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SUBMITTAL TRANSMITTAL

August 17, 2011
WGC Submittal No: 04150-001

PROJECT: Harold Thompson Regional WRF
 Birdsall Rd.
 Fountain, CO 80817
 Job No. 2908

ENGINEER: GMS, Inc.
 611 No. Weber St., #300
 Colorado Springs, CO 80903
 719-475-2935 Roger Sams

OWNER: Lower Fountain Metropolitan
 Sewage Disposal District
 901 S. Santa Fe Ave.
 Fountain, CO 80817
 719-382-5303 James Heckman

CONTRACTOR: Ammex Masonry, Inc.
 P.O. Box 1272
 Commerce City, CO 80022
 303-853-9008 Amy Wheeler

SUBJECT: Submittal for Masonry Accessories: Horizontal Joint Reinforcing, Control Joint Products, and Masonry Insulation

SPEC SECTION: 04150 - Masonry Accessories

PREVIOUS SUBMISSION DATES:

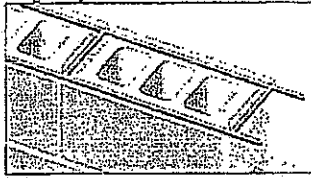
DEVIATIONS FROM SPEC: ___ YES X NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver General Construction and approved with respect to the means, methods, techniques, & safety precautions & programs incidental thereto. Weaver General Construction also warrants that this submittal complies with contracted documents and comprises on deviations thereto:

<p>Contractor's Stamp:</p> <p>Date: 8/17/11 Reviewed by: H.C. Myers <input checked="" type="checkbox"/> Reviewed Without Comments <input type="checkbox"/> Reviewed With Comments</p> <p>ENGINEER'S COMMENTS:</p>	<p>Engineer's Stamp:</p>
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Horizontal Joint Reinforcing

HOME > DUR-O-WAL® MASONRY
Single Wythe Joint Reinforcement
Single Wythe Ladur



BRAND

Dur-O-Wal®

PRODUCT NO.

DA3200

DESCRIPTION

Prefabricated reinforcement designed for embedment in the horizontal mortar joints of single-wythe masonry walls:

- To control shrinkage cracking
- To bond intersection walls
- To provide principal steel in engineered masonry walls
- To reinforce stack bond masonry

WIRE GAGES

- STANDARD WEIGHT: 9 gage (3.7mm) Side Rods and 9 gage (3.7mm) Cross Rods
- EXTRA HEAVY WEIGHT: 3/16 inch (5mm) Side rod and 9 gage (3.7mm) Cross Rods
- SUPER HEAVY WEIGHT: 3/16 inch (5mm) Side rods and 3/16 inch (0.187 or 5mm) Cross Rods

FINISHES

Brite Basic, Mill Galvanized, Class Coated Hot Dip Galvanized and Stainless Steel

- DUR-O-WAL recommends Mill Galvanized for interior applications, (not glass block)
- DUR-O-WAL recommends Hot Dip Galvanized for all Exterior applications, including glass block masonry and where Mean Relative Humidity exceeds 75%
- Always check local building codes for requirements

ADVANTAGES

Tests show continuous reinforcement improves masonry wall performance by providing: Crack control, greater elasticity, butt-welded, single plane construction, high bond with the deformed side rods, better resistance to rain penetration and increased horizontal flexural strength.

DIMENSIONS

- Out-to-out spacing of deformed side rods is approximately 2 inches (50mm) less than the nominal thickness of the wythe or wall in which the reinforcement is to be placed
- Ladur is provided in 10 feet 8 inch lengths (3250mm) with Cross Rods welded 16 inches (400mm) on center [15 inches (380mm) on center is available in 10 feet (3050mm) lengths]

SPECIAL NOTES

Prefabricated Corners and Tees are available and measure 32 inches (810mm) x 32 inches (810mm).

RELATED DOWNLOADS

- Single Wythe System
- BraceRite Masonry Bracing System
- Threaded Splicing Systems Handbook
- TTF Brochure
- Masonry Products-Tech Data Sheets
- Steel Lintels Handbook
- Dur-O-Wal Safety Information
- Masonry Product Catalog
- Masonry Joint Reinforcement & Anchor Selection Guide
- Masonry Repair Handbook
- MSDS-Carbon Steel Products

RELATED LINKS

- Accessories Price List
- Play the \$10,000 Calendar Quiz Challenge

PRODUCT DOWNLOADS

Dur-O-Wal Handbook

X



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Control joint

MOVEMENT CONTROL JOINT PRODUCTS SUBMITTAL SHEET

PVC MOVEMENT CONTROL JOINTS

Joints that control movement are a necessary part of a masonry structure's design as the various materials used in the construction of the structure tend to expand and contract. The type, as well as the location of these movement control joints are critical to the long term performance of the structure.

