SPECIFICATION

Sections 07 90 00 / 07 95 00

Willseal WJS by WILLSEAL

Elastomeric Concrete Nosing and Gland Expansion Joint System Designed for Use in Parking Structures and other Trafficked Applications.

PART 1 – GENERAL

1.01 Work Included

1. The work shall consist of furnishing and installing waterproof expansion joints in accordance with the details shown on the plans and the requirements of the specifications. The expansion joint system is comprised of an elastomeric concrete nosing and an extruded rubber gland and wing.
2. Related Work
   * Division 3 - Cast-in-Place Concrete

* Miscellaneous Metal/ Expansion Joints
  + Division 7 - Flashing and Sheet Metal
  + Division 7 - Sealants, Caulking and Waterproofing

1.02 Submittals

A. General – Submit the following according to Division 1 Specification Section.

B. Standard Submittal Package – Submit typical expansion joint drawing(s) indicating

pertinent dimensions, general construction, blockout dimensions, expansion joint opening dimensions and

product information.

C. Sample of material is required at time of submittal.

D. All products shall be certified in writing to be:

a) Capable of being expanded from the mean joint size at 40°F to the stated maximum dimension without exerting any tension on the attached substrate;

b) Capable of withstanding 150°F (65°C) for 3 hours while compressed down to the minimum of movement capability dimension of the basis of design product (-50% of nominal material size) then extended to the stated extension (+50%) without evidence of foam delamination or sealant face de-bonding from the material; and that the same material after the heat stability test and after first being cooled to room temperature will subsequently self-expand to the maximum of movement capability dimension of the basis-of-design product (+50% of nominal material size) within 24 hours at room temperature 68°F (20°C).

1.03 Product Delivery, Storage and Handling

A. Deliver products to site in Manufacturer’s original, intact, labeled containers. All materials must have the WILLSEAL logo and the nominal joint size labeling on the gland. Handle and protect as necessary to prevent damage or deterioration during shipment, handling and storage. Store in accordance with manufacturer’s installation instructions.

1.04 Basis-of-Design

A. All joints shall be designed to meet the specified performance criteria of the project as

manufactured by: Willseal, 34 Executive Drive, Hudson, NH 03051, 800-274-2813.

Willseal.com, [custserv@willseal.com](mailto:custserv@willseal.com).

B. Alternate manufacturers must demonstrate that their products meet or exceed the design criteria and must submit certified performance test reports performed by nationally recognized independent laboratories as called for in section 1.02 Submittals. Submittal of alternates must be made three weeks prior to bid opening to allow proper evaluation time.

1.05 Quality Assurance

1. The General Contractor will conduct a pre-construction meeting with all parties and trades involved in the treatment of work at and around expansion joints including, but not limited to, concrete, blockout, mechanical, electrical, HVAC, landscaping, masonry, curtain wall, waterproofing, fire-stopping, caulking, flooring and other finish trade subcontractors. All superintendents and foremen with responsibility for oversight and setting of the joint gap must attend this meeting. The General Contractor is responsible to coordinate and schedule all trades and ensure that all subcontractors understand their responsibilities in relation to expansion joints and that their work cannot impede anticipated structural movement at the expansion joints or compromise the achievement of water tightness. This meeting shall be held prior to any con­crete placement at expansion joint blockouts and may be held in conjunction with the concrete pre-pour meeting.
2. Joint Opening Adjustment – the Project Engineer shall provide calculations to the concrete subcontractor to adjust the nominal joint opening the day of the concrete placement. Use a “temperature adjustment table” with expansion joint openings calculated in five (5ºF) degree increments based on a temperature range of [adjust for project] -20ºF to 120ºF. Expansion joints shall not be installed until the structure has undergone its anticipated short-term shortening and creep.
3. Expansion Joint Blockouts - shall be floated and troweled before final cure to remove all air pockets, voids and spalls caused by formwork.
4. Areas Adjacent to Expansion Joint - two feet on each side of joint gap shall be finished and graded perpendicular to joint gap creating flush slab-to-slab transition with identical elevations. Creation of an elevated concrete wash is recommended at these locations to insure a downward slope for water drainage.
5. Pre-installation Inspection – the General Contractor, Engineer/Architect, Manufacturer’s Representative and Certified Contractor, will conduct a pre-installation project site inspection. The General Contractor shall provide a field report that summarizes the project conditions and any remedial action necessary to correct field conditions (substrate, joint size, blockout, vertical offsets, etc.) that may affect expansion joint system performance.
6. Service Condition - insure that anticipated service conditions (loads, speed of traffic, movement, etc) are part of the expansion joint system selection criteria.

