

## **SECTION 09650**

### **DETECTABLE WARNING TACTILES**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Section includes specifications for detectable warning tactile panels for installation at the following locations: Station platform edge, and the pedestrian crossings at stations, and at vehicular grade crossings. See Section 09655 for detectable guide tactiles.
- B. The tactile panels (panels) shall be surface install for installation only on concrete surface.

##### **1.02 REFERENCE STANDARDS**

- A. ADA (Americans with Disability Act) Standards for Accessible Design, 2010 or latest
- B. American Society for Testing and Materials (ASTM International):
  - 1. B117 Practice for Operating Salt Spray (Fog) Apparatus
  - 2. C501 Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
  - 3. C1028 Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
  - 4. D570 Test Method for Water Absorption of Plastics
  - 5. D638 Test Method for Tensile Properties of Plastics
  - 6. D695 Test Method for Compressive Properties of Rigid Plastics
  - 7. D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
  - 8. D1308 Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
  - 9. D5420 Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)
  - 10. E84 Test Method for Surface Burning Characteristics of Building Materials

11. G155 Practice for Operating Xenon-Arc Light Apparatus for Exposure of Non Metallic Materials

C. Caltrain Standard Drawings

### 1.03 SUBMITTALS

- A. Shop Drawings: showing fabrication details; panel surface profile; fastener locations; plans of panel placement including joints, and material to be used as well as outlining installation materials and procedure. Include procedures for containment and disposal of milling and sawcutting waste water.
- B. Product Data: manufacturer's literature describing products and installation procedures. Include product data for adhesives and sealants.
- C. Samples:
  1. Samples of panels measuring at least 12 inches x 12 inches. Panel sampled shall include longitudinal edge with integral flange and transverse ship-lap edges.
  2. Samples of panels and sealant for verification of color match.
- D. Maintenance Instructions: manufacturer's specified maintenance practices for each type of panel and accessory as required.
- E. Quality Assurance Submittals:
  1. Material Test Reports: test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties specified in this Section. Tests which indicate performance for the panels shall have been performed within three (3) years of the Invitation to Bid.
  2. Submit list of projects in California that successfully demonstrate the proposed products' durability and weatherability.

### 1.04 QUALITY ASSURANCE

- A. Panels and accessories, including panel adhesive, fasteners, and sealants, shall be from a single source. Products shall have been in successful service for a period of five (5) years.
- B. Installer's Qualifications: Engage an experienced Installer certified in writing by panel manufacturer as qualified for installation, who has successfully completed panel installations similar in material, design, and extent to that indicated for Project. Only persons who are thoroughly trained and experience in the installation of the panels shall perform the work.
- C. Provide services of manufacturer's field representative who shall be present at all times during installation.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Panel type shall be identified by part number on packages.

**1.06 SITE CONDITIONS**

- A. Environmental Conditions and Protection: Perform field work only when environmental conditions fall within those recommended by manufacturers of the products.

**1.07 WARRANTY**

- A. Panels shall be covered by a written warranty for a period of five (5) years from date of final completion. The warranty includes defective work, breakage, deformation, delamination, fading and chalking of finishes, and loosening of panels. Warranty shall include furnishing new materials, removal of existing panels, and installation of new panels.

**1.08 EXTRA STOCK**

- A. Furnish four (4) additional panels of each type of installed panels and corresponding fasteners. Deliver extra stock to location (within 30 mile radius of work site) designated by the Engineer. Furnish extra stock materials from same manufactured lot as materials installed and enclose in protective packaging with appropriate identification.

**PART 2 - PRODUCTS**

**2.01 PANELS**

- A. Manufacturers: Subject to conformance with the requirements of this Section, use products fabricated by the following manufacturers may be acceptable, or other Engineer approved equal:
  - 1. ADA Solutions, Inc.
  - 2. Transit-Tile
  - 3. Armor-Tile by Engineered Plastics, Inc.
- B. Panels shall be homogenous glass and carbon reinforced composite or an epoxy polymer composition which is color and UV stable. Color shall be Federal Safety Yellow (FS 33538) and homogenous throughout the panel thickness.
- C. Truncated Dome Geometry:
  - 1. Truncated dome surface shall comply with ADA and ABA guidelines, 705, Detectable Warnings. (Title 49 CFR Transportation, Part 37.9 Standards for Accessible Transportation Facilities, Appendix A, Section 4.29.2 – Detectable Warnings on Walking Surfaces).

2. Truncated Dome Description:
  - a. Staggered Dome and In-Line Patterns (nominal dimensions):  
The truncated dome shall measure 0.45 inch diameter at the top of the dome, 0.90 inch diameter at the base of the dome, 0.20 inch high, and 1.6 inch on center (staggered pattern) and 2.35 inch on center (in-line pattern).
  - b. In order to ensure a uniform appearance of the detectable warning surface throughout the system, equivalent facilitation findings or alternate patterns will not be acceptable.
3. Truncated dome pattern shall align properly from Panel to Panel.

