

## **02000 - SITE WORK**

### I. DESIGN

A. All site design must conform to the requirements of the Fairfax County Public Facilities Manual (PFM), Fairfax County Zoning Ordinance (ZO), Americans with Disabilities Act Accessibility Guidelines (ADAAG), and other governing codes and ordinances. All references for site construction and site details shall be to the PFM and/or to Virginia Department of Transportation (VDOT) standards.

#### B. Drainage

1. All storm sewer systems shall be designed for the 10-year storm event. It is recommended that all storm sewer pipes shall have no less than 1% slope, and all designs shall conform to PFM requirements. If slopes less than 1% are required, these storm sewers need to be highlighted and noted for special construction attention.
2. Drainage systems shall be designed to convey water to a natural watercourse or to an existing storm drainage facility on or off site. Outfalls of drainage systems which discharge onto adjacent property shall be in easements from the property line to either an existing easement or to a natural watercourse with bed and banks, per the PFM.
3. Overland relief shall be provided so that buildings will not be flooded during major storms. Overland relief shall be evaluated using the 100-year storm event.
4. The drainage system, including overland relief, shall be designed to account for flows from both on site and off site areas.
5. Grate inlets are prohibited on County maintained facilities unless approved in writing by DPWES-Maintenance and Stormwater Management Division (MSMD).
6. No buildings or parts of buildings, including overhangs and footings, retaining walls, or other building structures shall be constructed or placed within, or encroached upon, County storm drainage, sanitary sewer, or utility easements, unless prior approval received. In some cases, utilities can be “sleeved” under a retaining wall to prevent future maintenance issues.
7. All storm drainage pipes shall be reinforced concrete pipe with a 15” diameter minimum, unless otherwise approved in writing by the County Project Manager and MSMD. For heavy traffic bearing surfaces or deep excavation applications, RCP is required to be used.

### C. Grading

1. Buildings must be sited so that no flooding will occur even if there is a failure of the piped system.
2. The site must be graded such that if the piped system did not exist, there would be no flooding of any buildings. The site plan will be reviewed against the above standard and must conform to it.
3. The first floor elevation of the building shall be at least 18" above the 100-year water surface elevation of the flood routing.
4. The building shall be sited on a pad that slopes away from the building at a slope of 5% for a minimum of 10 feet, except for hardscape areas which should be sloped at 2%.
5. All paved and/or formed surfaces excluding equipment pads shall be designed to slope throughout their entire area for positive drainage unless otherwise noted. Sloped surfaces shall include all indoor and outdoor vehicle storage, maintenance, and parking facilities as well as pedestrian walking areas exposed to outdoor weather.
6. All intentionally level surfaces shall include provisions for drainage such as floor or trench drains.
7. Grading will be designed to provide convenient access to the storm sewer and sanitary sewer facilities for maintenance and use.
8. No plants or landscaping shall be placed where they will interfere with the drainage patterns or where they will block inlets or access. When planting trees 20 feet or closer to a building adhere to Public Facilities Manual Section 12 (vegetation, preservation and plating).
9. All grassed areas shall have a minimum slope of 2% unless otherwise approved in writing by the County Project Manager.

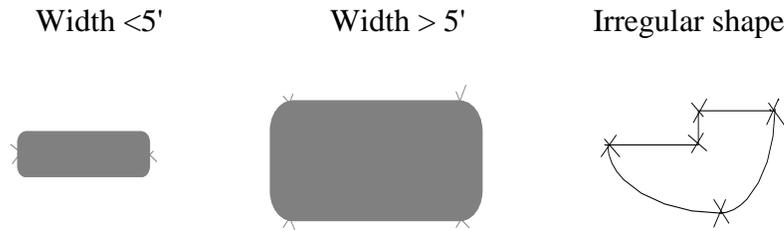
### D. Stormwater Management

1. All Stormwater Management (SWM) and Best Management Pond (BMP) facilities shall be designed for 2-year and 10-year storm events and shall pass the 100-year storm event as required by the PFM.
2. Building Design and Construction Division (BDCD)/DPWES encourages the use of innovative stormwater detention and water quality provisions including the use of rain gardens, sand filters, bioretention ponds, vegetated dry ponds, porous pavement, and conservation easements, where applicable and subject to MSMD and LDS approval. Landscaped dry ponds are preferred, subject to approval of MSMD.

