipe centered for maximum joint separation. Washington Department of Ecology Criteria will also apply.

6-07 Sewer Main Connections to Existing System

a. New sewer mains shall connect to existing sewer main at manholes.

b. When connecting to an existing manhole, opening shall be core-drilled, fitted with an approved connecting device and manhole base rechanneled.

c. When connecting to an existing manhole which has access less than 24" in diameter, the manhole shall be upgraded to current standards unless otherwise approved.

d. Connections to end of existing pipe:

- If end of pipe is known to have a bell, and new pipe is the same material as existing, plans can specify connection by inserting spigot of new pipe into existing bell end, with an O-ring gasket.

- If existing pipe is plain end, or must be cut, plans should specify use of an approved coupling to connect new and existing lines.

e. Approved couplings for use on sanitary sewer systems:

- Ductile iron mechanical couplings (equal to ROMAC) on ductile iron, concrete, vitrified clay, or pipes with differing materials or diameters.

- On PVC or HDPE mains, PVC or HDPE couplings with compatible dimension ratio and gaskets to connect new and existing pipes shall be used.

- When a section of existing PVC pipe is replaced by "dropping-in" a new section of PVC pipe, the connections to existing pipe shall be made with PVC closure couplings (slip couplings).

6-08 Oil / Water Separation, Grease Interceptor

Oil/Water Separator

Industrial or Commercial Businesses that regularly wash vehicle/equipment exterior surfaces or engage in engine cleaning and other cleaning operations that use acids, caustics, or other metal brighteners as part of their integral maintenance operations, must use closed loop water recycling systems, that have zero discharge. Sludge accumulations from these systems can usually be disposed of in a landfill. Check with Skagit County Health Department for details regarding the disposal.

a. Evaporator type systems meeting Air Pollution Authority requirements are also permissible.

b. Contractors must submit the maintenance and operation plan for these systems for the City's approval.

c. Miscellaneous floor drains within these businesses may discharge to the sanitary sewer system following pre-treatment for oil removal.

d. Maintain free access to the separator at all times for inspection and compliance determination sampling. A sampling tee must be located on the outlet with a minimum 18-inch drop below invert.

Whenever an industrial or commercial business generates mineral/petroleum oils exceeding 100 milligrams per liter to be discharged to the sanitary sewer, pre-treatment is required. An oil/water separation device shall be installed by the property owner as specified in the appropriate standard drawings. Selection and sizing of an oil/water separator shall be subject to approval by the Utility. Water discharged from any oil/water separator to the sanitary sewer system shall not contain in excess of 100 milligrams per

liter of petroleum oil, non-biodegradable cutting oil or mineral products, and shall be in compliance with the City of Mount Vernon regulations for discharge to the sanitary sewer.

a. Sizing of a separator facility shall be based upon maximum available flow to the separator and provision of a forty-five minute retention time in the separator at that flow, with a minimum capacity of at least 100 gallons.

b. The oil/water separator shall be covered with removable sections. Access and inspection covers, weighing not more than 30 lbs. and with suitable handholds, are to be provided directly above inspection "tee" and oil/grit collection compartments.

c. Only waste water from floor drains and covered parking areas shall drain to the separator. The location and design shall minimize or eliminate the possibility of storm water reaching the separator – ***Area over two hundred square feet open to rainfall shall not drain to the separator***. Sewage from restrooms and shower facilities shall not drain to the separator.

d. Allowable materials for construction are as follows:

   - Tank – concrete
   - Baffles – concrete, steel plate
   - Or as approved by Engineering Services Manager during plan review

e. The separator shall be located within 20 feet of drive for access by maintenance vehicle.

f. A sampling tee shall be located on the outlet with a minimum 18-inch drop below the invert. Access to the separator shall be maintained free for inspection and compliance determination sampling at all times.

g. The effluent discharged from any oil/water separator to the sanitary sewer shall not exceed 100 milligrams per liter total oil.

h. When pre-treatment is no longer required, the inlet and outlet pipes shall be permanently plugged, the separation chambers pumped out, and the vault removed, or filled with an approved structural fill or controlled density fill.

i. Vehicle fueling stations that regularly engage in the filling of vehicle fuel tanks must have a dead end sump, closed tank system to contain accidental and miscellaneous spills that occur at the fueling area during the fueling operations. The City must approve the capacity of the tank. The contaminated reservoir contents must be disposed of according to Department of Ecology standards. Discharge to the sanitary sewer will not be allowed.

Grease Interceptor

Whenever a commercial and/or retail food preparation operation, regardless of size, generates animal/vegetable fats, oils or grease (F.O.G) waste, which causes a visible sheen or accumulations in the effluent, to be discharged to the sanitary sewer, pre-treatment is required. A grease interception device and/or other biological, chemical, or other pre-treatment approved by the City of Mount Vernon, shall be installed by the owner. Effluent discharged from any grease interceptor shall not contain a visible sheen or accumulations of F.O.G. and shall be in compliance with the City of Mount Vernon regulations for discharge to the sanitary sewer.

a. Size and design of the grease interceptor shall conform to the Uniform Plumbing Code, Appendix H standards, and shall be 600 gallons except as noted by the City of Mount Vernon.

b. Fixtures in the kitchen area which discharge waste-water containing grease are to be connected to the grease interceptor. Such fixtures include dishwashers, pot sinks, range woks, janitor's sinks, floor sinks, and rotoclones. Toilets, urinals, and wash basins shall not flow through the interceptor.

c. The interceptor shall be located outside the building within 20-feet of the access drive for maintenance vehicles.

d. The interceptor shall be filled with clean water prior to start-up of system.

e. Allowable materials for construction are:
    - Tank – concrete
    - Baffles – concrete, steel plate
    - Or as approved by Engineering Services Manager during plan review

f. Access to the interceptor shall be maintained free for inspection and compliance determination sampling at all times.

g. When pre-treatment is no longer required, the inlet and outlet pipes shall be permanently plugged, the separation chambers pumped out, and the vault removed, or filled with an approved structural fill or controlled density fill.

h. Grease Interceptors shall be cleaned every six months and an invoice shall be provided to the Public Works Department. A City of Mount Vernon approved maintenance program must be posted in the kitchen area.

6-09 Easements

a. All easements shall be a minimum of 20’ in width, or twice the depth of pipe, whichever is greater. Locate sewer main 10 feet from edge of easement facing interior lot, to ensure setback from building.

b. Show easements on plans and identify width.

c. All easements with public utilities shall be granted to the City of Mount Vernon

d. Storm and sanitary facility access. Unless otherwise approved by the Public Works Director, all public storm and sanitary catch basins and manholes not constructed in the street section, must have an all-weather drivable surface constructed to each catch basin and manhole. The all-weather drivable surface must be of adequate grade, width and surfacing to allow access by maintenance vehicles.

6-10 Side Sewers

a. Side sewer stub shall extend from main line to minimum 10’ past edge of property line, with above grade cleanout outside of the dry utility easement.

b. The end of each sanitary sewer stub shall be marked with pressure treated 2x4 painted green, or a PVC pipe. All side sewers must have locator tape or locator wire buried with the pipe.

c. 4” minimum pipe diameter shall be used for single-family residential side sewers.

d. For multi-family and commercial developments, side sewers shall be sized according to the intended use with a minimum of 6” in diameter.

e. Side sewers shall connect to new main sewer lines with an approved fitting. Side sewer stubs shall run perpendicular to the sewer main in the right-of-way. Indicate station of side sewer tee from nearest downstream manhole. Also indicate the length of side sewer stub from main to clean-out and the cap at end of lateral. Call out invert at clean-out and provide finish floor elevation.

f. Minimum side sewer slope shall be 2%.

g. All side sewer clean-outs on commercial and multi-family projects shall include traffic rated enclosures for clean-outs within driving surfaces.

h. Maximum distance between side sewer clean-outs shall be 100 feet.

i. Connections to existing side sewers shall be made with pre-approved devices.

j. All side sewers shall be pressured tested. Hydrostatic Testing is preferred.

6-11 Sewer Materials

General

All materials not specifically referenced shall comply with applicable sections of ASTM, AWWA or WSDOT Standard Specifications.

Pressure Sewer Pipe

PVC pressure pipe shall conform to AWWA C900 pressure class 100 (DR 25) unless otherwise approved. Joints shall be constructed as recommended by the pipe manufacturer for pressure pipe.

PVC fittings compatible with AWWA C900 pipe, or ductile iron fittings, when allowed, shall conform to these specifications.

Fittings

All fittings shall be of the same material as the pipe unless otherwise approved.

Backwater Valve

Backwater check valve installed on side sewers shall be rubber flapper swing type check valve. Flapper shall be constructed from steel reinforced rubber with 45-durometer standard rubber hardness. Valve seat shall be at 45° angle to direction of flow. Flow area through valve shall equal full pipe area. Valve body shall be cast iron with flanged ends and bolted over to allow removal of flapper without removing valve from line.

Trench Bedding and Backfill

Gravel backfill for pipe zone bedding shall be per WSDOT standard plans and specifications.

Trench backfill shall be gravel borrow as per WSDOT Standard Specifications.

6-12 Sewer Cleaning

General

All new sewer mains between manholes must be cleaned and inspected by video prior to acceptance by the City. It is the responsibility of the developer to provide the necessary cleaning, inspection and reports.

The following standards are intended to regulate the activities of independent contractors, when working on newly installed sewer. All pipe cleaning and video inspection work will be as specified by the most current NASSCO-PACP Standards and the following:

Sewer Line Cleaning

a. Intent:

- The intent of sewer line cleaning is to remove foreign materials from the lines and restore the sewer to a maximum carrying capacity. The contractor shall be solely responsible for all injuries and property damage resulting from the cleaning activities.

b. Cleaning Equipment:

- High-Velocity Jet (Hydro cleaning) Equipment: All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel. The NASSCO Jetter Code of Practice shall be consulted as a guide for the selection of different type nozzles and recommended pressure applications for various cleaning requirements.

Material removal: Material shall be removed from the pipe at the downstream manhole and not allowed to continue downstream.

c. Cleaning Precautions:

- During sewer cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line are used, precautions shall be taken to insure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. The developer must obtain permission from the Skagit County PUD and the City of Mount Vernon Fire Dept. prior to fire hydrant use.

d. Sewer Cleaning:

- Sewer cleaning shall be performed using combination vacuum/jetter units. No manhole entry will be allowed except in extenuating circumstances and following OSHA confined space entry requirements. The equipment and methods selected shall be satisfactory to the Owner's representative. When cleaning is complete, the pipe shall be free of all dirt, grease, rocks, sand, and other debris and materials.