D. Panel Configuration:

1. Panel thickness: 3/8 inches minimum, solid thickness for all type of panels.
2. Butt Joint, Staggered Truncated Domes:
  - a. For station platform edge (staggered pattern): Nominal 24 inches × 48 inches with a 7/16-inch thick deep flange along both long sides. The perimeter of the standard panel features a chamfer (no 90 degree return).
  - b. For station pedestrian crossings (staggered pattern): Nominal 36 inches × 48 inches (or longer) with a 7/16-inch thick deep flange along both long sides. The perimeter of the standard panel features a chamfer (no 90 degree return).
  - c. For pedestrian crossings at vehicular crossings (in-line pattern): Nominal 36 inches × 48 inches (or longer) with a 7/16-inch thick deep flange along both long sides. The perimeter of the standard panel features a chamfer (no 90 degree return).
2. The panel shall feature a butt joint detail from tactile warning panel to panel. Alternatively a ship lap detail may also be furnished.

E. Fastener Holes in the Panel:

1. Holes for fasteners shall be formed in the factory. The holes shall be located only at the centers of the truncated domes.

F. Performance characteristics: Panels shall meet the following standards.

Property	ASTM Test Method	Nominal Value
Accelerated Weathering (2,000 hours)	G155	Delta E: 5.0 max
Chemical Resistance	D1308	No Stain or Discoloration
Flexural Strength	D790	25,000psi min

Compressive Strength	D695	20,000psi min
Tensile Strength	D638	10,000psi min
Gardner Impact Test	D5420	110 in-lb min
Flame Spread	E84	FSI: 25 max SDI: 150 max
Slip Resistance	C1028	Friction Coeff: 0.80 min (wet or dry)
Wear Resistance	C501	500 min
Water Absorption (2 weeks)	D570	0.20% max
Salt Spray (120 hours)	B117	No Change

**2.02. ACCESSORIES**

- A. Fasteners for Concrete: Color matched nylon expansion sleeves with 1/4 inch diameter by 1-1/2 inches long stainless steel drive pins or as recommended by panel manufacturer for specific job conditions and accepted by the Engineer.
- B. Adhesive: Type approved by the panel manufacturer.
- C. Sealant: Urethane sealant of type approved by the panel manufacturer.
- D. Backer Road: Acceptable to sealant manufacturer. Where required, such as at platform expansion joints.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- A. Apply adhesives, sealants and mechanical fasteners in accordance with the guidelines provided by their respective manufacturers.
- B. Utilize manufacturer-provided template to lay out area to receive panels.
- C. Form recess for panels by either milling with diamond blade head or casting recess in place (at new paving) so that installed panel will still flush relative to adjacent surface. Grind or form to the depth and width required by the approved shop drawings and manufacturer’s instructions. Finish cast-in-place recess with equivalent of a light broom finish. When milled, substrate shall have a light ribbed finish.
- D. Contain and remove slurry resulting from concrete milling and sawcutting. Do not wash slurry into track bed area. Slurry contaminates and stains track structure and impedes drainage.
- E. For Panels with Recessed Flanges:
  - 1. Utilize diamond bladed double headed wet saw to achieve parallel grooves to receive panels. Both sawcuts shall be made simultaneously from the same machine. Sawcut parallel to platform edge.
  - 2. After sawcutting, vacuum and power wash surface with clean clear water, free from all dirt and debris. Visually inspect surface for

obtrusions or foreign matter. If obtrusions are present, remove by grinding. Remove foreign matter by grinding or further washing, as appropriate.

- F. Immediately prior to application of the setting adhesive, inspect surfaces to receive panel to ensure that they are clean, dry, free of voids, curing compounds, projections, loose material, dust, oils, grease, sealers, and other contaminants. Verify that surfaces are structurally sound and that concrete has cured a minimum of 30 days. Obtain panel manufacturer's representative's and Engineer's approval of surface preparation before installing panels.
- G. Air entrapment: Apply generous amount of adhesives to eliminate air entrapment between the panels and the concrete surfaces.
- H. Set panels and install fasteners in accordance with panel manufacturer's instructions and as follows:
  - 1. Wherever possible, install full size (uncut) panels. Do not install panel sections measuring less than 24 inches in length. Only cut panels where absolutely necessary.
  - 2. Maintain gap between panels for expansion and contraction in accordance with manufacturer's instructions.
  - 3. At platform expansion joints, cut panels on their short sides, finish cut edges smoothly, and lay panels with cut edges aligned with the edges of the substrate along the joints. Install fasteners on either side of the expansion joint at the time of initial installation. After a minimum of 4 hours, make a sawcut measuring 5/16 inch wide across the composite detectable warning surface panel and fill with sealant. Make sawcut in the zone between truncated domes.
    - a. Where there is platform curvature, composite detectable warning surface panels shall be treated in a similar manner so that the joints remain uniform across the width of the joint between successive panels. However, in areas of platform curvature, the joint shall take on somewhat of a triangular configuration.
  - 4. Cutting through panel domes shall be kept to a minimum. Where less than half of the truncated dome remains, grind off balance of dome; where over half of the truncated dome remains, feather dome so as not to present a tripping hazard.
- I. Install sealant in accordance with manufacturer recommendations.

