

Attachment G—Reference Documents

1. BPS Haunch Reinforcement Details, 03200-001, dated 03/02/2015, from WTC-964.951
2. RFI No. 017, BPS Haunch at Cedar and West Streets, dated 03/02/2015, from WTC-964.951, Tower 1 BPS
3. RFI No. 55, BPS Haunch Detail and Shallow Bollard Footing, dated 02/12/2015, from WTC-324.828.F-01 Liberty Park
4. WTC Flood Mitigation and Resiliency Improvements Program—Bollard Protection System at Vehicular Security Center—Reference Photos
5. 05706C-001-00 Spray Foam for Bollard Cover Installation, dated 10/17/2013, from WTC-324.359.01
6. Bollard Photos Procedure to Remove Bollard Covers
 - Photo 07A—Type I Bollard Filled with Concrete
 - Photo 07B—Type I Bollard with Cover Off
 - Photo 07C—Type II Bollard with Cover Off
 - Procedure for Removing Bollard Cover
7. Photograph of Continuous Gasket in Deployment

TRANSMITTAL
No. 00194

PROJECT: WTC Street Scape Phase 1

DATE: 9/20/2013

TO: Tishman Construction Corp of NY
115 Broadway
14th Floor
New York, NY 10006

REF: Submittals

ATTN: Tim Croke

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
<input type="checkbox"/> Shop Drawings	<input checked="" type="checkbox"/> Approval	<input type="checkbox"/> Approved as Submitted
<input type="checkbox"/> Letter	<input type="checkbox"/> Your Use	<input type="checkbox"/> Approved as Noted
<input type="checkbox"/> Prints	<input checked="" type="checkbox"/> As Requested	<input type="checkbox"/> Returned After Loan
<input type="checkbox"/> Change Order	<input type="checkbox"/> Review and Comment	<input type="checkbox"/> Resubmit
<input type="checkbox"/> Plans		<input checked="" type="checkbox"/> Submit
<input type="checkbox"/> Samples	SENT VIA:	<input type="checkbox"/> Returned
<input type="checkbox"/> Specifications	<input checked="" type="checkbox"/> Attached	<input type="checkbox"/> Returned for Corrections
<input checked="" type="checkbox"/> Other: Product Data - Spray Foam	<input type="checkbox"/> Separate Cover Via: Mail	<input type="checkbox"/> Due Date:

ITEM NO.	COPIES	DATE	ITEM	NUMBER	REV. NO.	DESCRIPTION	STATUS
1	1	9/20/2013	SUT	05706C-001	000	Spray Foam for Bollard Cover Installation	FRO

REFERENCE DOCUMENT NO. 5
CONTRACT WTC-964.952

**WTC STREETS, UTILITIES AND RELATED
INFRASTRUCTURE
DSP SHOP DRAWING/SUBMITTAL REVIEW**

CONTRACT NO. WTC 324.359.01

PACKAGE NO. _____

SUBMITTAL NO. 0576C-001

CONFORMS REVIEW NOT REQUIRED

CONFORMS AS NOTED REJECTED, RESUBMIT

REVISE AS NOTED AND
RESUBMIT

REVIEWED BY (PRINT): AWERENCHUK Date: 10.3.13

REVIEWED BY (SIGN): [Signature]

THIS DOCUMENT HAS BEEN REVIEWED FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT ONLY.
This review does not release the contractor or any subcontractor of responsibility for full compliance with contract requirements; for correctness of dimensions, clearances, and material quantities; for proper design and details; for proper fabrication and construction techniques; for proper coordination with other trades; and for providing all devices required for safe and satisfactory construction and operation.

CC:

Signed: _____

SUBMITTAL DATA SHEET

WTC STREETSAPES, UTILITIES, INFRASTRUCTURE PHASE II

Contract # WTC-324.359.01

Area: Liberty & Greenwich Streets

Submittal No: 05706C-001-00

Ref Specification No. 05706C

Ref Drawing/Detail No. _____

First Submission Date: 9/20/13

Item Submitted: Great Stuff - Window & Door

Application of Use: Spray Foam for Bollard Cover Installation

Contractor: _____

Subcontractor/
Supplier: _____

Lead Time: _____

Notes: FOR RECORD ONLY

REFERENCE DOCUMENT NO. 5
CONTRACT WTC-964.952

REFERENCE DOCUMENT NO. 5
CONTRACT WTC-964.952

16 oz.
value size



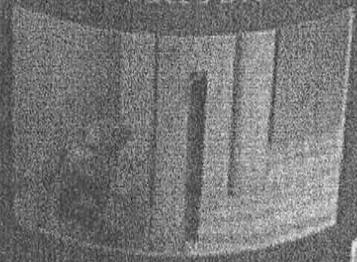
Great Seal

Save
Energy
Dollars

INSULATING FOAM SEALANT

WINDOW & DOOR

- Seals & Insulates Without Bowing
- Self-Expanding & Flexible For Expansion & Contraction
- Reduces Drafts



