

DITCH-DIGGING 101

- OR -

**How I covered my ditch without incurring the wrath of
VDOT and my neighborhood association!**

A How-To Guide, Courtesy of:

**Tabb Lakes Homeowners Association
P.O. Box 8088
Yorktown, VA 23693**

With Special Thanks to:

**Mr. John Mazur
Asst. Resident Engineer
Virginia Department of Transportation**

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Dear Homeowner,

So, you're thinking about filling in the drainage ditch in your front yard? Your homeowner's association and your neighbors applaud your desire to beautify your property and would welcome the improvement in aesthetics. Just remember that any such property modification needs to first be approved by the Architectural Review Committee, our neighborhood watchdog on aesthetics. Beyond that, you will also have to meet a number of engineering requirements, including approval from Virginia Dept of Transportation (VDOT) to ensure your final design and installation do not negatively impact our fragile water drainage system. In a number of significant cases, uninformed residents have improperly engineered this modification, adding to the flooding woes we've experienced here in Tabb Lakes.

Before going any further, you need to ask yourself several questions:

1. Will your proposed design be compatible with any existing installations in your next-door neighbors' yards?
2. Is the bottom of your present drainage ditch at least 3 ft (36 inches) below the level of the street in front of your house? (For reasons given later in this guide, anything less will be disapproved by VDOT.)
3. Would you be satisfied with just lining your ditch with concrete?
4. Are you prepared to provide engineering drawings, complete some required VDOT paperwork, and purchase a Surety Bond to cover the full cost of the installation in event it goes wrong and VDOT has to tear it out?
5. Failing the requirements of (4.) above, are you prepared to pay a bonded contractor to take care of the paperwork and installation requirements? Typical cost of hiring a bonded contractor to do the work will run between \$4000 and \$7500 for 125' of yard frontage.

If the answer to any of the above is NO, then you are a candidate for either preserving your current drainage ditch, or resorting to the simpler (and cheaper) alternative of lining your ditch with concrete. (See *Atch. 7* for examples.) This is actually the method preferred by VDOT, as it makes it much easier for VDOT to clean out obstructions. All you'll need to do is submit a completed Architectural Review Committee request form (available at 505 Bridgewood) to get Tabb Lakes Homeowners Assn approval; the process is simple and painless.

Okay, so now you've had an opportunity to reconsider the above, but you've made your mind up and would like to get that ugly ditch out of sight. What do you do now? Well, this guide was developed to help you in your decision process. First, we'll lay out some of the requirements for you, so you can understand the rationale for treating this project with seriousness. And then we'll provide you with a handy checklist to ensure you remember what steps are required to make this project a winner.

The following list provides you with some of VDOT's requirements for replacing a ditch with pipe. It is not necessarily all-encompassing, but will give you a feel for basic requirements. Your VDOT representative may levy additional steps to ensure a sound installation.

1. **VDOT Form CE-7, Land Use Permit** (a.k.a. the "pipe permit", sample at *Atch. 1*) – this is the basic form you will need to prepare for submission to VDOT, outlining your project and requesting their approval to begin the work. A limited number of these forms are available through your Architectural Review Committee members, or you may have to visit the VDOT office on 4451 Ironbound Rd, Williamsburg, to procure a copy.
2. **Proof of Surety Bond** to cover the cost of installation.
 - a. If you're doing the work yourself, the Surety Bond may be satisfied one of two ways:
 - (1) The **VDOT Form MP-231 "Irrevocable Letter of Credit Bank Agreement"** (*Atch 2*), in which your bank or financial institution ensures the bond money is available, or
 - (2) **VDOT Form MP20, "Land Use Permit Surety Bond"** (*Atch 3*) – which is issued through a bonding agent. (Approx. cost is 10% of the total project cost.)
 - b. If work is to be done by a contractor, ensure he is a **bonded** contractor. Have him provide the Surety information in the appropriate block of the VDOT Form CE-7.
3. **Engineering drawing** of the installation. (Example at *Atch. 4*.) This drawing must accompany the VDOT Form CE-7 and must include the following as a minimum:
 - a. **Swale grades** (depression of the ground above the pipe to ensure water is channeled into the system from both the yard and the roadway).

