Guide to the
Single Family Site Development Process

City of Virginia Beach
Planning Department
Development Services Center (DSC)
(757) 385-8277
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Guide to the Single Family Site Development Process

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INTRODUCTION

The following guidelines apply to single family development and other improvements proposed on residential properties being reviewed by the Development Services Center (DSC). These guidelines do not supersede, but are used in conjunction with, the Public Works Specifications and Standards, the Virginia Erosion and Sediment Control Handbook, and City Development Ordinances.

The purpose of these guidelines is to provide the City review staff, design consultants, property owners, and contractors with a concise document that explains the broad scope and details of site plan requirements, drainage design, construction and maintenance on properties, whether new development, infill, or redevelopment. The accompanying Review Process, Documents and Required Notes are designed to clarify the plan requirements and minimize the time and effort necessary to gain plan approval. Close adherence to the Checklist and Required Notes by the consultant, owner and builder is essential for a successful project.

Site plans for single family homes are reviewed by the DSC staff when a drainage or subdivision construction plan was not previously approved for that site. NOTE: There is a separate process for single family site plans located in the Chesapeake Bay Preservation Area (CBPA) Resource Protection Area (RPA). The city staff reviews for compliance with city ordinances, regulations, procedures, standards and policies and to help ensure that the proposed construction will not have a detrimental effect on the surrounding properties, neighborhoods, and environment. Under these guidelines, multiple single family sites that share drainage and/or access facilities will be reviewed under the multi-lot site plan.

These guidelines include reference to and excerpts from the governing ordinances, specifications and other documents. For more detailed information, it is suggested that the user refer directly to the referenced document.

DESIGN PRINCIPLES AND GOALS

Site Drainage (Stormwater)

Many infill and redevelopment properties are located in subdivisions or areas without adequate drainage systems designed to handle intense storm events and treat runoff for water quality. In order to encourage development and redevelopment that is consistent with the City of Virginia Beach’s mission of enhancing the physical quality of the community, the following goals have been established relating to site drainage:

- Minimize runoff by minimizing the impervious cover, if applicable;
- Maximize the use of infiltration where soils are suitable, if applicable;
- Maintain the natural contours and vegetation of the land whenever possible;
- Minimize fill and the use of retaining walls;
- When fill and/or retaining walls are needed, ensure that it does not block runoff presently crossing or entering the property;
- Ensure that runoff does not drain onto adjoining properties; and
- Direct runoff to an improved, publicly or privately maintained system.
Site Utilities (Water and Sanitary Sewer)
Most single family sites are served by public water and sanitary sewer systems. Several sites, however, both in the urban and rural areas of Virginia Beach utilize private wells and/or septic systems. In all cases, it is critical that the site plan clearly shows how the residence will be served by water and sanitary sewer systems. Many properties have stood vacant for years due to lack of these services. The availability of public service cannot be assumed, even in densely populated areas. Verification of the existence and adequacy of these public services must be determined prior to site plan approval. Likewise, the ability of on-site soils to accept septic drainfields and the use of potable wells cannot be assumed. Well and septic issues must be addressed and approved by the Virginia Department of Health, prior to approval of the site plan by the DSC.

Staff Review of Single Family Site Plans
DSC staff is tasked with reviewing and approving hundreds of single family site plans each year. It is the design consultant’s responsibility to ensure that adequate consideration of the on-site and off-site conditions are accommodated in the design, calculations and supporting information. If problems occur, either during or after construction, that were not adequately addressed on the site plan, the consultant and permit holder (builder, owner, etc.) will be responsible for correcting the situation.