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GREAT STUFF PRO™ WINDOW & DOOR INSULATING FOAM SEALANT



PRODUCT NAME

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant

MANUFACTURER

The Dow Chemical Company
Dow Building Solutions
200 Larkin
Midland, MI 48674
1-866-583-BLUE (2583)
Fax 1-989-832-1465

Dow Chemical Canada ULC
Dow Building Solutions
450 - 1st St. SW, Suite 2100
Calgary, AB T2P 5H1
1-866-583-BLUE (2583) (English)
1-800-363-6210 (French)

www.dowgreatstuff.com

PRODUCT DESCRIPTION

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant is a one-component, minimal expanding, low pressure-build,* flexible polyurethane foam exclusively formulated to air seal the gap around a window or door frame and the rough opening. The foam expands to generate an effective seal, and when applied properly is proven not to distort or bow window and door frames.

BASIC USE

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant is designed to form a durable, airtight, water-resistant bond to vinyl, wood and metal surfaces. Its foam skin repels and deflects water, which can help reduce the potential for moisture damage in frame openings.

GREAT STUFF PRO™ Window & Door:

- Expands to take the shape of cracks and voids, helping stop drafts
- Reduces pathways where insects can enter
- Is tack-free in 5-10 minutes, trims within 1 hour, fully cured in 12 hours**

SIZES

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant is available in gun- and straw-applied versions. See Table 1 for size and estimated yields.

ACCESSORIES

Using one of several PRO Series foam dispensing guns simplifies the application of GREAT STUFF PRO™ Window & Door. In addition to enabling pinpoint application control, an airtight and moisture-tight seal between the gun and the can prevents the foam from curing and blocking the dispensing valve, allowing a can to be reused.

GREAT STUFF PRO™ Gun Cleaner simplifies cleanup of uncured polyurethane foam from dispensing guns.

TECHNICAL DATA

APPLICABLE STANDARDS

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant conforms to ASTM E2112 – Standard Practice for Installation of Exterior Windows, Doors and Skylights. It has also been tested to the following standards using a 1 cm-wide gap assembly:

- ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E283 – Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
- ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference
- ASTM E547 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cyclic Static Air Pressure Difference
- ASTM C1620 – Standard Specification for Aerosol Polyurethane and Aerosol Latex Foam Sealants
- CAN/ULC S710.1 – Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification

For more information on standards/test approvals and classifications, see Table 2.

Contact your Dow sales representative or local authorities for state/provincial and local building code requirements and related acceptances.

PHYSICAL PROPERTIES

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant exhibits the typical physical properties indicated in Table 3 when tested as represented.

INSTALLATION

GREAT STUFF PRO™ Window & Door should be applied at temperatures between 40°F and 100°F (4°C and 38°C) at relative humidity ≥ 20 percent. Surface where applied should be free of dust, grease, oil, wax and release agents. Damp surfaces will not impair the bond.

SAFETY AND CONDITIONS OF USE

- Read the label and Material Safety Data Sheet carefully before use.
- GREAT STUFF PRO™ Insulating Foam Sealants contain isocyanate and a flammable blowing agent. Vapor may travel to other rooms. Ensure adequate ventilation. Shut off all pilot lights and extinguish open flames; eliminate all sources of ignition before use. Do not smoke or use lighters or matches while dispensing foam.
- Do not breathe vapor or mist. Use in well-ventilated areas or wear proper respiratory protection. Isocyanate is irritating to the eyes, skin and respiratory system, and may cause sensitization by inhalation or skin contact.

