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SECTION 31 21 00

OFF-GASSSING MITIGATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes Off-gassing Mitigation Panels system using specialized manufactured products.

1.02 REFERENCES

A. ASTM E1465 - Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings.

B. ASTM E2121- Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings.

C. ICC-ES AC461 - Acceptance Criteria for An Alternate Gas Permeable Layer of a Subslab Depressurization System for Radon Gas Control

D. UL Evaluation Report ER11812-06

E. Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

G. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

H. ICC ES AC12 - Acceptance Criteria for Foam Plastic Insulation.

I. LEED v4, LEED (Leadership in Energy and Environmental Design): Green Building Rating System

1.03 SUBMITTALS

A. Submit insulation manufacturer's product literature and installation instructions, including:

1. Provide UL Evaluation Report for with evidence of compliance with code. Submit current compliance report numbers from UL with conformance to the International Building Code (IBC) and International Residential Code (IRC). Code report shall include compliance with ICC ES AC12 (Foam Plastic) dated June 2012 and ICC ES AC 461 (Radon Gas Control) dated October 2015.

2. Installation Data: Manufacturer's installation Instructions.

3. Third Party certification of flame spread and smoke developed indexes

4. Third Party certification of physical properties in compliance with ASTM C578.

5. 50-year in-service, non-prorated thermal performance warranty.

B. Sustainable Design Submittals: In accordance with Section 01 81 13: Sustainable Design Requirements. Provide required Sustainability documentation for Product as follows.

1. Product Certificates for Credit [LEED] [Built Green] [other]

C. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.04 DELIVERY, STORAGE & HANDLING

A. Deliver insulation in packages labeled with material Type, R-value, load capacity, and UL Evaluation Report number with compliance to ICC-ES AC471.

B. Store in original unopened packaging above ground, and protected from moisture and sunlight prior to installation.

C. Product should not be exposed to open flame or other ignition sources.

1.05 WARRANTY

A. Provide 50-year in-service, non-prorated R-value warranty covering the long-term thermal performance of expanded polystyrene insulation.

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Expanded polystyrene foam insulation & ventilation panels for use with gas exhaust piping and other components as part of an Off-gassing Mitigation system.

2.02 PERFORMANCE REQUIREMENTS

A. Off-gassing Mitigation Panels: Meet or exceed UL ER11812-06

B. Insulation compliance with ASTM C578.

C. Insulation with ASTM E84 flame spread of less than 25 and a smoke developed index of less than 450

2.03 Materials

A. Off-gassing Mitigation Panel: 4 inches thick expanded polystyrene insulation incorporating minimum 1-1/2 inch high ventilation pedestals.

1. Acceptable materials: [Foam-Control ® Radon Guard ® insulation & ventilation panels].

B. Supplier

Note to Specifier Select the name and address of the local Radon Guard Suppliers.

1. ACH Foam Technologies, Inc., 5250 North Sherman St., Denver, CO 80216
2. ACH Foam Technologies, Inc., 111 W. Fireclay Ave., Murray, UT 84107
3. ACH Foam Technologies, Inc., 775 Waltham Way, Suite 105, McCarran, NV 89434
4. ACH Foam Technologies, Inc., 90 Trowbridge Drive, Fond du Lac, WI 54936-0660
5. ACH Foam Technologies, Inc., 4001 Kaw Drive, Kansas City, KS 66102
6. ACH Foam Technologies, Inc., 809 East 15th Street, Washington, IA 52353
7. ACH Foam Technologies, Inc., 2731 White Sulphur Road, Gainesville, GA 30501
8. Big Sky Insulations, Inc., 15 Arden Drive, Belgrade, MT 59714
9. Branch River Plastics, Inc., 15 Thurber Boulevard, Smithfield, RI 02917
10. Henry Products, Inc., 302 S. 23rd Avenue, Phoenix, AZ 85009
11. Cellofoam Winchester, 326 McGhee Road, Winchester, VA 22603
12. NoArk Enterprises, Inc., 10101 Highway 70 East, North Little Rock, AR 72117
13. Pacific Allied Products, Ltd., 91-110 Kaomi Loop, Kapolei, HI 96707
14. Poliestireno Alfa-Gamma S.A. DE C.V., Maquiladoras #331 Interior A y B, Tijuana, BC, Mexico, 22500
15. Poliestireno Alfa-Gamma S.A. DE C.V., Boulevard Mexico km 2.5, Exejido Aquiles Serdan, C.P. 35080, Gomex Palacio, Durango, Mexico
16. Plasti-Fab EPS Product Solutions, 116 Pine Street South, Lester Prairie, MN 55354
17. Therma Foam, LLC, 1240 Hwy 77 North, Hillsboro, TX 76645
18. Thermal Foams, Inc., 2101 Kenmore Avenue, Buffalo, NY 14207
19. Thermal Foams/Syracuse, Inc., 6173 South Bay Road, Cicero, NY 13039
20. AFM Corporation, 17645 Juniper Path, Suite 260, Lakeville, MN 55044

2.04 ACCESSORIES

A. [Radon] [Methane] Gas Exhaust Vent Pipe: 4 in. nominal diameter [ABS] [PVC] [Steel] pipe in accordance with Section [22 13 16 Sanitary Waste and Vent Piping].