6-13 Testing of Gravity Sewers

Immediately following the pipe cleaning, or as directed by City Inspector, the sewer pipe installation shall be tested with low-pressure air. As per WSDOT Standards Specifications, air shall be slowly supplied to the plugged pipe sections until the internal air pressure reaches 4 pounds per square inch. The internal pressure shall be held for 4 minutes.

The City, at any time may require proof of calibration of gauges and any other instrumentation that is used as part of the testing equipment.

For side sewer testing see Section 6-10

6-14 Video Inspection

a. After installing, replacing, repairing or cleaning a portion of the public sewer the manhole/pipe sections shall be visually inspected and recorded with digital video. A representative of the City may monitor the inspections.

    - The City shall be notified a minimum of five (5) working days in advance of the inspection.
    - All repair, replacement, or alterations made to the pipe after the initial television inspection will require the contractor to provide a new inspection at the contractor's expense.
    - If, in the opinion of the City's representative, debris and or damage from the contractor's activities have affected additional manhole/pipe sections, the contractor shall provide additional inspection video at the contractor's expense.

b. The video camera used for the inspection shall be one specifically designed and constructed for such inspection.

    - The camera shall be 100% digital.
    - Any analog or NTSC video camera will be deemed unacceptable.
    - Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe.
    - The camera shall be operative in 100% humidity conditions.
    - The camera, monitor, and other components of the video system shall be capable of producing picture quality sufficient to determine condition of the pipes being inspected.
    - The camera used for television inspection shall be self-propelled, crawler-type units having 360° pan and tilt capabilities.
    - No hand winching units shall be allowed.

- The camera shall be moved through the line at a rate that allows complete inspection, stopping when necessary to permit proper documentation of the sewer's condition.
- In no case will the television camera travel at a speed greater than 30 feet per minute.

c. A device for measuring the depth of standing water shall be visible on the video at all times. The operator shall stop or reduce speed to sufficiently measure the depth of standing water. A contrasting, non-staining dye must be added to each run, prior to being videoed.

d. Distance Measurement:

- The “zero” point of the inspection shall be the centerline of the manhole where the camera is inserted.
- The footage counter shall be set accordingly by adding the footage from the centerline of the manhole to the edge of the manhole plus the camera length (or the camera length plus the camera focal length). The importance of accurate distance measurement is emphasized.
- During any inspection procedure, the video cable shall only be removed from the reel by a motorized system.
- At no time during the inspection is the cable to be removed manually, by hand.
- The television cable between the counter and the cameras shall be taught at all times.
- All cleaning and video inspection reports shall show the recorded distances to within 2 feet of the measured lineal footage.

e. Documentation of the video inspection results shall be as follows:

- Inspection videos shall be recorded and provided in MPEG format with a frame resolution of at least 640x480 pixels, and a frame rate of at least 29 fps.
- The video shall provide a clear view free of obstructions and lens obscuring damage or debris.
- Video recording shall be started after the camera is placed into the manhole and shall end prior to pulling the camera back out.
- The video shall be free of superfluous “dead space” while the operator makes initial adjustments to equipment.
- Each individual pipe run must be included in a single file, and shall be named using the following convention:
    - Upstream MHID - - Downstream MHID - - YYYYMMDD. For example, a video of a pipe run from upstream MH#A10 to downstream manhole C25 recorded on July 1 of 2015 would be named **“A10 - - C25 - - 20150701.mpg”**.

f. The following information must be provided as screen text on the video recording:

- The text should be clearly displayed on a contrasting background (e.g. white text on dark background or black text on white background).
- This text should be displayed for approximately 15 seconds or for the duration of the start-up narration, whichever is longer.
- If an inspection is being performed on consecutive pipe runs with the same setup, this information must be provided at the start of each pipe run:
    - Upstream and downstream manhole numbers
    - Pipe size
    - Pipe material
    - Direction of camera travel
    - Name of project
    - Location
    - Date and time of day
    - Contractor name
    - Operator's name

g. During video, the running screen must include the following information. The display of this information must in no way obscure the central focus of the pipe being inspected.

- Running footage (distance traveled)
- Upstream and downstream (or "from" and "to") manhole numbers of inspected pipe run.
- The end point of the inspected pipe run should be indicated with screen text for approximately 15 seconds. The ending screen text should indicate:
    - Ending footage
    - Date and time of day
    - Upstream and downstream manhole numbers of inspected pipe run

h. Video Inspection Reports shall be provided by the Contractor for each inspected pipe run.

- The reports shall provide a graphic of the pipe and indicate, at a minimum, the pipe location, including the street name, starting and ending manholes, date and time of inspection, direction of inspection, pipe diameter, material, joint length, and final inspected length.
- The report shall clearly show the distance from the centerline of the starting manhole of each observation and other points of significance such as locations of building sewers or other connections, broken or cracked pipe, separated or offset joints, vertical misalignment (sags), presence of roots, scale, corrosion, exposed aggregates, grease, sediment, debris, or

infiltration, and other discernible features or unusual conditions, using NASSCO-PACP observation codes.

- Comments shall be noted to document atypical conditions not otherwise described by the observation codes.
- A copy of each video inspection report shall be supplied to the City in PDF format in a single report per file.
- The pdf file shall be named in accordance with the same convention as the digital video file as noted in this section.

APPENDIX A

SIGNATURE BLOCK FOR COVER SHEETS

CITY OF MOUNT VERNON

COMMUNITY AND ECONOMIC DEVELOPMENT

ENGINEERING SERVICES

LAND USE # _____

PERMIT # _____

Recommended For Approval By

Signature	**Mount Vernon Fire Marshal**	**Date**
Signature	**Mount Vernon Planning Review**	**Date**
Signature	**Mount Vernon Civil Review**	**Date**

This plan sheet is approved for construction in accordance with the City of Mount Vernon ordinances and policies. This plan sheet does not imply or convey permission to construct any item unless accompanied by an approved permit covering the work. All permits must be on a City approved form reviewed for compliance to City Codes. Actual conformance of the design with applicable laws is the sole responsibility of the professional engineer whose name and stamp appear on this sheet. Acquiring, complying with and providing mitigation for all Federal, State, County, and Local laws, permits and mandates, including but not limited to the Endangered Species Act, Federal Wetland Permit, State Department of Fisheries Hydraulics Permit, Federal Flood Plain Permits, National Pollutant Discharge Elimination System Permits is the responsibility of the Developer, Landowner, and their Engineer. The issuance of this plan shall not be construed as proof of compliance with applicable laws and permit requirements.

APPROVED BY: _____ Date _____

This approval will expire in one year from the date noted above.

SIGNATURE BLOCK FOR ALL OTHER CIVIL PLAN SHEETS

This plan sheet is approved for construction in accordance with the City of Mount Vernon ordinances and policies. This plan sheet does not imply or convey permission to construct any item unless accompanied by an approved permit covering the work. All permits must be on a City approved form reviewed for compliance to City Codes. Actual conformance of the design with applicable laws is the sole responsibility of the professional engineer whose name and stamp appear on this sheet. Acquiring, complying with and providing mitigation for all Federal, State, County, and Local laws, permits and mandates, including but not limited to the Endangered Species Act, Federal Wetland Permit, State Department of Fisheries Hydraulics Permit, Federal Flood Plain Permits, National Pollutant Discharge Elimination System Permits is the responsibility of the Developer, Landowner, and their Engineer. The issuance of this plan shall not be construed as proof of compliance with applicable laws and permit requirements.

APPROVED BY:_____ Date_____

This approval will expire in one year from the date noted above.

FIRE DEPARTMENT APPROVAL

This plan sheet is approved for construction in accordance with the City of Mount Vernon ordinances and policies. This plan sheet does not imply or convey permission to construct any item unless accompanied by an approved permit covering the work. All permits must be on a City approved form reviewed for compliance to City Codes. Actual conformance of the design with applicable laws is the sole responsibility of the professional engineer whose name and stamp appear on this sheet. Acquiring, complying with and providing mitigation for all Federal, State, County, and Local laws, permits and mandates, including but not limited to the Endangered Species Act, Federal Wetland Permit, State Department of Fisheries Hydraulics Permit, Federal Flood Plain Permits, National Pollutant Discharge Elimination System Permits is the responsibility of the Developer, Landowner, and their Engineer. The issuance of this plan shall not be construed as proof of compliance with applicable laws and permit requirements.

APPROVED BY:

Signature	City of Mount Vernon Fire Marshall	Date

This approval will expire in one year from the date noted above.

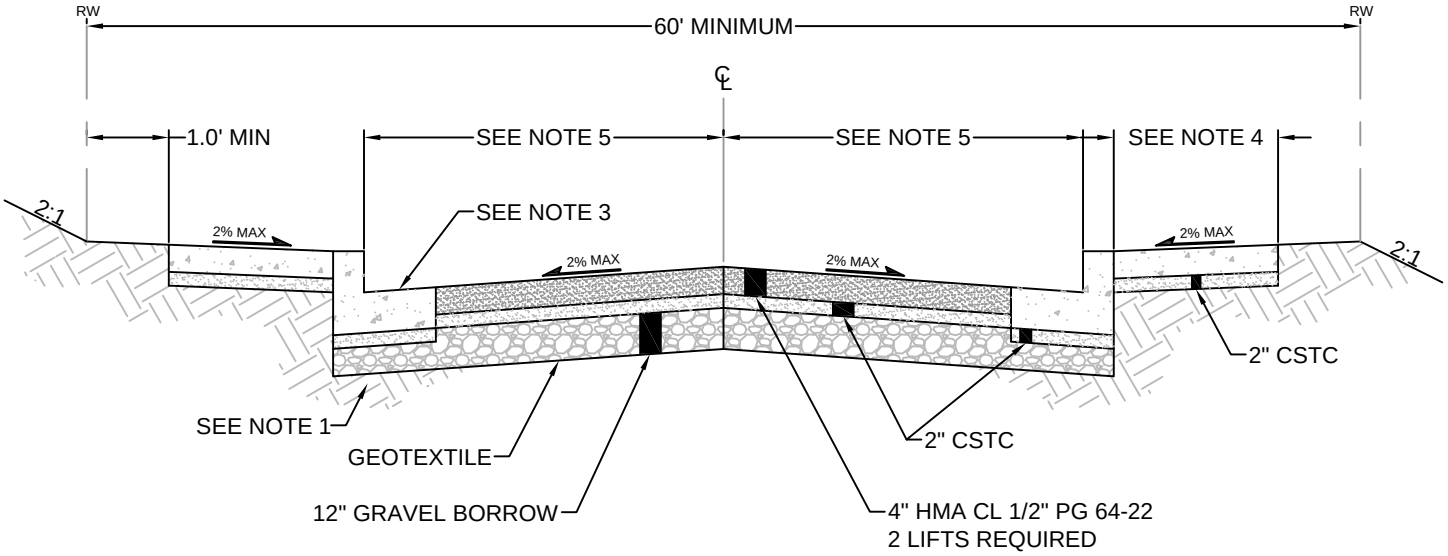
SIGNATURE BLOCK FOR MOUNT VERNON FIRE DEPARTMENT, AS REQUIRED.