TABLE 1: SIZE AND ESTIMATED YIELDS FOR GREAT STUFF PRO™ WINDOW & DOOR INSULATING FOAM SEALANT

CAN SIZE, OZ (G)	DELIVERY	NO. OF WINDOWS ⁽¹⁾
20 (567)	Straw	6-9
20 (567)	Gun	8-11

⁽¹⁾ Estimated yield under ideal conditions for 36" x 60" (0.9 m x 1.5 m) window, 3/8" (0.9 cm) wide gap, 1" (25 mm) deep, 3/8" bead

TABLE 2: GREAT STUFF PRO™ WINDOW & DOOR INSULATING FOAM SEALANT APPROVALS/CLASSIFICATIONS

STANDARD	RESULT
ASTM E283	Air leakage <0.01 cfm/ft ² at 6.24 psf pressure (or 50 mph wind speed) in 1 cm-wide gap
ASTM E331/E547	No water leakage at 12 psf negative pressure in 1 cm-wide gap
AAMA 812-04	Conforms to standard at 0.08 psi pressure-build (gun foam)
ABAA Specifications	Meets sealant component air barrier requirements
UL Classified	Classified per UL 723 as under UL File R13655
CCMC 13074-L CAN/ULC S710.1	Meets stringent CAN/ULC durability requirements as air leakage control sealant
ICC-ES ESR-1961	Evaluated as an insulating sealant

⁽¹⁾ Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

* Per AAMA 812-04, refers to pressure development while foam cures

** Dependent upon temperature, relative humidity and size of foam bead

- GREAT STUFF PRO™ foam is very sticky and will adhere to most surfaces and skin. Do not get foam on skin. Wear long sleeves, gloves, and goggles or safety glasses. Cured foam must be mechanically removed or allowed to wear off in time.
- The contents are under pressure. The can may burst if left in areas susceptible to high temperatures, such as motor vehicles, or near radiators, stoves or other sources of heat. Do not place can in hot water. Do not puncture, incinerate or store at temperatures above 120°F (49°C).
- Cured GREAT STUFF PRO™ foam is combustible and will burn if exposed to open flame or sparks from high-energy sources. Do not expose to temperatures above 240°F (116°C). GREAT STUFF PRO™ foam should not be used around heaters, furnaces, fireplaces, recessed lighting fixtures or other applications where the foam may come in contact with heat-conducting surfaces. For proper ventilation of combustion appliances, visit www.epa.gov/iaq/homes/hip-ventilation.html.
- Do not inject GREAT STUFF PRO™ foam into large or confined cavities such as behind holes in drywall or under tub wall surrounds where flammable vapors may collect. Foam must be exposed to atmospheric moisture to thoroughly cure.

Visit www.dowbuildingsolutions.com or contact a local Dow representative for more specific instructions.

AVAILABILITY

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant is distributed through an extensive network. For more information, call: 1-800-232-2436 (English) 1-800-565-1255 (French)

WARRANTY

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant is expressly warranted for a period of 10 years when used as part of a WEATHERMATE™ Weather Barrier Solutions installation. See warranty document (Form No. 179-07374) or www.dowbuildingsolutions.com for details.

MAINTENANCE

GREAT STUFF PRO™ Window & Door has a shelf life of 18 months when stored at 75°F (24°C).

TECHNICAL SERVICES

Dow can provide technical information to help address questions when using GREAT STUFF PRO™ Window & Door Insulating Foam Sealant. For technical assistance, call:
1-866-583-BLUE (2583) (English)
1-800-363-6210 (French)

FILING SYSTEMS

www.dowbuildingsolutions.com
www.sweets.com

TABLE 3: TYPICAL PHYSICAL PROPERTIES⁽¹⁾ OF GREAT STUFF PRO™ WINDOW & DOOR INSULATING FOAM SEALANT

PROPERTY AND TEST METHOD	VALUE
Flexural Strength, ASTM C203, Parallel to rise, psi (kPa), min.	5.2 (35.9)
Apparent Aged k-factor (Thermal Conductivity) per inch (25 mm), ASTM C518 @75°F (24°C) mean temp., Btu•in/ft ² •hr•°F (W/m•°C), min.	0.262 (0.038)
Compressive Strength, ASTM D1621, Parallel to rise, psi (kPa)	2.8 (19.2)
Apparent Density, ASTM D1622, pcf (kg/m ³)	1.63 (26)
Dimensional Stability, ASTM D2126, % Volume Change	
100°F/100%RH@1wk	-0.646
-40°F/ambRH@1wk	1.306
Open Cell Content, ASTM D6226, %	<88.00
Tensile Strength, ASTM D1623, Parallel to rise, psi (kPa)	5.7 (39.3)
Elongation, %, "Test immed. after cut"	19.6
Shear Strength, ASTM C273, Parallel to rise, psi (kPa)	7.07 (48.7)
Flame Spread/Smoke Developed ⁽²⁾ , ASTM E84	10/20