Staff Review Procedures
- **DSC staff** will perform a minimum check on the following items. Other items may be added as-needed:
  - Comparison of site plan with resources available on City’s (internal) GISWeb:
    - Zoning
    - Air Installations Compatible Use Zones (AICUZ)
    - Flood Zone
    - Watershed
    - Legal description
    - Plat recording information
    - Recorded plat (must be a legally created lot)
    - General shape and size of property
    - Capital Improvements Program (CIP) projects in the area
    - Soils (for infiltration of stormwater)
    - Public water availability
    - Public sanitary sewer availability
    - Existing improvements on-site
    - Existing improvements on adjoining sites
    - General topography/drainage in the area
    - Improvements on public property, rights-of-way and easements

  - Review of required information on the site plan (see checklist and required notes)

  - Review of Design:
    - Drainage, grading and Stormwater Management Facility (SWMF) design
    - Verify plan does not negatively impact the adjoining properties (drainage issues)
    - Driveway and driveway apron type, width and slope
Street improvements, ditch, curb & gutter, shoulder, etc.
Any construction on adjoining properties (requires written permission from adjoining property owner)
Erosion and Sediment (E&S) controls

- **Zoning staff** checks for compliance with all zoning requirements, including but not limited to, setbacks, building coverage, variances, etc.
- **Public Utilities** reviews for water and sanitary sewer availability and adequacies and provides cost estimates for taps.
- **Waterfront Operations** will determine if a Joint Permit Application (JPA) or Wetlands Board approval is needed.
SITE PLAN REVIEW PROCESS FOR SINGLE FAMILY SITES

1. Site Plan Submittal for Review: The applicant will submit the following to the DSC:
   - DSC submittal checklist
   - Thirteen (13) folded copies of the site plan including the Landscaping Plan
   - Six (6) copies of the project narrative
   - Two (2) copies of drainage/CBPA calculations
   - Two (2) copies of Water Resource Recovery Fee Computation Sheet (DFU) (if applicable)
   - Two (2) copies of AWWA Water Customer Data Sheet (Figure 4-5) (if applicable)
   - Review Fee
   - If the plan includes a private sewer force main, two (2) additional copies of plan are required with each submittal (Return to Flowchart)

2. Intake Process: The DSC technician will login the plan submittal, create the file folder and route the plans.
The site plan package will be distributed for review as follows:
   - Civil Inspections (if applicable):
     - One (1) site plan
     - One (1) copy of the project narrative
   - DSC engineer:
     - One (1) site plan
     - One (1) copy of drainage calculations (if applicable)
     - One (1) copy of the project narrative
   - Current Planning: (if applicable)
     - One (1) site plan
     - One (1) copy of the project narrative
   - Zoning:
     - One (1) copy of the site plan
     - One (1) copy of the project narrative
   - Waterfront Operations: (if applicable)
     - One (1) copy of the site plan
     - One (1) copy of the project narrative
   - Planning/Management & Support:
     - One (1) copy of the site plan
     - One (1) copy of the project narrative
   - Public Utilities Engineering:
     - One (1) copy of the site plan
     - One (1) copy of the project narrative
     - One (1) copy of the Water Resource Recovery Fee Computation Sheet (DFU)
     - One (1) copy of the AWWA Water Customer Data Sheet (Figure 4-5)
   - DSC project coordinator:
     - The file folder and all extra copies of the plans and other submitted information
   - Environmental Health: (if applicable)
     - One (1) copy of the site plan
• Fire Administration (if applicable)
  □ One (1) copy of the site plan \(\text{(Return to Flowchart)}\)

3. **Coordination of the Review:** Each review agency will forward their comments to the DSC project coordinator. The DSC project coordinator will write the review letter within five (5) working days after the review agencies comments are due and send it to the applicant’s consultant (via fax only) and the owner/developer. \(\text{(Return to Flowchart)}\)

4. **Revised Resubmittal:** If the plan was not approved, the consultant will make the necessary revisions and resubmit the plans for review. The resubmittal package shall consist of the following:
   • Thirteen (13) copies of the site plan, including the Landscaping Plan
   • Two (2) copies of drainage calculations, if revised
   • One (1) copy of Water Resource Recovery Fee Computation Sheet (DFU)
   • One (1) copy of the AWWA Water Customer Data Sheet (Figure 4-5)
   • Eight (8) copies of a letter addressing the City’s comments and identifying all of the revisions made to the plan \(\text{(Return to Flowchart)}\)