B. Warranty – Manufacturer’s standard warranty shall apply.

C.

PART 2 – PRODUCT

2.01 General

A. Provide a durable, watertight, expansion joint rated for expansion joints in trafficked applications. Typical locations include, but are not limited to the following: subject to review, stair tower perimeters, elevator perimeters, stadium tread and risers, parking deck joints, treatment plant perimeters and covers, and structural expansion joints. System shall perform waterproofing, traffic bearing as well as accommodate movement functions as the result of a single installation.

B. Provide Willseal WJS as manufactured by WILLSEAL and as indicated

on drawings for horizontal-plane expansion joint locations. Expansion joint system shall be comprised of the following components:

1) Extruded rubber gland with integral wing and bulkhead designed to dampen tire impact and provide a watertight seal.

2) Elastomeric concrete nosing impact tested and designed to resist pedestrian and vehicular traffic.

3.) Single component rubber polymer activator that allows for chemical crosslinking between the extruded rubber gland and the elastomeric concrete.

4.) Seam splice kit comprised of a primer, an adhesive, and strips of uncured rubber for transitions and terminations of the extruded rubber gland.

C. Material shall be capable of movements of +/50% (100% total) of nominal material size

depending on the anticipated movement of the joint design. Standard sizes of 2”, 3”, and 4” (50 mm, 76 mm, and 101 mm) Depth of seal is 2.29” (50.8 mm), 3” (76.2 mm), or 3.75” (95 mm) depending on joint dimension.

D. The rubber gland shall be a flexible, extruded thermoplastic elastoprene rubber compound exhibiting the physical properties listed in the table below. The design shall have factory-punched holes in the wing flaps through which the elastomeric concrete material bonds the seal to the deck to ensure watertightness and proper joint performance.

Elastoprene membrane seal must exhibit the following physical properties.

Property Requirement ASTM Method

Tensile Strength 1000 psi (+75/-0) D412

Ultimate Elongation 445% D412

Hardness, Shore A 65 +/- 3 pts. D2240

Tear Strength 140 pli / 24.5 kN/m @ 23°C D624

58 pli / 10.2 kN/m @100°C D624

Compression set

168 hrs. 25% @ 23°C D395

168 hrs. 38% @ 100°C D395

Ozone Resistance No Cracks D1149

UV Resistance Very Good

Brittle Point -76°F(-60°C) D746

E. Elastomeric concrete shall be produced in an ISO2001 manufacturing facility consisting of polyurethane liquid components “A” and “B” and a specialty aggregate component “C” and supplied by Willseal. Elastomeric concrete must cure exothermically.

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Physical Properties of Elastomeric concrete binder after seven-day cure at room temperature:

##### Property Requirement ASTM Method

Tensile Strength 4750 psi D412

Compressive strength 9200 psi D695

Ultimate Elongation 10% D412

Hardness, Shore D 78 +/- 5 D2240

Tear Resistance 200 pli / 35 kN/m D624

Water Absorption 3% D570

Heat Shrinkage, max. 2% D1299

Compression Set 48% D395

Pot Life 25 minutes (after mixing)

Physical Properties of Elastomeric concrete binder & aggregate mix:

##### Physical Property Requirement ASTM Method

Compressive strength 2800 psi D695

Resilience @ 5% deflection 95% D695

Compressive stress, psi 800 psi min. D695

Impact resistance, ft-lb, @ -20°F No Cracks Ball drop

Adhesion Concrete Failure D421

F. The rubber polymer activator shall allow for polymers of the rubber gland to chemically bond with the elastomeric concrete.

G. Select the expansion joint system model appropriate to the movement and design

requirements at each joint location that meet the project specification or as defined by the structural engineer of record.

H. Manufacturer’s Checklist must be completed by expansion joint subcontractor and returned to manufacturer at time of ordering material.

2.02 Fabrication

A. Willseal WJS by WILLSEAL must be supplied in the longest practical continuous length coiled on manufacturer’s standard reel or on wooden pallets and shrink-wrapped..

