

DITCH-DIGGING 102

- OR -

**How can I cover 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, former Asst. Resident Engineer
Virginia Department of Transportation**

**Revision Date: 9/25/2014
(Supersedes Ditch-Digging 101)**

Dear Homeowner,

So, you're thinking about filling in that ugly drainage ditch in your front yard? Your homeowner's association and your neighbors applaud your desire to beautify your property, and we welcome the improvement in aesthetics. You, in turn, will enjoy the fact you can mow your lawn without having to climb into a ditch or risk injury from trying to run a lawnmower down a steep slope. Just remember: any external property modification needs to first be approved by the Architectural Review Committee, our neighborhood watchdog on aesthetics. This is a Covenant responsibility for **EVERY** homeowner in Tabb lakes.

Beyond that, you will want to meet a number of engineering requirements, to ensure your installation complies in principle with standards set by the Virginia Dept. of Transportation (VDOT). Why is this important? Because we need to ensure your final design and installation don't negatively impact our fragile water drainage system! In a number of significant cases, uninformed and un-cautious residents have improperly engineered this modification, adding to some of the flooding woes we've experienced during past major storm events in Tabb Lakes.

This guide is a rewrite of our original guide, "*Ditch Digging 101*", which was published in 2001 with the help of a VDOT engineer. Its purpose is to make you think about what's entailed when you set about modifying your drainage ditch, and what kind of engineering steps you will need to take to make it successful and efficient in carrying stormwater. Moreover, the Guide is written for laymen!

You have 2 initial decisions to make: 1) Do I want my ditch modification to fully meet VDOT construction standards, thereby precluding possible problems later that might force me to restore the original ditch?, or 2) should I take the significantly cheaper route of modifying it without seeking pre-approval from VDOT, and trust that the quality of my work will sufficiently meet VDOT requirements and not attract undue attention?

Once you've made a decision on taking the formal or informal route, you need to ask yourself several more 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.)
3. Would you be dissatisfied with just lining the sides of your ditch with concrete?
4. Are you willing to assume full legal and financial responsibility for the installation?
5. Are you willing to indemnify Tabb Lakes Homes Association from any legal or financial responsibility, for having giving you approval and encouragement to do the work?
6. If you elect to subject yourself to official VDOT approval, 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 tears it out?
7. 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 questions above is **NO**, then you're a candidate for either preserving your current drainage ditch, or resorting to the simpler (and cheaper) alternative of lining the bottom of your ditch with concrete. This is actually the method preferred by VDOT, as it reduces the possibility of having to ask VDOT for help to clean out any obstructions. However, it does little to improve the looks of your property; nor does it make it any easier to mow your front lawn!

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 planning 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.

To start, you'll need to submit a completed Architectural Review Committee request form (available on the www.tabblakes.org website; copies are also available with the Quarterly Newsletter) to get Tabb Lakes Homeowners Assn approval. The process is simple and painless, and you

will get near-expert advice on how to do the modification without getting on VDOT's radar or incurring the wrath of the Association.

CAVEAT EMPTOR AND A BIT OF PHILOSOPHY:

Let's be straight about what it means to get ARC approval for a ditch project: The Tabb Lakes Homes Association's Board of Directors (BOD) is charged by the Covenants to maintain and/or improve the property values of homes within Tabb Lakes. Notionally, we applaud efforts to enclose our ditches because it improves the looks and desirability of our neighborhood to potential home buyers. On the other hand, the BOD also has responsibility to ensure our storm drainage system isn't compromised in any way by property mods. We simply cannot afford to permit an installation that ultimately results in flooded streets because it fails to properly direct stormwater into the Lakes. And who wants to take a chance of causing property damage to nearby homes due to flooding?

In the past, we encouraged every homeowner to submit to the VDOT approval process. VDOT does maintain our roads, and anything in the "easement area" around the ditch is fair game for them. However, at least one interim VDOT chief engineer had refused to approve applications for ditch modifications, while concurrently refusing to enforce VDOT regulations on a few homeowners who clearly compromised our drainage system! For years, his obstinance tied our hands and stymied our efforts to improve neighborhood aesthetics. More recently, and after much debate, the BOD decided to encourage PROPERLY-engineered and installed modifications, PROVIDED the homeowner agrees to assume full responsibility in the unlikely event that VDOT raises any objections.

From the BOD's standpoint, if you are willing to take on all of the responsibility, we will provide you with advice that closely approximates VDOT standards and should keep you out of trouble. So, ARC approval simply means "yes, go for it!" as long as you accept our help and advice to make it a quality installation. This includes any decision on your part to turn the job over to a contractor: We must insist that your contractor meet our minimal standards to ensure success. If you are still unclear about your responsibilities, contact any Board Member and we'll happy to discuss your proposed project with you, as well as your contractor.