5. **Plan Routing for Review:** The site plan, including the Landscaping Plan, will be routed to the following initial reviewing agencies: Civil Inspections, DSC engineer, Zoning, Waterfront Operations, Planning/Management and Support, Public Utilities Engineering, Environmental Health, as needed. \(\text{(Return to Flowchart)}\)

6. **Site Plan Approval:** Each review agency will forward their comments to the DSC project coordinator. The DSC project coordinator will write the approval letter within five (5) working days after the review agencies comments are due and send to the applicant’s consultant (via fax only). Copies will be forwarded to the applicant by mail or fax upon request and to the reviewing agencies. \(\text{(Return to Flowchart)}\)

7. **Site Plan Distribution:** Upon approval \(\text{(not release)}\), copies of the site plan will be distributed to:
   • Civil Inspections: one (1) copy of the approved site plan and approval letter, if applicable
   • Public Utilities Engineering: six (6) copies of the approved site plan with approval letter
   • DSC File: one (1) copy of approved site plan with approved drainage calculations (if not on plans), approval letter, and all other correspondence pertaining to the site \(\text{(Return to Flowchart)}\)

8. **Street Address:** When the plan is approved, the DSC project coordinator shall contact Planning/Management and Support to obtain the street address on six (6) copies of the plan. \(\text{(Return to Flowchart)}\)

9. **Holds:** When the plan is approved, the following are typical “holds” that may be placed on the release of the approved plan:
   • Submittal of the Responsible Land Disturber (RLD) information and certificate
   • Posting of a right-of-way surety and issuance of a right-of-way permit
• Posting of an erosion and sediment control surety and obtain a Land Disturbing Activity Permit
• Subdivision Plat, recordation of final subdivision plat and/or easements and/or other development related legal documents (Return to Flowchart)

10. Site Plans Released: Upon satisfaction of the “holds,” the plans will be released to the applicant and the plans will be distributed as follows (a copy of the approval letter will be attached to each plan):

- **Applicant:** receives a total of four (4) copies of the approved site plan, two (2) copies for Permits & Inspections and two (2) copies for applicant’s use
- **Civil Inspections:** distributed two (2) copies of the approved site plan (in addition to step 7 above) and copies of all sureties, permits and the RLD information and certificate, if applicable
- **DSC/Surety Specialist:** if the project involves sureties, a plan will be placed in a separate surety file and current established procedures for commercial site plan sureties will be followed (Return to Flowchart)
Appendices
Checllist for SINGLE FAMILY SITE PLAN PACKAGE Submittal

Date:___________________________________________

Consulting Firm:___________________________________________

Contact Person:_________________________Phone:________________Fax:_____________________________

Owner or Developer:___________________________________________

Owner/Developer’s Address:___________________________________________

Plan Title:___________________________________________

The following items are required in the Single Family Site Plan submittal package. Each item must be included or the submitted package will be rejected and returned to the consultant without review or comment.

☐ Transmittal Letter

☐ Six (6) copies of the Project Narrative -
   A letter which explains the project. The letter must include a summary of the project parameters, variances requested or previously granted, previous City Council or Board of Zoning Appeals (BZA) action, proffers, prior agreements (written or verbal), and any other items which will help determine the appropriate review action required for the project.

☐ Thirteen (13) folded copies of the complete Site Plan Drawing
   (Additional copies of the plan may be required after plan Approval)

☐ Two (2) copies of Water Resource Recovery Fee Computation Sheet (DFU) (if applicable)

☐ Two (2) copies of AWWA Water Customer Data Sheet (Figure 4-5)

☐ Review Fee of $75.00- Make check/money order payable to Treasurer, City of Virginia Beach - Check #________________________

Water Tap Installation:
☐ City of Virginia Beach
☐ Developer/Owner
☐ Not Applicable

