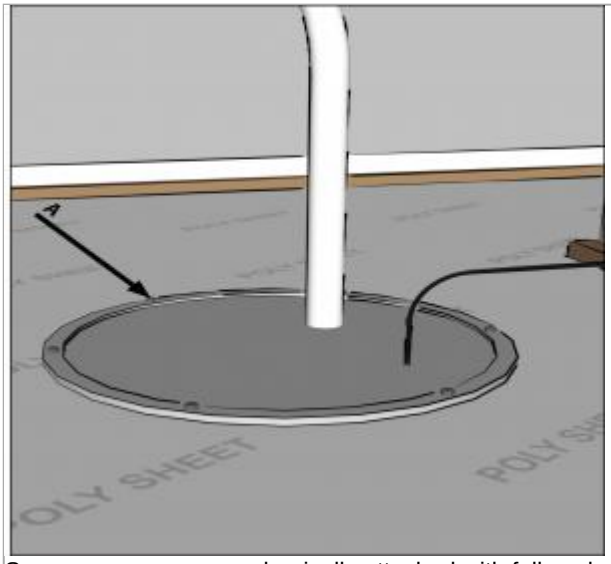
Sump Pump Cover Gasket

Last Updated: 03/14/2016

Scope


Sump pump covers mechanically attached with full gasket seal or equivalent

Select and install sump pumps that have tight-fitting lids with gaskets and mechanical fasteners.

See the **Compliance Tab** for related codes and standards requirements, and criteria to meet national programs such as DOE's Zero Energy Ready Home program, ENERGY STAR Certified Homes, and Indoor airPLUS.

Description

Water management strategies that help remove excess water from the foundation often include the installation of a reservoir called a sump in the basement or crawlspace of the home. For more information about drains and sumps see the guide **Drain or Sump Pump Installed in Basements or Crawlspaces**. The sump is generally a small pit (also called a crock or vault) that extends through the slab into the ground below and provides a drainage place for excess water.

When building a home, the best way to protect the foundation from moisture issues is with **proper site grading**, installation of **gutters and downspouts**, and installation of **exterior footing drain pipe** that drains to daylight, a drywell, or a storm sewer. When renovating a house that has evidence of water issues, if it is not feasible to construct an exterior drainage system, drain pipe can be installed along the interior footing that drains to a sump pump, which collects the water and sends it to the storm water, sewer, drywell, or other approved location. Even if there is no sign of water intrusion in retrofit or new construction, a sump pit is sometimes installed in the basement floor slab as a precaution; then, if there are future changes in ground water levels, a pump can be installed in the sump pit (Ueno and Lstiburek 2010).

The sump pit should be covered with a gas-tight lid, which is a requirement of the **2009**, **2012**, and **2015** IRC and of **ENERGY STAR Certified Homes** Version 3.0, Revision 08. While sump pumps are very effective in removing water, if they are not covered and installed properly, they can create additional water management issues, as well as indoor air quality concerns for the house. Sumps usually have standing water. If the sump pit is open or has a loose-fitting lid, this water can evaporate into the air, raising the relative humidity inside the home, basement, and crawlspace. This can encourage the growth of mold, which is a health concern, and can increase the moisture level of wood framing, inviting fungal decay and wood-eating pests. Uncovered or improperly sealed sump pumps can also allow radon and other soil gases to enter the basements and crawlspaces and then mix with air inside the home (**EPA 2012**).

Radon is a naturally occurring radioactive, carcinogenic gas found in varying levels in the soil and air. In high-radon areas, if soil gases are allowed to enter the home, radon can accumulate inside the home in potentially toxic levels (**EPA 2001**). See **Approved radon-resistant features installed in Radon Zone 1 homes** for more information on radon and ways to reduce radon accumulation in homes.

The **2009**, **2012**, and **2015** IRC require that any sumps pumps that are installed have a gas-tight, removable cover. ENERGY STAR Certified Homes requires the sump lid to be mechanically attached and that the sump be fitted with a full gasket seal.

Figure 1. An open sump pump can allow moisture, soil gases, and radon to enter the home.