Several different types of control joints are used in masonry construction. As each joint type performs a specific function, the materials used in each type of joint should never be interchanged.

Two examples of movement control joints in masonry construction are control joints and expansion joints. Control or contraction joints are used in CMU (concrete masonry units) walls and expansion joints are used in clay brick masonry. This is because concrete masonry units have a tendency to shrink and clay bricks, being a fired product, are likely to expand in use.

PRODUCT DESCRIPTION

Five different control joint shapes are available, each manufactured from a black flexible PVC (polyvinyl chloride) compound. All are designed to be used with standard sash CMU. When the cells are to be grouted, the #6, #8 and #12 items can also be placed between stretcher units.

DA2002 Regular PVC Control Joint is designed to be used at any location needing a control joint.

DA2004 #6 Wide Flange PVC Control Joint is designed for use in 6" CMU walls.

DA2006 #8 Wide Flange PVC Control Joint is designed for use in 8" CMU walls,

DA2007 #12 Wide Flange PVC Control Joint is designed for use in 12" CMU walls,

DA2020 Rapid "T" PVC Control Joint is designed with a shear key on one side only and is used at 90° intersecting CMU walls.

It is recommended that any control joint exposed to weather or view be appropriately caulked.

MATERIAL

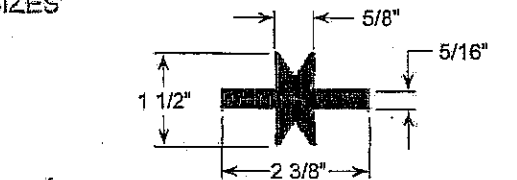
PVC control joints are manufactured by extruding a high grade, black, polyvinyl chloride compound which conforms to ASTM D2240.

Standard length is 48" with 32" lengths available.

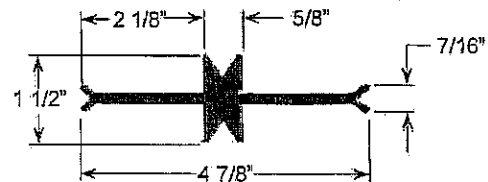
STRENGTH

The use of a Dur-O-Wal rubber control joint restricts out-of-plane movement while permitting in-plane movement. The 5/8" thick shear key keeps the wall sections on either side of the movement joint in alignment with each other and constrains out-of-plane movement.

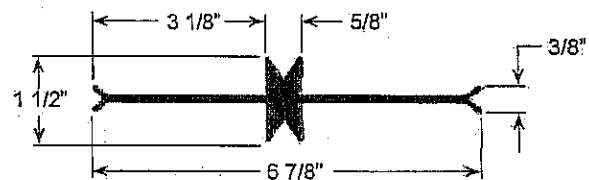
SIZES



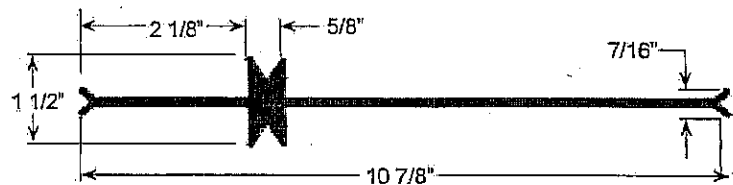
DA2002 Regular PVC Control Joint



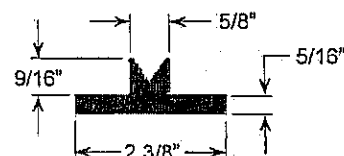
DA2004 #6 Wide Flange PVC Control Joint



DA2006 #8 Wide Flange PVC Control Joint



DA2007 #12 Wide Flange PVC Control Joint



DA2020 Rapid "T" PVC Control Joint

MOVEMENT CONTROL JOINT PRODUCTS SUBMITTAL SHEET

PHYSICAL PROPERTIES

Properties	Test Method	Nominal Value
Tensile Strength	ASTM D638	2,420 psi
Specific Gravity	ASTM D792	1.40
Elongation	ASTM D638	200%
Hardness Shore A	ASTM D2040	85 +/-5

CONTROL JOINT SPACING

Proper placement of control joints provide crack control in masonry walls constructed of CMU, as the control joints reduces restraint by accommodating shrinkage of the CMU.