### **3.02 CLEANING AND PROTECTING**

- A. After the area has been fully tiled and sealant system applied, clean panel surface, following the manufacturer recommended maintenance and cleaning procedures.

- B. Protect sealant and panels against damage during construction period. Comply with panel and sealant manufacturers' recommendations.
- C. Protect panels against damage from rolling loads following installation by covering with plywood or hardwood.
- D. Clean panel by method specified by the manufacturer.

**END OF SECTION**





## **SECTION 09655**

### **DETECTABLE GUIDE TACTILES**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Section includes specifications for surface applied and recessed detectable guide or directional tactiles (tactiles) for use on the station platforms to provide guidance or direction to the Ticket Vending Machines (TVMs) and the passenger shelters, as well as to mark the location of the mini-high platforms.
- B. The tactiles shall be surface install for installation only on concrete surface.

##### **1.02 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM International):
  - 1. B117 Practice for Operating Salt Spray (Fog) Apparatus
  - 2. C501 Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
  - 3. C1028 Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
  - 4. D543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents
  - 5. D570 Test Method for Water Absorption of Plastics
  - 6. D638 Test Method for Tensile Properties of Plastics
  - 7. D695 Test Method for Compressive Properties of Rigid Plastics
  - 8. D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
  - 9. D1037 Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
  - 10. D5420 Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)
  - 11. E84 Test Method for Surface Burning Characteristics of Building Materials
  - 12. G155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

### **1.03 SUBMITTALS**

- A. Shop Drawings: Submit shop drawings showing fabrication details; tactile surface profile; fastener locations; plans of tactile placement including joints, and material to be used as well as outlining installation materials and procedure.
- B. Product Data: Submit manufacturer's literature describing products and installation procedures. Include product data for sealants.
- C. Samples: Submit samples of tactile and sealant for verification of color match.
- D. Samples for Verification Purposes: Submit samples of full size tactiles of the kinds proposed for use.
- E. Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of tactile tile and accessory as required.
- F. Quality Assurance Submittals:
  - 1. Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties in this Section.
  - 2. Submit list of projects in California that successfully demonstrate the proposed products durability and weatherability.

### **1.04 QUALITY ASSURANCE**

- A. Provide tactiles and accessories as produced by a single manufacturer. Products shall have been in successful service for a period of two (2) years.
- B. Installer's Qualifications: Engage an experienced installer certified in writing by tile manufacturer as qualified for installation, who has successfully completed tactile installations similar in material, design, and extent to that indicated for Project.

### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Tactile type shall be identified by part number on packages.

### **1.06 SITE CONDITIONS**

- A. Environmental Conditions and Protection: Perform field work only when environmental conditions fall within those recommended by manufacturers of each product.

### **1.07 WARRANTY**

- A. Tactiles shall be covered by a written warranty for a period of five (5) years from date of final completion. The warranty includes defective work, breakage, deformation, fading, and chalking of finishes, and loosening of tactiles.

Warranty shall include furnishing of new tactiles, removal of existing tactiles, and installation of new tactiles.

**1.08 EXTRA STOCK**

- A. Furnish 10 linear feet long additional tactiles and corresponding amount of fasteners. Deliver extra stock to location (within 30 mile radius of work site) designated by the Engineer. Furnish extra stock materials from same manufactured lot as materials installed and enclose in protective packaging with appropriate identification.

**PART 2 - PRODUCTS**

**2.01 TILES**

- A. Nominal dimensions: 6 inches by 48 inches long by 0.125 inches thick and 0.325 inches thick at the top of the bars. Tactiles shall be formed with holes for anchors. Color: Federal Safety Yellow (FS 33538).
- B. Manufacturer: Armor Tile directional bar tiles, as manufactured by Engineered Plastics, Inc, or Engineer approved equal.
- C. Material: epoxy polymer composition employing aluminum oxide particles in the linear bars. Color shall be homogenous throughout the tactile.
- D. Performance characteristics: Tactiles shall meet the following standards.