How to install a sump pump cover

1. Install the electric sump pump to manufacturer's specifications, making sure the float is unobstructed. Installation of the pump should happen after the home's electric meter has been set. This will allow you to test the pump and ensure it is operating properly and discharging water as intended.
2. Select a sump pump model with a cover that is tight fitting and that seals the entire surface of the crock or vault. Sump covers should be made of durable plastic or other rigid material and designed for air-tight sealing with a built-in gasket. Select a sump pump with a lid that has built-in air-sealing grommets around all penetrations for electrical wiring, water ejection pipes, or radon vent pipes.

3. Mechanically fasten the cover in place with screws or other means that will maintain tight contact between the lid, the gasket, and the rim of the crock. Sump covers that permit observation of conditions in the sump pit are recommended. If the sump is installed in a concrete slab, caulk around the outside edge of the vault where the vault meets the concrete (EPA 1994). If the sump is installed in a crawlspace with a dirt floor covered by a polyethylene vapor barrier, ensure that polyethylene covers the ground around the sump pump and is taped to the rim of the vault.

Figure 2. This sump pump is properly sealed with a mechanically fastened, gasketed lid.

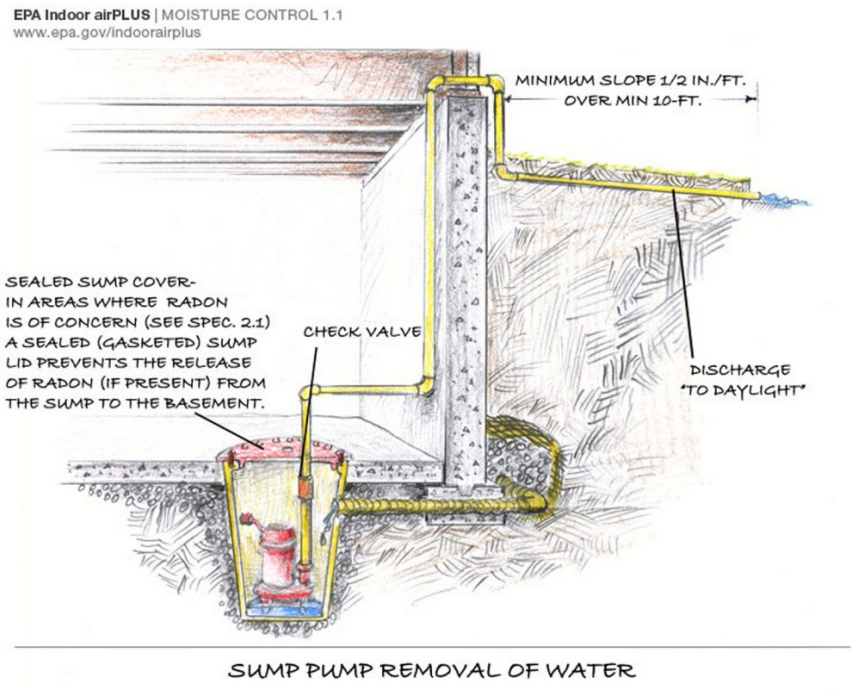


Figure 3. A sump pump is installed in the basement slab to pump away water that collects in the foundation drainage system. The sump has a tight-fitting cover to keep soil gases and water vapor from entering the basement.

Ensuring Success

In areas where radon is a known specific threat to air quality (i.e., EPA Radon Zone 1 areas), an important part of the radon mitigation strategy is a sump pump cover that is mechanically attached with a full gasket seal. After the sump pump has been installed, complete radon testing to ensure that the cover is sealed and not allowing any radon into the living space.

Climate

No climate specific information applies.

Training

Right and Wrong Images

Display Image: ES_WMSBC_1.7_PG26_43b_32311_0.jpg

Reference: Water Management System Builder Checklist Guide

Author(s): EPA
Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

Display Image: ES_WMSBC_1.7_PG26_43b_32311_0.jpg

Reference: Water Management System Builder Checklist Guide

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Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

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Reference: Water Management System Builder Checklist Guide

Author(s): EPA
Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

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Reference: Water Management System Builder Checklist Guide

Author(s): EPA
Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

Display Image: ES_WMSBC_1.7_PG26_45e_32311_0.jpg

Reference: Water Management System Builder Checklist Guide

Author(s): EPA
Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

Display Image: ES_WMSBC_1.7_PG26_45e_32311_0.jpg

Reference: Water Management System Builder Checklist Guide

Author(s): EPA
Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

CAD

None Available

Compliance

The Compliance tab contains both program and code information. Exact code language is copyrighted and may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

DOE Zero Energy Ready Home

The U.S. Department of Energy (DOE) **Zero Energy Ready Home National Program Requirements** requires (Exhibit 1, and 6) that all homes meet ENERGY STAR Certified Homes Version 3 or 3.1 and the U.S. Environmental Protection Agency Indoor airPLUS Construction Specifications

EPA Indoor airPLUS

The U.S. Environmental Protection Agency **(EPA) Indoor airPLUS Construction Specifications** requires homes to meet the ENERGY STAR Certified Homes requirements. Additional requirements include the following.

