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**SPECIFICATION**

**FOR**

**OUTDOOR ONE-WALL HANDBALL COURTS**

**A.G.MERLENE    AUGUST, 2003**

## SECTION 07900

### JOINT SEALERS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section includes providing the necessary labor, materials, equipment, and supervision necessary for, and reasonably incidental to the completion of joint sealing as shown on the Drawings and herein specified. Locations of sealers shall include, but not be limited to the following:
  - 1. All exterior joints.
  - 2. Perimeter of concrete handball walls.

##### 1.02 REFERENCES

- A. American Society for Testing and Materials
  - 1. Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer (ASTM C661)
  - 2. Standard Specification for Elastomeric Joint Sealants (ASTM C920)
- B. Federal Specification TT-S-227

##### 1.03 SYSTEM DESCRIPTION

- A. Sealers shall be provided at all locations noted on the Drawings and as required for watertight construction.

##### 1.04 SUBMITTALS

- A. Submit copies of product data sheets and the manufacturer's installation instructions. If two or more different sealants are to be in physical contact with each other, obtain from each manufacturer confirmation that its product is compatible with the proposed and adjacent products, including any other products which may be used by other sub-contractors. Primer literature shall be included with their submittal documents unless the manufacturer's sealant submittal specifically eliminates the need for a primer. If a stain type primer is required for the sealant selected, such information shall be specifically included on submittal documents

calling attention to the need for such staining type primer and noting the planned precautions to prevent exposed stain residue.

- B. Submit copies of the manufacturer's standard color charts. Upon request, cured samples of each chosen color shall be submitted for verification of actual color to be installed.
- C. Furnish certificates from the manufacturer of the sealant attesting that sealant materials meet specified performance test requirements, of the referenced standards, and that the compound will not stain the material being caulked.

#### **1.05 QUALITY ASSURANCE**

- A. System Applicator foremen shall have a minimum of 5 years experience installing sealants.
- B. Compatibility with substrate: Applicator shall be responsible for verifying that sealants used are compatible with joint substrates.
- C. Joint tolerance: Joint width/depth ratios are critical to sealant performance. Compliance with the manufacturer's limitation is required.
- D. Manufacturer: The manufacturer of the sealant used shall have been in the business of manufacturing the specified types of such sealants for not less than 5 years.
- E. The sealant manufacturer will have the full responsibility for:
  - 1. Instructing the Contractor on the required configuration of joints.
  - 2. Reviewing and approving joints prior to installing the sealant.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

Delivery shall be in the manufacturer's original unopened container, clearly identifying each product specified, relating it to the product literature submitted.

#### **1.07 SITE CONDITIONS**

- A. Joints to be treated shall be clean and dry prior to installation of sealant.

- B. Proceed with installation only when the ambient temperature is within the manufacturers recommended temperature range.
- C. Prevent positive ventilation throughout the installation period, and until vapors have dissipated.
- D. Provide smoking and remove spark producing equipment from the preparation area and the application area until vapors have dissipated.
- E. Provide adequate protection for site and personnel according to manufacturers recommendation.

#### **1.08 SEQUENCING AND SCHEDULING**

Coordinate application of sealers with the Work of other sections of the specification.

#### **1.09 WARRANTY**

- A. Sealant joints shall be guaranteed in writing against adhesive and cohesive failure of the sealant and against water penetration through the sealed joint for 5 years from date of acceptance by the Company.
- B. Should cracking, leakage or other defects occur due to faulty materials or workmanship, as adjudged by the Project Manager, the Contractor shall, at no expense to the Company, remove replace and repair all such defective work.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Materials as manufactured by the following manufacturers will be acceptable:
  - 1. Harry S. Peterson Co., Inc.
  - 2. Tremco
  - 3. Sika Corporation
  - 4. Bostik/Emhart Fastening Systems
  - 5. Mameco International (Vulkem)

#### **2.02 MATERIALS**

- A. Joint Sealant:
  - 1. The joint sealant shall be one and two component polyurethane nonsag sealants of the chemical curing type containing no asphalt, fillers or plasticizers. The

sealant shall be used with a compatible primer prescribed by the manufacturer. All sealants shall be produced by a single manufacturer. The sealant material in areas subject to traffic shall have a durometer hardness of 30 + 5.

