



## **SMART VENT Foundation Flood Vent NAHB Model Green Home Building Contribution**

Smart VENT Products, Inc. is committed to a sustainable approach to construction. From recycled packaging, to an emphasis on education, Smart VENT believes in the power of a cooperative and integrated approach to planning, designing, and construction or remodeling of buildings. By the nature of the products, Smart VENT Inc's focus has been on practical engineering with a respect for the environment.

Redevelopment of infill sites is always encouraged over new development. Historically, urban areas have always developed near water (river, coast, lake, etc.) Due to this, many communities are in designated floodplains. Because of climatic changes, potentially devastating storms are increasing, and instances of flooding are more common, which results in larger flood zones. Smart VENT provides an environmentally responsible way to redevelop an area in a designated flood zone.

Specifying and installing Smart VENT Foundation Flood Vents can contribute toward achievement of numerous points to attain a Bronze, Silver, or Gold NAHB level of green building. The performance and technologies engineered into these automatic openings can help to achieve points in the following categories of NAHB Model Green Home Building: *Lot Design, Preparation, and Development; Resource Efficiency; Energy Efficiency; Indoor Environmental Quality; and Operation, Maintenance, and Homeowner Education.*

In addition, several benefits of utilizing automatic engineered openings are not addressed by the NAHB Model Green Home Building Guidelines, and provide opportunities to pursue points for *Innovation Options*. Possibilities for achieving Innovation points have been suggested and appear at the end of applicable sections.

The following pages include the section and points that can be pursued with the help of Smart VENT Foundation Flood Vents. For each section, see "Smart VENT Contribution" to find out how the solution contributes to attaining points.

# NAHB Model Green Home Building Guidelines

## Section 1 – Lot Design, Preparation, and Development

### 1.1 Select the Site

#### 1.1.2 Choose an infill site.

**Intent:**

Building on an infill site can effectively conserve resources (e.g., infrastructure) and preserve open space that could be lost from “green field” development.

#### 1.1.3 Choose a greyfield site.

**Intent:**

Redevelopment of a greyfield site can provide an efficient use of land and infrastructure. Greyfield redevelopment allows for the preservation of open space and wildlife habitat in the midst of growth.

#### **Smart VENT Contribution:**

Redevelopment of an area as infill or greyfield into an existing community is always preferred. Planning with the intended utilization of Smart VENT Foundation Flood Vents in the home will enable redevelopment into an existing floodplain while fulfilling NFIP regulations and ICC code requirements. These flood vents are the only automatic engineered openings that are accepted by FEMA for NFIP requirements and certified by the ICC for code compliance.

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### 1.3 Design the Site

Minimize environmental impacts; protect, restore, and enhance the natural features and environmental quality of the site.

#### 1.3.4 Minimize soil disturbance and erosion.

**Intent:**

Sediment and the pollutants contained in it are recognized sources of water quality problems. Exposed soils should be minimized to reduce erosion, promote water quality, and reduce damage caused to native vegetation. Heavy equipment and excessive digging can result in compaction or loss of topsoil along with the introduction of invasive and problematic flora. Minimizing soil disturbance and erosion both reduces stressors on downstream water bodies and saves valuable topsoil for the site.

#### 1.3.5 Manage storm water using low-impact development when possible.

**Intent:**

Percolation through soil is one of the most effective means for filtering pollutants carried by storm water. By using natural water and drainage features, minimizing impervious surfaces, and distributing storm water flows, builders can reduce harmful pollutants carried off-site while safely and effectively managing much of their storm water load onsite.

#### **Smart VENT Contribution:**

Use of fill soil disrupts the site conditions and contributes to a deterioration of the natural water infiltration and to the increase of storm water runoff. In addition, foreign soil may contain different components, potentially adding to site pollution contaminants. By utilizing Smart VENT Foundation Flood Vents in a continuous perimeter foundation wall, the building does not require fill soil to be placed under the foundation footprint to raise it above the base flood elevation.

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## **NAHB Model Green Home Building Guidelines Section 2 – Resource Efficiency**

### **2.1 Reduce Quantity of Materials and Waste**

#### **2.1.3 Use building dimensions and layouts that maximize the use of the resources without the need to cut materials.**

**Intent:**

Use of standard or modular dimensions in layout will reduce waste by not having to cut materials.

**Smart VENT Contribution:**

Smart VENT Foundation Flood Vents are manufactured in standard sizes. Smart VENT's Flood Vents and dual-function Smart VENTs are 16"x8" – sized to be inserted into a standard block/masonry foundation wall. Smart VENT's Stud Wall Flood Vents are 14.5" X 8.5" – sized to fit in standard 16" on-center stud wall construction.

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#### **2.1.5. Use building materials that require no additional finish resources to complete application onsite.**

**Intent:**

Materials that do not require additional finish resources save on priming, painting, and/or additional resources at the installation stage. Additionally, fewer resources are needed for recurring maintenance.