THE FORMAL PROCESS WITH VDOT:

If you, or your contractor, elect to apply for formal VDOT approval, the following list provides you with some of the VDOT requirements for replacing a ditch with pipe. It is not all-encompassing, but will give you a feel for basic requirements. A VDOT representative may levy additional steps to ensure a sound installation. You can easily see this may prove expensive:

1. **VDOT Form LUP-A, 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. These forms are available online at virginiadot.org, 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 LUP-LC, "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 LUP-SB, "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 LUP-A.
3. **Engineering drawing** of the installation. (Example at *Atch. 4*.) This drawing must accompany the VDOT Form LUP-A, 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. Depth of the swale should be a minimum of 6" below the surface of 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 **6" 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 15-16"** for most locations, and must be connected to your driveway pipe with a leakproof connection. The pipe size 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 prevent debris hanging up inside the pipe. The VDOT engineer who originally assisted the BOD with our Ditch-Digging Guide 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 as closely as possible to VDOT requirements, because this is the only way to prevent additional stress on the fragile water-handling system in our neighborhood. On the other hand, we appreciate that too-close adherence to VDOT standards often imposes a financial penalty that is too high for a residential neighborhood. Hence, we have chosen to encourage ditch modifications as long as they meet minimal standards for maintaining our stormwater drainage system.

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.

ELLIS SHARADIN, Member at Large
Editor, for the Board of Directors

Attachments:

1. VDOT Form LUP-A, Land Use Permit (sample)
2. VDOT Form LUP-LC, Bank Credit Agreement (sample)
3. VDOT Form LUP-SB, Land Use Permit Surety Bond (sample)
4. Sample of an Engineering drawing
5. Pipe Bedding — Sample Diagram of VDOT “Spec. 21”
6. Where to Place Drainage Inlets
7. Inlet Grate, Standard 24” Drop Inlet/Drain

Checklist for Drainage Ditch Modifications

(NOTE: Delete the references to VDOT forms and coordination if you elect to pursue construction without VDOT pre-approval.)

- Obtain and complete VDOT Form LUP-A
- Prepare Engineering drawing
- Estimate cost of installation and materials
- Prepare VDOT Form LUP-SB or LUP-LC for Surety Bond,
or:
- Hire a Bonded Contractor to prepare the above forms
- Make copies of all documentation and submit to ARC, including (at a minimum) a hand-drawn diagram of the planned installation.
Allow 10 days for Association assessment and advice before submitting documents to VDOT. We'll turn it around expeditiously as possible, but remember, we're all volunteers!
- 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 suitable Drain Inlet with an inlet grate is installed at no greater than 100' intervals (i.e., yard intersections) and proper drainage swale and pipe angle (drop) are incorporated.
- BEFORE DIRT FILL IS APPLIED:** have VDOT inspect and approve the pipe installation portion of the work.
- Add 9-12" 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.



APPLICATION is hereby made for permit as shown on the accompanying plan or sketch and as described below. Said activity(s) will be done under and in accordance with the rules and regulations of the Commonwealth Transportation Board of Virginia, in so far as said rules are applicable thereto and any agreement between the parties herein before referred to. Where applicable agreements may be attached and made a part of the permit assembly including any cost responsibilities covering work under permit. Applicant agrees to maintain work in a manner as approved upon its completion. Applicant also hereby agrees and is bound and held responsible to the owner for any and all damages to any other installations already in place as a result of work covered by resulting permit. Applicants to whom permits are issued shall at all times indemnify and save harmless the Commonwealth Transportation Board members of the Board, the Commonwealth and all Commonwealth employees, agents, and offices, from responsibility, damage, or liability arising from the exercise of the privileges granted in such permit to the extent allowed by law. In consideration of the issuance of a permit the applicant agrees to waive for itself, successors in interest or assigns any entitlements it may otherwise have or have hereafter under the Uniform Relocation and Assistant Act of 1972 as amended in event the Department or its successor, chooses to exercise its acknowledged right to demand or cause the removal of any or all fixtures, personality of whatever kind or description that may hereafter be located, should this application be approved.