2. The sealant shall meet or exceed the requirements of Interim Federal Specification TT-S-227-E, Sealant Class A, Type 1 and 2. The sealant shall not debond or fail while elongated 25 percent in a water immersion test, according to Federal Specification TT-S-227-E (Page 7, Footnote 10, Paragraph 4.3.9.4.1). When tested according to Paragraph 4.3.5 of Federal Specification TT-S-227-E, weight loss shall not be greater than 5 percent.

3. Provide appropriate sealer for the application indicated.

B. Primer:

The primer shall be used in accordance with manufacturer's instructions, with all primers being applied prior to the installation of any backer rod or bond breaker tape. Manufacturer shall be consulted for all surfaces not specifically covered in submittal application instructions. If a stain type primer is used, apply material in a manner that will prevent exposed stain residue related to application procedures.

C. Backer Rod:

Shall be open or closed cell polyethylene or polyurethane as recommended by the sealant manufacturer.

D. Handball Wall Expansion Joints

1. Horizontal: Vulkem 200, or approved substitute

E. Bond Breaker Tape:

An acceptable polyethylene or polyurethane as recommended by the sealant manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Substrate surface shall be inspected to ensure that no materials contaminate the surface to which the sealant is to adhere and to ensure that unsound substrates are repaired. Installation of sealant shall be evidence of acceptance of the substrate.

- B. Joint dimensions shall be verified prior to installation of the sealant to ensure that all dimensions are within tolerance established in the manufacturer's literature. Unacceptable variations shall be called to the Engineer attention for resolution prior to installing any material.

### 3.02 PREPARATION

- A. Prepare all joints in accordance with manufacturer's recommended instructions to ensure maximum adhesion. Prime as required, protecting all adjacent exposed surfaces.
- B. Sealant shall be prepared as required, including proper mixing of multi-component sealants, then installed in accordance with manufacturer's recommendations and instructions in order to ensure proper width/depth ratio. Take all necessary steps to prevent three sided adhesion. Sealant depth shall be one half of joint width, with a minimum depth of 1/4", and a maximum of 1/2", unless otherwise required by the manufacturer.

### 3.03 INSTALLATION

- A. Sealant shall be applied at cracks in concrete members designated by the Engineer.
- B. Control joints shall be routed to a profile acceptable for sealant installation.
- C. The surfaces shall be primed prior to sealant installation.
- D. Install sealant according to the manufacturer's recommendations.
- E. Sealants should not be installed until primer has cured and joint is dry.
- F. Install a bond breaker in accordance with the sealant manufacturer's recommendations.
- G. Backer rod shall be installed using only blunt or rounded tools which will ensure a uniform (+ or - 1/8") depth without puncturing the material. Backer rod shall be a minimum of 33% oversized for closed cell and minimum of 50% oversized for open cell backer rod, unless otherwise required by the manufacturer.
- H. Surrounding surface shall be protected as required to ensure that no sealant contaminates these surfaces.

- I. The installed sealant shall be recessed from the member surface 1/16 inch.

### **3.05 CLEANING**

Surfacing of material adjacent to caulked joints shall be cleaned free of all smears of compound or other soiling due to caulking operations as the work progresses.

### **3.05 PROTECTION**

Provide adequate protection for the completed work. Prevent traffic, storage or movement of equipment until the sealant has cured.

**END OF SECTION 07900**

## SECTION 02835

### CHAIN LINK FENCES AND GATES

#### PART I GENERAL

##### 1.01 SUMMARY

- A. Section includes materials, labor, equipment, services and supervision necessary for and reasonable incidental to completing the Work of this section.

##### 1.02 REFERENCE

- A. ANSI/ASTM A123: Zinc (Hot Galvanized) Coatings of Products Fabricated from Rolled, pressed and forged steel shapes, plates, bars and strips.
- B. ANSI/ASTM F567: Installation of Chain Link Fence.
- C. ASTM A120: Pipe, Steel, Black, and Hot-dipped Zinc-Coated (Galvanized) Welded and Seamless, for ordinary uses.
- D. ASTM A53: Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- E. ASTM A153: Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- F. ASTM A392: Zinc Coated Steel Chain-Link Fence Fabric.

##### 1.03 SUBMITTALS

- A. Materials list of items proposed to be provided under this Section.
- B. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
- C. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
- D. Manufacturer's recommended installation procedures which, when approved by the Engineer, will become the basis for accepting or rejecting actual installation procedures used in the Work.