City of MOUNT VERNON

SIGNATURE BLOCKS

STANDARD DETAIL	1-1
SCALE	NONE
REVISION DATE	05/16

ARTERIAL ROADWAY SECTION



NOTES:

1. SUBGRADE TO BE TESTED AND APPROVED BY A LICENSED GEOTECHNICAL ENGINEER. UNSUITABLE MATERIAL TO BE REPLACED WITH SUITABLE MATERIAL AS DIRECTED BY THE GEOTECHINCAL ENGINEER AND APPROVED BY THE PUBLIC WORKS DIRECTOR.

2. MATERIAL AND COMPACTION TESTING OF GRAVEL BORROW, CRUSHED SURFACING TOP COURSE AND HMA WILL BE REQUIRED. LOCATIONS AND FREQUENCY FOR ASPHALT AS PER CITY STANDARDS SECTION 3-22. ALL TESTING WILL BE CONDUCTED BY A LICENSED TESTING LABORATORY. HMA TO BE COMPACTED TO 92%.

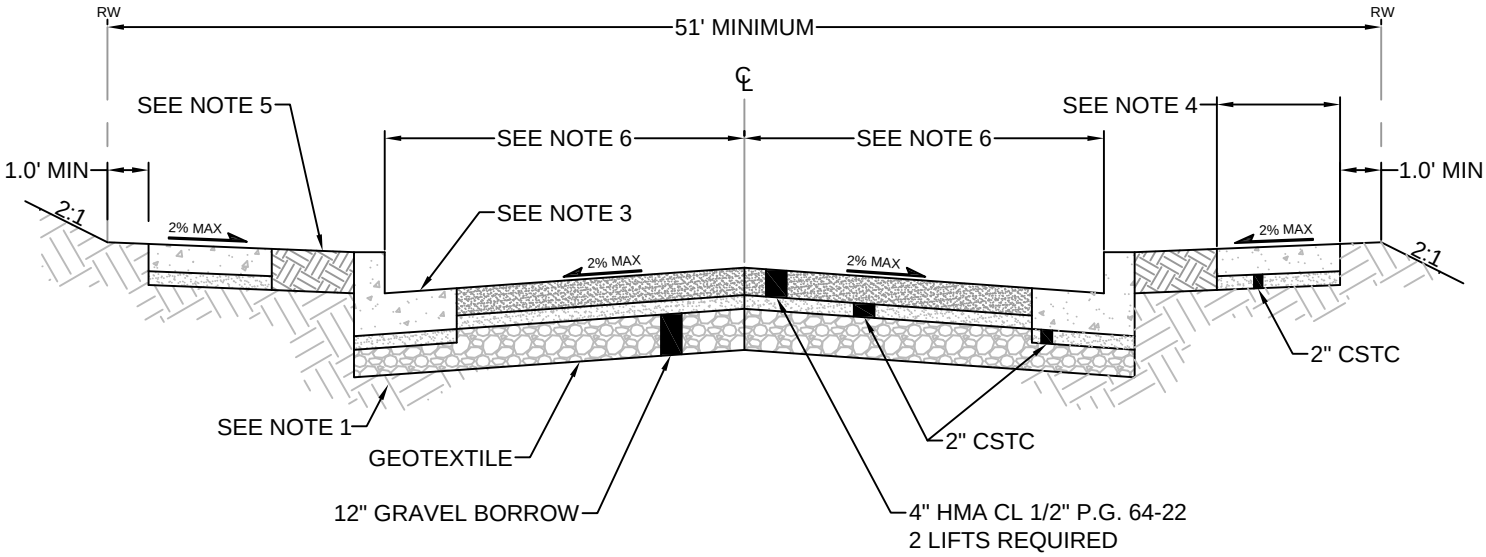
3. CEMENT CONCRETE CURB AND GUTTER AS PER WSDOT STANDARD PLAN F-10.12-03.

4. CEMENT CONCRETE SIDEWALK AS PER WSDOT STANDARD PLAN F-30.10-03. SIDEWALK WIDTH IS 6.0' FOR ARTERIAL STREETS.

5. MINIMUM PAVEMENT WIDTH AS PER CITY OF MOUNT VERNON ROADWAY CLASSIFICATIONS.
   PRINCIPAL ARTERIAL - 44.0'
   MINOR ARTERIAL - 44.0'
   URBAN COLLECTOR - 40.0'

City of MOUNT VERNON	ROADWAY SECTION DETAILS ARTERIAL STREETS	STANDARD DETAIL	3-1
		SCALE	NONE
		REVISION DATE	04/16

NEIGHBORHOOD ROADWAY SECTION



NOTES:

1. SUBGRADE TO BE TESTED AND APPROVED BY A LICENSED GEOTECHNICAL ENGINEER. UNSUITABLE MATERIAL TO BE REPLACED WITH SUITABLE MATERIAL AS DIRECTED BY THE GEOTECHINCAL ENGINEER AND APPROVED BY THE PUBLIC WORKS DIRECTOR.

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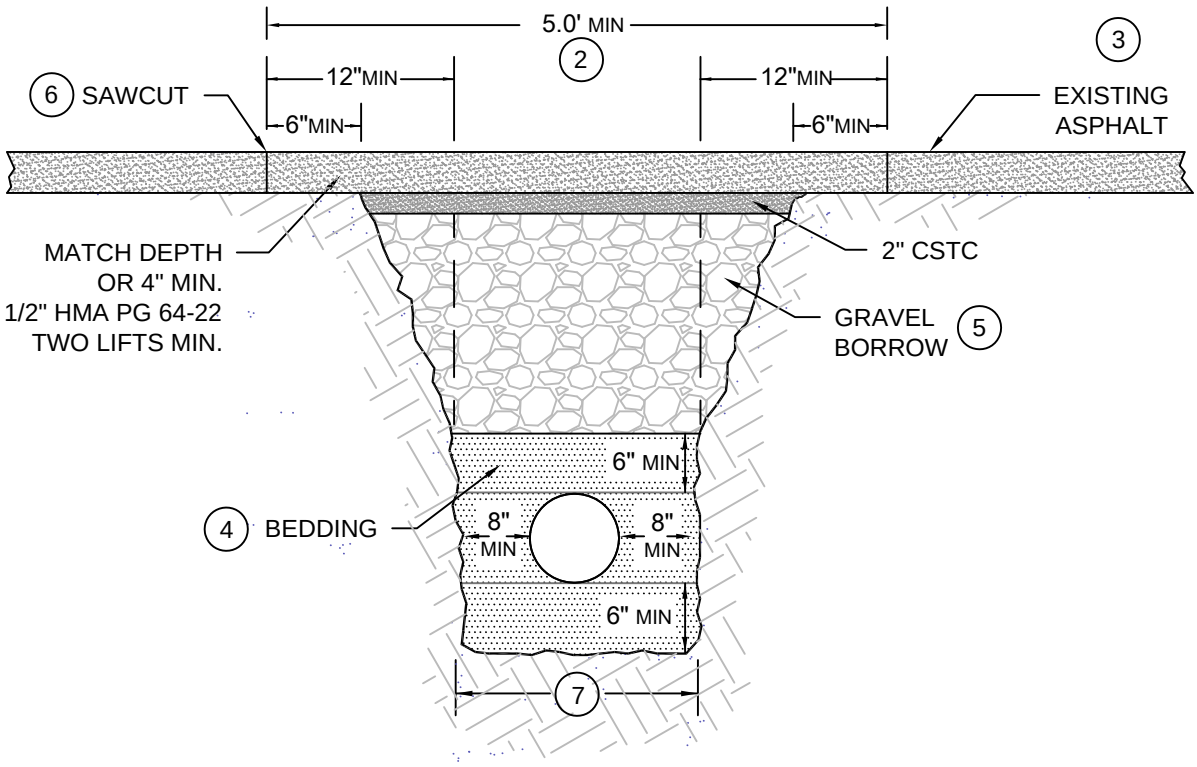
4. CEMENT CONCRETE SIDEWALK AS PER WSDOT STANDARD PLAN F-30.10-03. SIDEWALK WIDTH IS 6.0' FOR ARTERIAL STREETS.

5. PLANTER STRIP - 4.0' MINIMUM - SEED/PLANT AS PER PLANS. MINIMUM 6" LIGHTLY COMPACTED TOPSOIL.

6. MINIMUM PAVEMENT WIDTH AS PER CITY OF MOUNT VERNON ROADWAY CLASSIFICATIONS.
   TYPE 3 STREET - 32.0'
   TYPE 4 STREET - 36.0'

City of MOUNT VERNON	ROADWAY SECTION DETAILS NEIGHBORHOOD STREETS	STANDARD DETAIL	3-2
		SCALE	NONE
		REVISION DATE	04/16

ROADWAY AND TRENCH RESTORATION



NOTES:

1. ALL TRENCH CUTS AND REPAIR SHALL CONFORM WITH THE CITY OF MOUNT VERNON TRENCH RESTORATION AND STREET REPAIR STANDARDS.

2. THE RESTORATION WIDTH AS PER CITY ENGINEERING STANDARDS CHAPTER 3, SECTION 3-24. A MINIMUM OF 1 FOOT WIDER, ON EACH SIDE, THAN THE PROPOSED TRENCH. THE MINIMUM RESTORATION SHALL BE 5 FEET.

3. ASPHALT STRIP BETWEEN TRENCH RESTORATION AND EDGE OF EXISTING CURB AND GUTTER OR EDGE OF EXISTING PAVEMENT MAY BE REMOVED AND REPLACED WITH 1/2" HMA PG 64-22 OF EQUIVALENT DEPTH AT THE DIRECTION OF THE PUBLIC WORKS DIRECTOR.

4. GRANULAR MATERIAL 100% PASSING A 5/8" SCREEN, OR 5/8" CLEAR CRUSHED (NOT 5/8" MINUS) HAND COMPACTED. NO MORE THAN 3% BY WEIGHT PASSING A #200 SIEVE.