Sanitary Sewer Installation:
☐ City of Virginia Beach
☐ Developer/Owner
☐ Not Applicable

Has there been any discussion with City staff regarding this project? _______ Yes _______ No
If yes, with whom:___________________________________________

Items discussed:__________________________________________________________________________
Guide to the Single Family Site Development Process

City of Virginia Beach
Development Services Center

Checklist for **DUPLEX/SINGLE FAMILY AS-BUILT PACKAGE** Submittal

Date: ____________________________

Consulting Firm: ________________________________________________________________

Contact Person: __________________________________ Phone: __________________ Fax: __________

Owner or Developer: ____________________________________________________________________________

Owner/Developer’s Address: ____________________________________________________________________________

Plan Title: __________________________________________________________________________

The following items are required in the As-built submittal package. Each item must be included or the submitted package will be rejected and returned to the consultant without review or comment.

- Transmittal Letter
- Two (2) copies of the Project Narrative - A letter which explains the project. The letter must include a summary of the project parameters and any other items which will help determine the appropriate review action required for the project.
- Five (5) folded copies of the complete As-built Drawing
  - Single Family
  - Duplex

Required By:
- DSC DSC File # __________________________
- Permits & Inspections Building Permit # __________________________

Has there been any discussion with City staff regarding this project? ________Yes ________No
If yes, with whom? _________________________________________________________________
Items discussed: ____________________________________________________________________________

__________________________

10
SUBMITTAL PACKAGE REQUIREMENTS FOR SINGLE FAMILY SITE PLANS

The review time for site plans is approximately three (3) weeks. The following items are required to be submitted to the DSC for site plan submittals:

1. DSC submittal checklist
2. Six (6) copies of the Project Narrative
3. Two (2) copies of the drainage/CBPA calculations
4. Two (2) copies of Water Resource Recovery Fee Computation Sheet (DFU) (if applicable)
5. Two (2) copies of AWWA Water Customer Data Sheet (Figure 4-5) (if applicable)
6. Review fee for site plans: $75.00
7. Thirteen (13) copies of a site plan containing the following information:
   - Sealed, Signed and Dated (on each sheet) by a Professional duly licensed in the Commonwealth of Virginia, to perform such work, including license number
   - Name, address and phone and fax numbers of consulting firm
   - Name, address and phone and fax numbers of owner/developer
   - A blank space for City approval stamps, measuring 7”x 9” on the right hand side of the first sheet of the set of plans
   - A title block that clearly states the legal description (lot, block, subdivision name, or other defining name, etc.) of the property

   Note: Sites containing more than one lot normally require a resubdivision plat to vacate interior lot lines.
   - Property lines, complete with metes and bounds information, street names and north arrow
   - Approximate or exact street tie to the next improved street (for field location purposes)
   - Location Map
   - Graphic and/or written scale
   - Lot numbers or other property designations on the site and all adjoining sites.
   - Current topographic survey, including (but not limited to):
     - all existing building structures, walls, fences and other improvements on site, and on adjoining sites if within ten (10) feet of the property lines
     - Elevation Based on the NAVD 1988 Datum- See DSC Notice # 115
     - Elevations sufficient to determine the drainage patterns on site and on adjoining sites
     - location and sizes of water mains, sewer mains and other utilities
     - location of existing water meters and sewer cleanouts, fire hydrants, streetlights, power poles, power lines, transformers, telecommunications boxes, etc.
     - locations, sizes and species of significant trees on and adjoining the site that will effect or be effected by the proposed construction
     - existing septic tanks, drainfields and wells
     - non-tidal wetlands
     - edge of tributary streams
Proposed improvements on the site including:
- Building footprint, upper floor overhangs, chimneys, porches, decks, steps, attached sheds, accessory buildings, etc.
- Building dimensions (to 0.1')
- Setback distances from the right of way line and other property lines to the building (to 0.1')
- Driveway and parking areas
- Sidewalks
- All Impervious Surfaces
- Trees (in accordance with Appendix E of the City Code, Tree Planting, Preservation and Replacement Ordinance)
- Walls and fences
- Stormwater management improvements - gutters and downspouts, swales, pipes, trenches, inlets, SWMF’s, etc.
- Proposed septic tanks and drainfields
- Proposed wells