TYPE OR PRINT CLEARLY

Driver's license or Tax ID number _____ Owner Name _____ Address _____ City _____ State _____ Zip Code _____	Contact Name _____ E-mail Address _____ Phone Number (____) _____-_____ Emergency Number (____) _____-_____ Fax Number (____) _____-_____ _____ Driver's license or Tax ID number _____ Agent Name _____ Address _____ City _____ State _____ Zip Code _____
Permit Term Requested _____ Fees Enclosed \$ _____ Check Number _____ Coupon Number(s) _____ Money Order _____ Other _____ Estimated cost of work to be performed on VDOT Right of Way \$ _____	
Surety Information: Surety Company Name _____ Amount of Surety \$ _____ Obligation Amount \$ _____ Check # _____ Bond # _____ ILC # _____ <input type="checkbox"/> Corporate Surety <input type="checkbox"/> Resolution <input type="checkbox"/> Ordinance <input type="checkbox"/> Waived	
The Surety posted by Owner () or Agent () Surety Refunds paid to Owner () or Agent ()	
<p style="text-align: center;"><u>Applicant has provided proof of the following requirements in accordance as defined in Code of Virginia section 2.2-1151.1.</u></p> (1) The utility company has registered as an operator with the appropriate notification center. (2) Attached is a notarized affidavit, stating that the utility owner has notified the commercial and residential developer, owner of commercial or multifamily real estate, or local government entities with a property interest in any parcel of land located adjacent to the property over which the land use is being requested, that application for the permit has been made.	

Request Permission: To perform the following activity(s)

 _____ as per attached plans.

Location: Tax Map Number _____ Applicant Job No. _____
 Geographically in County / Town / City of _____ On Highway Route and /or Name _____
Between Route _____ St. Name _____ Latitude _____ Longitude _____
And Route _____ St. Name _____ Latitude _____ Longitude _____

IF APPLICABLE, I AGREE TO PAY THE FULL SALARY AND EXPENSES OF A STATE ASSIGNED INSPECTOR IN CONJUNCTION WITH THIS PROJECT, COVERED BY ACCOUNT RECEIVABLE NUMBER.

Signature of applicant _____ Title _____ Date _____
 Signature of agent _____ Title _____ Date _____

All applicable items on this form must be completed to avoid delay in processing the issuance of a VDOT Land Use Permit.
 Prepayment Required - make Remittance payable to Virginia Department of Transportation.

VDOT USE ONLY

Receipt is hereby acknowledged for: CHECK No. _____ In The Amount of \$ _____ Authorized VDOT Signature: _____	COUPON No. _____ for Permit Fee \$ _____ Date _____	M.O. No. _____ Cash Surety \$ _____ Date _____
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VDOT Form LUP-LC, "Irrevocable Letter of Credit Bank Agreement"

(Page 1)

[Bank Letterhead]

LETTER OF CREDIT BANK AGREEMENT

Date: _____ **APPLICANT NAME:** _____
Issuing Bank: _____ **Tax ID number or Driver's license Number:** _____
Address: _____ **Telephone Number:** _____
City: _____ **State** _____ **Zip Code** _____ **Address:** _____
Amount: _____ **City:** _____ **State** _____ **Zip Code** _____
Expiration Date: _____

VIRGINIA DEPARTMENT OF TRANSPORTATION

Address: _____
City: _____ **State** _____ **Zip Code** _____

We hereby issue Irrevocable Letter of Credit number _____ in favor of the Virginia Department of Transportation (the Department) for the account of _____ in an amount not to exceed _____ U.S. Dollars (\$ _____) available by sight draft on the above stated issuing bank accompanied by the documents specified below:

A certified statement signed by the Department's Permit Manager or their representative stating that _____ has not satisfactorily completed work pursuant to the permit issued to the permittee or his agent to perform the work as described on the face of the land use permit in the **County of** _____, Virginia.

A certified statement signed by the Department's Permit Manager or their representative stating that: "**This draw is for the explicit purpose of providing for completion or restoration of the right of way to the terms of the Land Use Permit Regulations and pursuant to the agreement of the permittee or his Agent to perform the work covered by permit to the satisfaction of the Department.**" All drafts must bear the clause "Drawn under _____ Irrevocable Letter of Credit No. _____ dated _____, 20____."

VDOT Form LUP-LC, "Irrevocable Letter of Credit Bank Agreement

(Page 2)

We hereby engage with drawers, endorsers and bona fide holders that all drafts drawn in compliance with the terms of this credit shall be duly honored upon presentation and delivery of this document. This Irrevocable Letter of Credit shall remain in full force and effect for a period of two (2) years from the date hereof and shall automatically renew itself from year to year for three (3) years, one (1) year periods thereafter unless and until the above issuing bank shall give ninety (90) days prior written notice to the department by CERTIFIED MAIL, RETURN RECEIPT REQUESTED, of its intent to terminate same at the expiration of said ninety-day period. During said ninety (90) days notice period, this Irrevocable Letter of Credit shall remain in full force and effect.

