



INSTALLATION GUIDE

This guide is intended to aide in the installation of Dura-Trench systems. There are many different applications and situations for the use of this product and the installation procedures need to be carefully evaluated and altered to fit the application. This guide gives the standard procedures for the most common applications of the system. If additional installation methods are required or used it is the responsibility of the installation contractor to determine these procedures based on the soil conditions, project environment, and project construction documents.

RECOMMENDED TOOLS

SLEDGE HAMMER FOR DRIVING INSTALLATION LEGS
SOCKET SET OR WRENCHES
CORDLESS DRILL OR IMPACT DRIVER
WOOD OR DRYWALL SCREWS (1 1/2" & 2 1/2")
2X4 LUMBER FOR SUSPENDING TRENCHES
LINEMAN PLIERS
TIE WIRE
MASON LINE (STRING)
LEVEL
SHOVELS

**PLEASE READ ENTIRE INSTRUCTION
MANUAL BEFORE PROCEEDING!**



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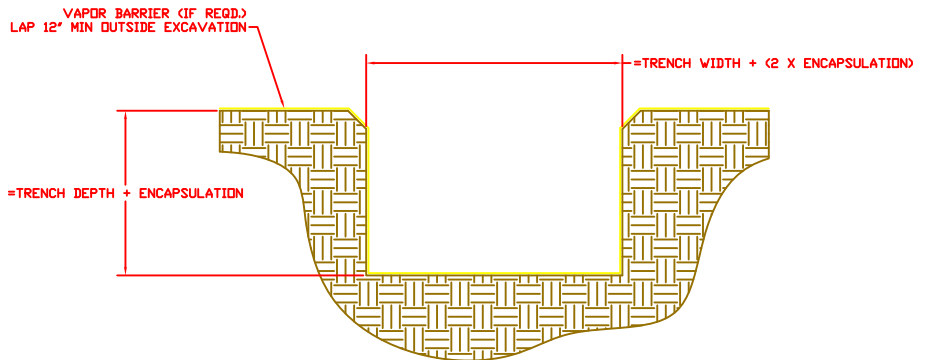


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1. Excavate, Grade, and Compact

- Excavation should be the trench width plus the width of the concrete encapsulation on both sides. The depth of the excavation should follow the depth of the trench plus the encapsulation thickness. The excavation should be closely controlled in order to conserve concrete. Grade the bottom of the ditch closely and check the sides of the excavation prior to proceeding to make sure the excavation is wide enough along the entire length of the trench. (It is recommended that a string be pulled down the sides to check the excavation width) Compact the bottom of the excavation with a compactor prior to proceeding. Alternatively, over excavate the width of the trench and set edge forms according to plan dimensions. Again, compact bottom of excavation before proceeding.



2. Vapor Barrier and Rebar -

Place any required vapor barrier and ensure that all seams and penetrations are properly sealed. Place all rebar at this time. Ensure that the alignment of the rebar is straight and properly centered in the excavation. Tie all bars and make sure the rebar cage is rigid.

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3. Prepare trenches - The Dura-Trench system is pre-assembled for you. First, remove bands on pallets to access trenches. If you are using U shaped rebar legs, insert the legs into the installation brackets on the sides of the rails and tighten the bolt to secure them to the form. Note that if you are using straight bars do not put them in at this time. If using straight bars you will want them long enough to drive into the sub soil to maintain alignment and resist flotation. For clay soils make sure you drive them at least 24" into the soil. For sandy soils you will need 36" to 48" into the soil to gain enough resistance against flotation.



Begin the installation at the deep end / outlet end of the run. Place the forms beside the trench. The trenches are numbered according to the shop drawings (typically the numbers correspond with the depth of the trench at the deep end of the section). The deepest sections need to be located adjacent to the outlet (pipe). The trenches should get sequentially smaller the further you move away from the outlet location. Make sure all arrows are pointing toward the outlet piping. All arrows should face the same direction unless you have a high point in the trench where the trench begins to slope the opposite way.

4A. Hanging Method - If your installation has forms erected near the trench or is a retrofit application the easiest way to install the trench is by hanging it from the forms or existing slab. Cut 2x4 lumber to a length that will span the opening or from form to form. Place the 2x4 boards across the top of the trench and 2 1/2" long drywall or wood screws to attach the lumber to the Dura-Trench sections, or you can wire to attach the lumber to the nelson studs. You will need two boards for every section of Dura-Trench. Note that we recommend a spacer below these boards so that the trench is set lower than the surrounding grade to ensure positive flow into the trench.



After the suspension lumber has been attached, starting at the deep end, set the sections inside the excavation by hanging from the forms. Center the forms and secure the first 2x4 to the forms (screws are preferred over nails because they help resist flotation. Nails can be used but they should be driven on an angle and the installation legs are more critical). We recommend applying a joint sealant at the overlap joint such as NP1 or Liquid Nails to seal joints at this time (Silicone joint sealant can also be used). Set the next section and

slide it into the female flange of the previous section. Check that the rails are centered and use a small scrap piece of lumber or plywood to screw the plywood tops together with proper alignment. Repeat until all sections are connected. If any sections are greater than 12" deep it is also recommended to screw the trench bodies together at the overlap joint to ensure that the alignment is maintained during the concrete placement. Check alignment with a string before proceeding.

Once all sections are installed, if you are using straight installation legs drive them deeply into the ground and tighten bolts to resist flotation. Soil condition will determine how deep the legs must be in the ground to resist the flotation. Sandy soils need several feet while clay soils may only need one to two feet to secure the trench bodies against flotation.