5. GRAVEL BORROW PLACED IN LOOSE LIFTS NOT EXCEEDING 8" IN DEPTH AND COMPACTED TO A MINIMUM OF 95% DENSITY. CONTROL DENSITY BACKFILL (CDF) MAY BE USED IN LIEU OF GRAVEL BASE.

6. SAWCUT AND SEAL FINISHED JOINT WITH AR 4000.

7. TRENCH LIMITS PER SECTION 2-09.4 OF WSDOT STANDARD SPECIFICATIONS.

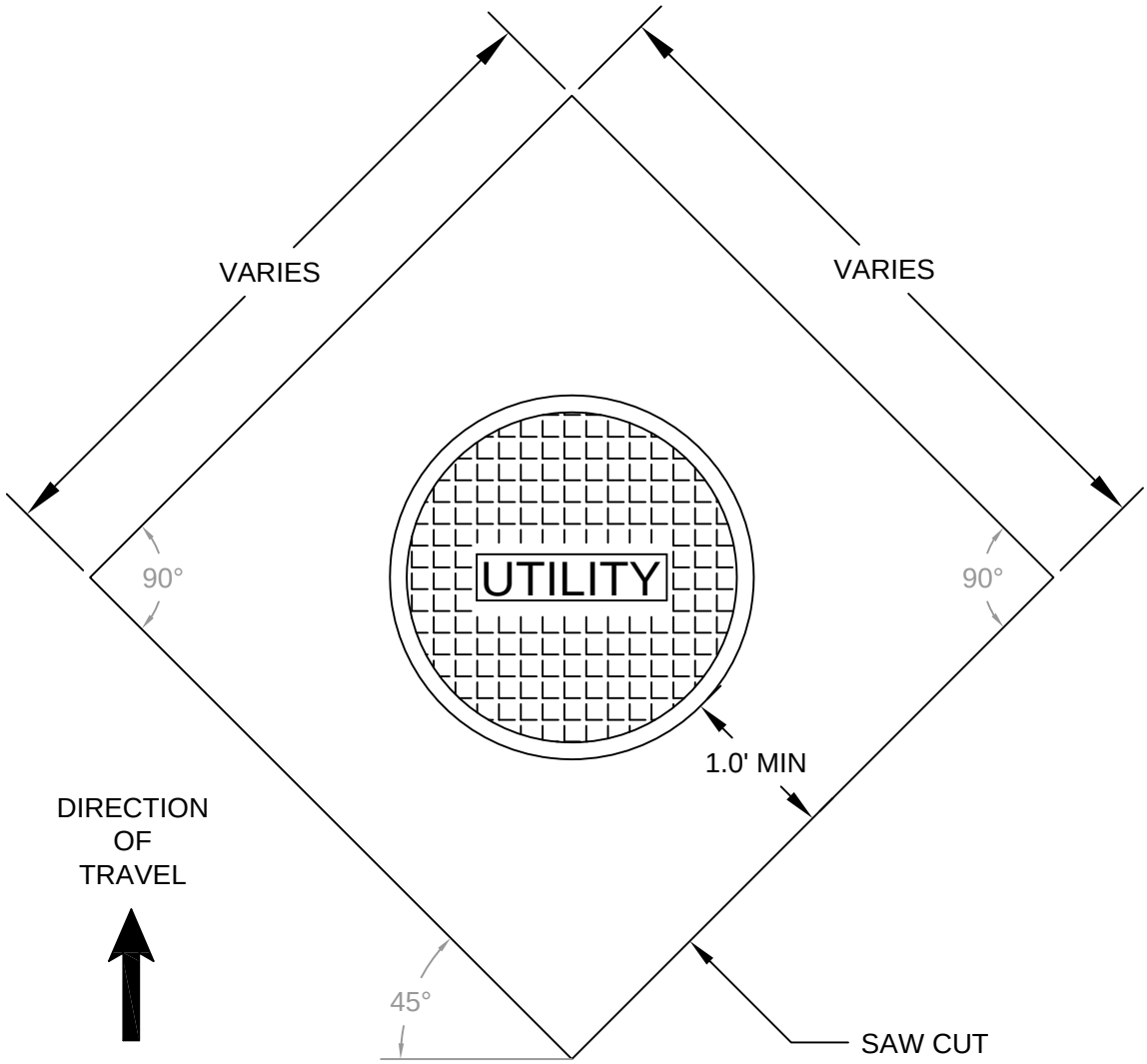
8. TRENCH REPAIR IN CONCRETE STREETS MAY DIFFER FROM THESE STANDARDS.

9. WIDTHS INDICATED ARE MINIMUMS. TRENCH RESTORATION WIDTHS SHALL BE INCREASED TO PROHIBIT CONSTRUCTING A PATCH WITHIN A PATCH. THIS MAY REQUIRE REMOVING AND RECONSTRUCTING EXISTING PATCHES THAT ARE ADJACENT TO OR CONTIGUOUS TO THE PROPOSED TRENCH. TRENCH RESTORATION WIDTHS SHALL ALSO BE INCREASED TO PREVENT THE CREATION OF ISOLATED SECTIONS OF PAVEMENT

10. TRENCH LIMITS AND STREET CUT RESTORATION WIDTH MAY BE REDUCED FOR UTILITY SIDE SERVICE LINE INSTALLATION AND REPAIR, WITH CITY APPROVAL.

City of MOUNT VERNON	ROADWAY AND TRENCH RESTORATION	STANDARD DETAIL	3-3
		SCALE	NONE
		REVISION DATE	04/16

ADJUSTING UTILITY IRON TO GRADE

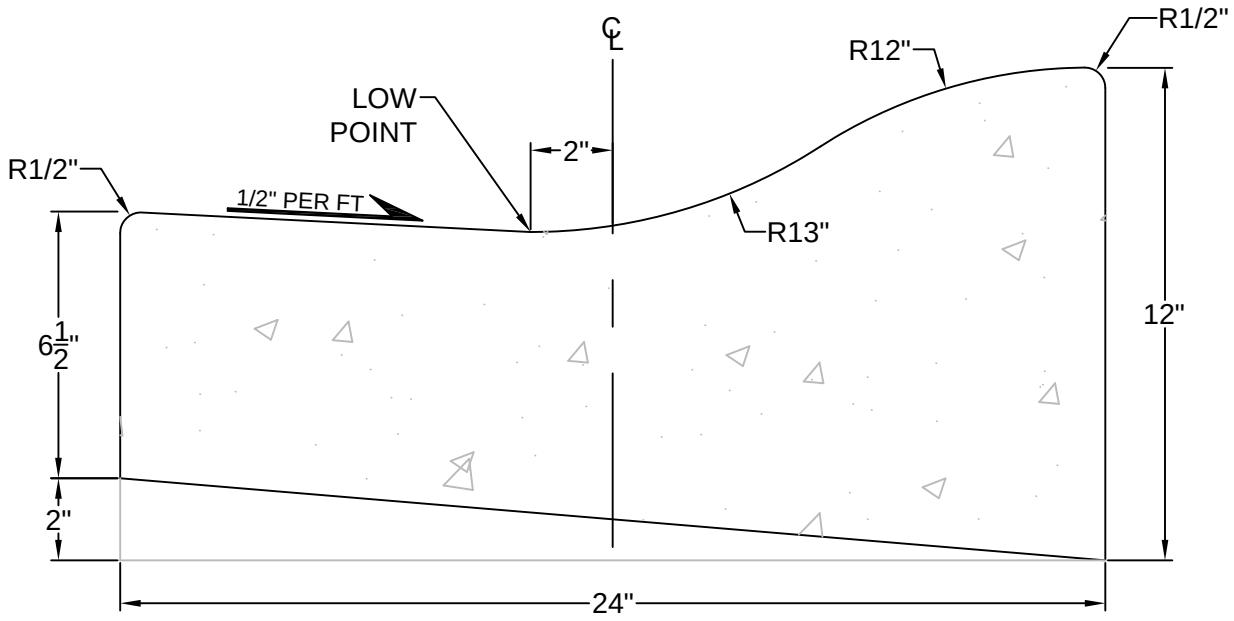


NOTES:

1. SAW CUT AND REMOVE ASPHALT FULL DEPTH TO LIMITS SHOWN.
2. ADJUST FRAME TO MATCH FINISHED GRADE USING APPROVED CONCRETE ADJUSTMENT RINGS AND APPROVED NON-SHRINK GROUT.
3. TACK ALL EDGES.
4. PLACE, GRADE AND COMPACT ASPHALT. 2.0" LIFTS, 92% COMPACTION.
5. ROLLER FINISH.
6. SEAL JOINT WITH APPROVED MATERIAL.