During the last thirty (30) days while this Irrevocable Letter of Credit is in force and effect after notice of termination has been given, **the** Department may draw up to the full amount of this Irrevocable Letter of Credit when accompanied by a document stating that _____ has failed to provide an acceptable substitute Irrevocable Letter of Credit or deposit in an escrow account, and **further** stating that **"The draw will be held by the Department for the sole purpose of providing for the completion or restoration of the right of way for work covered by the land use permit issued to _____ until such work is completed or restored to the Department's satisfaction. This Irrevocable Letter of Credit shall be terminated upon the Department's Permit Manager or their appointed representative giving written release stating that the terms of the permit have been completed and accepted by the Department."** Requests for the termination of this Irrevocable Letter of Credit should be addressed to the local Department office that issued the land use permit.

Note: Continuous Letters of Credit for utilities (telephone, electric power lines, water, sewer, gas) cannot be cancelled unless facilities covered by the permit have been removed from the right of way or the principal has arranged for replacement surety protection or when responsibility and maintenance has been taken over by another company and the body assuming responsibility for maintenance of that facility advise the Department in writing of its intentions to do so, and posted a replacement of surety.

Except as otherwise expressly stated herein, this credit is subject to the Uniforms Customs & Practices for Documentary Credit (2007 Revision), International Chambers of Commerce Publication No. 600.

Attest: _____

(Seal)

Authorized Signature

Type or Print Name

Title

REV 04/30/2014

Atch. 2b



BE KNOWN THAT WE _____ as Principal, and _____, a corporation duly incorporated under the Laws of the State of _____, as Surety, are held and firmly bound unto the Commonwealth of Virginia in the full and just sum of _____ U.S. Dollars (\$ _____), to be paid to the Commonwealth of Virginia to the payment whereof we hereby bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents, sealed and dated this _____ day of _____ (month), 20 _____ (year).

WHEREAS, The said Principal hereunder has been or will be granted permit(s) authorizing one or more of the following activities:(A) to move house property upon public highways of Virginia (B) to cut surface of the highways of Virginia, or to tunnel under such highways; (C) to install and/or erect and maintain telephone, electric power lines, water, sewer, gas or other utilities on, under or over such highways, bridges or tunnels;(D) to install an entrance or tie-in into a public roadway and/or grading upon the right -of-way; or (E) for the following purposes: Explain below exact purpose(s) for which surety coverage is being obtained.

Work to be performed in the County, City or Town of: _____

THEREFORE, The conditions of this obligation are such that if the said Principal shall in all respects comply with the terms and conditions of said permit(s), and fully meet and perform obligations thereunder in accordance with requirements for permits as set forth in the Land Use Permit Manual in effect at time of permit issuance, and shall satisfactorily complete the work permitted, and shall indemnify and save harmless the Commonwealth of Virginia against and from all loss, cost, expense damage or injury to highways and bridges and to persons and property lawfully on such highways, growing out of the granting of such permit(s) to said Principal, then this obligation be void, otherwise to be and remain in full force and virtue.

NOW, THEREFORE, It is expressly understood that this Bond may be canceled by the Surety at the expiration of sixty (60) days from the date which the Surety shall have lodged with the Commonwealth Transportation Commissioner or his designees written notice to so cancel. This provision, however, shall not operate to relieve, release or discharge the Surety from any liability already accrued, or which shall accrue, on permits issued before the expiration of the sixty-day period. **Bonds securing performance on specified active permit(s) may be canceled only upon satisfactory completion of permit(s), as determined by the Department Engineer.** NOTE: Continuous Bond cannot be canceled unless facilities covered by the permit have been removed from the Right -of-way, or the principal has arranged for replacement surety protection. **ALL permit work covered under section (C) above shall be covered by a bond at all times.**

Said principal and surety, being properly authorized, have caused these presents to be executed and their seals affixed the day and year first above written.

Surety name _____	Principal name _____
Bond number _____	TAX ID # or DMV ID # _____
Address _____	Address _____
City _____ State _____ ZIP _____	City _____ State _____ ZIP _____
Contact person _____	Contact person _____
Telephone number _____	Telephone number _____
Attorney-in-Fact name _____	Signature _____
Signature _____	

Attorney-In-Fact
(Seal)

POWER OF ATTORNEY AUTHORIZATION TO BE ATTACHED

Acknowledgement of Principal

STATE OF _____ COUNTY / TOWN / CITY OF _____
I, the undersigned, a Notary Public in and for the County / Town / City aforesaid, in the State aforesaid, do certify that, _____ whose name as Principal is signed to the foregoing writing bearing date this _____ day of _____ (month), 20 _____ (year), personally appeared before me and acknowledged the same.
Given under my hand this _____ day of _____ (month), 20 _____ (year) My Commission expires: _____

