

ELASTUFF 310

MASTER GUIDE SPECIFICATION

SECTION 09800

100% Solids, Fluid-Applied Elastomeric Polyurea Waterproofing System

PART I – GENERAL

1.01 SCOPE

This Master Guide Specification has been established as an up-to-date inspection, preparation and membrane coating system installation for interior or exterior surfaces.

1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

- A. ASTM D412 – Test Methods for Rubber Properties in Tension
- B. ASTM D570 – Test Method for Water Absorption of Plastics
- C. ASTM D1004 – Test Method for Rubber Property Tear Resistance
- D. ASTM D2240 – Test Method for Rubber Property Durometer Hardness
- E. ASTM D4060 – Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- F. ASTM D4541 – Bond Strength as Measured by an Elcometer
- G. ASTM D2794 – Impact Resistance
- H. Federal Standard 141a-6221/6223 – Low Temperature Flexibility
- I. ASTM B117 – Resistance To Salt Spray
- J. ASTM C672 – Resistance To De-Icing Chemicals

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Warranties: Section 01740
- B. Concrete: Section 03300
- C. Shotcrete: Section 03360
- D. Crack Repair By Epoxy Pressure Injection: Section 03740
- E. Concrete Spall Repair: Section 03750
- F. Painting: Section 09900
- G. Metal: Section 05000

1.04 SUBMITTALS

- A. Submit Manufacturer's literature, certificates and samples in a single package to the Architect, Engineer or Owner in accordance with requirements specified in General Conditions and Division I, General Requirements.
- B. Manufacturer's Literature: Literature on the protective coating, as well as related repair materials, primers, sealers, sealant, reinforcement, etc. shall be submitted for review before work is started. Literature shall include material specification, physical properties (including ASTM and other test methods utilized), Manufacturer's estimated application rate for required dry film thickness, current application instructions, warnings or precautions, and Material Safety Data Sheets.
- C. Applicator's Qualifications: Submit a copy of Approved Applicator letter and/or certificate as issued and signed by an Officer of the Manufacturer of the 100% solids elastomeric polyurea coating system.

1.05 QUALITY ASSURANCE

- A. Qualifications of Contractor
 - 1. The Contractor shall be approved by the Coatings Manufacturer for application of its 100% solids elastomeric polyurea coating system, and shall have a minimum of three (3) years experience in the application of 100% solids elastomeric polyurea coatings.
 - 2. The Contractor shall provide a list of project references similar in nature to the one proposed, including verifiable contact names and telephone numbers.



- B. Qualifications of Manufacturer
1. Manufacturer of the fluid-applied, 100% solids elastomeric polyurea coating system shall have a proven 10-year track record of successful installations utilizing 100% solids elastomeric polyurea coating technology.
 2. Manufacturer shall submit certification, signed by an Officer of the Manufacturing Company, that neither coal tar, highly aromatic hydrocarbons or Moca are used in the manufacture of any component of the elastomeric coating system.
 3. Other Manufacturer's products shall be considered for use on this project only after submittal of product data files supporting quality, equality and full compliance with specifications herein. The Architect, Engineer or Owner reserves the right to reject substitution proposals should it be determined they do not provide all functions required for application.
 4. Pre-Bid Job Walk and Conference: The Contracting Officer shall conduct a pre-bid job walk and conference to review the drawings and specifications, as well as the procedure for on-site inspection and acceptance of the substrate and the coating system. Pertinent structural details that may require special attention shall be reviewed at this time. Contracting Officer's requirements and limitations relating to the Contractor's plan for coordination of the work between the various trades involved with the facility and its personnel shall also be covered.

1.06 PRODUCT DELIVERY, STORAGE & HANDLING

- A. Delivery of Materials: Materials shall be delivered to the jobsite in original, sealed containers with labels legible and intact.
- B. Storage of Materials: Materials shall be stored in an area specifically designated for that purpose, where temperatures will not be less than 50°F (10°C) or higher than 100°F (38°C).
- C. Material Handling: Materials shall be handled and installed per Manufacturer's instructions and all applicable health and safety regulatory agencies.
- D. Damaged Materials: Contaminated, damaged or unsealed materials, or materials not conforming to the specified requirements shall not be used in the installation. Rejected containers shall be immediately removed from the jobsite and replaced at no additional cost to the Owner.

1.07 ENVIRONMENTAL CONDITIONS

- A. Install all materials in strict accordance with Manufacturer's published safety and weather precautions.
- B. Do not apply elastomeric polyurea coating system components when the ambient and/or surface temperature is below 40°F (5°C) or above 110°F (43°C) or if any surface moisture is present, without first taking appropriate precautions. Do not apply if weather conditions will not permit complete reaction of components before rain, dew, fog or freezing temperatures occur. Do not apply if wind velocity exceeds 15 mph (24 kph) without taking necessary precautions to eliminate overspray.
- C. Take all measures necessary to protect unrelated surfaces from coating overspray or spillage.