- b. **Invert elevations** (i.e. the “drop” from the top end of the pipe to the outflow end; normal readings are a nominal 1% slope to ensure proper drainage).
- c. **Drainage calculations** to verify pipe size can handle the worst-case anticipated runoff from the yard and the roadway.
- d. Minimum of **4” gravel bedding material** below the pipe, IAW VDOT Specification “21B”. (See also *Atch. 5*.)
- e. **Dirt cover:** Minimum 9” above a concrete pipe; or **12”** for polyethylene plastic pipe.
- f. **Minimum pipe inner diameter is 15”** for most locations, but may be increased to 24” for collector pipes.
- g. Placement of **drainage inlet grates** at maximum intervals of 100’ usually mandates an inlet at each yard intersection. This is to ensure VDOT drain-clearing equipment has the “reach” required to clear any obstructions that may occur in the system. Also, any drainage inlets must meet the VDOT Drain Inlet “1” specification shown in *Atch. 6*.
- h. **Soil compaction** – the soil fill above the pipe installation must be compacted to VDOT specs (95% compaction) and certified by the contractor or a certified soil technician. This is provided to VDOT after work completion, to release the Surety Bond.
- i. Earlier in this guide, we alluded to the need for a **minimum of 36” depth on your present ditch**. This is how it works out: a 15” inner-diameter concrete pipe has 3” thick walls, bringing the outer diameter to 21”. Add 9” of compacted soil on top, and several inches below the surface of the roadway for drainage, and you now have 36” of depth required before you can plan on enclosing your ditch. (In addition, the ditch will have to be dug out 4” deeper to accommodate the bedding material.)

To reiterate, VDOT prefers concrete lining of ditches because they are much easier to clean out. When pipe is laid, they prefer reinforced concrete, especially if vehicular load (as under driveways) is involved. Plastic pipe will suffice in non-traffic areas; the preference is for the smooth-bore type with exterior flexible corrugations, to minimize debris hanging up inside the pipe. VDOT engineer John Mazur particularly stressed the need to design in proper slope, sufficient swale, and drainage inlets. When an installation fails to channel water off the roadway and leaves standing water, it accelerates deterioration of the pavement. This, in turn, negatively impacts VDOT’s responsibilities for road maintenance. Remember this overriding concern when you question why VDOT has such stringent requirements.

We hope this guide has given you a better appreciation for factors to consider before you attempt any modification of your present drainage ditch. The Tabb Lakes Homes Association is committed to ensuring residents adhere to VDOT requirements, because this is the only way to prevent additional stress on the fragile water-handling system in our neighborhood.

General questions may be addressed to members of the Architectural Review Committee, or the Covenant Committee. We will do our best to provide you with additional guidance, but as always, VDOT will be the final arbiter on all design questions.

Appendix 1 is a handy checklist for ensuring your project is coordinated properly.

AUDREY MURPHY TRUE
Chairman
Architectural Review Committee

ELLIS SHARADIN
Co-Chairman
Covenants Committee

Attachments:

1. VDOT Form CE-7, Land Use Permit (sample)
2. VDOT Form MP-231, Bank Credit Agreement (sample)
3. VDOT Form MP-20, Land Use Permit Surety Bond (sample)
4. Engineering drawing (sample of required information)
5. Pipe Bedding – Method A
6. Where to Place Drainage Inlets
7. Inlet Grate, VDOT Standard Drop Inlet Drain
8. Standard Paved Ditches

Checklist for Drainage Ditch Modifications

Obtain and complete VDOT Form CE-7

Prepare Engineering drawing

Estimate cost of installation and materials

Prepare VDOT Form MP20 or MP-231 for Surety Bond

Or

Hire a Bonded Contractor to prepare the above forms

Make copies of all documentation and submit to ARC

Carry all documentation to VDOT at 4451 Ironbound Road, Williamsburg, VA; phone number is 253-4832. Ask for P.K. Das or John Mazur, Engineers.

Provide any additional information/forms required by VDOT.

Once approved by VDOT, provide 48 hr notice to VDOT inspector before work begins.

Dig the ditch and lay the pipe. Ensure a VDOT-approved Drain Inlet with metal inlet grate is installed at maximum 100' intervals (i.e., yard intersections) and proper drainage swale and drop are incorporated.

BEFORE DIRT FILL IS APPLIED: have VDOT inspect and approve the pipe installation portion of the work.

Add topsoil cover for the pipe and compact it to VDOT specification of 95%

Have contractor or soil technician certify Compaction Report.