Property	ASTM Test Method	Nominal Value
Accelerated Weathering (3000 hours)	G155	Delta E: 4.5 max
Chemical Stain Resistance	D543	No stain or discoloration
Chemical Resistance	D1308	No Stain or Discoloration
Flexural Strength	D790	25,000 psi min
Compressive Strength	D695	28,000 psi min
Tensile Strength	D638	19,000 psi min
Gardner Impact Test	D5420	550 in-lb min
Flame Spread	E84	FSI: 15 max
Slip Resistance	C1028	Friction Coeff: 0.80 min (wet or dry)
Wear Resistance	C501	500 min
Water Absorption (2 weeks)	D570	0.05% max
Salt Spray (200 hours)	B117	No Change

**2.02. ACCESSORIES**

- A. Fasteners: Stainless steel low profile expansion anchors 3/16 inch diameter by 2 inches long.
- B. Adhesive: Type approved by the tactile manufacturer.

- C. Sealant: Urethane sealant of type approved by the tactile manufacturer.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION**

- A. Apply adhesives, sealants and mechanical fasteners in strict accordance with the guidelines set by their respective manufacturers.
- B. Lay out area to receive tactile and mark with a thin indelible felt pen a reference grid for the tile to be laid. Lines shall be covered by tile or sealant or removed in completed installation.
- C. Set the diamond head planer to the appropriate depth to achieve the necessary recess in the area to receive the tactile.
- D. After planing, vacuum and power wash surface with clean clear water, free from all dirt and debris. Visually inspect surface for obtrusions or foreign matter. If obtrusions are present, remove by grinding. Remove foreign matter by grinding or further washing, as appropriate.
- E. Immediately prior to application of the setting adhesive, inspect surfaces to receive tactile to ensure that they are clean, dry, free of voids, curing compounds, projections, loose material, dust, oils, grease, sealers, and other contaminants. Verify that surfaces are structurally sound and that concrete has cured a minimum of 30 days.
- F. Clean backs of tactiles in accordance with manufacturer's instructions.
- G. Apply the adhesive to provide a sound resonating affect after the tactile is installed. All perimeter edges of the tactile shall receive a minimum of a 1 inch perimeter bond of adhesive.
- H. Inspect the tactile and clean with acetone all dust and other contaminants from the surfaces to be adhered, then set the tile in place, true and square. Drill holes true and straight to the depth required using the recommended bit with holes located by the molded recesses provided in the tactile. Clean dust from the holes with acetone to provide clear passage for the anchor and eventually the concealed cap.
- I. Mechanically fasten tactiles to surface using equipment and technique per manufacturer's instructions. Ensure the fastener has been set to full depth, straight and true, leaving sufficient clearance between the top of fastener and top of dome to not interfere with the concealed cap. Prevent damage to tile surface from inadvertent blows with the hammer.
- J. Maintain gap between tactiles for expansion and contraction in accordance with manufacturer's instructions.
- K. Following the installation of the tactiles, apply sealant to the joint between abutting tactiles and between tactiles and adjacent surface in accordance with

sealant manufacturer instructions, including masking and tooling. Clean joint and remove any debris. Cut away any excess adhesive. At sawcut, cut away any excess adhesive to provide sufficient depth for the sealant in the saw cut as indicated on the Contract Drawings.

### **3.02 CLEANING AND PROTECTING**

- A. After the area has been fully tiled and sealant system applied, clean tactile surface, following the manufacturer recommended maintenance and cleaning procedures.
- B. Protect panels against damage during construction period to comply with tile manufacturer's specification.
- C. Protect tactiles against damage from rolling loads following installation by covering with plywood or hardwood.
- D. Clean tactiles not more than 4 days prior to date schedule for inspection intended to establish completion for each area. Clean tactile by method specified by the manufacturer.

**END OF SECTION**



## **SECTION 09900 PAINTS AND COATINGS**

### **PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

- A. Section includes specifications for paints and coatings.

#### **1.02 DEFINITIONS**

- A. Paint: As used herein, means coating systems materials including primers, emulsions, epoxies, enamels, sealers, fillers, and other applied materials whether used as primer, intermediate, or finish coats.

#### **1.03 EXCLUDED WORK**

- A. Do not paint metal surfaces of anodized aluminum, stainless steel, and similar finished materials, unless otherwise noted on the Contract Documents.
- B. Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.
- C. Do not paint glass, concrete with sealer, nor other finished surfaces, unless otherwise noted or on the Contract Documents.

#### **1.04 SUBMITTALS**

- A. Product Data: a complete list of materials proposed for use, together with manufacturer product specifications.
- B. Samples:
  - 1. Five 8.5 inches by 11 inches samples of each color and each gloss for each material on which the finish is specified to be applied for review and approval of the Engineer.
  - 2. Revise and resubmit each sample until the required gloss, color, and texture is achieved. Samples approved by the Engineer will become standards of color and finish for accepting or rejecting the work of this Section.
  - 3. Final approval of gloss, color, and texture shall be made through approval of mockups, if required by the Engineer.
- C. Certificates of Compliance: Certificates of compliance from manufacturer certifying that proposed materials comply with the specified requirements and are the manufacturer's best-quality grade materials.
- D. Manufacturers' Review: Record of paint manufacturer's review as specified herein.