The industry's general "rules of thumb" for placement of movement control joints in CMU walls, include but are not limited to the following:

- Three times the wall height with a maximum spacing of 25 feet or,
- A distance of not over one-half the allowable joint spacing from all corners,
- At returns and jambs of wall openings,
- At changes in wall height or thickness,
- At construction joints in foundations, roofs and floors and
- At wall intersections.

When cladding a CMU wall with a veneer the CMU control joint spacing must be coordinated with the expansion joint spacing in the veneer.

Control joints should also be used to isolate any portions of a steel frame that could restrict movement of the masonry.

LEEDS

May qualify for LEEDS credit as control joint is manufactured from 100% post-industrial recycled materials.

BUILDING CODES

Dur-O-Wal Movement Control Joints meet the requirements of Section 2.5 of the *ACI 530.1-05/ASCE 6-05/TMS 602-05 Commentary on Specification for Masonry Structures*.

PACKAGING

Item	Length	Carton Quantity
DA2002	48"	60 feet
DA2004	48"	60 feet
DA2006	48"	60 feet
DA2007	48"	60 feet
DA2020	48"	40 feet
DA2002	32"	32 feet
DA2004	32"	32 feet
DA2006	32"	32 feet
DA2007	32"	32 feet
DA2020	32"	32 feet

NOTICE

The information contained in this publication does not constitute any professional opinion or judgment and should not be used as a substitute for competent professional determinations. Each construction project is unique and the appropriate use of these products is the responsibility of the engineers, architects and other professionals who are familiar with the specific requirements of the project.

WARRANTY

DAYTON SUPERIOR CORPORATION (THE COMPANY) WILL REFUND THE PRICE OF OR REPLACE, AT ITS ELECTION, ANY PRODUCT THAT IT FINDS TO BE DEFECTIVE PROVIDED THE PRODUCT HAS BEEN USED PROPERLY. EXCEPT AS STATED ABOVE, THE COMPANY MAKES NO WARRANTY OR MERCHANTABILITY OF FITNESS FOR ANY PARTICULAR PURPOSE NOR DOES IT MAKE ANY WARRANTY, EXPRESSED OR IMPLIED, OF ANY NATURE WHATSOEVER WITH RESPECT TO THE PRODUCT OR THE USE THEREOF.

BY WAY OF ILLUSTRATION AND NO LIMITATION, IN NO EVENT SHALL THE COMPANY BE LIABLE FOR ANY DELAY CAUSED BY DEFECTS, FOR LOSS OF USE, FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT ITS WRITTEN CONSENT.

THE FOREGOING IS THE RESPONSIBILITY OF THE COMPANY EVEN THOUGH THE COMPANY MAY HAVE BEEN NEGLIGENT.

PERLITE LOOSE-FILL MASONRY INSULATION

Description, Properties, Benefits

DESCRIPTION

Perlite loose fill masonry insulation is an inert volcanic rock expanded by a special heat process and is often treated with water repellent material. The resulting granular product is lightweight with countless tiny, sealed air cells, which account for its excellent thermal performance and fire resistance.

Perlite insulation has been proven over a period of many years in the insulation of storage tanks for liquid gases at temperatures as low as -400°F (-240°C).

PROPERTIES AND BENEFITS

INSULATING - Reductions in heat transmission of masonry walls of 50% or more may be obtained with perlite loose fill insulation. Thermal performance tests using ASTM C236, *Test Method for Steady State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box* have shown perlite to be a superior concrete block insulation when compared to vermiculite, EPS inserts, EPS beads, and foamed-in-place insulations.

Recent testing of an 8 inch medium weight concrete block wall filled with perlite loose-fill insulation using dynamic temperature conditions simulated by a National Bureau of Standards 24 hour (diurnal) test cycle indicates that the measured total energy (total heat flow through a wall for a 24 hour period) was only 72 percent of the total energy predicted by steady-state analysis.

NON-COMBUSTIBLE - The fusion point of perlite is 2,300°F (1260°C)

ASTM E84 - Flame Spread 0, Fuel Contribution 0, Smoke Density 0.

FED. SPEC. HH-1515D - Critical Radiant Flux greater than 1.07 Watts/cm². Smoldering Combustion, Flaming Combustion -None, Weight Loss- Nil

4 HOUR FIRE RATINGS - Underwriters' Laboratories Design No. U905 shows that a 2 hour rated 8, 10 or 12 inch (20, 25, or 30 cm) concrete block wall is improved to four hours when cores are filled with water repellent treated perlite. U.L. Designs U901, U904, and U907 also achieve 4 hour fire ratings.