- Install a drain or sump pump in basement and crawlspace floors, discharging to daylight at least 10 feet outside the foundation or into an approved sewer system.
    - Exception: In areas of free-draining soils identified as Group 1 (Table R405.1, 2009 IRC) by a certified hydrologist, soil scientist, or engineer through a site visit – installation of a drain or sump pump is not required.

ENERGY STAR Certified Homes

ENERGY STAR Certified Homes (Version 3/3.1, Revision 08), Water Management System Builder Requirements

1. Water-Managed Site and Foundation:

1.7 Sump pump covers mechanically attached with full gasket seal or equivalent.

Builders Responsibilities: It is the exclusive responsibility of builders to ensure that each certified home is constructed to meet these requirements. While builders are not required to maintain documentation demonstrating compliance for each individual certified home, builders are required to develop a process to ensure compliance for each certified home (e.g., incorporate these requirements into the Scope of Work for relevant sub-contractors, require the site supervisor to inspect each home for these requirements, and / or sub-contract the verification of these requirements to a Rater). In the event that the EPA determines that a certified home was constructed without meeting these requirements, the home may be decertified.

ENERGY STAR Revision 08 requirements are required for homes permitted starting 07/01/2016.

2009, 2012, 2015 International Residential Code (IRC)

Chapter 30 Sanitary Drainage, Section P3007 Sumps and Ejectors, The sump pump should have a gas-tight removable cover. Chapter 33 Storm Drainage, Section 3303 Sumps and Pumping Systems – the sump pump should be at least 18 inches wide by 24 inches deep, located at a depth so that all drainage flows into it by gravity, made of tile, steel, plastic, cast-iron or concrete and have a removable cover.

More Info.

Access to some references may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

Case Studies

None Available

References and Resources*

1. **Building Radon Out, A Step-by-Step Guide On How To Build Radon-Resistant Homes**
   Author(s): EPA
   Organization(s): EPA
   Publication Date: April, 2001
   Document detailing how to build radon-resistant homes.

2. **Bulk Water Control Methods for Foundations**
   Author(s): Ueno, Lstiburek
   Organization(s): BSC
   Publication Date: January, 2011
   Report about the fundamental concepts that must be understood at the planning or initial nspection of existing homes regarding surface and ground water management.

3. **DOE Zero Energy Ready Home National Program Requirements**
   Author(s): DOE
   Organization(s): DOE
   Publication Date: August, 2015
   Standard requirements for DOE's Zero Energy Ready Home national program certification.

4. **ENERGY STAR Certified Homes, Version 3 (Rev. 08) National Program Requirements**
   Author(s): EPA
   Organization(s): EPA
   Publication Date: September, 2015
   Document outlining the program requirements for ENERGY STAR Certified Homes, Version 3 (Rev. 08).

5. **Radon Mitigation Standards**
   Author(s): EPA
   Organization(s): EPA
   Publication Date: January, 1994
   Standard providing information on contractors who offer radon control services to homeowners.

6. **Technical Guidance to the Indoor airPLUS Specifications**
   Author(s): EPA
   Organization(s): EPA
   Publication Date: October, 2015
   Website providing technical guidance to help home builders and their subcontractors, architects, and other housing professionals understand the intent and implementation of the specification requirements of the IAQ labeling program.

7. **Water Management System Builder Checklist Guide**
   Author(s): EPA
   Organization(s): EPA
   Publication Date: February, 2011
   Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

*Publication dates are shown for formal documents. Dates are not shown for non-dated media. Access dates for referenced, non-dated media, such as web sites, are shown in the measure guide text.

Contributors to this Guide

The following Building America Teams contributed to the content in this Guide.

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