## 1.05 QUALITY ASSURANCE

- A. Regulations: In case of conflict between regulatory requirements and specified materials, submit alternative materials to the Engineer for approval.
- B. Manufacturer's Standards: Comply with manufacturer's recommendations and standards
- C. Personnel: Use adequate number of skilled workers who are thoroughly trained and experienced in the necessary crafts; and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- D. Paint Coordination:
  - 1. Provide finish coats that are compatible with the prime coats actually used.
  - 2. Review the Contract Documents, verify the prime coats to be used, and ensure compatibility of the total coating system for the various substrata.
- E. Paint Manufacturer's Review: Before purchasing paint materials, review the proposed paint systems, materials, and substrates with qualified representatives of the proposed paint product manufacturers. Obtain manufacturer's concurrence of the proposed paint systems, or any recommended changes thereto, before providing product data, samples, and mock-ups specified herein.
- F. Mockups:
  - 1. Do not apply final coats until the colors and textures have been approved by the Engineer. To accomplish this, if requested by the Engineer, paint a sample panel of approximately 24 square feet of the colors and textures selected on every type of surface to be painted. Notify the Engineer at least three days in advance of when sample panels will be ready for review and approval.
  - 2. For interior finishes, permanent lighting shall be installed and in operation in the rooms or areas where the sample panels have been painted. Temporary lights at the same level and of the same type, intensity, and color as the permanent lights will be permitted for viewing of sample panels.

## 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job in original packages and containers bearing name of manufacturer; containers shall be new and unopened and shall clearly show manufacturer's best-grade certification on each container; store appropriately and provide fire protection.
- B. When materials are not in use, store in hermetically covered containers.



- C. Maintain containers used in storage, mixing and application of paint in a clean condition, free from deleterious materials and residue.

**1.07 SITE CONDITIONS**

- A. Environmental conditions specified herein are minimum parameters. Comply with manufacturer's requirements.
- B. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45 degrees F unless otherwise permitted by the manufacturer's published instructions.
- C. Weather Conditions:
  - 1. Do not apply paint when the relative humidity exceeds 85 percent; or to damp or wet surfaces, unless otherwise permitted by the manufacturer's published instructions.
  - 2. Do not apply paint when dust is blowing.

**PART 2 - PRODUCTS**

**2.01 PAINT MATERIALS AND COLORS**

- A. Quality: Best quality grade of specified types as regularly manufactured by recognized paint and varnish manufacturers; materials not bearing manufacturer's identification as standard best grade product of regular line are not acceptable.
- B. Undercoats and Thinners:
  - 1. Provide undercoat paint produced by the same manufacturer as the finish coat.
  - 2. Use only the thinners recommended by the paint manufacturer and use only to the recommended limits.
  - 3. Undercoat, finish coat, thinner material, and related elements shall be components of a unified paint finish system.

**2.02 MATERIAL LIST**

- A. Metal Treatment and Primers:
  - 1. Rust Inhibitive Primer: Compatible formulation with shop applied primer and subsequent coats.
- B. Exterior Prime Coats
  - 1. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.

- a. ICI Dulux Paints; 4020-XXXX Devflex DTM Flat Interior/Exterior Waterborne Primer & Finish: Applied at a dry film thickness 2.2 mils minimum.
  - b. Kelly-Moore; 1725 Kel-Guard Acrylic Metal Primer: Applied at a dry film thickness of 1.5 to 2.0 mils.
  - c. Kelly-Moore; 5725 DTM-Acrylic Metal Primer: Applied at a dry film thickness 1.5 to 2.0 mils, under full-gloss acrylic-enamel coatings
  - d. Sherwin-Williams; Pro-Cryl Universal Metal Primer B66: Applied at a dry film thickness 3.0 mils minimum.
  - e. Or equal.
2. Exterior Galvanized Metal Primer: Factory-formulated galvanized metal primer for exterior application.
    - a. ICI Dulux Paints; 4020-XXXX Devflex DTM Flat Interior/Exterior Waterborne Primer & Finish: Applied at a dry film thickness 2.2 mils minimum.
    - b. Kelly-Moore; 1725 Kel-Guard Acrylic Metal Primer: Applied at a dry film thickness of 1.5 to 2.0 mils.
    - c. Sherwin-Williams; Pro-Cryl Universal Metal Primer B66: Applied at a dry film thickness 2.0 mils minimum, under full-gloss acrylic-enamel finishes.
    - d. Or Engineer approved equal.
- C. Exterior Finish Coats
1. Exterior Semigloss Acrylic Enamel: Factory-formulated semigloss waterborne acrylic-latex enamel for exterior application.
  2. ICI Dulux Paints; 4216 Lifemaster Pro High Performance Waterborne Acrylic Semi-Gloss Finish: Applied at a dry film thickness 1.3 mils minimum.
  3. Kelly-Moore; 1250 Acry-Lustre Exterior Semi-Gloss Acrylic Finish: Applied at a dry film thickness 1.3 mils minimum.
  4. Sherwin-Williams; A-100 Latex Gloss A8 Series: Applied at a dry film thickness 1.3 mils minimum.
  5. Or Engineer approved equal.