B. Directional changes and terminations into horizontal plane surfaces can be provided by

factory supplied 90-degree angles Consult manufacturer for proven field transition methods. Only straight butt splice connections shall be spliced on the jobsite. Utilize steel splice reinforcing pins and chemically weld with Elastoprene Splice Adhesive. Ensure that all internal and external webs of the seal profile are properly bonded at all splice locations

1. The elastomeric concrete nosing shall be shipped in manufacturer’s approved containers, shrink-wrapped on wooden pallets.
2. Extruded rubber gland and elastomeric concrete shall be supplied in standard black color.

PART 3 – EXECUTION

3.01 Installation

A. Preparation of the Work Area

1. The contractor shall provide properly formed concrete blockouts and prepared expansion joint openings constructed to the exact dimensions and elevations shown on manufacturer’s standard system drawings or as shown on the contract drawings. Deviations from these dimensions will not be allowed without the written consent of the engineer of record.

2. The contractor shall clean the blockout and joint opening of all contaminants immediately prior to installation of expansion joint system. Concrete form release agents, water repellents, laitance, surface dirt, rust, old sealants and other surface treatments and protective coatings must be removed from the blockout substrate surface in order to obtain the proper elastomeric concrete bond. Repair spalled, irregular or unsound joint surfaces using accepted industry practices for repair of the substrates in question. Remove protruding roughness to ensure joint sides are smooth. Ensure that there is sufficient depth of the blockout to receive the full depth (minimum 3/4”) of the nosing material as well as sufficient depth for the extruded rubber gland being installed. Refer to Manufacturer’s Installation Guide for detailed step-by-step instructions.

3. Actual field conditions of existing expansion joint blockouts may be deeper and wider than the proposed new expansion joint system as detailed on the contract drawings. When existing blockout is larger additional elastomeric concrete material shall be used. Do not use an unapproved patching material to fill and reduce blockout depth. When blockout size is smaller it shall be made larger by saw cutting.

4. For new construction and full concrete restorations it is recommended to create an elevated concrete wash with a two-foot flat surface at the top. Elevations at the top of the wash shall be above those of the finished deck insuring a downward slope for water drainage.

5. For projects without elevated washes it is recommended that the finished concrete slab elevation be identical for a two-foot transition area on each side of the expansion joint opening.

6. Mask adjacent concrete surfaces with tape to provide neat, clean joint line, workmanlike appearance. Tape should be removed after application and prior to curing process.

7. Do not install expansion joint systems until the concrete has been air-dried at temperatures at or above 45 degrees F. for at least 28 days minimum and the concrete must have a measured moisture content that is below 4 percent. The blockout area must be completely dry prior to placement of the elastomeric concrete. Blockouts requiring the use of structural repair materials must be cured for 72 hours. Blow out the area thoroughly using compressed air.

8. The base of the recess must be formed level and at the same elevation across the joint. The joint sidewall interfaces must be parallel, and continuously equidistant from each other. They are to be perpendicular to the base surfaces of the blockout – making the corner a perfect 90° angle. Any edge or area in need of repair shall utilize structural concrete repair materials.

9. No drilling, or screwing, or fasteners of any type are permitted to anchor the expansion joint system into the substrate.

10. The membrane seal element shall be unpackaged and laid in a relaxed position to relieve any temporary coiling from shipment packaging. Prior to placement, the winged flaps of the membrane seal shall be wiped with an acceptable non-petroleum solvent cleaner such as Denatured Alcohol.

11. Refer to Manufacturers Installation Guide for detailed step-by-step instructions on how to install the WJS extruded rubber gland and wing, polymer activator, and elastomeric concrete materials.

12. System to be installed by qualified sub-contractors only according to detailed published installation procedures and/or in accordance with job-specific installation instructions of manufacturer’s field technician.

13. IMPORTANT – Premature exposure to vehicular traffic can cause stress on the bond line related to vertical slab deflection. For best results wait a minimum of **24 hours (**depending on temperature and humidity) before allowing vehicular traffic to drive over the system (contact manufacturer if faster opening time is required).

3.02 Clean and Protect

A. Protect the system and its components during construction. Heavy construction vehicles will not be permitted to cross the expansion joint. Subsequent damage to the expansion joint system will be repaired at the general contractor’s expense. After work is complete, clean exposed surfaces with a suitable cleaner that will not harm or attack the finish.

END OF SECTION