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3. Landscaping at all SWM and BMP must be coordinated with and approved by County Project Manager (PM to coordinate with MSMD and LDS).
4. Refer to the latest edition of the PFM for acceptable soil mix and planting materials in the bioretention facilities:  
<http://www.fairfaxcounty.gov/dpwes/publications/pfm/chapter6.pdf>
5. Where feasible, use of curb and gutter at on-site roadways and parking areas should be minimized to encourage sheet flow to lawn areas and minimize concentration of stormwater to structures and pipe.
6. Refer to PFM for the design criteria relating to the maintenance of stormwater management facilities (detention and water quality), including the following:
  - a. Access ways to be cleared, graded, or constructed with the facility construction.
  - b. Proximity to a public right-of-way to minimize the length of the access way.
  - c. Multiple access ways for major facilities.
  - d. No plantings, fences, or other obstructions to access.
  - e. No plantings on the dam or berm of any stormwater management pond, without specific approval of the County Project Manager and MSMD.
  - f. No slopes greater than 3:1 along the edge of the access ways.
  - g. One all-weather roadway for access to major facilities.
  - h. A concrete trickle ditch is not recommended;
7. Underground stormwater detention and BMP chambers are specifically prohibited from use on County facilities. All exceptions shall be reviewed and coordinated with the County Project Manager and MSMD.
8. Spot elevations should be provided in sufficient numbers to indicate to the Contractor the clear intent of the design for site grading and top of curb elevations.

9. On parking lot islands, top of curb elevations shall be provided as shown below:



#### E. Accessibility

1. All site design shall comply with the requirements of the most current ADAAG. Any potential variance shall be brought to the attention of the County Project Manager before incorporation into the plans.
2. Accessible travel ways can not exceed a 2% cross slope, or a 5% running slope. Slopes in excess of 5% must be designed as ramps per ADAAG requirements.
3. Accessible path of travel shall be noted on the site plan from public street point of access and other site features to the main entrance.

#### F. Landscape Development

##### 1. Designer Credentials

Any firm or individual charged with the preparation of landscape plans for new or existing public facilities must submit to the County Project Manager the name of the person or persons who will be responsible for the plan preparation.

##### 2. Plant Recommendations on Fairfax County Properties

The selection of plant materials will, in general, be made from the approved list of plant materials included in the PFM. Plant materials appropriate for the particular site and location should be reviewed and selected to promote short and long term survival and not require irrigation. Common names of plants shall be included in the planting schedule for the site. Additional species may be used with approval of the County Project Manager.

<http://www.fairfaxcounty.gov/dpwes/publications/pfm/chapter12.pdf>.

##### 3. Spacing

- a. Plants shall normally be spaced so that they will touch when they achieve 2/3 of their largest potential size. This rule varies according to specific design

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objectives, but over-planting to achieve a premature "finished" look is not acceptable; nor is expanded spacing that results in permanent, unplanted, mulched areas.

- b. No woody shrub is to be planted closer than three feet from a building wall. No tree, other than columnar evergreens should be within 15 feet from a building wall.
- c. Maintain 10 feet clear around siamese connections and four feet clear around fire hydrants.

#### 4. General Suggestions

- a. Locate plants in areas that are compatible with their growth requirements, i.e., azaleas should be used in a semi-shaded, well-drained locations rather than in sunny, pavement surrounded areas.
  - b. Large mass planting beds or plants that will achieve a natural height or more than 3 feet shall not be used, except by roads, parking lots, etc. In general, such mass planting beds shall not be greater than 10 feet wide at any given continuous mulched bed. A/E shall consider CPTED principals and sight distance requirements in the site design.
  - c. Beds planted solely with low ground cover plants, such as vinca minor, hедера helix, or pachysandra, are not acceptable, except on slopes too steep to mow. Such plants (except hедера helix) shall be used in conjunction with woody shrubs. Woody ground covers such as horizontal junipers, cotoneaster, helleri holly, germander, or herbaceous materials such as liriopе, sedum, etc. are acceptable, provided no planting of a single species exceeds 12 feet in bed width. Exceptions can be made depending on specific site conditions.
  - d. All plants specified must be hardy to U.S.D.A. Zone 6. Specifications for all plant materials shall include adherence to the latest Landscape Specifications for the Baltimore-Washington Metropolitan Area.
  - e. Specifications shall identify proper preparation of beds for trees, shrubs and ground cover in order to promote best chances for survival of plantings.
5. Locations for trees and shrubs must be coordinated with wet and dry utilities, utility easements and street/site lighting (including conduit), prior to submission to LDS.
6. Specifications shall provide that all trees, shrubs and lawns are to be have warranty and be maintained by the Contractor (watered, fertilized, pruned, weeded, etc.) to ensure survival and to support the warranty for a minimum of one year after installation and acceptance of the landscaping, but not less than one year from date of substantial

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completion. Upon completion of the maintenance and warranty period, the Facilities Management Department (FMD), Building Design and Construction Division (BDCD) and the Contractor shall conduct a final walk-through of the site to ensure all plantings and lawn areas (grass) are acceptable. Minimum maintenance shall include weekly watering, as required, and spring and fall mulching.