Proposed improvements in the right of way, including:
- driveway apron
- street sidewalk
- curb and gutter
- pavement widening
- ditches or swales
- drainage structures and pipes
- shoulders

Note: major right of way improvements will require a separate plan submittal

Proposed elevations, grading and drainage on and adjoining the site, including:
- finished floor elevations of the lowest floor or floors in the house
- finished floor elevation of the garage (attached and detached garages)
- finished grades at the primary corners of the house, garage, accessory structures, pool decks, and pool equipment
- finished grades on the driveway apron at right of way line and edge of pavement
- finished grades along all property lines
- top and toe of fill and/or cut slopes
- limits of fill and/or cut
- top of wall elevations and finished grade elevations on both sides of the wall
- locations & elevations of HVAC pads and generator pads
- locations, sizes and elevations of drainage swales, trench drains, infiltration facilities, roof gutter downspouts, etc.
- connection of site drainage to a public or privately maintained drainage facility
- elevations of street improvements (edge of pavement widening, curb and gutter, ditches, drainage facilities, etc.)
Proposed utility connections, including:

- specify who is installing water and/or sewer taps (City or Developer) (See DSC Notice #122)
- locations of the nearest upstream and downstream sanitary sewer manholes with rim and invert elevations of the connecting main
- locations of existing and proposed water and/or sanitary sewer mains, sizes, and material
- locations of existing and proposed water and/or sanitary sewer taps, sizes, and material
- locations of proposed or existing water meters and/or sanitary sewer cleanouts
- provide rim and invert elevations of proposed sanitary sewer cleanout
- provide field verification of the existing number of sewer manhole connections into the existing manhole. A total of four (4) connections is acceptable. This only required if the proposed site is connecting to a manhole via gravity or private force main
- show known and potential conflicts, e.g., stormwater pipes/structures and private utilities
- provide proposed and existing water meter size and ID #’s

Note: major utility improvements will require a separate plan submittal

- If applicable, clearly show and label the 50’ seaward buffer, the 50’ landward buffer, the top of the 6% slope (if applicable) and the landward limit of the variable width buffer (measured 100’ from the top of slope).
- Clearly show and label the Limits of Land Disturbance.
- All erosion control methods must be clearly shown on the plan. (Standard details are not required)
- Construction entrance (12’ x 30’ minimum)
- Tree Protection
- Inlet Protection (if applicable)
- Vehicular access areas
- Stockpile
- Staging areas
- Landscape Plan included on site plan:
  - Existing trees and vegetated areas
  - Outline of all proposed improvements, including SWMF’s

Required Notes for Single Family Site Plans

Required Details:

- SWMF details:
  Include the following note with the detail:
  “If encountering unsuitable, poorly drained or very poorly drained soils during the installation of a SWMF, excavate to a sand layer and backfill with sand or stone to the bottom of the design elevation of the SWMF, at the direction of City Inspector.”

- Retaining wall details:
  Include the following note with the detail:
"The City of Virginia Beach does not review retaining walls for structural integrity. The owner/developer agrees to hold The City of Virginia Beach harmless in the event of a failure."

If the retaining wall is three feet (3’) high or higher, the detail must be certified by a Professional Engineer or Architect licensed in Virginia.