B. Gas Exhaust Vent Collar: Inside diameter and material to match pipe selected in 2.14A [ABS] [PVC] [Steel] exhaust vent with flange.

1. Length [to suit combined depth of insulation] [as indicated].
2. Acceptable materials: [Radon Guard Vent Collar Fitting] [Tee fitting per pipe manufacturer, interconnect intake with off-gassing mitigation panels ventilation channels].

C. Inline [Radon] [Methane] Gas Exhaust Fan: In accordance with Section [23 34 00 HVAC Fans] [23 35 00 Special Exhaust Fans].

D. [Radon] [Methane] Gas Retarder Membrane: In accordance with Section [07 26 23 Below Grade Gas Retarders].

E. Sealant: [ABS] [PVC] [Steel] pipe and fitting adhesive in accordance with Section [22 00 00].

F. Non-expanding aerosol foam in accordance with Section [07 21 00 Spray-in-place Polyurethane Foam]

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for off-gassing mitigation panels installation.

1. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to

proceed from Consultant.

B. Start of off-gassing mitigation panels installation indicates installer's acceptance of substrate conditions.

3.02 PREPARATION

A. Prepare sub-slab in accordance with [Section 03 30 00 - Cast-in-Place Concrete]

1. Install underslab infrastructure and utilities [as indicated] before starting installation of off-gassing mitigation system.

3.03 INSTALLATION

A. Install off-gassing mitigation system in accordance with Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions.

B. Panel Installation: Lay gas mitigation panels side by side with edges butting and with pedestal columns facing down directly over [undisturbed soil (no organics)] [compacted fill] [crushed stone] [sand base] [per engineer] substrate.

1. Align gas mitigation panels butted to each other side-by-side in any pattern desired.

2. Cover entire under-slab area with gas mitigation panels.

3. Trim panels to fit odd sizes and penetrations.

4. Use low-expanding aerosol foam to fill penetrations and excessive voids

C. Gas Exhaust Vent Installation: Install in location indicated [in accordance with prescriptive code solutions for vent pipe installations] [Off-gassing mitigation exhaust vent collar] [Tee fitting per pipe manufacturer, interconnect intake with off-gassing mitigation panels ventilation channels].

1. Gas mitigation system exhaust vent collar installation:

a. Cut 4" diameter hole in gas mitigation panel to suit gas exhaust vent collar diameter in location that allows direct vertical access to future gas mitigation exhaust vent piping system above.

b. Insert gas exhaust vent collar through gas mitigation panel with flange on top side of panel.

1) Ensure collar fits tightly.

D. Insert [ABS] [PVC] [steel] gas vent exhaust pipe into collar.

1. Ensure pipe is 6 inches minimum longer than collar.

E. Ensure airway is open to underside of panel and not blocked.

F. Temporarily cap pipe to ensure no debris enters and mark with [radon] [methane] information as required by building code.

G. Seal with [ABS] [PVC] [steel] adhesive in accordance with Section [22 13 16 Sanitary Waste and Vent Piping].

H. Install [radon] [methane] gas retarder over gas mitigation panels in accordance with Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions and Section [07 26 23 Below Grade Gas Retarders].

I. Lap joints and seal edges and penetrations in accordance with Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions.

J. Install concrete slab in accordance with Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions and Section [03 30 00 Cast-in-Place Concrete].

1. Install in-slab items [as indicated].

2. Caulk penetrations and edges. in accordance with Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions.

K. [ ]Install [complete passive gas mitigation exhaust piping vent system to outdoors][complete active gas mitigation exhaust piping vent system] to outdoors in accordance with Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions.

L. [ ] Install inline [radon] [methane] gas exhaust fan in in accordance with Foam-Control ® Radon Guard ® Sub-Slab Radon Gas Mitigation Installation Instructions and Section [23 34 00 HVAC Fans] [23 35 00 Special Exhaust Fans].

3.04 CLEANING

A. Progress Cleaning: Perform cleanup as work progresses [in accordance with Section 01 73 00 Execution].

1. Leave work area clean at end of each day.

B. Final Cleaning: Upon completion, remove surplus materials, rubbish, tools, and equipment [in accordance with Section 01 73 00 Execution].

C. Waste Management:

1. Coordinate recycling of waste materials with Section [01 74 19 Construction Waste Management and Disposal].

2. Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.

3. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.05 PROTECTION

A. Protect off-gassing mitigation from damage during construction period.

B. Repair damage to adjacent materials caused by off-gassing mitigation installation.

END OF SECTION