1.08 FIELD QUALITY CONTROL

- A. The overall weather conditions, including surface temperature, surface moisture, ambient temperature, relative humidity and wind velocity shall be recorded by the Contractor, at designated time intervals, on the Daily Quality Control Report Form if so requested by the Architect, Engineer or Owner.
- B. Verification of Protective Coating Thickness: The quantity of primer used, batch numbers and the area in square feet or meters shall be recorded daily, as shall the wet film thickness, quantity, batch numbers and area in square feet or meters applied of the elastomeric coating, on the Daily Quality Control Form.

PART II – PRODUCTS

2.01 DESCRIPTION

- A. All surfaces shall be clean and dry, free from any existing coatings, sealers, dirt, grease, oil, pollution fallout, smoke, wax, form release agents, chemical contamination, latex, etc.
- B. New Portland Cement ASTM Type I concrete shall be allowed to cure for a minimum of 28 days. New Portland Cement ASTM Type II shall be allowed to cure for a minimum of 7 days. Repairs made using Shotcrete shall be allowed to cure for a minimum of 28 days.
- C. Inspect surfaces to determine condition of expansion joints, and to identify any severe cracks or other conditions requiring special attention. Use urethane caulk, epoxy injection or other appropriate, approved patching material for repairing cracks and/or large voids in the concrete surface. Repair any leaks or other structural details as instructed by the Structural Engineer.
- D. Actual surface preparation procedures that are to be followed on a specific project will vary depending upon service conditions, condition of the substrate, and the presence of existing paints, coatings or other contaminants. The following surface preparation procedures and recommendations are provided for guideline use only.

2.02 SURFACE PREPARATION

- A. CHEMICAL CLEANING: Surfaces that are contaminated with oil, grease, dirt, chemicals or other surface contaminants shall be cleaned prior to blasting or acid etching with **United Cleaning Concentrate (UCC)** or other approved biodegradable chemical cleaner and water, as per ASTM D4258 "Surface Cleaning Concrete for Coating". Dilute UCC at the rate of 1 part cleaning concentrate to 10 parts water. Apply dilute mixture to the surface under low pressure in accordance with the Manufacturer's printed application instructions. Mechanical scrubbing may be necessary to remove tightly adhering contaminants. After allowing the cleaner to sit a minimum of 15 minutes, thoroughly power rinse using fresh, clean water to remove all traces of the chemical cleaner. Power washer shall be rated at a minimum of 4.5 gallons per minute (1.8 l/minute) with a minimum operating pressure of 2,500 psi (17,225 kPa), utilizing a 25° or 40° ceramic nozzle.

- B. **ABRASIVE BLAST CLEANING:** Concrete that cannot be adequately cleaned or prepared by chemical cleaning shall be abrasive blast cleaned as per ASTM D4259 "Abrading Concrete", to provide a minimum surface height profile of 5 to 8 mils (127 to 203 microns). Blasting must produce an even profile, free of loose aggregate, weak matrix, crusts, dusting and other contaminants. Existing paints or coatings must be completely removed, except for residual areas that resist thorough blast cleaning. Any loose edges of remaining coating must be bevel-cut to sound adhesion.
- C. **ACID ETCH CLEANING:** Concrete may be acid-etched as an alternative to blast cleaning, provided that acid etching produces an even profile of 5 to 8 mils (127 to 203 microns). Acid etching shall be accomplished using a 10% Muriatic Acid solution. Following Manufacturer's instructions, the diluted solution shall be sprinkled onto the concrete surface. After the solution has stopped bubbling or foaming (normally 5 to 10 minutes), the area shall be scrubbed thoroughly using mechanical scrubbers. After scrubbing, all surfaces shall be thoroughly rinsed with liberal amounts of fresh water to assure complete acid removal. Surfaces may require additional rinsing or a high pressure rinse to remove all traces of the acid solution.
- D. Any moving cracks less than 1/8" (3 mm) wide shall be filled with a 100% solids, one or two component polyurethane sealer approved by the Coatings Manufacturer. Control joints and cracks over 1/8" (3 mm) wide shall be filled using the same polyurethane sealer, in combination with a polyethylene back-rod. Apply a minimum 1" (2.5 cm) bond-breaker tape over the top of the sealed crack, which will allow the coating membrane to expand and contract.
- E. Metal surfaces must be free of rust scale, forming oils, metal slivers and weld slag, as well as any grease, wax, oil or other contaminants prior to blasting. Chemically clean and/or abrasive blast as per specific project requirements.