⁽¹⁾ Not to be considered sales specifications

⁽²⁾ This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

NOTICE: No freedom from any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries or regions. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO EXPRESS WARRANTIES ARE GIVEN EXCEPT FOR ANY APPLICABLE WRITTEN WARRANTIES SPECIFICALLY PROVIDED BY DOW. ALL IMPLIED WARRANTIES INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

CAUTION: When cured, these products are combustible and will burn if exposed to open flame or sparks from high-energy sources. Do not expose to temperatures above 240°F (116°C). For more information, consult MSDS, call Dow at 1-866-583-BLUE (2583) or contact your local building inspector. In an emergency, call 1-866-636-4400 in the U.S. or 1-519-339-3711 in Canada.

GREAT STUFF PRO™ Insulating Foam Sealants contain isocyanate and a flammable blowing agent. Read the label and Material Safety Data Sheet carefully before use. Eliminate all sources of ignition before use. Wear long sleeves, gloves, and safety glasses or goggles. Provide adequate ventilation or wear proper respiratory protection. Contents under pressure.

GREAT STUFF PRO™ Gun Cleaner is flammable and contains acetone and propane. Read the label and Material Safety Data Sheet carefully before use. Eliminate all sources of ignition before use. Wear gloves, and goggles or safety glasses. Provide adequate ventilation or wear proper respiratory protection. Contents under pressure.

Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mold formation. No material supplier including Dow can give assurance that mold will not develop in any specific system.

IN THE U.S.

FOR TECHNICAL INFORMATION: 1-866-583-BLUE (2583)

FOR SALES INFORMATION: 1-800-232-2436

THE DOW CHEMICAL COMPANY

Dow Building Solutions • 200 Larkin • Midland, MI 48674

IN CANADA

FOR TECHNICAL INFORMATION: 1-866-583-BLUE (2583) (English) • 1-800-363-6210 (French)

FOR SALES INFORMATION: 1-800-232-2436 (English) • 1-800-565-1255 (French)

DOW CHEMICAL CANADA ULC

Dow Building Solutions • Suite 2100 • 450 - 1st St. SW • Calgary, AB T2P 5H1



Printed in U.S.A.

www.dowgreatstuff.com

Form No. 179-07324X-1212MCK
178-00746X-1212MCK



Reference Document No. 6 Contract No. WTC-964.952
Bollard Cover Removal Procedure

INSTALLATION AND CLEANING INSTRUCTIONS

A: Inner Bollard Cover

- 1) Install (4) 3/8" Diameter x 6" galvanized anchor bolts per anchor bolt manufactures specifications. – Use Template
- 2) Use nuts to adjust to required elevation and insure level.
- 3) Correctly orientate and place inner bollard base over Type 1 or Type 2 Base as required (match mark number to placement plan.
- 4) Level bollard to required elevation (shim as required).
- 5) Install non-metallic no shrink grout.
- 6) Complete concrete site work as per site plan requirements.

B: Outer Bollard Cover:

- 1) Orientate and place outer bollard cover over Type 1 or Type 2 Base as required (match mark number to placement plan)
- 2) Install (2) stainless steel set screws (use anti-seize) into outer cover passing thru inner cover.
- 3) Tighten to a snug fit applying pressure in equal amounts to center outer bollard on inner bollard.
- 4) Once bollard is centered, tighten set screws as to seat into steel bollard.
- 5) Install (2) stainless steel caps.

C: Cleaning Instructions: Inner and Outer Covers:

- 1) Covers have a protective coating applied after the electro polishing process, it is removed with mild soap and water after the bollard installation is in place.
- 2) Take care as not to splash new concrete / concrete clean products on to bollard during concrete cleaning phase, shield and protect bollard. If concrete materials / concrete cleaning products come in contact with the stainless steel, immediately remove by water or etching of stainless can occur.

07A









REFERENCE DOCUMENT
No. 7 - CONTINUOUS GASKET