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4B. Install Installation Legs - If the trench will be poured with a slab placement or other pour where there are no forms nearby to hang the trench from, you will want to install the trench system using rebar legs. For placements where there is a vapor barrier that cannot be penetrated use U shaped rebar legs. If there is no vapor barrier straight #4 rebar can be used. Place a string line along the length of the trench at the desired elevation aligned with one edge of the desired location of the trench. Starting from the deep end of the trench, hold the first section in line with the string. Loosen the set screws and move the rebar legs down to the ground. If using straight bars drive them into the ground. Pull the trench up to grade and tighten set screws. We recommend applying a urethane joint sealant such as Np1 at this time on the overlap between the two sections (silicone sealant also works well). Get the next section and slide the male end into the female overhang of the previous section. Use a small scrap piece of lumber to screw the two sections together at the top. Adjust the rebar legs on these sections until the trench is on grade. Repeat until all sections have been installed. Drive additional bars beside the trench and use tie wire to pull trench in line with the string. This will ensure that the trench will not move during placement. Deeper trench sections are more likely to move and need additional bars to align the trench sections.



5. Connect to outlet pipe - Note that end caps and outlet pipe fittings come pre-installed into the trench sections so all that remains is connecting the pipe. The pipe connection is typically made with a rubber no-hub fitting, but it can be made with a coupler or other fitting as necessary. Simply

connect the proper pipe size and type of pipe to the outlet pipe cast into the trench. If your outlet plates were shipped separately, they are typically screwed and glued with urethane caulk to the deepest section of trench drain.



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6. Place mud slab - In order to keep the trench drains from floating during the final concrete placement a mud slab pour is recommended, but not required. It is possible to pour the trench without the mud slab if straight bars are driven deep enough to resist the flotation, or other means of anchoring the trench against flotation are taken. Pouring a mud slab is a sure way to ensure that flotation will not occur. The mud slab pour is 2-3 inches of concrete in the bottom of the excavation the entire width of the trench. Check to make sure that the rebar legs are covered by about 1-2" of concrete and completely encapsulated. The mix design should be fluid enough to ensure that the pour covers the entire bottom of the trench and gets around all of the bars. This pour needs to be set completely before final concrete placement. In cool weather this may take 48 hours or more depending on cement mix design. In very hot weather this may only take a few hours depending on mix design.



7A. Place concrete after mud slab - Start placing concrete at one end and work towards the other end. Place concrete on both sides evenly so that the line of the trench is not disturbed. **DO NOT PLACE CONCRETE ON ONE SIDE ONLY!** This is best accomplished by placing concrete directly on top of the trench drain and allowing it to fall evenly on both sides. Once concrete is placed on both sides to the top of the form it is time to begin vibrating the concrete. Begin vibrating concrete back 8' from where the concrete is being placed. This will ensure that you do not alter the alignment of the trench. Begin vibrating the concrete with a pencil vibrator while standing on the trench. (NOTE: **DO NOT STAND ON THE TRENCH DRAIN IF REBAR LEG INSTALLATION IS USED UNTIL**



CONCRETE HAS BEEN PLACED FULLY AROUND THE TRENCH BODY TO FINISH GRADE). Vibrator should be inserted at 1' on center and pulled back out when air bubbles cease to surface. Vibrator should be inserted quickly as deep as possible and pulled back out slowly. After the vibration of the trench is complete, any suspension lumber and wires can be removed for finishing operations (this is assuming that you have properly anchored the trench with the rebar installation legs). Make sure the vibrator is a minimum of 16' away from where the suspension lumber is being removed.

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7B. Full lift concrete placement - THIS IS NOT THE RECOMMENDED PLACEMENT METHOD FOR INEXPERIENCED INSTALLERS. Start placing concrete at the deep end of the trench and work towards the shallow end. Place concrete on both sides evenly so that the line of the trench is not disturbed. **DO NOT PLACE CONCRETE ON ONE SIDE ONLY!** This is best accomplished by placing concrete directly on top of the trench drain and allowing it to fall evenly on both sides. The



first lift of concrete should be poured up 1-2" on the bottom of the trenches. After placing this lift vibrate the concrete thoroughly on 1' centers ensuring that all trapped air has been removed from the concrete. (DO NOT STAND ON THE TRENCH DURING THIS PLACEMENT AS IT MAY COMPROMISE THE ELEVATION OR ALIGNMENT). This concrete lift must now be allowed to firm so that it is no longer fluid. This is tricky because you should not allow this pour to become solid as it will create a cold joint. Test by pushing a rod into the mix. When the rod begins to get some resistance, but can still enter 2-3" it is time to begin the second concrete lift. This may take as little as 30 minutes in warm weather to as much as 2 hours in cold weather.

It is also dependent on mix design so monitor the initial placement carefully. The next lift should be poured on the center of the trench to evenly fill both sides to final elevation. Once concrete is placed on both sides to finish elevation it is time to begin vibrating the concrete. Begin vibrating concrete back 8' from where the concrete is being placed. This will ensure that you do not alter the alignment of the trench. Begin vibrating the concrete with a pencil vibrator while standing on the trench. Vibrator should be inserted at 1' on center and pulled back out when air bubbles cease to surface. The vibrator should be inserted down to the bottom lift to mix the two lifts (MAKE SURE THAT THE BOTTOM LIFT DOES NOT BECOME COMPLETELY FLUID AS IT WILL CAUSE THE TRENCH TO FLOAT). Vibrator should be inserted quickly and pulled back out slowly. After the vibration of the trench is complete, any suspension lumber and wires can be removed for finishing operations. Make sure the vibrator is a minimum of 16' away from where the suspension lumber is being removed.

8. Place Grates - Remove the plywood tops on the system by taking out the bolts along each rail (Typically 6 per rail section). Once all of the bolts are removed the plywood can be taken out. All of the grates can now be installed. Note that the grates should typically have 1/8" gap between them for expansion and contraction. Locks for the grates are available if the grates will be installed in high speed traffic.



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