Watertight INTEGRITY
Dampproof vs. Waterproof

Sam Lines
Concrete Sealants, Inc.
Course Outline

- Precast Concrete Joints
  - Rubber gaskets
  - Butyl sealants
  - Joint wrap
- Concrete Porosity
  - Sealers
  - Coatings
Precast Concrete Joints

Making watertight connections
About ASTM International

- One of the world’s largest international standards developing organization.
- 30,000 Global Members
- >12,500 Int. Standards
- >140 Countries
- 145 Tech Committees
The Technical Committees are divided into seven families:

- (A) Ferrous Metals
- (B) Non-Ferrous Metals
- (C) Cementitious, Ceramic, Concrete and Masonry Materials
- (D) Miscellaneous Materials
- (E) Miscellaneous Subjects
- (F) Materials for Specific Applications
- (G) Corrosion, Deterioration and Degradation of Materials
ASTM C443
Joints for Pipe and Manholes

- Rubber Gasket Specification
- 13 psi / 10 minutes in straight alignment
- 10 psi / 10 minutes deflected
- Specific joint designs
ASTM C990

Preformed Butyl Tape

- 10 psi / 10 minutes
- Self-Adhesive
- Fills irregular joints
- Testing to meet the ASTM C443 requirements
Hydrostatic Testing
13 psi for 10 minutes
Note 1—This specification covers only the design and material of the sealing bands. Sealing bands covered by this specification are adequate, when properly installed, for external hydrostatic pressures up to 13 psi, (30 ft) without leakage. The amount of infiltration or exfiltration flow in an installed pipeline is dependent upon many factors other than the sealing bands; allowable quantities and suitable testing of the installed pipeline and system must be covered by other specifications.
Type I

FIG. 1 Sealing Band Type I Schematic (Not to Scale)

From ASTM C877-16
Type II
Type III
Placement of Preformed Butyl Sealant in a Precast Joint
Preformed Butyl Sealant Installation

- Sealant Characteristics
  - size
  - placement
  - compression
- Joint quality
- Honeycomb/Spalls in joint
- Dirt and debris
Sealant Placement
Watertight System

ELASTOMERIC SEALANT

BACKER ROD (FILLER) AS NEEDED
Concrete Porosity
Concrete is Porous
Waterproof or Dampproof

- Hydrostatic condition
- Below/Above grade
- Coating thickness
Waterproof Definitions

• “Building codes typically require that basement walls be dampproofed for conditions where hydrostatic pressure will not occur, and waterproofed where hydrostatic pressures may exist.”
  - National Concrete Masonry Association
Waterproof Definitions

• Waterproofing coatings are typically 40 mils or greater in thickness.
• Dampproofing coatings are generally thin: around 12 mils or less.
• Resistant to hydrostatic pressure.
• Can anything truly be watertight? What about steel? Glass? Plastic?
A Variety of Technologies

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Coatings vs. Sealers
Coatings Challenges

- Delamination
- Excessive Concrete moisture
- Concrete dirty or dusty
- Form release agent on the concrete
- Forming surface
The “X” Adhesion Test
Coating Problems

• Outgassing
  • Air escapes from concrete
  • Leaves pinholes, typically in thin coatings
Cementitious Coatings

Cement based coatings bond well to concrete. They often fill the small voids in the concrete. They offer a thicker coating than some paints.
Cold Applied Waterproofing Membrane

- ASTM C836
- Elastomeric (flexible)
- Resists Hydrostatic Pressure
- 40 – 60 Mils Typical
- Single and Two Component Systems
Penetrating sealers come in different sizes. Smaller molecules penetrate deeper, some are reactive, and some create hydrophobicity.
Crystalline Waterproofing

- Concrete admixture (powder/liquid)
- Works internally, reacts chemically
- Crystals created to block the pores
- Waterproof [CRD C48]
- Low Permeability [ASTM C1585]
Waterproofing from the inside
Questions?

Thank you!
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