Notary Public

Affidavit and Acknowledgement of Surety

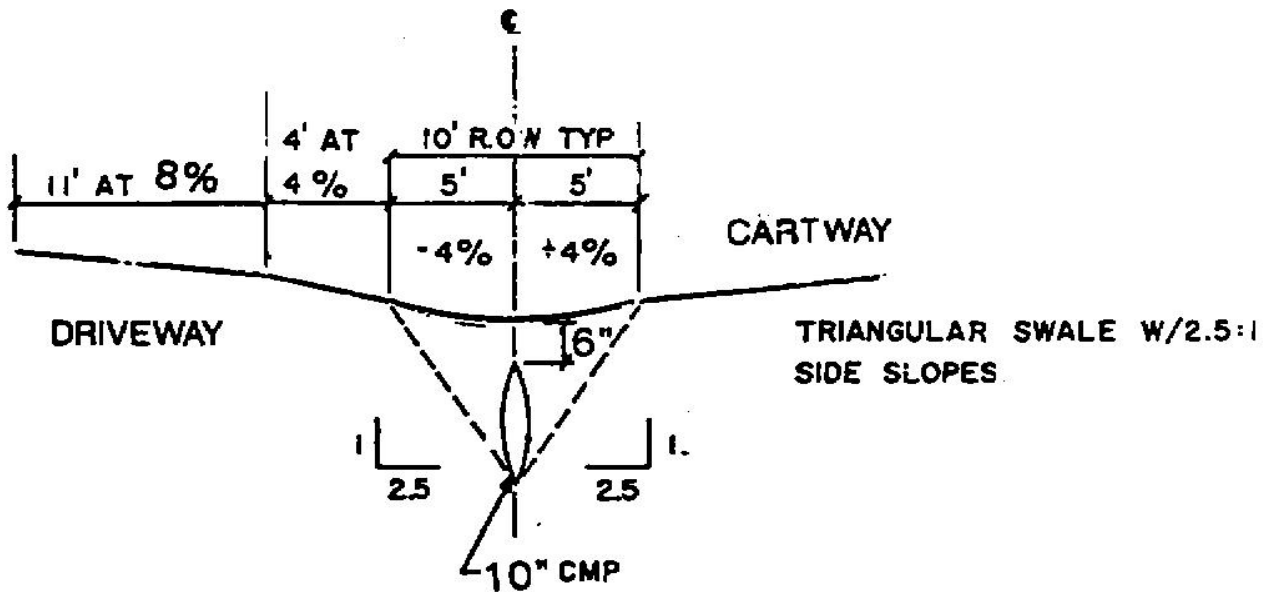
STATE OF _____ COUNTY/TOWN/CITY OF _____
I, the undersigned, a Notary Public in and for the County/Town/City aforesaid, in the State aforesaid do certify that, _____ (Name of Attorney in Fact) personally appeared before me and made oath that he is _____ (Title) of the _____ (Name of Surety), that he is duly authorized to execute the foregoing bond by virtue of a certain power of attorney of said company; that said power of attorney has not been revoked; that the said company has complied with all the requirements of law regulating the admission of such companies to transact business in the State of Virginia; that the said company holds the certificate of the Commissioner of Insurance authorizing it to do business in the State of Virginia; that it has a paid-up cash capital of not less than \$250,000; that the paid-up capital plus the surplus and undivided profits of said company is \$ _____; that the penalty of the foregoing bond is not in excess of ten percentum of said sum; that the said company is not by said bond incurring in the aggregate, on behalf or on account of the principal names in said bond, a liability for an amount larger than one-tenth of its paid-up capital, plus its surplus and undivided profits; that the said company is solvent and fully able to meet promptly all its obligations, and the said (Attorney in fact name) thereupon, in the name and on behalf of the said company, acknowledged the foregoing writing as its act and deed.