- **Private Sewer Force Mains:**
  - An encroachment agreement is required for the portion of the private sanitary sewer within the public right of way or easement. Contact Public Works Real Estate at 385-4161 for an encroachment application.
  - Provide a detail of the standard saxophone connection on the plan, if connecting to an existing public sewer manhole.
  - Whenever possible, connect to the gravity sewer system through a manhole or service lateral.
  - Connection of a private force main to a public force main shall be performed by the Developer. Prior to making the connection, the Developer shall coordinate the “tie in” with the Department’s Operations Division and/or HRSD as needed.
  - Connection of a private force main to a public force main shall be by either 1) a tapping sleeve and valve or, 2) a tee with a 4-inch (minimum) gate valve. A tapping sleeve will not be permitted if the new force main is of the same diameter as the existing force main.
  - If connecting to an existing city or HRSD force main, provide City of Virginia Beach PU Standard Detail #13.
  - Show the entire length of the force main, including the gravity manhole to which it will be discharging. In some instances, a profile will be required.
  - Show the discharge rate of the private pump station in GPM and the TDH.
  - Provide the following note: “The DSC office does not review private pump stations. The owner/builder must consult with the Virginia Department of Health and City of Virginia Beach Permits and Inspections Office on this matter”
  - If the force main will be plastic or any other non-metallic pipe, provide a note on the plans to provide tracer wire for the entire length of the force main within the right of way.
  - Provide a note that states: *Provide two (2) coats of Sika 62 or Sika Hi Build to the interior walls of the receiving gravity sanitary sewer manhole.*
REQUIRED NOTES FOR SINGLE FAMILY SITE PLANS

The following notes are required in this order (separate any other notes from these on the plan):

1. The subdivision plat for this property was recorded in (map book & pages, deed book & pages or instrument numbers).
2. GPIN: __________________
3. Zoning: __________________
4. Proposed Number of Dwelling Units: _______
5. Number of ERU’s: ___________
6. The property falls in the ____________________ Watershed. (Chesapeake Bay, Southern, Owls Creek, Atlantic Ocean)
7. The property does/does not fall in a Special Flood Hazard Area as shown on the FEMA NFIP FIRM for the City of Virginia Beach, Community-Panel Number 515531-__________, dated __________. The property falls in Flood Zone(s) _______. Base Flood Elevation (if applicable) _____ (NGVD 1929). The proposed dwelling is/is not located in a special flood hazard area.
8. The property does/does not fall in Floodplains Subject to Special Restrictions(refer to Site Plan Ordinance, Section 5B.5(c))
9. The lowest proposed floor elevation, including basements and attached garages, is at least one foot above the one-hundred year base flood elevation as adopted by the City of Virginia Beach.
10. This Plan is based on the NAVD 1988 Datum. The City of Virginia Beach control reference point used for the survey and design of this plan is #__________, Elevation _______.
11. The lot grading on this plan is in accordance with the latest subdivision construction plan submitted to and approved by the Director of Planning or his designee on _______________. (Use N/A if not applicable)
12. Sidewalks are/are not required per the approved subdivision plans.
13. This site lies within aircraft Accident Potential Zone _____ and/or Clear Zone and/or Noise Zone(s) ______ db and may be subject to aircraft accidents and/or above average noise levels due to its proximity to airport operations. Noise zone attenuation measures for new construction are required in accordance with the airport noise attainment and safety ordinance and height restrictions have been imposed in accordance with Section 202(b) of the City Zoning Ordinance.
14. All erosion and sediment control measures shall be in accordance with the Virginia Erosion and Sediment Control Handbook, and as required by the city’s inspectors.
15. Any and all material or debris tracked onto a public or private road surface will be removed at the end of each day. Sediment will be removed from roads by shoveling or sweeping, and will be transported to a sediment controlled disposal area.
16. All excavated material shall be disposed of in a lawful manner.
17. Area of site: ______________ sq.ft. __________ acre(s)
18. Area of site outside of water and tidal wetlands: ______________ sq.ft.
19. Impervious Area calculations:
   Pre-development impervious area: ______ sq.ft. __________ % of site
   Post-development impervious area: ______ sq.ft. __________ % of site
20. Area of Land Disturbance: __________ sq.ft. ______________ acre(s)
21. Residential tree calculation: __________ sq.ft. required
   __________ sq.ft. provided
   *(refer to Tree Planting, Preservation and Replacement Ordinance)*
22. Sequence of Construction: *(Site specific)*
   All construction sequences will contain the following first three steps:
   A. Obtain all required permits
   B. Install Silt Fence
   C. Install Tree Protection Fencing
23. Revegetation/seeding schedule: *(Site specific)*
### Sizing Water Service Lines and Meters