City of MOUNT VERNON	ADJUSTING UTILITY IRON TO GRADE	STANDARD DETAIL	3-4
		SCALE	NONE
		REVISION DATE	04/16

ROLLED CURB AND GUTTER

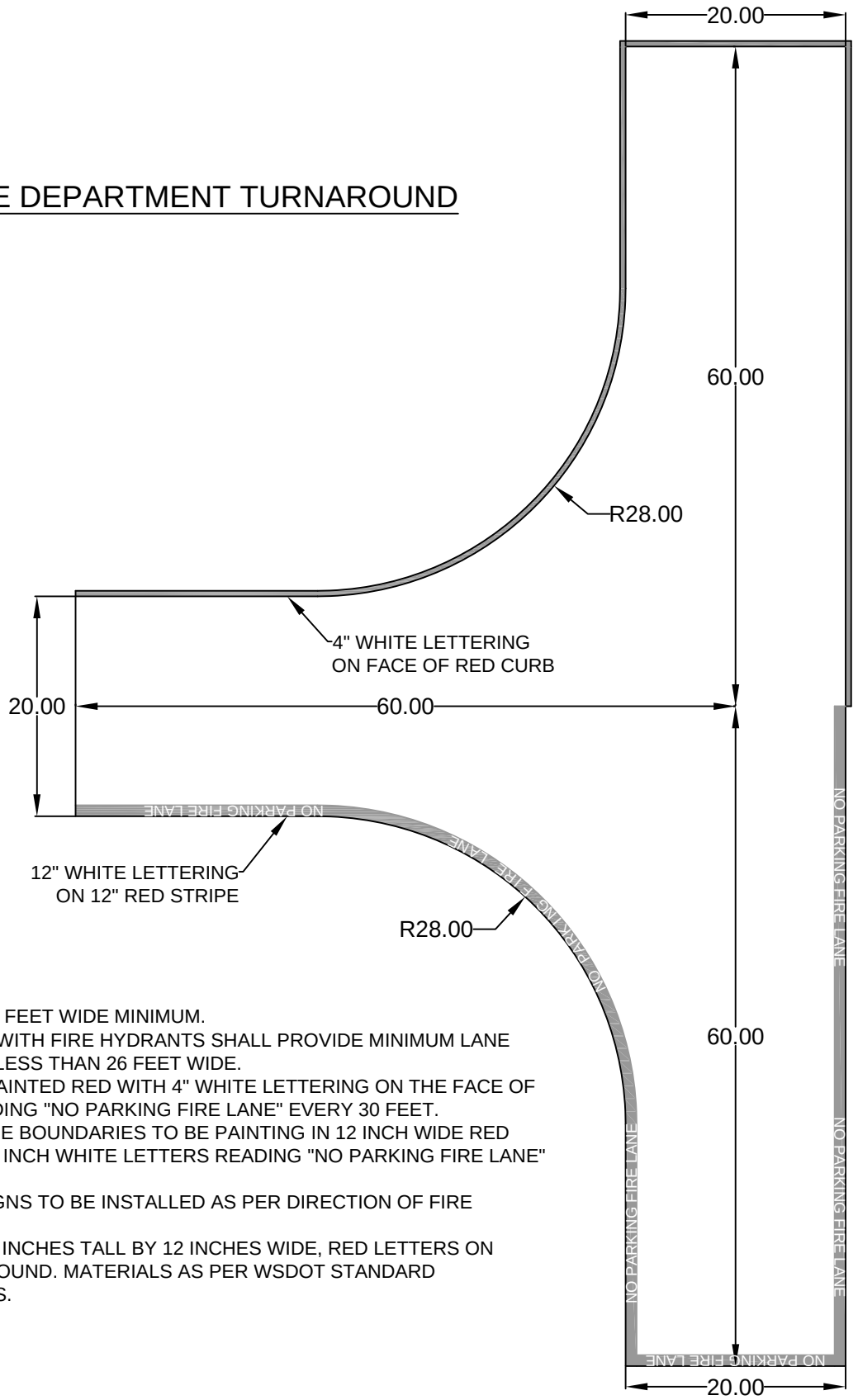


NOTES:

1. ROLLED CURB AND GUTTER MAY ONLY BE USED IN RESIDENTIAL SUBDIVISIONS AND ONLY WITH WRITTEN APPROVAL.
2. FORMS SHALL BE TRUE TO LINE AND GRADE AND SECURELY STAKED.
3. THRU JOINTS SHALL BE PLACED ADJACENT TO CATCH BASINS, INLETS, CURB RETURNS, ALLEYS, OR A MAXIMUM SPACING OF 12 FEET.
4. EXPANSION MATERIAL SHALL BE 3/8" WIDE PRE-MOLDED JOINT FILLER.
5. LIGHT BROOM FINISH.
6. ALL SIDEWALKS BEHIND ROLLED CURB SHALL BE 6 INCHES THICK OVER 2 INCHES OF CRUSHED SURFACING TOP COURSE COMPACTED TO 95% OF MAXIMUM DENSITY ON APPROVED SUB-GRADE.

City of MOUNT VERNON	CEMENT CONCRETE ROLLED CURB AND GUTTER DETAIL	STANDARD DETAIL	3-5
		SCALE	NONE
		REVISION DATE	05/16

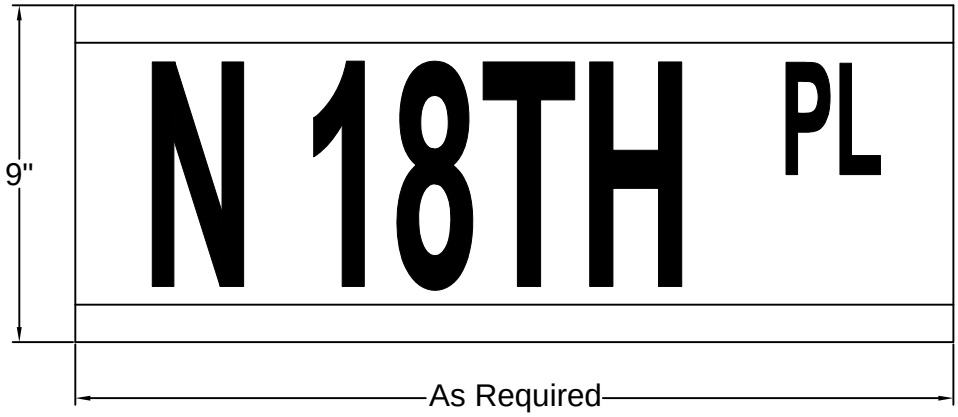
FIRE DEPARTMENT TURNAROUND

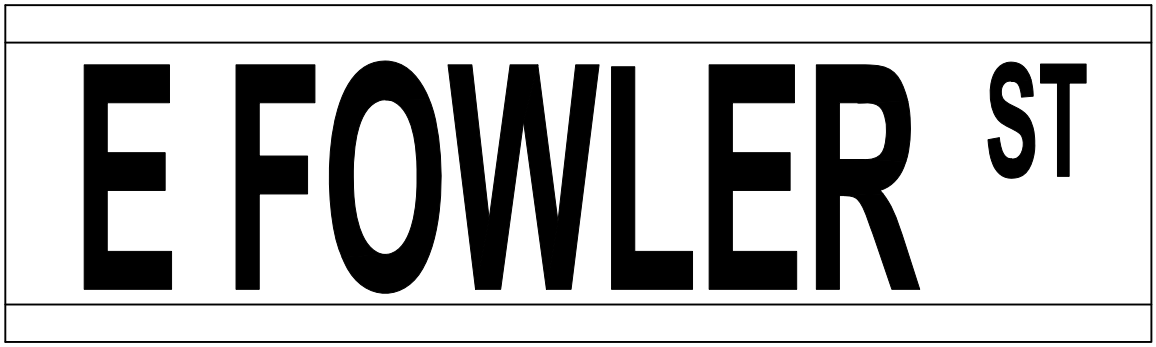


NOTES:

1. LANES TO BE 20 FEET WIDE MINIMUM.
2. TURNAROUNDS WITH FIRE HYDRANTS SHALL PROVIDE MINIMUM LANE WIDTH OF NOT LESS THAN 26 FEET WIDE.
3. CURBS TO BE PAINTED RED WITH 4" WHITE LETTERING ON THE FACE OF THE CURB READING "NO PARKING FIRE LANE" EVERY 30 FEET.
4. IF NO CURBS THE BOUNDARIES TO BE PAINTING IN 12 INCH WIDE RED STRIPE WITH 12 INCH WHITE LETTERS READING "NO PARKING FIRE LANE" EVERY 30 FEET.
5. NO PARKING SIGNS TO BE INSTALLED AS PER DIRECTION OF FIRE MARSHAL.
6. SIGNS TO BE 18 INCHES TALL BY 12 INCHES WIDE, RED LETTERS ON WHITE BACKGROUND. MATERIALS AS PER WSDOT STANDARD SPECIFICATIONS.

City of MOUNT VERNON	FIRE DEPARTMENT TURNAROUND	STANDARD DETAIL	3-6
		SCALE	NONE
		REVISION DATE	04/16

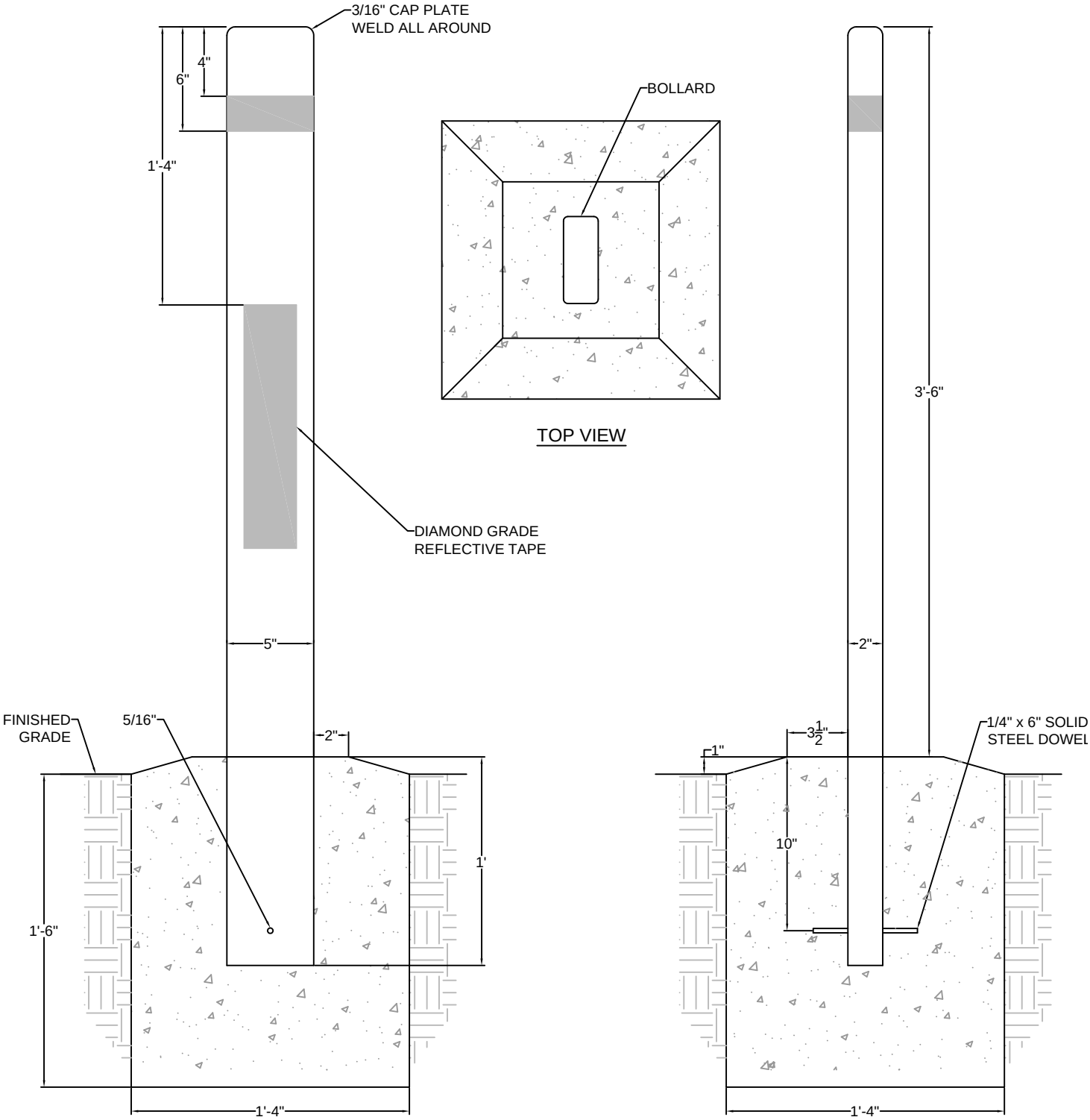




NOTES:

1. 9" EXTRUDED BLADE - .080 ALUMINUM WITH HIGH INTENSITY PRISMATIC SHEETING - DOUBLE SIDED - GREEN.
2. LETTERS - 6" AND 3" TALL CAPITAL WHITE HIGH INTENSITY PRISMATIC - FHWA SERIES C.
3. BOTH SIDES OF SIGN TO BE THE SAME.
4. LETTERING AND BACKGROUND SHALL BE HIGH INTENSITY PRISMATIC SHEETING PER FHWA SHEETING GUIDE LINES ASTM D4956-04 "TYPE" DESIGNATIONS.
5. MOUNTING HARDWARE - ZUMAR 812EX2R AND 812EX90X OR APPROVED EQUAL.
6. PRIVATE STREET SIGNS TO BE BLACK LETTERS ON YELLOW BACKGROUND.