Given under my hand this _____ day of _____ (month), 20 _____ (year) My Commission expires: _____

Notary Public

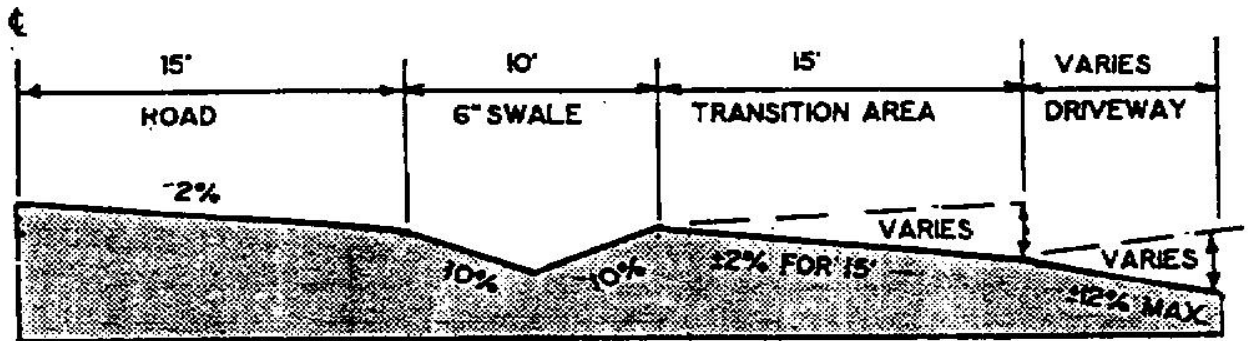
Original to be filed with the Virginia Department of Transportation (VDOT)
Requests for the release of land use permit surety bonds should be addressed to the local VDOT office that issued the permit

Sample of an Engineering Drawing of Ditch



DEEPEN SWALE IN LOWER REACHES OF WATERSHED TO ACCOMODATE 12" DRAIN PIPE UNDER DRIVEWAY.

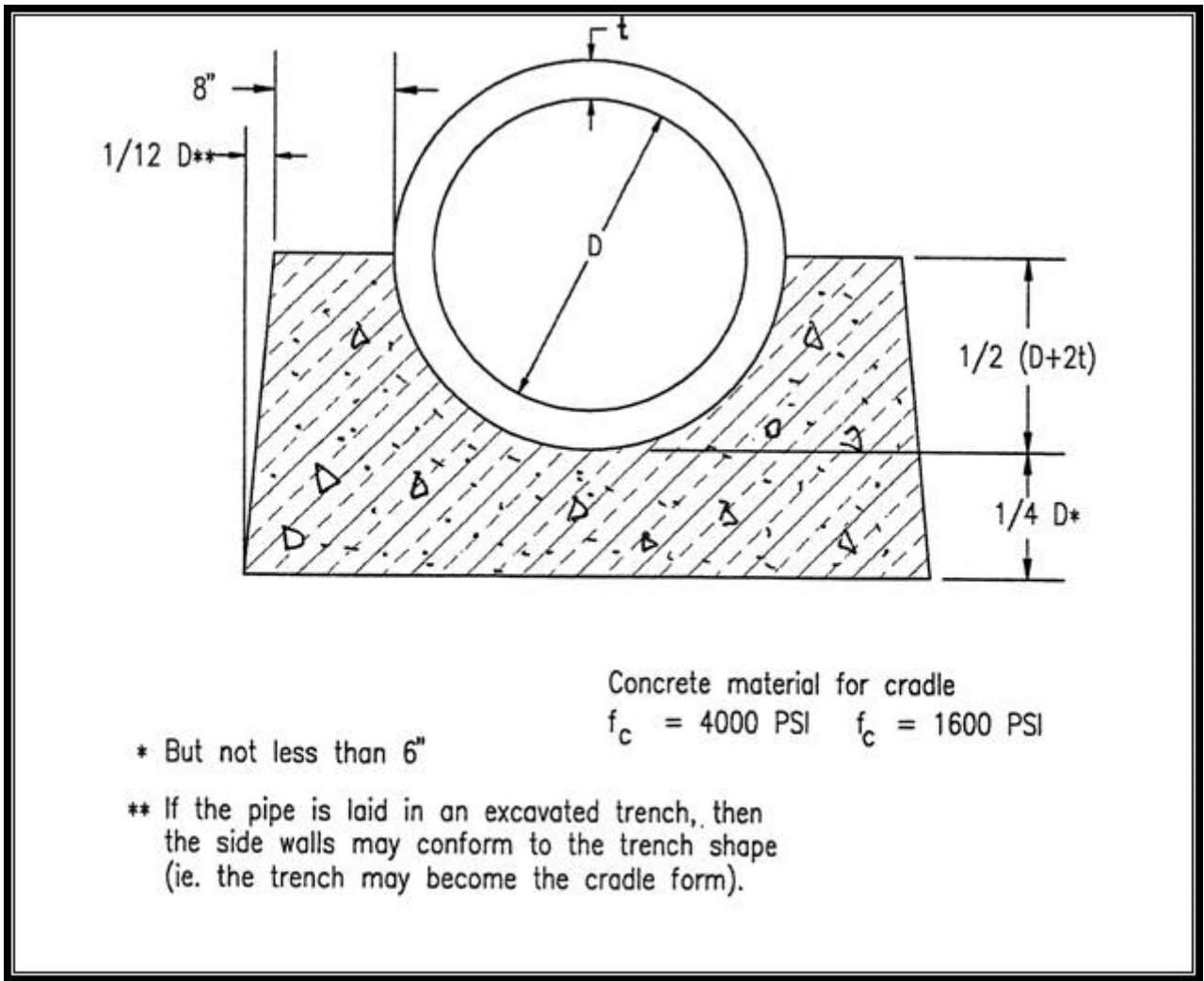
Typical Driveway Section With Drain Pipe
(No Scale)