##### 1.04 QUALITY ASSURANCE



Manufacturer: Company specializing in commercial quality chain link fencing with minimum five years experience.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Anchor Fence
- B. U. S. Steel
- C. Cyclone Fence Co.
- D. Other Approved Equals

**2.02 MATERIALS**

In fabricating items which will be exposed to view, limit materials to those which are free from surface blemishes, pitting, rolled trade names, and roughness.

**2.03 COMPONENTS**

**A. Fabric:**

1. Type: Zinc-coated steel chain-link fence fabric, hot-dipped galvanized, #9 gage woven wire in 1" chain link diamond mesh, ASTM A392.
2. Finish: Zinc-coating, 202. Zinc per square foot of uncoated wire surface, ASTM A392, Class II.

**B. Framing:**

1. Standards: ASTM A53, for minimum dimensions and weights of posts, braces, rails, and accessories. ASTM A123 for Zinc-coating. Posts, rails, and fittings shall be hot-dip galvanized.
2. End and corner posts: 2-7/8" o.d. galvanized steel pipe, 5.79 lbs. per lineal foot.
3. Line posts: 2-3/8" o.d. galvanized steel pipe, 3.65 lbs. per lineal foot.
4. Center and top rails: 1-5/8" o.d. minimum, galvanized steel pipe, 2.27 lbs. per lineal foot.

5. Gate posts:

<u>Gate Post Size (o.d.)</u>	<u>Gate Leave (Length)</u>
2-7/8"	less than 6'
4"	6'-10'
6"	10'-15'

2.04 ACCESSORIES

- A. Tension Wire: High carbon steel, galvanized, not less than #7 gage.
- B. Wire Ties: #9 gage galvanized wire.
- C. Fittings: Steel, malleable iron or wrought iron, standard type, galvanized according to ASTM A153 with zinc weights per table I.
- D. Ties for fabric to tension wire: 11 gage hog rings at 24" distances.
- E. Touch-up paint: Zinc rich paint for galvanized surface ASTM A780.
- F. Bolts, clamps, turnbuckles and other hardware: Manufacturer's standard galvanized.
- G. Stretcher bars: One piece lengths equal to full weight of fabric with a minimum cross-section of 3/16" x 3/4". Furnish one stretcher bar for each gate and end posts and two for each corner.
- H. Fabric Strap: 1" x 11 gage, galvanized steel, spaced 12" o.c. to secure stretcher bars to corner gate post.

2.05 FABRICATION OF GATES

- A. Fabricate gate frames of 1-5/8" o.d. galvanized tubular members. Provide additional horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware and accessories.
  - 1. Assemble gate frames by welding of fittings and rivets for rigid connections. Use same fabric as used for fence.
  - 2. Install fabric with stretcher bars at vertical edges. Attach stretcher bars to gate frame at 12" distances.
  - 3. Attach hardware with rivets or by other means which

will provide security against removal and breakage.

- B. Provide diagonal cross-bracing consisting of 3/8" diameter adjustable length truss rods on gates where necessary to provide frame rigidity without sag or twist.
- C. Gate hardware: Provide the following hardware and accessories for each gate:
  - 1. Hinges: Fabricated steel bar assembly, non-lift-off type, to permit 180° gate opening. Provide 1-1/2 pairs of hinges for each leaf.
  - 2. Latch: Type to permit operation from either side of gate.
- D. Equip gates with a locking device which fastens the gate when closed at the top, bottom, and at the handle.
  - 1. The handle shall have provision for locking by padlock.
  - 2. Install fittings to latch both leaves of the gate in the full open position.
  - 3. Set gate stops in concrete.
  - 4. Provide gate stop to restrain the gate in the closed position.
- E. Equip posts with tops.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. General
  - 1. Provide top rails between posts for entire length of partition.
  - 2. Fasten rails ends to posts by means of malleable iron or pressed steel clamps.
  - 3. Tension Wire: Install bottom tension wires before stretching fabric and tie to each post with clips.
  - 4. Fabric: Leave a maximum of 1-1/2" between top of finished grade or floor slab and bottom selvage. Pull fabric taut and tie posts, rails and tension wires; anchor to framework so that fabric remains

in tension after pulling force is released.