**City of Virginia Beach**

**Water Customer Data Sheet**

<table>
<thead>
<tr>
<th>Customer</th>
<th>Address</th>
<th>Building Address</th>
<th>Zip Code</th>
<th>Subdivision</th>
<th>Lot No.</th>
<th>Blk. No.</th>
<th>Type of Occupancy</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Fixture</th>
<th>No. of Fixtures</th>
<th>Fixture Value 60 psi</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathtub</td>
<td>x</td>
<td>8</td>
<td>=</td>
</tr>
<tr>
<td>Bedpan Washers</td>
<td>x</td>
<td>10</td>
<td>=</td>
</tr>
<tr>
<td>Bidet</td>
<td>x</td>
<td>2</td>
<td>=</td>
</tr>
<tr>
<td>Dental Unit</td>
<td>x</td>
<td>2</td>
<td>=</td>
</tr>
<tr>
<td>Drinking Fountain - Public</td>
<td>x</td>
<td>2</td>
<td>=</td>
</tr>
<tr>
<td>Kitchen Sink</td>
<td>x</td>
<td>2.2</td>
<td>=</td>
</tr>
<tr>
<td>Lavatory</td>
<td>x</td>
<td>1.5</td>
<td>=</td>
</tr>
<tr>
<td>Showerhead (Shower Only)</td>
<td>x</td>
<td>2.5</td>
<td>=</td>
</tr>
<tr>
<td>Service Sink</td>
<td>x</td>
<td>4</td>
<td>=</td>
</tr>
<tr>
<td>Toilet – Flush Valve</td>
<td>x</td>
<td>35</td>
<td>=</td>
</tr>
<tr>
<td>– Tank Type</td>
<td>x</td>
<td>4</td>
<td>=</td>
</tr>
<tr>
<td>Urinal – Pedestal Flush Valve</td>
<td>x</td>
<td>35</td>
<td>=</td>
</tr>
<tr>
<td>– Wall Flush Valve</td>
<td>x</td>
<td>16</td>
<td>=</td>
</tr>
<tr>
<td>Wash Sink (Each Set of Faucets)</td>
<td>x</td>
<td>4</td>
<td>=</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>x</td>
<td>2</td>
<td>=</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>x</td>
<td>6</td>
<td>=</td>
</tr>
<tr>
<td>Hose (50 ft Wash Down) - 1/2 in.</td>
<td>x</td>
<td>5</td>
<td>=</td>
</tr>
<tr>
<td>– 5/8 in.</td>
<td>x</td>
<td>9</td>
<td>=</td>
</tr>
<tr>
<td>– 3/4 in.</td>
<td>x</td>
<td>12</td>
<td>=</td>
</tr>
<tr>
<td><strong>Combined Fixture Value Total</strong></td>
<td>=</td>
<td>=</td>
<td></td>
</tr>
</tbody>
</table>

