

SECTION 07 17 00
BENTONITE WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Bentonite Waterproofing.
 - a. Bentonite Panels on exterior surfaces of below grade concrete.

1.2 RELATED REQUIREMENTS

- A. Cast-in-Place Concrete: Section 03 30 00
- B. Earthwork: Section 31 20 11

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. ASTM International (ASTM):
 1. ASTM D1557 (2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2700 kN-m/m³)
 2. ASTM D217 (2017) Standard Test Methods for Cone Penetration of Lubricating Grease

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 1. Description of each product, Bentonite Materials, Bentonite Panels and Accessories.
 2. Manufacturer instructions for application, protection and corrections procedures.

1.5 DELIVERY

- A. Deliver, store, and handle bentonite waterproofing materials in original manufacturer's packaging and in strict accordance with manufacturer's printed instructions. Do not place or store bentonite materials in wet areas or during precipitation. Keep materials dry prior to use with polyethylene or canvas covering for sides and top and chocks or skids underneath, of sufficient height to maintain separation from ground water. Protect materials and accessories from moisture. Remove and replace products that show evidence of exposure

to moisture prior to completion of installation. Remove materials which show evidence of damage, deterioration, or contamination. Provide bentonite products and containers with manufacturer's labels intact and identifying all materials.

1.6 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."
- B. Upon completion and acceptance of the project, the manufacturer will issue a warranty agreeing to promptly replace defective materials for a period of five years.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Bulk and Panel
 - 1. Provide high-swelling, sodium bentonite containing a minimum of 90 percent montmorillonite and a maximum of 10 percent unaltered volcanic ash or other native sediments.
- B. Bentonite
 - 1. Provide material meeting the following requirements:
- C. Free Swell Rating
 - 1. Two grams of granular bentonite sifted into deionized water must swell to occupy a minimum volume of 16 cubic centimeters.
- D. Active Ingredient

Hydrous silicate of alumina, composed of the following chemical percentages and their allowable deviations:

Silica	61.0 plus/minus 3.0
Alumina	19.5 plus/minus 1.5
Iron oxide	5.0 plus/minus 1.0
Magnesia	2.8 plus/minus 0.4
Soda and potash oxides	2.4 plus/minus 0.7
Calcium oxide	0.6 plus/minus 0.5
Molecular water	6.1 plus/minus 0.6
Minor	2.6 plus/minus 0.6

E. Bentonite Panels

1. Provide panels containing bentonite material sealed between two layers of absorbent material, with a minimum of 4.9 kilograms one pound of evenly distributed bentonite per square meter foot. Provide bentonite panels with a minimum thickness of shall be 48 inches square by a minimum dry thickness of 3/16 inch.

F. Bentonite Mineral Based Gel

1. Provide material in accordance with ASTM D217 for a worked penetration range of 215 to 275. Provide gel with a minimum of 45 percent controlled, partially hydrated, high swelling sodium bentonite by weight with a minimum pH of 8.8, no free water, and 25 percent or more residual swell.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- A. Examine surfaces prior to treatment, eliminate irregularities and remove loose and foreign materials. Remove form tie rods. Point cracks and honeycombs in concrete surfaces. Make surfaces of finished patches flush with adjacent concrete surfaces. Allow cement mortar to dry for minimum of 72 hours prior to application of bentonite panels.

3.2 APPLICATION

- A. Apply bentonite waterproofing on exterior surfaces of below grade concrete walls and where indicated in accordance with manufacturer's printed instructions. Securely fasten panels over all construction joints and all expansion joints. Thoroughly pack all through-wall openings and penetrations with bentonite gel or granular bentonite, or both, prior to placement of bentonite panels per manufacturer's written instructions and details.

3.3 PROTECTION

- A. Provide protection to bentonite panels during backfilling and compaction as recommended by manufacturer of bentonite materials. If backfill is not immediately applied, protect panels against precipitation by covering temporarily with polyethylene. Replace damaged panels with new panels before and during backfilling and compaction. Compact backfill to at least 85 percent of ASTM D 1557 maximum density.

3.4 BACKFILL

- A. Backfill with smooth and uniform material with no sharp projections. Compact backfill to at least 85 percent of ASTM D1557 maximum density. Ensure backfill material is not contaminated with salt or other materials that could prevent bentonite from hydrating.

3.5 CORRECTIONS

- A. Repair leaks and defective areas in accordance with manufacturer's printed instructions.

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