PERMANENT - Perlite is an inorganic, naturally occurring mineral and it is as permanent as the walls which contain it. It supports its own weight and will not settle or bridge.

WATER REPELLENT - The nonflammable water repellent treatment significantly improves low water retention properties of perlite. Laboratory tests on water transmission by Structural Clay Products Research Foundation show that a cavity wall filled with treated perlite resists transmission of water to the interior wythe. Performance of overall wall was rated "excellent" in accordance with procedures established by the National Bureau of Standards in BMS 82. However, it should be noted that treated perlite insulation will not waterproof a poorly constructed masonry wall. Good construction practice should also incorporate the use of weep holes covered with copper, galvanized steel, or fiberglass screening.

SOUND REDUCTION - Perlite loose-fill insulation has the ability to fill all voids, mortar lines, and ear holes thus enabling it to reduce airborne sound transmission through walls. Lightweight 8 in. (20 cm) masonry block filled with perlite achieves an STC of 51 which exceeds HUD sound transmission standards.

ECONOMICAL - Perlite loose-fill masonry insulation offers excellent thermal and fire resistant properties at an economical cost. It is lightweight and pours easily and quickly without requiring special equipment or skills.

STANDARDS, SPECIFICATIONS AND REFERENCES

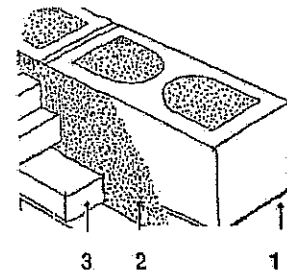
- ASTM Specification C549 Perlite Loose Fill Insulation
- ASTM Specification C520 Density of Granular Loose Fill insulation
- ASTM Test Method C236 Test Method for Steady State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box
- ASTM Test Method E84 Test for Surface Burning Characteristics of Building Materials
- FHA Use of Materials Bulletin UM-37
- GSA Commercial Item Description A-903 - Insulation, Thermal (Expanded Perlite)
- Brick Institute of America Technical Notes No. 21A
- National Concrete Masonry Association Tek 101A
- Federal Specification I-IH- 1-51 SD for: Smoldering Combustion/Critical Radiant Flux

TABLE 1. THERMAL DESIGN^{1,2}, CONCRETE MASONRY WALL

Block Size	Type ⁶	Perlite Filled	R ³ Value	U ³ Value
6 inch (15cm)	Lightweight Lightweight	No	2.64	.38
		Yes	6.75	.15
8 inch (20 cm)	Lightweight Lightweight	No	2.86	.35
		Yes	9.07	.11
10 inch (25 cm)	Lightweight Lightweight	No	3.00	.33
		Yes	11.02	.09
12 inch (30 cm)	Lightweight Lightweight	No	3.12	.32
		Yes	13.44	.07
6 inch (15 cm)	Heavyweight Heavyweight	No	1.95	.51
		Yes	3.40	.29
8 inch (20 cm)	Heavyweight Heavyweight	No	2.10	.48
		Yes	4.40	.23
10 inch (25 cm)	Heavyweight Heavyweight	No	2.19	.46
		Yes	5.34	.19
12 inch (30 cm)	Heavyweight Heavyweight	No	2.26	.44
		Yes	6.18	.16

1. The values in this table represent typical R values of concrete block. The actual R value of a concrete block is influenced by the concrete constituents and by moisture content. More accurate estimates of thermal conductivity k or thermal resistance R of the specific block has been determined by tests. Procedures to make calculations for blocks of known conductivity are described in Perlite Institute Technical Data Sheet No. 2-6.
2. R values expressed in °F·ft²·h/Btu include inside and outside air film resistances.
3. U factors expressed in Btu/h·ft²·°F are calculated using thermal conductivity k factor of 0.32 Btu·in/h·ft²·°F. Different densities of perlite in the core spaces of concrete block have only a slight effect on the overall U factor. For estimates of this effect see Perlite Institute Technical Data Sheet No. 2-6 which provides the calculation techniques.
4. Metric: To determine R values and U factors in SI (metric) units use the following conversion factors.
 Thermal Resistance, R: °F·ft²·h/Btu x 1.761 102E-01 = K·m²/W
 Thermal Transmittance, U: Btu/h·ft²·°F x 5.687 263E+00 = W/m²·K
5. R values and U values from NCMA Tek Sheet 101A
6. Lightweight masonry units 80 lb/ft³ (1280 kg/m³), heavyweight masonry units 135 lb/ft³ (2160 kg/m³)