NOTE DRIVEWAYS FOR INDIVIDUAL LOTS SHALL CONFORM TO THE SPECIFICATIONS OF THIS TYPICAL DRIVEWAY SECTION
 € OF DRIVEWAYS SHALL BE LOCATED AT LEAST 75' FROM € OF ROAD INTERSECTION.

Typical Driveway Section Without Drain Pipe
(No Scale)

VDOT “Specification 21” – Pipe Bedding

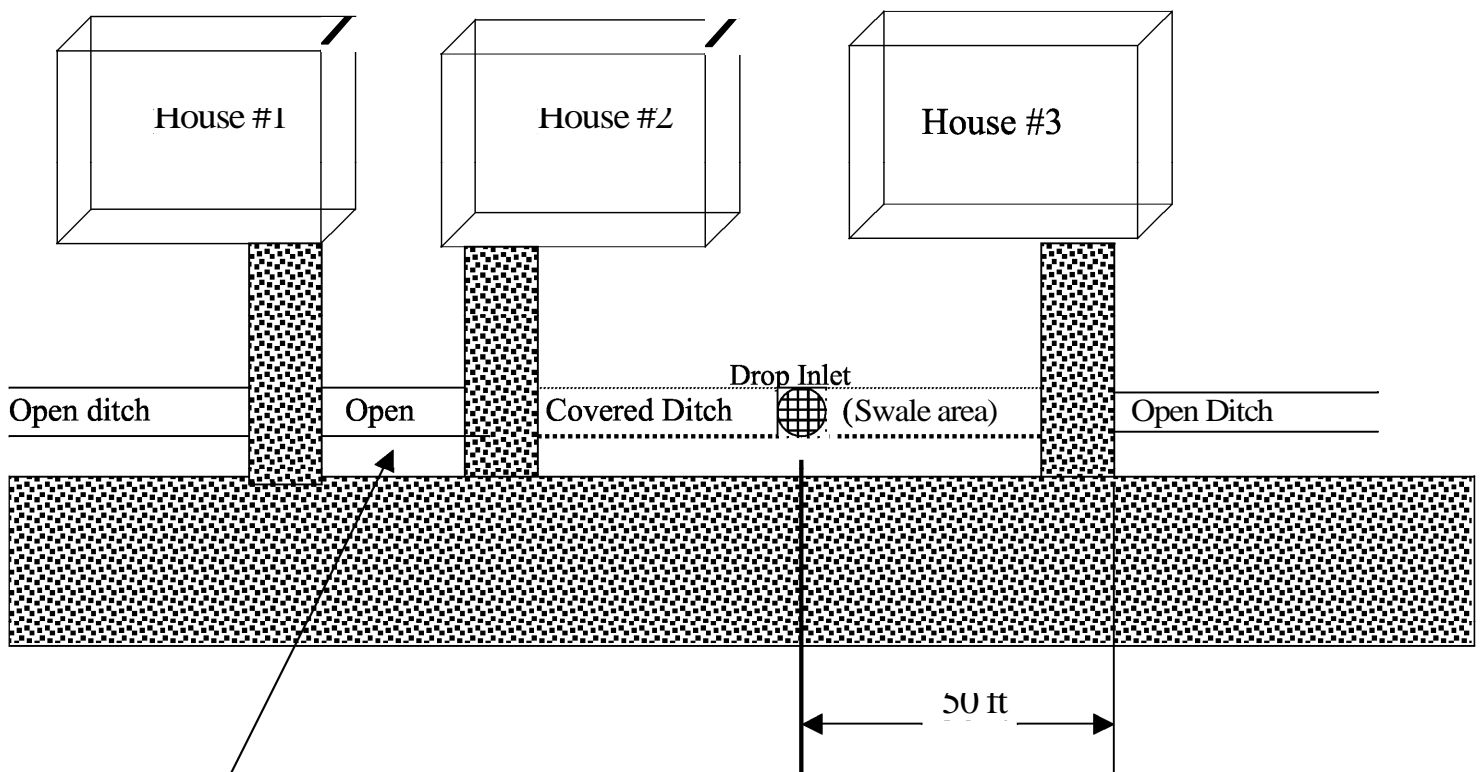


VDOT “Specification 21” calls for gravel backfill to be used as bedding material below and along the lower sides of the pipe. Per the diagram above, the portion below the pipe is to be the thickness of $\frac{1}{4}$ of the pipe inner diameter (D). Since our pipes are approximately 16” in diameter, that would call for lower bedding of 4” deep. HOWEVER, take note of the *, which calls for ‘But not less than 6”’. Therefore, for our neighborhood standard, you’ll need to have a minimum of 6” bedding material below the pipe. Now, add the Pipe Diameter of 16” to the Bedding Material of 6”, and also add in at least 6” of “swale” below the surface of the road (to ensure drainage off the road and into the stormwater system) plus the “drop” of the pipe at it’s lowest point, and 9-12” dirt cover, and you can see why pipe is not suitable for shallow ditches that are less than about 3 ft deep below the surface of the roadway!

Where to place drainage inlets