5. Stretcher bars: Thread through fabric and secure to posts with metal bands spaced not over 12" o.c.
6. Gates: Install gates plumb, level and secure for full opening without interference. Adjust hardware for smooth operation.
7. The distance between posts shall not exceed 10 feet.
8. Set posts 3 feet into concrete footing 12 inches in diameter in Class "C" 1-2-4 mix concrete.
9. Fence shall be a minimum 7'-0" high.

**END OF SECTION 02835**

## SECTION 02500

### PAVING AND SURFACING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section includes materials, labor, equipment, services, and supervision necessary for and reasonably incidental to the completion of the paving and surfacing work including, but not limited to, the following:

1. Asphaltic Concrete Paving
2. Pavement subbase course

- B. Products Installed but not Furnished Under this section:

1. Colorcoating - (See Attachment "A" )

##### 1.02 REFERENCES

- A. Delaware State Highway Administration:
1. Standard Specifications for Construction and Materials.
  2. Standards for Highways and Incidental Structures.

##### 1.03 SYSTEM DESCRIPTION

The asphalt paving shall be installed to conform to the materials, geometry, and workmanship requirements of the Delaware State Highway Administration.

##### 1.04 SUBMITTALS

Submit a written certification from the supplier that the asphaltic concrete paving is as specified herein.

##### 1.05 WARRANTY

The Contractor shall guarantee to maintain the court paving for a period of two years from date of placing the material.

#### PART 2 PRODUCTS

##### 2.01 MATERIALS

- A. Bituminous Paving

1. Base and Sub-base material 6 inch thick.
2. Binder course - 2 inch thick.
3. Surface course - 2 inch thick.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. The Contractor shall provide all drainage ditches, gutters, and side drains necessary to carry off storm water during the construction work and to maintain the subgrade free from standing water.
- B. The Contractor shall insure that proper grades and sections are obtained prior to any paving operations. Hauling on the subgrade after checking will be the minimum practicable and all damage to the subgrade shall be repaired as directed by the Owner.

**3.02 PREPARATION**

After preparation of subgrade as specified, thoroughly scarify and sprinkle the entire area to be paved, and then compact to a smooth, hard, even surface of 90% compaction to receive the aggregates.

**3.03 INSTALLATION**

**A. Placement of Base Courses**

**1. Sub-base:**

- a. Spread the specified subbase material to a thickness providing the compacted thickness shown on the Drawings.
- b. Compact to 95%.

**2. Base:**

- a. Spread the specified base material to a thicknesses providing the compacted thickness shown on the Drawings.
- b. Compact to 95%.

**3. Thickness tolerance:** Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".

**4. Smoothness tolerance:** Provide the lines and grades shown on the Drawings within a tolerance of 3/8" in

ten feet. Correct deviations by removing materials, replacing with new materials, and reworking or recompacting as required.

5. Moisture content: Use only the amount of moisture needed to achieve the specified compaction.
6. Remove all loose materials from the compacted base.

B. Asphaltic Concrete Paving

1. Install the specified headers and stakes to achieve the arrangement of paving shown on the Drawings.
2. Apply the specified prime coat, and tack coat where required, and allow to dry, in accordance with the manufacturer's recommendations.
3. Receipt of asphaltic concrete materials:
  - a. Do not accept material unless it is covered with a tarpaulin until unloaded, and unless the material has a temperature of not less than 280 degrees F.
  - b. Do not commence placement of asphaltic concrete materials when the atmospheric temperature is below 50 degrees F, nor during fog, rain, or other unsuitable conditions.
4. Spread material in a manner which requires the least handling.
5. Rolling:
  - a. After the material has been spread to the proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.
  - b. Roll in at least two directions until no roller marks are visible.
  - c. Finished paving smoothness tolerance:
    1. Free from birdbaths.
    2. No deviations greater than 1/8" in six feet.
6. Flood Test:
  - a. Prior to application of seal coat, perform a

flood test in the presence of the Owner.

b. Method:

1. Flood the entire asphaltic concrete paved area with water by use of a tank truck or hoses.
2. If a depression is found where water ponds to a depth of more than 1/8", fill or otherwise correct to provide proper drainage.
3. Feather and smooth the edges of fill so that the joint between fill and original surface is invisible.

7. Seal Coat:

- a. Prepare the surfaces, mix the seal coat material, and apply in accordance with the manufacturer's recommendations as approved by the Engineer.
- b. Apply one coat of the specified sealer.
- c. Achieve a finished surface seal which, when dry and thoroughly set, is smooth, tough, resilient, of uniform black color, and free from coarse textured areas, lap marks, ridges, and other surface irregularities.