- D. Heavy Duty Exterior Prime Coats: Exterior Metal Primer for Urethane: Factory-formulated metal primer for exterior application. For shop primed or galvanized ferrous metal:
  - 1. Ameron Amercoat 240, 4-12 mils dry film thickness, each coat.
  - 2. ICI Dulux Paints: 203, Devan Universal Epoxy Primer, 2 to 4 mils dry film thickness, each coat.
  - 3. Sherwin-Williams: Pro-Cryl Universal Metal Primer B66: 3 – 4 mils dry film thickness, each coat.
  - 4. Or Engineer approved equal.
- E. Heavy Duty Exterior Finish Coats: Exterior Gloss Urethane, factory-formulated gloss urethane for exterior application. The dry film thickness shall meet that recommended in manufacturer's product data.
  - 1. Ameron Amercoat 450HSG, 2-3 mils dry film thickness, each coat
  - 2. ICI Dulux Paints: Devthane 378 UVA Aliphatic Urethane Gloss Enamel, 2-3 mils dry film thickness, each coat.
  - 3. Kelly-Moore: KM-375 High Build Gloss Polyurethane Enamel, 2 to 5 mils dry film thickness, each coat.
  - 4. Sherwin-Williams: Hi-Solids Polyurethane, B65-300 Series Polyurethane, 3-4 mils dry film thickness, each coat.
  - 4. Or Engineer approved equal.
- F. Miscellaneous:
  - 1. Caulking Compound: Acrylic latex type.
- G. Provide other materials not specified but required for a complete and proper application, as selected by the Contractor for approval by the Engineer.

**2.03 APPLICATION EQUIPMENT**

- A. Spray and Roller Equipment: Proper type for work, subject to the approval of the Engineer.

**PART 3 – EXECUTION**

**3.01 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.02 MATERIALS PREPARATION

- A. General:
  - 1. Mix and prepare paint materials in accordance with the manufacturer's published instructions.
- B. Stirring:
  - 1. Stir materials before application producing a mixture of uniform density.
  - 2. Do not stir film, which may form on the surface into the material. Remove the film and strain or filter the material appropriately before using.

### 3.03 SURFACE PREPARATION

- A. General:
  - 1. Cure concrete for a minimum of three (3) weeks prior to applying paint.
  - 2. Moisten concrete surface prior to applying paint to prevent concrete from absorbing water out of paint.
  - 3. Concrete: Remove efflorescence, chalk, form release agent, and other materials from surface of concrete which will inhibit adherence and coverage of paint. Brush concrete or apply primer coat of low viscosity penetrant paint to prepare walls and ceiling to receive top coats.
  - 4. Protect all adjacent finish surfaces from paint including colored concrete pavement, rolling grille, signage, light fixtures, switches and switch boxes, and other finished surfaces.
  - 5. Perform preparation and cleaning procedures in accordance with the paint manufacturer's published instructions and as approved by the Engineer. Clean concrete and metal surfaces free of all mill rust, form release agents, and efflorescence and prime metals.
  - 6. Remove removable items, which are in place and are not scheduled to receive paint finish; or provide surface-applied protection prior to surface preparation and painting operations.
  - 7. Following completion of painting in each space or area, reinstall the removed items by using workers who are skilled in the appropriate trades.
  - 8. Clean each surface to be painted prior to applying paint of surface treatment.
  - 9. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200 degrees F prior to start of mechanical cleaning.

10. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto or affect wet newly painted surfaces.
- B. Preparation of Metal Surfaces:
1. Thoroughly clean surfaces until free from dirt, oil, grease and the like.
  2. On galvanized surfaces, use solvent for the initial cleaning and then treat the surface thoroughly with phosphoric acid etch. Remove etching solution completely before proceeding.
  3. Allow to appropriately dry before application of paint.