City of MOUNT VERNON	STREET NAME SIGN DETAILS	STANDARD DETAIL	3-7
		SCALE	NONE
		REVISION DATE	04/16



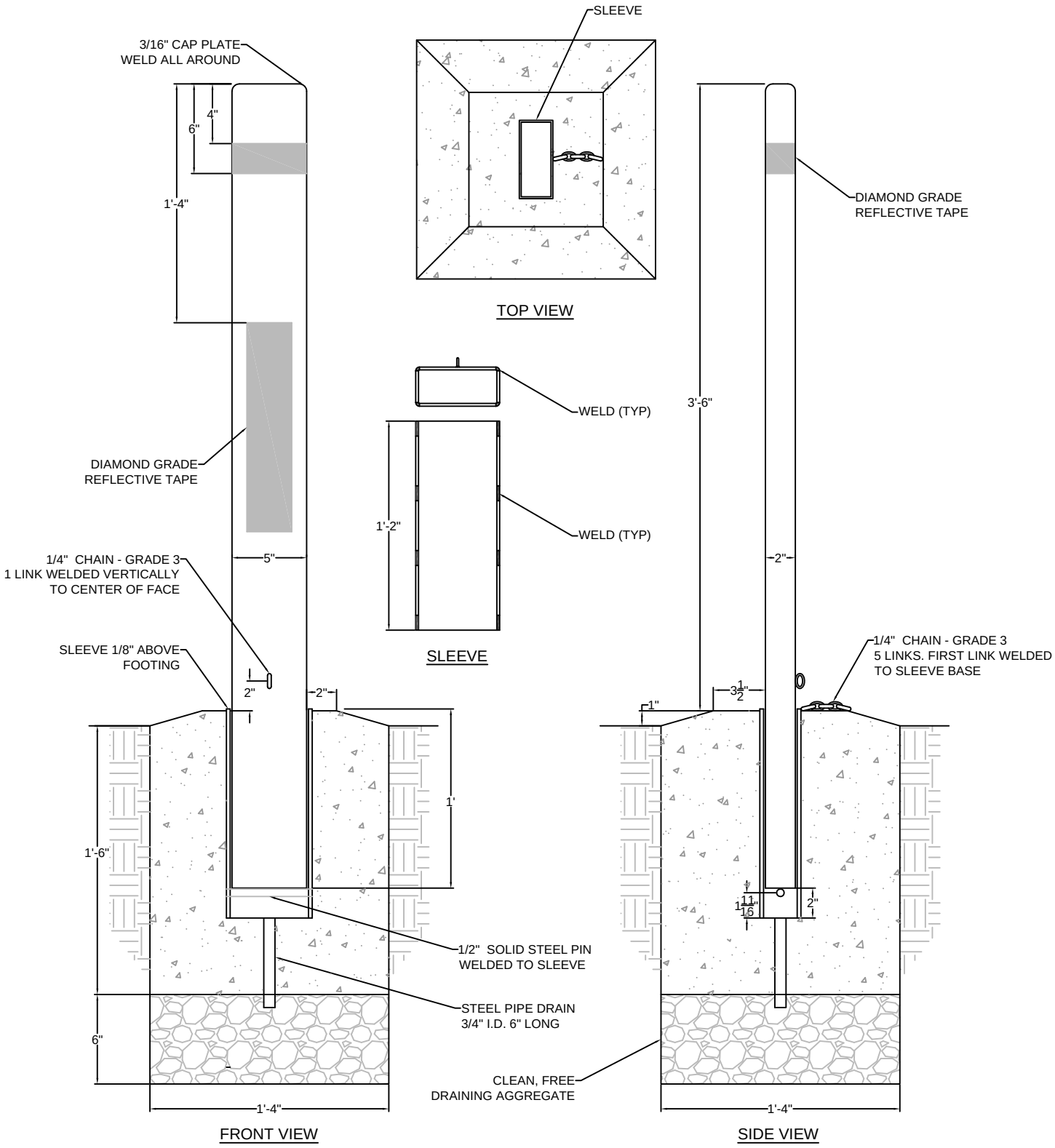
NOTES:

1. ALL STEEL SHALL BE 3/16" A36 STRUCTURAL STEEL UNLESS OTHERWISE NOTED.
2. ALL STEEL SHALL BE POWDER COATED FOREST GREEN USING CARDINAL BRAND FINISH GN03 OR APPROVED EQUAL.
3. FOOTING - COMMERCIAL CLASS (3000 psi) CONCRETE.
4. REFLECTIVE TAPE SHALL BE WHITE DIAMOND GRADE. 2" TAPE ON ALL SIDES. 3" x 14" ON TRAFFIC SIDE ONLY.

City of MOUNT VERNON

FIXED BOLLARD DETAIL

STANDARD DETAIL	3-10
SCALE	NONE
REVISION DATE	04/16



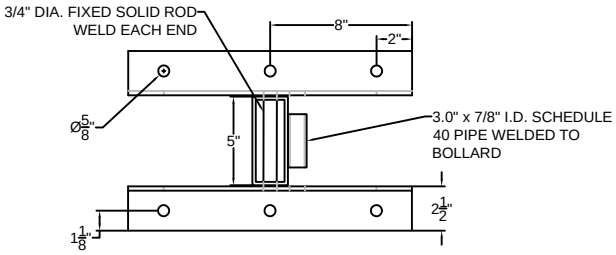
NOTES:

1. ALL STEEL SHALL BE 3/16" A36 STRUCTURAL STEEL UNLESS OTHERWISE NOTED.
2. ALL STEEL SHALL BE POWDER COATED FOREST GREEN USING CARDINAL BRAND FINISH GN03 OR APPROVED EQUAL.
3. FOOTING - COMMERCIAL CLASS (3000 psi) CONCRETE.
4. REFLECTIVE TAPE SHALL BE WHITE DIAMOND GRADE. 2" TAPE ON ALL SIDES. 3" x 14" ON TRAFFIC SIDE ONLY.
5. BOLLARD SHALL INCLUDE (1) AMERICAN LOCK MODEL A5200KZ, KEYED TO MOUNT VERNON PARKS DEPARTMENT SPECIFICATIONS BY A1 MOBILE LOCK AND KEY IN MOUNT VERNON.

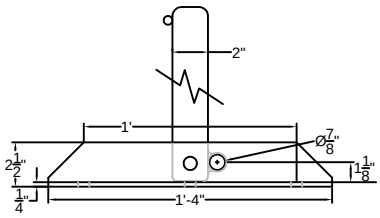
City of MOUNT VERNON

SLEEVED BOLLARD DETAIL

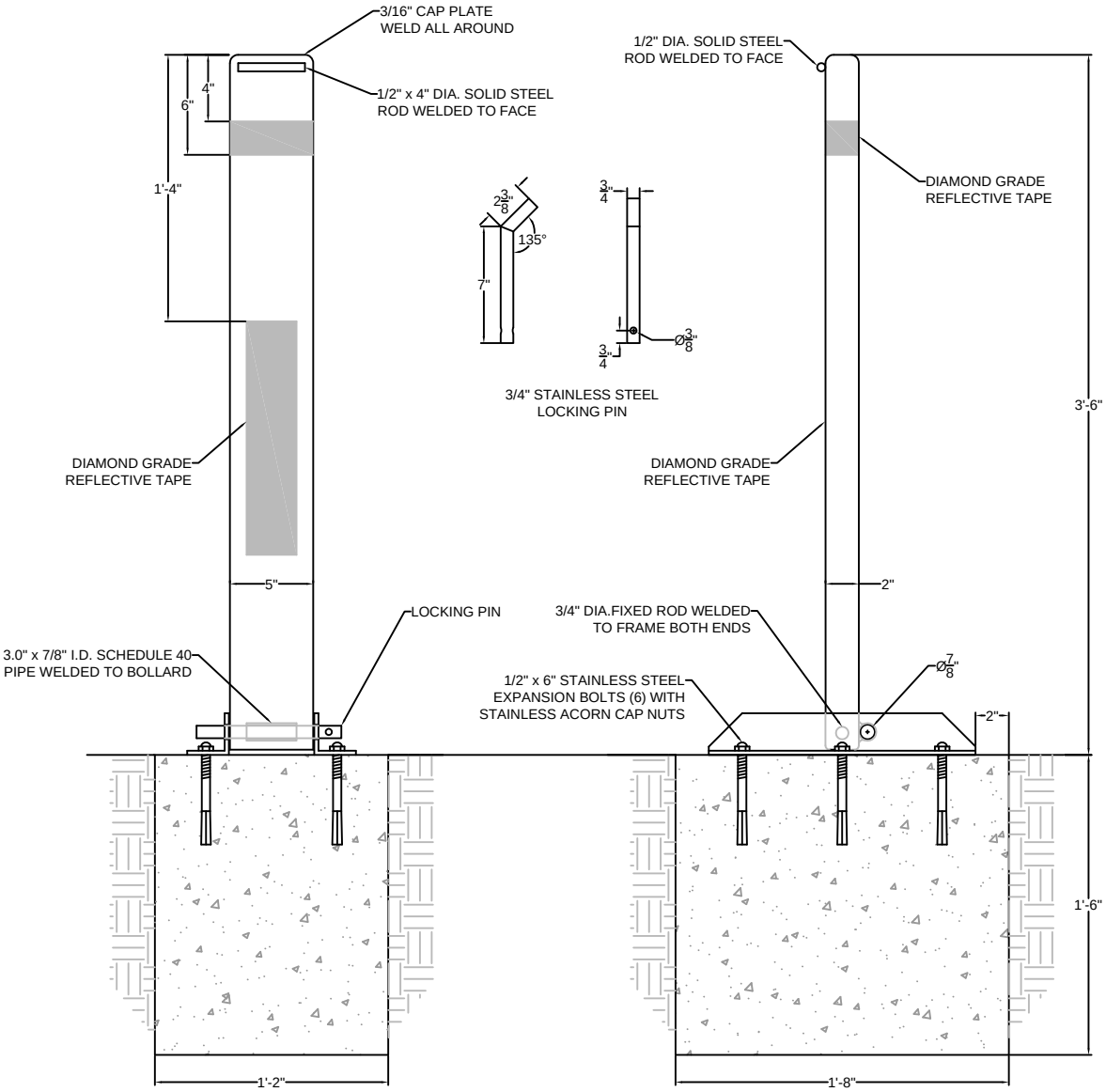
STANDARD DETAIL	3-11
SCALE	NONE
REVISION DATE	04/16