7. The first approximately ten feet of lawn area nearest to the building on all sides shall be planted with sod. The requirement must be clearly reflected on the site plan, with an appropriate specification section included. Sod should be further extended as appropriate on a site-to-site basis to avoid narrow gaps of seeding.
8. All project specifications shall require full lawn maintenance during the one year warranty/ maintenance period from the date of substantial completion including watering, fertilizing, mulching, grass cutting, pruning, pest control, weeding of plant beds, edging, etc.
9. All new or disturbed drainage swales are to be sodded; or seeded, mulched and stabilized with biodegradable mat or fabric. Specifications for seeding and mulching must include straw mulch, to protect seed during germination period. Use of rip rap is acceptable if the stormwater volume and/or velocity may necessitate such material.

#### G. Fire Lanes and Signage

1. All fire lanes and locations of signs shall be marked on the site plan per applicable edition of the Fairfax County Fire Prevention Code and the FRD Code Reference Package. See <http://www.fairfaxcounty.gov/fr/prevention/fmpublications.htm#crp>. Contractor is to provide required signs, curb markings and pavement striping.

#### H. Screening

1. If barrier fencing is required, coordinate with Owner for acceptable fencing, that must also comply with Zoning Ordinance requirements. Black, vinyl coated chain link fencing is generally preferred at rear and side yards, where acceptable.
2. If block, masonry, stone or rubble screening or retaining walls are used, all wall elements must be securely anchored in place to prevent vandalism.
3. Screening walls and fence surfaces shall be treated with an anti-graffiti coating.

#### I. Pavement Design

1. All pavement sections for parking lots and roadways shall be designed based on CBR tests to be performed at appropriate locations during the initial geotechnical investigation. Specifications shall require the contractor to obtain additional CBR test results from soil samples at actual subgrade, and submit CBR results to engineer

for final pavement design. Design of the pavement section must accommodate the specific facility needs for types of traffic.

2. Any exterior architectural brick or stone pavers are to have a rough texture finish to minimize risk of slipping. Use of pavers is discouraged along the exterior, accessible path due to risk of displacement leading to ADA non-compliance.
3. Provide a concrete pavement extension at the dumpster pad for truck tires. Include bollards at rear and sides of dumpster location. Refer to PFM for design guides.

#### J. Site Lighting

1. Site lighting may be installed by Dominion Virginia Power or Northern Virginia Electric Cooperative (NOVEC) under the County's Municipal Street Lighting Contract; or by the General Contractor if County standard site lighting fixtures are used as approved by FMD for operation and maintenance. Coordinate with the County Project Manager. The site lighting design shall be prepared by the Architect as coordinated with the BDCD for County standards. After approval by the County and Dominion Virginia Power (or NOVEC or FMD), the site lighting is to be incorporated into the site plan by the Architect. The empty conduit for the underground cables is to be included in the construction contract in projects where light poles, fixtures and wiring are to be installed by Dominion Virginia Power or NOVEC. Architect is to prepare plats for easement locations based on approved site lighting layout, if required. All site lighting designs must comply with Zoning Ordinance Glare Standards and shall utilize sharp cut-off fixtures.
2. See Section 16000 for specifications on County standard lighting pole and fixture for small to medium size parking lots. Coordinate with the County Project Manager for possible use of LEDs.

#### K. General Requirements

1. The Architect is to notify adjacent property owners of submission of site plan per DPWES- LDS and Zoning Ordinance requirements.
2. Specifications shall require that the Contractor retain a testing agency to perform all site work testing and inspections more than 5' outside the building footprint. The Contractor shall not use the same inspection firm as the County retains for Special Inspections program.
3. The water meter must be properly sized to avoid unnecessary cost of purchasing an oversized meter. The plans must note that the Owner will pay for the water meter and gets a receipt, and the contractor is responsible for the pick up from the Water agency and the installation.