**Smart VENT Contribution:**

Smart VENT Foundation Flood Vents are manufactured from high grade stainless steel. They are not to be finished in any way. To provide for options, Smart VENT products are available in colors. This optional finish is powder-coated, not painted, and will last for years. Either factory finish is rated for compliance with FEMA's NFIP regulations for flood resistant materials.

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### **2.2 Enhance Durability and Reduce Maintenance**

**Intent:**

Building designs, material choices, and installation techniques should seek to minimize the effects of degradation and weathering, enhance life expectancy of the assembly, and lessen maintenance needs.

**Smart VENT Contribution:**

Because Smart VENT Foundation Flood Vents are manufactured from stainless steel, and engineered for compliance with FEMA's NFIP regulations for flood resistant materials. As a result, they are corrosion resistant and have been tested and given a life expectancy in excess of 20 years. Maintenance requirements are minimal; needing only occasional rinsing and lubrication.

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## 2.3 Reuse Materials

### 2.3.2 Reuse salvaged materials, where possible.

**Intent:**

To minimize the waste stream by reusing materials. Ideally, salvaged materials should be reclaimed from a nearby or onsite demolition or remodeling project to minimize transportation.

**Smart VENT Contribution:**

Reuse of a structure in a floodplain requires a retrofit of the foundation walls to provide for proper flood venting. Smart VENT Foundation Flood Vents are manufactured in a standard masonry size (8" x 16"), affording an easy retrofit into an existing foundation wall to attain compliance with NFIP regulations and ICC codes. Smart VENT's Flood Vents provide venting while also maintaining an R 8.34 insulation factor.

Color options allow for planned integration to minimize visual impact with the existing surface material. In addition, Smart VENT accessories provide for flood venting in unusual applications. When needed, an interior trim flange, installed on the inside of the wall, provides a finished appearance to the vent opening. Fire damper models provide certified 2-hours of fire resistance.

## 2.4 Use Recycled-Content Materials

### 2.4.1 Use recycled-content building materials.

**Intent:**

To minimize the impact of home building on the environment.

**Smart VENT Contribution:**

Smart VENT Foundation Flood Vents are manufactured with a recycled content in excess of 70% due to its stainless steel construction. The vast majority of the steel is from post-consumer. Some is also from pre-consumer and post-industrial recycled steel products, with a very small percentage of the metal composed of the virgin elements needed to bring the steel up to grade specification. Additional materials (plastics, fibers, and other materials) used in the flood vents are minimal, as they comprise only the components integrated into the product for functionality and performance features.

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## 2.5 Recycle Waste Materials During Construction

### 2.5.3 Recycle construction waste offsite, e.g., wood, cardboard, metals, drywall, plastics, asphalt roofing shingles, concrete, block, other.

**Intent:**

Through a recycling program, divert from the landfill a minimum of 50% (by weight) of construction, demolition, and land clearing waste.

**Smart VENT Contribution:**

Smart VENT Products are all minimally packaged in recycled cardboard. This packaging can be disposed of on site with any other cardboard for recycling. Additionally, depending on the number of units needed for the project, pallet packaging can be arranged to further reduce the on site waste.

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## 2.8 Innovative Options

### 2.8.2 Use a life-cycle assessment (LCA) to compare the environmental burden/effects of building materials. Based on the analysis, choose the most environmentally preferable product for that building component.

**Intent:**

To highlight the best use of resources, including cost, to assure that all of the guiding principles have been considered.

**Smart VENT Contribution:**

Due to the superior engineering of Smart VENT Foundation Flood Vents, they are one of the best ways to maintain a home in a flood plain – as a home without structural damage after a flood event is obviously more environmentally preferable. In terms of life-cycle, initial cost of the vents is recouped in flood insurance premiums reductions. Due to the steel construction and minimal maintenance, life cycle costs over the estimated 20 year life of the product are negligible.

In addition, because Smart VENT Flood Vents are currently the only way to compliantly vent a conditioned crawl space or walk-out basement in a home in a flood plain, they are an obvious contribution to a full home conditioning plan; leading to significant energy savings over the life of the home.

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## NAHB Model Green Home Building Guidelines Section 3 – Energy Efficiency

### **3.1 Implement an Integrated and Comprehensive Approach to Energy-Efficient Design of Building Site, Building Envelope, and Mechanical Space Conditioning Systems**

**Intent:**

To use a whole-systems approach in designing and building an energy-efficient home. Key concepts are integrated and comprehensive.

#### **3.3.1 Building Envelope**

A. Increased effective R-value of building envelope using advanced framing techniques, continuous insulation, and/or integrated structural insulating system.

**Intent:**

To enhance the insulating value of the building envelope by selecting an efficient and cost-effective framing package or alternative structural wall system. Framing details such as two-stud corner framing, ladder blocking at wall intersections, and raised heel roof trusses can eliminate thermal bridges, i.e., areas where there is no room for insulation.