SAMPLE U FACTOR CALCULATIONS FOR VENEER AND CAVTTY WALLS



1. 8 inch (20 cm) heavyweight concrete block filled with perlite (from Table 1).....4.40
2. 3 inch (8 cm) cavity filled with perlite (from Table 2).....9.38
3. 4 inch (10 cm) face brick (from Table 2).....0.44

$R_t = 14.22$

$U = 1/R_t = 1/14.22 = 0.07$

GUIDE SPECIFICATIONS

Part 1- General

Scope

The work covered by this section of the specification includes supplying and installing loose-fill material for the thermal insulation of all masonry walls in accordance with these specifications and applicable drawings.

Part 2- Products

Materials

Perlite loose-fill insulation. Each package shall be clearly marked such. The insulation material shall conform to the requirements of ASTM Designation C549 and shall be a product of a member of Perlite Institute, Inc. Prior to installation of the insulation, the manufacturer shall furnish a certificate to the architect or owner stating that the product conforms to the Standard Specifications for Loose Perlite Fill Insulation as adopted and published by Perlite Institute, Inc.

TABLE 2. THERMAL RESISTANCE VALUES FOR VENEER AND CAVITY WALL CALCULATIONS

	R Values (°F·ft ² /h/Btu)	R Values (K·m ² /W)
Outside Air Film	0.17	0.03
Common Brick (with holes)	0.20	0.04
Face Brick (no holes)	0.44	0.08
Air Space in Cavity 3/4 to 4 inch (19-102 mm)	0.97	0.17
1 inch (2.5 cm) cavity filled with perlite	3.12	0.55
2 inch (5.1 cm) cavity filled with perlite	6.25	1.10
3 inch (7.7 cm) cavity filled with perlite	9.38	1.65
4 inch (10.3 cm) cavity filled with perlite	12.5	2.20
Reflective Air Space	3.08	0.54
Furring (Nonreflective Air Space)	1.01	0.18
Gypsum or Plaster Board 1/2 inch (13mm)	0.45	0.08
Gypsum or Plaster Board 5/8 inch (16 mm)	0.56	0.10
Inside Air Film	0.68	0.12

TABLE 3. APPROXIMATE PERLITE MASONRY BLOCK LOOSE-FILL COVERAGE*
Coverage per 4 ft² (110 litre) bag

	12 inch (25 cm) Block	10 inch (25 cm) Block	8 inch (20 cm) Block	6 inch (15 cm) Block
Number of Blocks Filled	9	13	17	23
	1 in. (2.5 cm) Cavity	1.5 in. (3.9 cm) Cavity	2 in. (5.1 cm) Cavity	2.5 in. (6.4 cm) Cavity
Square Feet of Wall Filled	48	32	24	19

* Data based on actual field conditions

TABLE 4. APPROXIMATE PERLITE MASONRY BLOCK LOOSE-FILL COVERAGE
(Number of 4 ft² bags required - 4 ft² equals approximately 110 litres)

Wall Area ft ² (m ²)	Core Fill			Cavity Fill		
	Block Size			Cavity Width		
	6 inch (15 cm)	8 inch (20 cm)	12 inch (25 cm)	1 in. (2.5 cm)	2 in. (5.0 cm)	3 in. (7.5 cm)
1,000 (93)	46	65	118	21	42	62

Part 3- Execution

Installation

- The insulation shall be installed in the following locations:
 - In the cores of all exterior (and interior) hollow masonry walls.
 - In the cavity between all exterior (and interior) masonry walls.
 - Between exterior masonry walls and interior furring.
- The insulation shall be poured directly (or via a hopper) in the top of the wall at any convenient interval (not in excess of 20 ft [6 m]). Wall sections under doors and windows shall be filled before sills are placed. Rodding or tamping is not necessary.

3. All holes and openings in the wall through which insulation can escape shall be permanently sealed or caulked prior to installation of the insulation. Copper, galvanized steel, or fiber glass screening shall be used in all weep holes. (The inclusion of weep holes is considered good construction design practice to allow passage of any water which might penetrate the cavities or core spaces of wall construction.)
4. Insulation must remain dry. Cavity caps or other suitable means should be used as the work progresses to insure that the insulation is protected from inclement weather.



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