### **3.04 PAINT APPLICATION**

- A. General:
1. The dry film thickness be at least than that recommended in manufacturer's product data. The specified number of coats is the minimum acceptable. If full coverage or required dry film thickness is not attained with specified number of coats, apply additional coats as necessary to achieve coverage and required thickness.
  2. Apply material evenly without runs, sags, crawls, holidays, or other defects. For brush work, brush out smooth and leave a minimum of brush marks. Where paint is rolled on, use fine nap roller so that a nearly flat or orange peel texture is obtained.
  3. Touch-up shop-applied prime coats, which have been damaged and touch-up bare areas prior to start of finish coats application.
  4. Do not apply additional coats until the completed coat has been inspected and approved by the Engineer.
  5. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
  6. Sand and clean dust and other debris between coats to remove defects visible to the unaided eye from a distance of 5 feet.
  7. On removable panels and hinged panels, paint the back sides to match the exposed sides.
- B. Drying and Re-Coat Window:
1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit weather conditions.
  2. Comply with manufacturer's re-coat timing restrictions.

- C. Spray Application:
  - 1. Confine spray application to metal framework and similar surfaces where hand brushwork would be inferior.
  - 2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
  - 3. Do not double back with spray equipment to build up film thickness of two coats in one pass.
- D. Completed work shall match the samples approved by the Engineer as to texture, color, and coverage.

### **3.05 FIELD QUALITY CONTROL**

- A. Testing: Measure thickness of paint on metal with magnetic dry mil thickness gauge to verify that manufacturer designated thickness has been attained and supply the Engineer with a certificate of compliance that said thickness has been attained.

### **3.06 PROTECTION AND CLEANUP**

- A. Protection: Protect building elements and components, paving, landscaping, and vehicles from damage, staining, overspray, marking, soiling, and the like. Leave work clean, whole, and as new. Correct damage by cleaning, repairing, replacing, or repainting.
- B. Hardware, Fixture Canopies, Outlet Covers, Switch Plates and Similar Items: Remove or loosen and replace as required for painting work. New hardware except for hinges shall not be installed until painting and finishing work is completed; mask and protect hinges from paint or damage.
- C. Cleanup: During progress of work clean up discarded paint materials debris cans, rags and the like; remove from the project site. Implement applicable safety methods in control or disposal of flammable materials.

### **3.07 PAINTING SCHEDULE**

- A. Exterior Finish System:
  - 1. Ferrous and other metals: Field apply primer. For shop primed ferrous metal: Touch-up primer as specified in Division 5, Metals.
  - 2. Intermediate and Finish Coats: As specified in Part 2 of this Section.
- B. Heavy Duty Exterior Finish System:
  - 1. Field apply primer. For shop primed ferrous metal: Touch-up primer as specified in Division 5, Metals.

2. Intermediate and Finish Coats: As specified in Part 2 of this Section.

**END OF SECTION**





## **SECTION 09950**

### **GRAFFITI-RESISTANT COATING**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Section includes liquid-applied sacrificial surface sealer for concrete that will prevent penetration of staining mediums and allow easy removal and reapplication.

##### **1.02 COATING REQUIREMENTS**

- A. The coating shall not darken, stain, or discolor substrate surfaces.
- B. The coating shall be non-yellowing.

##### **1.03 SUBMITTALS**

- A. Product Data: Manufacturer's literature describing product specifications, installation procedures, and general recommendations for specified coating materials.
  - 1. Include instructions and recommendations for cleaning and preparation of concrete surfaces, coating and recoating application techniques, equipment to be used, coverage rates, accessory materials, and special removal procedures.
  - 2. List material and cross-reference the specified coating, finish system, and application. Identify material by manufacturer's catalog number and general classification.
  - 3. Certification by manufacturer that products supplied comply with local air quality control regulations for volatile organic compounds (VOCs).
- B. Samples: Submit 8-inch x 10-inch samples of substrate to receive graffiti-resistant coating, with coating applied to half of each sample.
- C. Quality Control: Letter documenting work has been applied in compliance with specifications and manufacturer's written instructions and that specified field testing has been satisfactory.

##### **1.04 QUALITY ASSURANCE**

- A. VOC Regulations: Graffiti-resistant coatings shall comply with the latest regulations of the Bay Area Air Quality Management District (BAAQMD) regulations governing permissible content of volatile organic Compounds (VOC).
- B. Manufacturer's Qualifications: Graffiti-resistant coatings shall be furnished by a manufacturer specializing in the manufacture of graffiti-resistant coatings.

- C. Applicator's Qualifications: Application shall be by a applicator certified by the manufacturer who has a minimum of 3 years successful experience in application of similar graffiti-resistant coatings.
- D. Coating Manufacturer's Approval and Job Service:
  - 1. The coatings manufacturer shall inspect and approve coating applications and shall provide field services as part of the Work.
  - 2. Make all necessary arrangements with the coatings manufacturer to provide on-site consultation and inspection services to ensure the proper application and completion of the graffiti-resistant coating system.
  - 3. The coating manufacturer's representative shall be present at the time any phase of the work is started. Coatings shall be applied only over surfaces previously approved by the coating manufacturer's representative.