BASE BOTTOM VIEW



BASE SIDE VIEW



FRONT VIEW

SIDE VIEW

NOTES:

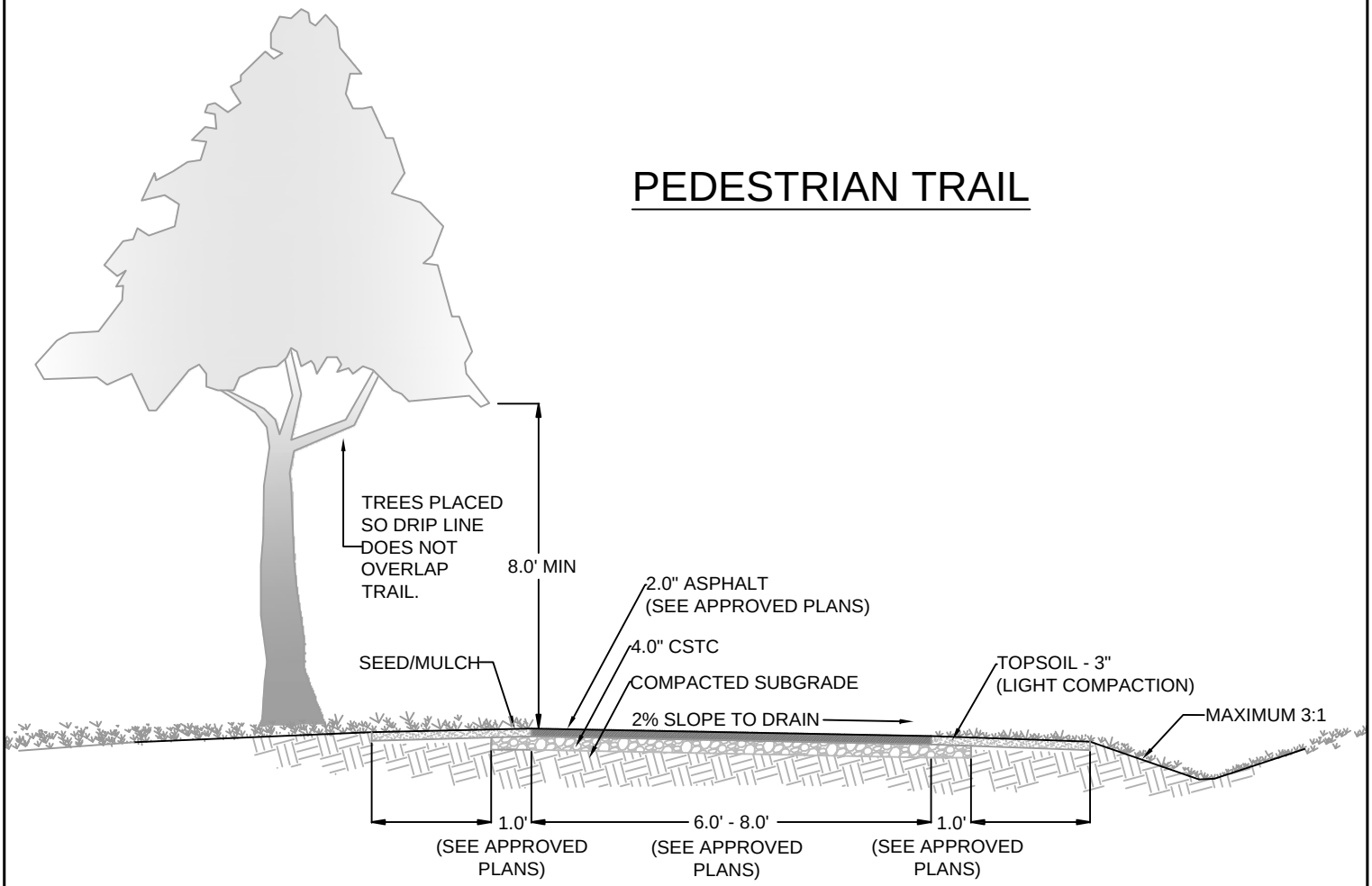
1. ALL STEEL SHALL BE 3/16" A36 STRUCTURAL STEEL UNLESS OTHERWISE NOTED.
2. ALL STEEL SHALL BE POWDER COATED FOREST GREEN USING CARDINAL BRAND FINISH GN03 OR APPROVED EQUAL.
3. FOOTING - COMMERCIAL CLASS (3000 psi) CONCRETE.
4. REFLECTIVE TAPE SHALL BE WHITE DIAMOND GRADE. 2" TAPE ON ALL SIDES. 3" x 14" ON TRAFFIC SIDE ONLY.
5. BOLLARD SHALL INCLUDE (1) AMERICAN LOCK MODEL A5200KZ, KEYED TO MOUNT VERNON PARKS DEPARTMENT SPECIFICATIONS BY A1 MOBILE LOCK AND KEY IN MOUNT VERNON.

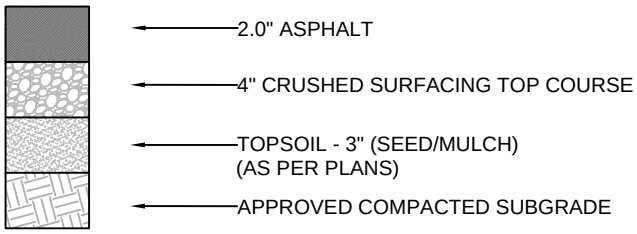
City of MOUNT VERNON

FOLD DOWN BOLLARD DETAIL

STANDARD DETAIL	3-12
SCALE	NONE
REVISION DATE	04/16

PEDESTRIAN TRAIL





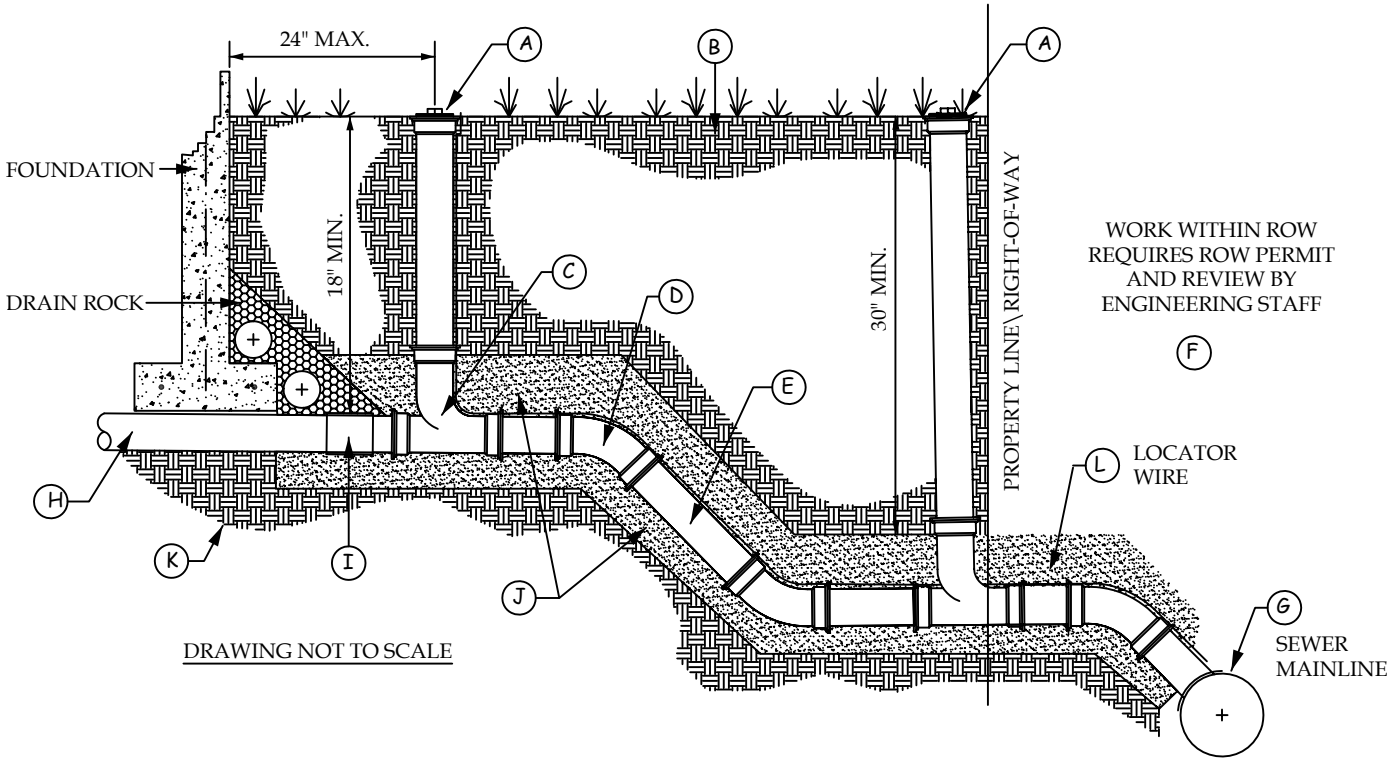
NOTES:

1. ALL DIMENSIONS SHOWN ARE MINIMUMS.
2. SIGNS ALONG THE TRAIL AND ON ANY ROAD THAT INTERSECTS MUST BE INSTALLED ACCORDING TO THE MUTCD STANDARDS.
3. GRADES SHALL NOT EXCEED 10 PERCENT.
4. SECTION SHOWN IS FOR TYPICAL CONDITIONS.