E. Expansion Joint

1. Install cork expansion joint filler at all intersections of pavements and wherever pavement abuts the concrete wall. Hold filler strip in place by means of appropriate installing device.
2. Install specified joint sealer. (Section 07900)

3.04 PROTECTION

Protect the paved areas from traffic until cured.

3.05 PAVEMENT SUBBASE COURSE:

Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course. Perform work in accordance with Delaware State Highway Administration Standard Specifications.

END OF SECTION 02500



ATTACHMENT "A"  
HANDBALL COURT COLORCOATING

**Description:**

This work shall consist of furnishing all materials, labor, tools, equipment and incidentals necessary to install the handball court color surfacing as described herein.

**Method:**

1. The installation contractor must provide references to Owner showing a minimum of ten (10) accepted projects over the past five (5) years, utilizing materials and methods described herein.
2. Application of the color surfacing system shall be in strict accordance with the instructions provided by the manufacturer. Industry products which will be accepted include those supplied by Court Master Recreational Surfaces, Nova Sports U.S.A., Copeland Latexite, California Products, Koch Asphalt Company (Decoralt), and others. Proposed materials must be approved by the Engineer.
3. Prior to the application of the color finish system, the court surface shall first be cleaned of all dirt, dust, oil, grease and debris. If necessary, water pressure and detergent shall be used to remove grease and oil. The court surface shall then be flooded with water to locate low areas that are greater than one-eighth inch deep. Minor depressions shall be leveled by spreading one layer or more of patch mix over the area by means of a straight edge screed or a squeegee. The patch binder must be compatible with the color surfacer system, and must be undiluted. Any rough paving joints and/or roller markers must be leveled smooth prior to application of colorcoat.

4. The curing time for the asphalt surface course shall be ten (10) days, after which the contractor may proceed to the resurfacer and colorcoating. The entire area of the court shall be covered with an asphalt filler course (binder coat or resurfacer). The following mix shall be used:

Description	AMOUNTS
Filler Coat Binder	55 Gallons
80-100 Mesh Sand	400 lbs.
Water	24 Gallons

The material shall be thoroughly mixed to ensure a uniform consistency. The total thickness shall not exceed one-eighth inch. The installation of this coat and the subsequent colorcoats shall be accomplished by the use of long flexible rubber squeegees. Each application must be thoroughly dried before proceeding to the next coat. The contractor shall allow the asphalt binder to cure for forty-eight (48) hours before proceeding to the colorcoat.

5. Following the filler course, the contractor shall apply three (3) coats of acrylic color texture course. The following mix shall be used for each course:

Description	Amounts
Colored Texture Course	55 Gallons
60-90 Mesh Sand	450 lbs.
Water	30 Gallons

The surface shall be checked for ridges between applications. Imperfections shall be scraped smooth and the surface cleaned of any loose material. These coats shall be applied parallel to the playing net.

6. Once the texture course has dried to a firm set, the final colored surface course shall be applied, parallel to the long dimension of the court. This mix shall consist of two parts coating to one part cool potable water.
7. The colorcoat materials shall not be applied when the ambient temperature is below 50°F, when the ~~tennis~~ <sup>HANDBALL</sup> court surface temperature is above 140°F, or when rain is imminent.
8. Once the final coat has thoroughly cured, the two-inch wide playing lines shall be laid out, taped and hand painted. The paint must be approved by the Engineer. The lines shall be installed in accordance with U.S. Handball Assoc. regulations.
9. Warranty: The Contractor shall guarantee in writing for the period of two (2) years from date of substantial completion, any structural cracking on the newly completed asphaltic surface. The Contractor will further guarantee the color finish materials for two (2) years from the date of substantial completion against chalking, checking, fading, discoloration, or other adverse affects from ultraviolet ray of the sun, moisture, or temperatures. Acrylic patching and crack repair work to be warranted for a period of two (2) years. This guarantee period for these items supersedes that found in the general conditions.

Basis of Payment:

1. Payment for all items covered in this specification shall be as indicated in the bid proposal sheets for each item. The lump sum, square yard, linear foot or each price bid shall include all equipment, materials, labor and tools necessary to satisfactorily complete the work as indicated in the drawings and herein described.