

SECTION 079200 – JOINT SEALANT AND EXPANSION CONTROL

PART 1: GENERAL

1.1 Scope of Standard

- A. This standard provides general guidance concerning the specific preferences for jointing of exterior vertical surfaces for the following materials:
 - 1. Concrete
 - 2. Masonry
- B. WVU recognizes that project conditions and requirements vary, thus precluding absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification, it is expected that these guidelines will govern the design and specifications.

1.2 Related Standards

- A. Structural Systems
- B. The Secretary of the US Department of the Interior’s Standards for Rehabilitation.
- C. Conservation of Building and Decorative Stone, 2 vols., John Asbury.
- D. Technical Notes on Brick Construction, Brick Industry Association.
- E. Masonry Veneer (Second Edition), Masonry Institute of America.

1.3 Definitions

- A. Construction joint
 - 1. Construction joints shall be located where construction will be facilitated or where the lack of a joint could cause the lack of structural integrity in the completed structure.
 - 2. Construction joints are theoretically undetectable in the completed structure and shall not cause any reduction in structural capacity or integrity.
- B. Control joint
 - 1. Control joints include expansion and contraction joints and are intended to provide for movement in the structure in order to “control” any possible movements that may have an impact on the structural integrity of the completed structure.

WVU DESIGN GUIDELINES & CONSTRUCTION STANDARDS
DIVISION 07 – THERMAL AND MOISTURE PROTECTION

2. Control joints also act as construction joints.
3. Control joints are often referred to as movement joints.

C. Expansion joint

1. Expansion joints are control joints that are designed to allow for the expansion of the concrete or masonry.
2. Expansion joints also act as contraction joints.

D. Contraction joint

1. Contraction joints are control joints that are designed to allow for the contraction of the concrete or masonry.

1.4 General Requirements:

- A. Jointing shall be integral with the architectural/ structural design and detailing, not added at the end of the design process to satisfy minimum requirements.
- B. This standard gives some general guidelines for the locations and sizes of joints. However, jointing design is dependent on the materials selected, the makeup of the materials, environmental conditions, and the architectural/structural design and detailing. Factors to be considered are:
 1. Temperature effects.
 2. Shrinkage effects.
 3. Creep.
 4. Stresses caused by the architectural/structural design.
 5. Moisture effects.
- C. All expansion and contraction joints shall be shown and detailed by the Engineer or Architect.
- D. Critical construction joints shall be planned for and shown on the drawings, with guidelines for other construction joints specified in section 033000, Cast-in-place Concrete, to be prepared as a part of the contract documents. Other proposed construction joints as specified in section 033000 shall be submitted by the Contractor to the Engineer for review and approval during construction.

PART 2: PRODUCTS

2.1 Joint Sealant

- A. Unless otherwise required for specialized conditions, joint sealant shall be a moisture-cured, single- or multi-component (depending on the application and required expansion/contraction capabilities), polyurethane-base, non-sag,

WVU DESIGN GUIDELINES & CONSTRUCTION STANDARDS
DIVISION 07 – THERMAL AND MOISTURE PROTECTION

electrometric sealant.

- B. Sealant depth-to-width ratio at the center of the joint shall be 1:2.
- C. Allowable expansion/contraction of the joint shall be $\pm 25 - 50\%$ of joint width, depending on the product capabilities.
- D. Where applicable, provide a compatible sealant primer.

2.2 Backer

- A. Joint sealant backer is required for all applications.
- B. Unless otherwise required for specialized conditions, joint sealant backer shall be a closed-cell, polyethylene rod.
- C. Where limitations prevent the use of a backer rod, specify a polyethylene, self-adhesive, bond-breaker tape shall be used.

2.3 Filler

- A. Joint filler shall be specified to provide filling of the gap and to prevent displacement and improper location of the backer.
- B. Joint filler shall be a continuous, non-bleeding material compatible with the joint conditions.