Customer Peak Demand From Fig. 4 -2 or 4 -3 x Press. Factor = _______ gpm

Add Irrigation - __________ Sections* x 1.16 or 0.40+ = _______ gpm

- __________ Hose Bits x Fixture Value x _______ Press. Factor = _______ gpm

Added Fixed Load = _______ gpm

**TOTAL FIXED DEMAND** = _______ gpm

* 100 ft² area = 1 section
+ Spray Systems- Use 1.16; Rotary systems- Use 0.40

**Figure 4-5 Water customer data sheet**


January 2007
<table>
<thead>
<tr>
<th>Fixture/Source</th>
<th>Fixture Units</th>
<th>No. of Fixtures</th>
<th>Total Fixture Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathroom Groupings Consisting of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Bath - 1 water closet, 1 lavatory, 1 bathtub or shower stall, 1 Bidet</td>
<td>5.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>½ Bath - 1 water closet, 1 lavatory</td>
<td>4.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Bathtub</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Bidet</td>
<td>1.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Combination sink and tray w/food grinder</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Combination sink and tray w/1&quot; to 1 ½&quot; trap</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Dental Lavatory/cuspidor</td>
<td>1.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Dishwasher (commercial)</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Drinking fountain</td>
<td>0.5</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Ice cream machines w/dipper wells</td>
<td>0.5</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Ice machines/free standing (residential/commercial)</td>
<td>1.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Kitchen sink, domestic (1 ½&quot; trap and grinder)</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Lavatory (1 ¼&quot; trap)</td>
<td>1.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Showers, domestic or per head</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td><strong>Sinks:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bar</td>
<td>1.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Flushing rim (w/valve)</td>
<td>6.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Laundry or wash sink (1 ½&quot; trap)</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>P trap (mop sink 3&quot; trap)</td>
<td>5.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Pot, scullery, etc. (large 3 or 4 comp. sink)</td>
<td>4.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Service (small 3 comp. sink)</td>
<td>3.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Shampoo/barber</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Slop (3&quot; trap)</td>
<td>5.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Surgeon's</td>
<td>3.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Urinal, Wall - Regular</td>
<td>4.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Urinal - 1 gal. or less</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Washing Machine (Commercial)</td>
<td>3.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Washing Machine (Residential)</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td><strong>Water Closet:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushometer Tank (Private/Public)</td>
<td>4.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Private Use</td>
<td>3.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>Public Use (Lobby Area)</td>
<td>4.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td><strong>Unlisted Fixture or Trap Size</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor Drain w/2&quot; waste</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>1 1/4&quot; or less</td>
<td>1.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>1 ½&quot;</td>
<td>2.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>2&quot;</td>
<td>3.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>2 1/2&quot;</td>
<td>4.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>3&quot;</td>
<td>5.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td>4&quot;</td>
<td>6.0</td>
<td>x</td>
<td>=</td>
</tr>
<tr>
<td><strong>NO CHARGE FOR HUB DRAINS OR CONDENSATE DRAINS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Floor Drain (2&quot; Trap)</td>
<td>0.0</td>
<td>x</td>
<td>=</td>
</tr>
</tbody>
</table>

**GRAND TOTAL OF FIXTURE UNITS**

Source: Uniform Statewide Building Code as Amended by the City of Virginia Beach

January 2001
NOTES:

- Depth dependent on depth to seasonal high ground water table and on the type of vegetation desired.
- Seasonal high ground water level must be at least 2 feet from bottom of bed.
- Stormwater flow must sheetflow to the bed.
- The slope into the bed from the sides should be between 0.5% & 1% to ensure positive drainage to maintain sheetflow.
- Bed can only be used if proper soil types exist on the site. An actual field exploration may be required.
- Bed must be at least 10 feet from the foundation of structure.
- An emergency overflow berm must be placed downslope of the bed.
- Maintenance of the bed is the sole responsibility of the homeowner.
- The bed should not be installed until during final frost grading; otherwise, it can become clogged or compacted.
- This detail shows the minimum cross section necessary to meet CDPAL requirements. The required length of the bed depends on the required storage volume. Larger beds than required may also be installed.
- Bed should be 3" higher on ends to prevent water running around the end.
- 3" depression must be maintained by the homeowner.
- For drainage / sumps calculation purposes, assume a 40% void space for storage.
- Bioretention planting bed should be placed along a single contour elevation so that runoff does not become concentrated.
- Bed should be placed above 5' MSL to prevent inundation during most high tide events.
- Bed may be planted with ground covers and shrubs.

CITY OF VIRGINIA BEACH
STANDARD
CHESAPEAKE BAY PRESERVATION AREAS (CDPALS) BIoretENTION/PLANTING BED RESIDENTIAL USE ONLY

PUBLIC WORKS B-46A