City of MOUNT VERNON	PEDESTRIAN TRAIL DETAIL	STANDARD DETAIL	3-13
		SCALE	NONE
		REVISION DATE	04/16

GENERAL NOTES

1. CALL 811 FOR LOCATES.
2. NO DISCHARGE OF SEDIMENT OR TURBID WATER TO CITY STORMWATER SYSTEM OR OFF-SITE.
3. NO DOWN SPOUTS OR OUTSIDE DRAINS ARE ALLOWED TO CONNECT TO THE SANITARY SEWER.
4. SIDE SEWER PIPE SHALL CONFORM TO PVC PLASTIC ASTM 3034. ALL BELLS MUST BE FACING IN THE UPHILL DIRECTION. ALL JOINTS SHALL BE RUBBER GASKETS; NO GLUE JOINTS ALLOWED.
5. MAXIMUM DISTANCE BETWEEN CLEAN-OUTS IS 100'. CLEAN-OUTS ARE REQUIRED FOR ANY BENDS GREATER THAN 45° ALONG WITH PRIOR APPROVAL FROM THE INSPECTOR. CLEAN-OUTS SHALL BE A CAPPED "Y". THERE SHALL BE A CLEAN-OUT A MAXIMUM OF 24" OUTSIDE OF FOUNDATION AND A CLEAN-OUT AT THE PROPERTY LINE.
6. PIPE SHALL BE BEDDED WITH PEA GRAVEL OR SAND, WITH 6" OF MATERIAL UNDER THE PIPE AND 6" OF MATERIAL OVER THE PIPE. THE BEDDING MATERIAL SHALL BE FREE FROM ORGANIC SUBSTANCES AND ROCKS GREATER THAN ½ ". THE SEWER PIPE SHALL BE AT LEAST 30" BELOW THE FINISHED GRADE AT PROPERTY LINE AND 18" MINIMUM COVER ON PRIVATE PROPERTY.
7. PARALLEL WATER AND SEWER LINES SHALL BE SEPARATED BY A MINIMUM 5' HORIZONTALLY OR 18" VERTICALLY. SEWER LINES AT ALL TIMES SHALL BE BELOW WATER LINES.
8. ALL SIDE SEWERS SHALL BE INSPECTED BY THE CITY INSPECTOR PRIOR TO TRENCH BACKFILL AND SHALL PASS A HYDROSTATIC AIR OR WATER TEST.



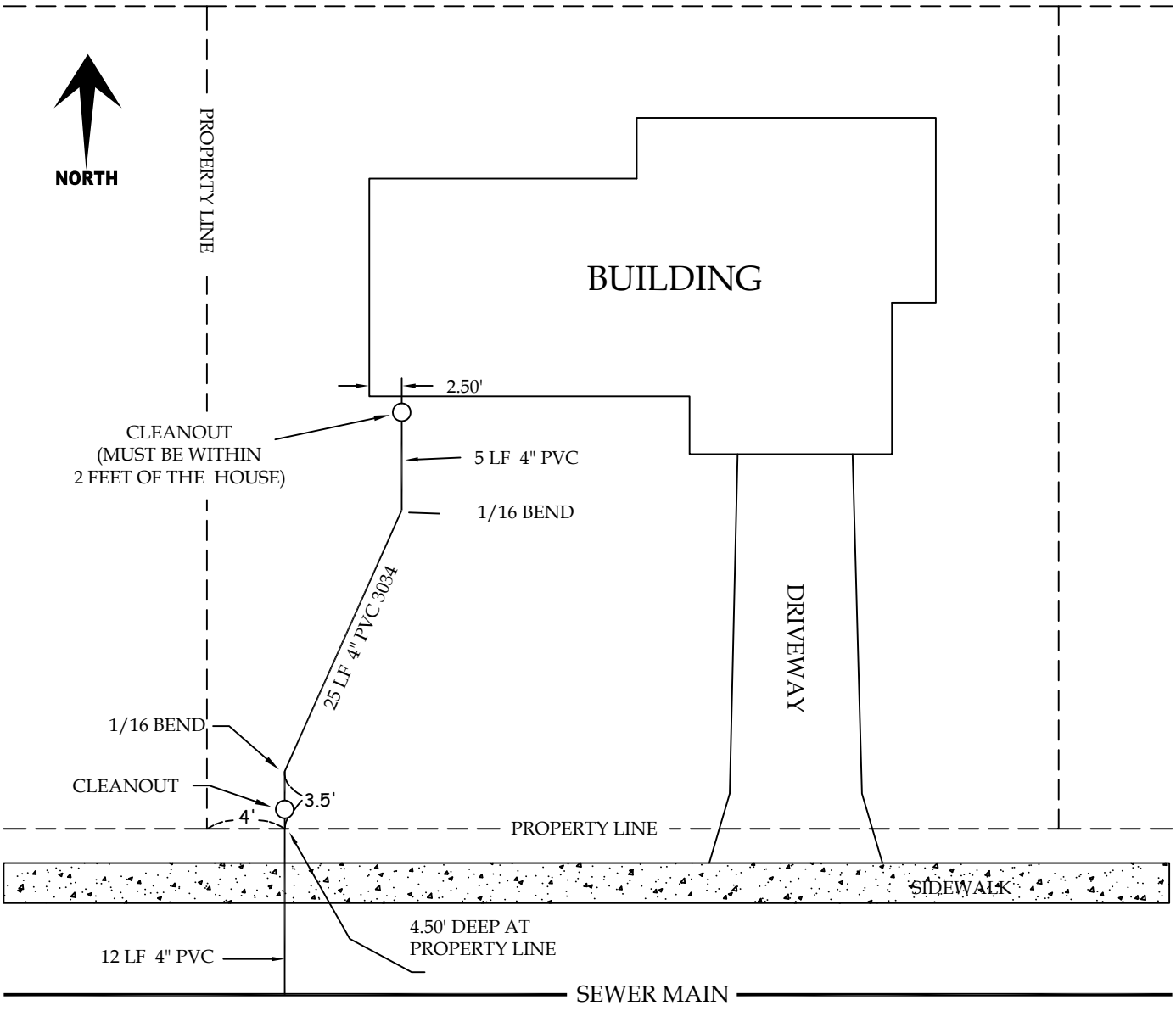
A. CLEANOUT - SHALL HAVE A SCREW-ON CAP
B. BACKFILL MATERIAL - TRENCH SHALL BE BACKFILLED WITH MATERIAL APPROVED BY THE INSPECTOR AND IN ACCORDANCE WITH THE U.P.C.
C. SWEEPING TEE
D. 45° BEND - THIS IS THE MAXIMUM ANGLE WITHOUT HAVING A CLEANOUT
E. 4" SEWER PIPE - A MINIMUM OF ¼" PER FOOT FALL IS REQUIRED
F. EXCAVATION AND RESTORATION IN CITY RIGHT-OF-WAY - REQUIRES SEPARATE PERMIT AND SHALL FOLLOW STREET CUT AND RESTORATION STANDARDS
G. CONNECTION TO THE MAINLINE - UNLESS A STUB-OUT IS PROVIDED, CONNECTION TO THE MAIN SHALL BE A PVC SANITARY "Y" SADDLE WITH STAINLESS STEEL STRAPS, CHANNELED TO DROP INTO THE MAIN LINE AT THE FLOWLINE
H. BUILDING SANITARY SEWER DRAIN LINE
I. APPROVED ADAPTER - GASKETED RIGID COUPLER
J. BEDDING MATERIAL - SEE NOTE #6 IN GENERAL NOTES ABOVE
K. UNDISTURBED EARTH
L. LOCATOR WIRE

City of MOUNT VERNON	SIDE SEWER DETAIL	STANDARD DETAIL	6-1
		SCALE	NONE
		REVISION DATE	4/18/16

PARCEL ID _____

ADDRESS _____

PERMIT NO _____



A LEGIBLE AND ACCURATE AS-BUILT DRAWING IS REQUIRED AT THE TIME OF FINAL INSPECTION.

City of MOUNT VERNON

SIDE SEWER ASBUILT EXAMPLE

STANDARD DETAIL	N/A
SCALE	NONE
REVISION DATE	4/18/16

APPENDIX B

CITY OF MOUNT VERNON
910 Cleveland Avenue
P.O. Box 809
Mount Vernon, WA 98273
Phone: (360) 336-6214 • FAX: (360) 336-6283
www.mountvernonwa.gov

REQUEST FOR DEVIATION FROM STANDARDS

INCLUDE THIS FORM WITH ALL DEVIATION REQUESTS

Permit and/or Application Number(s):

Project Name:

Requesting Individual:

Site Address:

Project Engineer *(individual's name)*:

Contact Phone: **Email:**

List attached supporting documentation. See Engineering Standards Chapter 1 Section 1-12 for required criteria.

NOTES:

- Identify the sheets on the approved civil plans which would be impacted by the deviation request
- Allow at least two weeks turnaround time for review and approval. Provide 2 sets of listed supporting documentation above.
- Include a transmittal of all items being submitted accompanied by a CD containing PDFs of supporting documents.

Owner/Agent Signature:_____ **Date:**_____

CITY OF MOUNT VERNON
910 Cleveland Avenue
P.O. Box 809
Mount Vernon, WA 98273
Phone: (360) 336-6214 • FAX: (360) 336-6283
www.mountvernonwa.gov

REQUEST FOR ENGINEERING STANDARDS REVISION

INCLUDE THIS FORM WITH ALL REVISION REQUESTS

Requesting Individual:

Company Name:

Additional Contact:

Address:

Contact Phone: **Email:**

Suggested revisions to the Engineering standards will be limited to one proposed change per every 6 months. Please list supporting documentation and/or information driving the proposed change and specify chapters and sections.

NOTES:

- Revisions to the Engineering Standards will be schedule annually in collaboration with City staff and stakeholders. Requesting parties are strongly encouraged to participate in the Engineering Standards Committee Meetings. Dates will be announced via website and/or emails
- Proposed revisions shall be submitted no later than three months prior to the scheduled date to commence review of the Engineering Standards.
- Include a transmittal of all items being submitted accompanied by a CD containing PDFs of supporting documents.

Owner/Agent Signature:_____ **Date:**_____