Drainage inlets ensure water collected within the swale makes it into the drainage system, rather than pooling in yards and streets. The maximum distance VDOT pipe-clearing equipment can reach is limited to approximately 50', and requires a minimum 24" access grate or an open pipe end to feed the equipment into the system. The 50' length includes the width of any driveway under which the pipe runs.

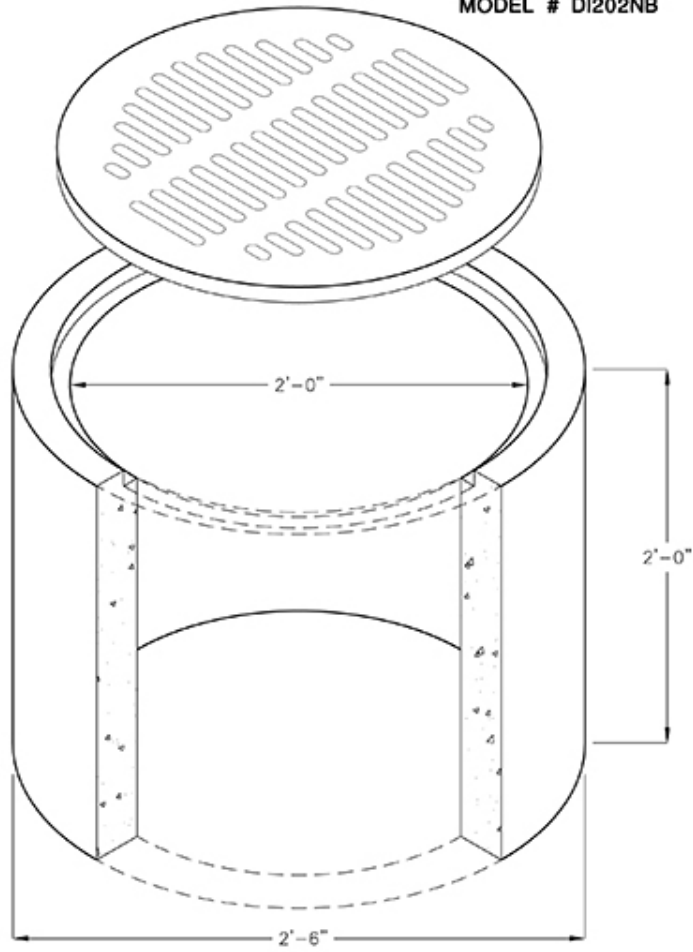
For houses #2 and #3 below, where adjacent homeowners laid pipe into the ditch, the ditch-clearing equipment could be fed into the pipe from the open ditch sides and reach the center. However, this would not provide any place for stormwater to enter the system until it reaches an open ditch. Thus, it makes sense for them to split the cost of installing a VDOT-approved 24" drop inlet/access grate at the intersection of their common property line.



In another example, if the owners of Houses #1 and #2 later elected to replace the open ditch between the driveways with pipe, this would also call for installation of a drop inlet between the driveways, in the position indicated by the arrow (again, at the intersection of property lines). This is necessary, 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. Note, in this case, the drop inlet could be smaller than 24"; a 12" grate size would be sufficient to drain the water off between the driveways.

Standard 24" Drop Inlet

24" DIA. DROP INLET
WITH 24" GRATE
MODEL # DI202NB



FOR COMPLETE DESIGN
AND PRODUCT INFORMATION
CONTACT JENSEN PRECAST.

9/23/02
DI202NB.dwg
© 2002 Jensen Precast

JENSEN
PRECAST

Atch. 7