PART 3: EXECUTION

3.1 Construction Joints

- A. Locate construction joints where anticipated stresses are low.
- B. Before placing new material against the completed side of the joint, clean the joint thoroughly and specify a bonding agent, mortar, lean grout, etc., as required to meet the definition and function of a construction joint.
- C. Structural reinforcing shall be 100% continuous across the joint.
- D. Where applicable, waterstops shall be provided for watertightness.

3.2 Control Joints

- A. Expansion joints
 - 1. Locate expansion joints to accommodate anticipated expansion at abrupt changes in the structure, where butting up to existing structures, and at least one corner of windows, doors, and other rectangular openings.

WVU DESIGN GUIDELINES & CONSTRUCTION STANDARDS

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

2. The spacing of joints shall be contingent on the material's capacity to sustain expansion without damage to the concrete or masonry (usually based on the amount of reinforcing).
3. Structural reinforcing shall be discontinuous across the joint. Terminate reinforcing a minimum of two (2) inches from the faces of the joint.
4. Smooth reinforcing dowels, properly detailed, shall be provided to prevent movement out of the plane of the vertical surface and to provide for shear transfer (as required).
5. The minimum expansion joint width shall be 1/4".
6. Expansion joints shall be sealed.
7. Where applicable, waterstops shall be provided for watertightness.

B. Contraction joints

1. Locate contraction joints to accommodate anticipated contraction, usually at a set spacing of between 15 - 30 feet.
2. The spacing of joints is contingent on the material's capacity to sustain expansion without damage to the concrete or masonry (usually based on the amount of reinforcing).
3. Maximum structural reinforcing shall be 50% continuous across the joint. Terminate non-continuous reinforcing a minimum of two (2) inches from the faces of the joint.
4. Smooth reinforcing dowels properly detailed can be provided to prevent movement out of the plane of the vertical surface and for shear transfer across the joint if the normal reinforcing detailed is not adequate.
5. The minimum contraction joint depth shall be 3/4 - 1 inch.
6. Typically, contraction joints are sealed.
7. Where applicable, waterstops shall be provided for watertightness.

C. Control joints

1. shall not abruptly terminate in the middle of a vertical surface. (For example, do not discontinue joints at parapets, but continue joints through the parapet.)

3.3 Concrete: The following guidelines are in addition to those noted above and refer specifically to concrete:

- A. Contraction joints in concrete shall be installed according to one of the following

WVU DESIGN GUIDELINES & CONSTRUCTION STANDARDS
DIVISION 07 – THERMAL AND MOISTURE PROTECTION

methods:

1. Pre-manufactured strips that are set in with the concrete and removed during or after the curing process of the concrete.
 2. Saw-cutting. To be effective, saw-cutting must occur as soon as possible after concrete placement. Many factors influence the timing of saw-cutting, including weather conditions, concrete mix design, curing, and time of placement. However, the following general guidelines shall apply:
 - a. Hot/dry conditions. Saw-cut within 4- 12 hours.
 - b. Cool moist conditions. Saw-cut within 24 hours.
- B. Contraction joints in concrete shall be provided at the following locations:
1. At major changes in wall heights.
 2. At changes in wall thickness.
- 3.4 Masonry: The following guidelines are in addition to those noted above and specifically to masonry:
- A. Expansion joints in masonry shall be provided at the following locations:
1. Below shelf angles or structural frames supporting masonry walls or panels.
 2. Above masonry walls or panels abutting structural frames.
 3. At major changes in wall heights.
 4. Near wall intersections.
 5. At regular intervals, not to exceed 25'-0."
- B. Contraction joints in masonry shall be provided at the following locations:
1. At major changes in wall heights.
 2. At changes in wall thickness.
 3. Above joints in foundations.
 4. At columns and pilasters.
 5. At one or both sides of wall openings.
 6. Near wall intersections.

WVU DESIGN GUIDELINES & CONSTRUCTION STANDARDS
DIVISION 07 – THERMAL AND MOISTURE PROTECTION

END OF SECTION 079200