4. The minimum horizontal between water mains and appurtenances (including but not limited to service lines, meter boxes, valve boxes, and hydrants) and gas mains shall be 5 feet. When a water main or appurtenance crosses a gas main, either above or below, a minimum vertical clearance of 12 inches is required. When a concrete pad is required by the pipeline company, the water main shall be routed around the concrete pads, using 4-45° horizontal bends. The requirements shall further be coordinated and verified with the water authority and utility companies as applicable on a project by project basis.
5. The geotechnical report for projects located in problem soils must be submitted for the review and approval by DPWES Land Development Services (LDS) prior to completion of the Design Development phase.
6. All utility company easements, new and existing, must be shown on the site plan. The Architect shall prepare and submit to LDS stamped mylar originals for all on-site and off-site easement plats for review and approval by the end of the design development phase. All easement plats are to be prepared in the DPWES standard easement plat format, and all plats must be finalized and approved by Land Acquisition Division (LAD) by the 50% CD stage. It should be noted that easement plats are required for sanitary and storm sewer facilities located on Fairfax County owned properties that convey off-site flow, and that Fairfax Water (or the appropriate water agency) easements must be recorded before inspections will be made by Fairfax Water (or the appropriate water agency). Easements are also required for Dominion Virginia Power, Verizon, Cable and telecommunications lines, but not during site plan review. All easements must be coordinated with site improvements including landscaping.
7. Building corners are to be tied to property lines, using survey coordinates on the site plan (geometric layout plan).
8. Identify the service entry conduits for telephone, cable television (CATV), computer/data (I-NET), and electric into the appropriate room of the building. Provide two four-inch conduits each for all Verizon (telephone) and Cox (CATV and I-NET) from the main telephone room to the property line. Coordinate all new utility services and relocations, and identify all existing and proposed utility locations on the site plans, and coordinate with all landscaping.
9. Utility meters, transformers, generators, and service yards and the like are not to be located at the front of the facility, and must be screened from view, where appropriate.
10. Delivery doors must be heavy duty and provided with curb cut for materials delivery.

#### L. Sidewalks and Trails

1. A minimum of two (2) feet is required between the trail edge and any vertical obstructions such as trees, utility poles, signs, or other obstacles.
2. All vegetative material within a clearing envelope of at least 10 feet high by 10 feet wide shall be removed prior to trail construction.
3. The minimum allowable longitudinal slope for trail construction shall generally be no less than one percent (1%). Maximum longitudinal slopes shall meet ADA standards and shall not exceed 5%, or 8.33% if designed as a ramp with handrails. The allowable transverse (cross) slope is 2.0%.
4. If longitudinal slopes on concrete sidewalks are equal to or in excess of three percent (3%) and when the underlying soil has 34% or more passing the No. 200 sieve and has a PI of 13 or less, Fairfax County Standard UD-3 sidewalk under-drain shall be installed.
5. Side slopes adjacent to sidewalks and trails shall not exceed 2:1.
6. All storm pipes associated with sidewalks and trails shall be reinforced concrete pipe, except for UD-3 sidewalk under-drains, where required by PFM.
7. Generally, 20 feet shall be the minimum allowable turning radius on sidewalks and trails. However, the actual minimum allowable turning radius shall be computed by the design engineer based on expected use and site conditions.
8. Provide a paved surface from all emergency exits leading away from the building to a paved area of refuge.

#### M. Termite Control

1. The A/E shall provide recommendation whether the termite control may be necessary for each project.
2. If termite control is necessary, the specifications shall require that under the slab termite control be provided with a one-year warranty from the date of substantial completion.

#### N. Accessible Design

1. Provide easy and direct access to all facilities.
2. Provide proper accessible circulation in/around a bus shelter.

3. Provide continuous accessible path of travel from building entrance to immediately adjacent bus stops and streets crossings.
4. Consider line of sight issues, including signs and sign placement, in all pedestrian access to and from the building.
5. In buildings with multiple functions and where separate entrances are provided for each function, each function shall have an accessible route and entrance.
6. When providing alternate accessible entry points to a room or building, consider the proper signage directing people to the ramp or entry point.
7. Consider two or more exterior accessible evacuation routes for emergency egress away from building.
8. Carefully consider use of pavers for accessible routes in conjunction with DPWES. Pavers tend to settle and create a maintenance issue. If a textured surface is desired consider other materials such as stamped concrete.
9. Consider population to be served when determining amount of accessible parking spaces to be provided. (Example: Senior Centers).
10. Provide accessible parking spaces adjacent to, or as close as possible to the building.
11. Consider accessible seating at the site/parking lots for rest areas. Consider accessible picnic tables to double for lunchtime/break use. Be mindful of curbs surrounding the area (access from parking lot by wheelchairs).
12. Accessible routes through a parking lot must comply with ADA slope requirements. Parking lots may have up to 10% grades but the accessible routes are limited to 5% running slope, 2% cross slope and 8.33% slope if ramped with handrails.
13. Design curb ramps so that drainage and debris do not collect at bottom of ramp. Do not place obstructions (drainage grates/inlets, trash cans) in the travel path. Pay careful attention to passenger drop off areas.
14. Any crossing signals adjacent to a County facility should be reviewed and coordinated with VDOT for length of crossing time.
15. Replace older (non-compliant) curb ramps that provide direct access to County facilities, including those immediately adjacent in the VDOT right-of-way.
16. Sidewalks should be a minimum width of 5' from the accessible parking area to the entrance(s) of the building.

17. Consider raising any crosswalk elevation to meet the sidewalk elevation. (Creates a subtle speed bump for drivers).
18. All crosswalks should be perpendicular to the roadway.
19. Provide an accessible path and parking for each program area of buildings with multiple entrances for different programs.