#### **1.05 MOCK-UP**

- A. Where directed by the Engineer, an area 3 feet x 4 feet of each different concrete substrate shall be treated with full coat finish and evaluated for product adhesion, compatibility, and for acceptability of the appearance of the treated surfaces.
- B. Application shall not continue unless each mock-up is acceptable to the Engineer.

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

- A. Deliver and store materials in the manufacturer's unopened containers labeled with the manufacturer's name and address and the date of manufacture.
- B. Store materials as recommended by manufacturer at site in a protected location, and away from flame and at temperatures between 45 and 90 degrees F.

#### **1.07 SITE CONDITIONS**

- A. Apply coatings only when temperature of surfaces to receive coatings and surrounding air temperatures between 45 and 90 degrees F, unless otherwise permitted by the coating manufacturer's printed instructions.
- B. Do not apply coatings during periods of fog, mist, and rain, or when rain is imminent.

#### **1.08 EXTRA STOCK FOR MAINTENANCE**

- A. At completion of the Work, deliver to the Engineer 10 gallons of specified graffiti application solution, and 10 gallons of the cleaning and removal solution.
- B. Stock shall be in factory sealed and clearly labeled containers.
- C. Stock shall be delivered and stored as directed by the Engineer.

**1.09 WARRANTY**

- A. Provide one year warranty, or manufacturer's warranty, whichever is longer.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. Prosoco or Engineer approved equal.

**2.02 MATERIALS**

- A. Graffiti-resistant coatings, base or prime coat and finish coats, shall be a two-component, polymer-based, non sacrificial product. The finished coating shall be stable, colorless, transparent, low sheen (flat), water soluble product.
  - 1. Prosoco Sure Klean Weather Seal "Blok-Guard & Graffiti Control II", or Engineer approved equal.
- B. Coatings shall be weather and rain resistant, abrasive resistant, peel resistant, ultra-violet resistant, non-yellowing, and shall permit moisture vapor relief.
- C. Graffiti-resistant coatings shall have the capability of having all types of paints and graffiti materials completely removed without damaging the uncoated surfaces to which they are applied.
  - 1. Removal and Cleaning System: Prosoco Defacer Eraser Graffiti Wipe.
- D. Products required to remove graffiti from the coating shall be non-toxic and shall comply with the local VOC regulations. Removal of graffiti shall cause no damage or change in the appearance of the treated surface.

**2.03 ACCESSORIES**

- A. Application Equipment: Medium-to-large capacity airless sprayer and hoses or other equipment as recommended by the manufacturer.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Coating manufacturer's representative shall verify that surfaces are dry, clean, and free of dust, dirt, grime, oils, alkali or acid residues, and other contaminants or compounds unacceptable to the graffiti-resistant coating manufacturer.
- B. Only apply coating system over surfaces approved by coating manufacturer's representative.

**3.02 PREPARATION**

- A. Clean and prepare substrates in accordance with graffiti-resistant coating manufacturer's instructions.

- B. Test for alkalinity and moisture content in accordance with manufacturer's instructions to ensure that surface is sufficiently dry. If surfaces are sufficiently alkaline to cause the finish coats to blister and burn, correct this condition as recommended by manufacturer before application.
- C. Protect adjacent surfaces not to receive coating from spillage or blow-over.
- D. Avoid wind drift to adjacent surfaces.
- E. Cover adjoining and nearby surfaces of metal and glass as required.
- F. Prepare and mix materials in accordance with the coating manufacturer's instructions and recommendations. Do not dilute or alter.

### **3.03 APPLICATION**

- A. Apply graffiti-resistant coating in accordance with manufacturer's application instructions and recommendations.
- B. Apply in thickness and sequence of coats as recommended by coating manufacturer for number of required coats.
- C. Completed Work: Match approved samples for texture and coverage. Recoat work not complying with specified requirements.

### **3.04 FIELD TEST**

- A. In the presence of the Engineer, apply and remove graffiti-resistant coatings to the satisfaction of the Engineer.
- B. The coating manufacturer's representative shall be present and provide written acceptance of the graffiti removal test.

### **3.05 CLEANING**

- A. Avoid runs or applying coating too heavily as this will impair transparency of cured material. Excessive coating will turn milky when it gets wet after curing.
- B. Runs or sags on concrete surfaces shall be immediately brushed out using a clean soft brush.
- C. Clean spillage from horizontal surfaces immediately after spillage.
- D. Remove temporary protective wrappings after coating operations.
- E. Provide "WET PAINT" signs to protect newly coated finishes.

## **END OF SECTION**