**Smart VENT Contribution:**

When building in a floodplain, NFIP and code requirements demand proper venting in the foundation of the building to provide for wet flood proofing as recommended by FEMA. To achieve venting and maintain maximum energy performance through the building envelope, the foundation flood vents must provide a level of insulation. Smart VENT's Flood Vent offers both an automatic engineered opening accepted by FEMA for NFIP requirements and certified by the ICC for code compliance, and also a level of insulation. The flood vent door provides an R 8.34 insulation factor.

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B. Incorporate air sealing package to reduce infiltration. (All measures that apply to project must be performed.)

**Intent:**

When building an energy-efficient home, it is equally or more important to prevent air infiltration as it is to provide a high R-value wall system. Air can pass through very small cracks, resulting in energy loss and condensation, so it is necessary to be very detail-oriented when it comes to air sealing.

**Smart VENT Contribution:**

Smart VENT's Dual Function Vent provides NFIP and code compliant flood vent protection with automatic natural air ventilation. The air vent offers a bi-metal coil that closes the vent louvers in cold weather, and opens them in warm weather, providing efficient functionality that can improve the building's HVAC efficiency through a reduction in cold air infiltration.

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## **NAHB Model Green Home Building Guidelines Section 5 – Indoor Environmental Quality**

## 5.2 Manage Potential Pollutants Generated in the Home

### 5.2.4 Install humidistat to control whole-house humidification system.

**Intent:**

Control excessive humidification, which can result in moisture damage.

**Smart VENT Contribution:**

Smart VENT's Dual Function Vent provides NFIP and code compliant flood vent protection with automatic natural air ventilation, supplying foundation air ventilation to attain building breathability – reducing moisture in the crawlspace. For those floodplain installations in climates that utilize natural foundation ventilation, the Smart VENT affords a perfect solution to install one product that achieves two purposes. When installed in accordance with ICC codes in a crawlspace over vapor barrier, the air ventilation requirements are exceeded.

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## 5.4 Innovative Options

**Smart VENT Contribution:**

Reuse of an existing building is often the biggest design challenge. Innovation in that reuse is the key to an effective reuse plan. Smart VENT Foundation Flood Vents afford innovative solutions to reusing an existing building that is sited in a floodplain. Smart VENT's stacked flood vent configurations afford flood protection on a large scale for buildings with a large footprint, but without the foundation wall space to vent in a traditional manner.

Smart VENT Foundation Flood Vents are engineered to mitigate structural damage; to maintain the structure in a flood, a far more sustainable solution to the problem than to replace a flood damaged structure. Smart VENT Foundation Flood Vents have been approved in Historic Districts, and provide an innovative solution to reuse an existing building in a floodplain. Should a designer have a reuse project in a floodplain, Smart VENT Products encourages that design team to contact them to find an environmentally sustainable, practical and economical solution to flood protection.

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## NAHB Model Green Home Building Guidelines Section 6 – Operation, Maintenance, and Homeowner Education

### 6.1 Provide Manual to Owners/Occupants on Use and Care of the Home

**Intent:**

Help homeowners to “live green” in their green-built home.

**Smart VENT Contribution:**

The type of Smart VENT foundation flood vents used (Dual-Function vs. Insulated Flood Vents) should be included, with an explanation of their functionality in regards to the energy efficiency of the home's crawlspace. (Either insulation OR air ventilation) Product packaging includes installation and maintenance instructions; a copy of which should be included in the Home Manual to enable future maintenance. Warranty information, available from Smart VENT and its dealers, should also be included.

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**6.2 Optional Items to Include in the Home Manual****Intent:**

Provide further information about maintenance and operation of a green home and the surrounding site.

**Smart VENT Contribution:**

Smart VENT Foundation Flood Vents, when properly installed in compliance with FEMA regulations, result in a reduction in flood insurance premiums for the homeowner. Savings vary by the risk level of the home's location and the construction below and above the Base Flood Elevation (BFE). A copy of the home's elevation certificate, indicating the use of foundation flood vents, should be kept in the Home Manual along with a quote from their insurance agent showing the difference in premiums – so that the homeowner knows their savings, and understands the restrictions of the use of any space below the BFE.

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**6.3 Provide Education to Owners/Occupants in the Use and Care of their Dwellings**

Instruct homeowners/occupants about the building's goals and strategies and occupant impacts on costs of operating the building. Provide training to owners/occupants for all control systems in the house.

**Intent:**

During the walk-through, demonstrate how to control all the mechanical systems in the home. Demonstrate how to use all controls such as thermostats, lighting controls, and fan controls.

**Smart VENT Contribution:**

The Smart VENT web site has video demonstrations of how the vents work in a flood event. In person, they are easily demonstrated for functionality - showing how the floats work to release the door, how the louvers open and close in the dual-function vents, and how to disassemble the vent doors for maintenance including the optional locking clips.

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