Foundation Drainage Requirements
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Water seeping in at the base of a foundation wall, have you ever seen this happen? Many homeowners have become very frustrated when their basement walls start leaking, causing moisture damage to stored items and finished habitable areas in a basement. Proper construction techniques, code compliant damproofing or waterproofing of the foundation, and a properly installed foundation drainage system can help avoid potential water and moisture damage on the interior of a foundation system. All of these items must be completed properly at the time of installation, since backfill around the foundation typically covers the damproofing, waterproofing and the foundation drainage systems.

Section R405 of the 2003 Michigan Residential Code (MRC) addresses code complaint foundation drainage. Section R405.1 tells us that drains are required around all concrete and masonry foundations that retain earth and enclose habitable or usable spaces below grade and within the foundation walls. Drain tiles, gravel or crushed stone drains, perforated pipe or other approved systems must be installed at or below the area being protected. These drains are required to discharge either by gravity or a mechanical system, such as a sump pump, to an approved drainage system or to daylight. Gravel or crushed stone drains are required to extend out at least 12 inches from the edge of the footing, at least 6 inches above the top of the footing, and be covered with an approved filter membrane type material. With either drain tiles or perforated pipe, a minimum of 2 inches of gravel or crushed stone is required as a base. Drain tiles and pipes should be covered with a minimum of 6 inches of gravel or crushed stone. The size of the gravel or stone should be at least one sieve size larger than the holes and/or joints in the pipe or tiles. When drain tile is used, the open joints of the drain tile must be protected with strips of building paper. There is one exception to the requirement for foundation drainage. A foundation drainage system is not required when the foundation is installed on well drained ground or sand - gravel mixture soils, as described in the Unified Soil Classification System, Group 1 Soils, shown in table R405.1 of the 2003 MRC.

When installing wood foundations, sections R405.2.1 through R405.2.3 list the requirements for foundation drainage. Section R405.2.1 describes the base requirements. A minimum 4 inch layer of gravel, crushed stone or coarse sand is required under the basement floor of a wood foundation. Provisions must also be made for the automatic drainage of this floor base, as well as the gravel or crushed stone wall footings. Section R405.2.2 requires a minimum 6 mil polyethylene moisture barrier over the base layer, prior to the basement floor being installed. Section R405.2.3 lists the specific details of how the drainage system must be terminated. In other than well drained ground or sand - gravel mixture soils, as described in the Unified Soil Classification System, Group 1 Soils, shown in table R405.1 of the 2003 MRC, a sump must be provided when installing a wood foundation. The sump must be a minimum of 24 inches in diameter or 20 inches square and extend at least 24 inches below the bottom of the basement floor. The sump must be capable of draining either by gravity or mechanically to remove any accumulated water. The drainage system must empty either to daylight or an approved sewer system.

Surface drainage is also important in directing surface water away from the foundation. Section R401.3 states that lots shall be graded so that surface water is drained away from the foundation. The grade must slope away from the foundation a minimum of 6 inches within the first 10 feet of the building. An exception to the slope requirement allows drains or swales to be installed when lot lines, slopes or other barriers prevent the grade to slope away from the foundation the required 6 inches within 10 feet.

Most jurisdictions require an inspection of the foundation prior to backfill. During this inspection, the inspector can verify that the foundation drainage system is installed properly. As with all aspects of construction, following the code requirements will assure that your construction project meets code and will be approved at the time of an inspection. Should you have any questions regarding the installation of foundation drainage systems, contact your local building dept. for further information.

Code information from the 2003 Michigan Residential Code