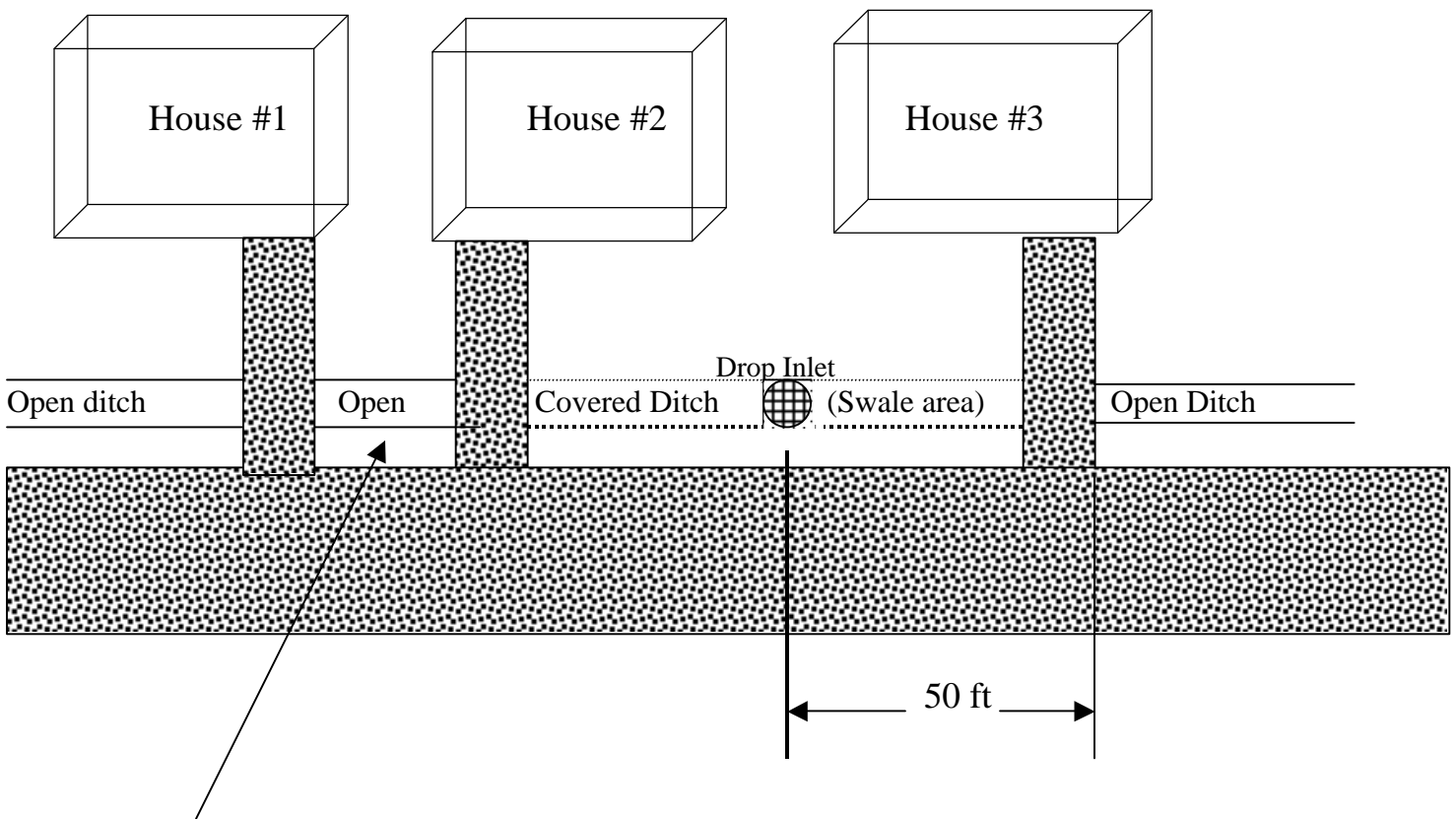
Carry Compaction Report to VDOT to release Surety Bond.

Plant your grass cover seeds.

Notify Architectural Review Committee that your project is completed and ready for a final inspection by neighborhood association. This completes your project and allows the neighborhood association to close out your paperwork.

Where to place drainage inlets

Note: Drainage inlets ensure that water collected within the swale makes it into the drainage system, rather than pooling in yards and streets. Also, the maximum distance VDOT pipe-clearing equipment can reach is limited to approximately 50'. This would include the widths of any driveways under which the pipe runs. Thus, for locations where adjacent homeowners cover their ditches, it makes sense for them to split the cost of installing a VDOT-approved drop inlet/access grate at the intersection of their property lines, as between House #2 and #3 below.



If, for example, the owners of Houses #1 and #2 later elected to replace the open ditch between their driveways with pipe, this would also call for installation of a VDOT-approved drop inlet between the driveways, in the position indicated (again, at the intersection of property lines). This is needed, even if clearing equipment reach is not a factor, simply because the hard-surface driveways are an impediment to water flow within the swale and would thus cause puddling between the #1 and #2 driveways.