2.03 PRIMER APPLICATION

- A. **FINAL CLEANING:** After repairs are completed and adequately cured, and prior to application of primer, all surfaces shall be cleaned using a vacuum or compressed air to remove all loose materials, dirt, dust and other foreign contaminants.
- B. **CONCRETE SURFACES:** Concrete surfaces shall be primed with one (1) coat of UNITED'S **Uni-Tile Sealer LV** (penetrating epoxy primer). Sealer shall be reduced as necessary and then applied by airless spray or roller at the rate of 250 to 500 sq. ft. per gallon (6.1 to 12.2 m²/l). Airless spray is the preferred method. Any spray equipment capable of 1,000 psi (6,890 kPa) and 1/2 gallon per minute (1.9 l/minute) delivery can be used. A reversible, self-cleaning spray tip with orifice size of .015" to .025" (.38 mm to .64 mm) and minimum 40° fan angle is recommended. For maximum production on large projects, airless spray equipment capable of 2,000 psi (13,790 kPa) and 1 gallon per minute (3.8 l/minute) delivery should be used. Allow a minimum of 1 hour dry time at 75°F (24°C) between application of **Uni-Tile Sealer LV** and the application of **ELASTUFF 310**. Colder temperatures will require additional dry time. Sealer should be topcoated within 24 hours, and should under no circumstances be left exposed longer than 48 hours. If primer is not topcoated within 48 hours, the surfaces must be brush blasted, followed by an additional, thin coat of **Uni-Tile Sealer LV** applied at the rate of 400 to 500 sq. ft. per gallon (9.7 to 12.2 m²/l).
- C. **STEEL SURFACES:** Steel surfaces shall be primed with UNITED'S **Primer 302 LV** to a thickness of 1.0 to 1.5 dry mils (35 to 38 microns), depending upon surface profile. For surfaces that have been blast cleaned to a 2 mil (51 micron) profile, **Primer 302 LV** should be applied at a minimum rate of 1 gallon per 250 to 300 sq. ft. (6.1 to 7.3 m²/l) of surface area. **Primer 302 LV** should be reduced up to 50% by volume with M.E.K., Xylol or Acetone, and then applied by conventional or airless spray, with airless spray being the preferred method. Any airless spray equipment capable of 1,000 psi (6,890 kPa) and 1/2 gallon per minute (1.9 l/minute) delivery can be used. A reversible self-cleaning spray tip with orifice size of .013" to .019" (.33 to .48 mm) and minimum 40° fan angle is recommended. Spray gun should be held not more than 24" from, and at a perpendicular angle to, the surface being primed. Allow **Primer 302 LV** to dry a minimum of 30 minutes prior to topcoating with **ELASTUFF 310**. All primed metal should be topcoated on the same day. If topcoating cannot be achieved within 48 hours, consult UNITED'S Technical Service Department for recommendations.

2.04 ELASTOMERIC COATING APPLICATION

- A. UNITED COATINGS' **ELASTUFF 310** is applied using 1:1 ratio plural component airless spray equipment. Refer to separate literature entitled **Plural Component Spray Equipment** for information on design and operation.
- B. **ELASTUFF 310** shall be applied to concrete surfaces that have been previously primed with **Uni-Tile Sealer LV** or steel surfaces previously primed with **Primer 302 LV**. It can also be applied to fiberglass or wood surfaces previously primed with **Uni-Tile Sealer LV**. All preparation work, including treatment of cracks, surface repairs, etc. must have been completed in accordance with UNITED'S published recommendations. Do not apply **ELASTUFF 310** when the ambient temperature is below 40°F (4°C) or above 110°F (43°C), or if rain is anticipated within 1/2 hour of application.
- C. Flush Methylene Chloride or M.E.K. solvent through the pumps, hoses and spray gun prior to introducing the material components. Set transfer pumps at the minimum pressure required to completely fill the proportioning cylinders as they cycle so that no cavitation occurs. This will typically require 200 to 300 psi (1,378 to 2,067 kPa) fluid pressure. Set main proportioning pump at 2,100 to 2,800 psi (14,469 to 19,292 kPa) fluid pressure to achieve an acceptable spray pattern, depending upon mix module and tip size, material temperature and ambient conditions.
- D. Plural component equipment must be equipped with in-line, high-pressure heaters as well as heated, insulated high pressure hose capable of developing and maintaining a minimum of 140°F (60°C) material temperature at the spray gun. In cooler ambient conditions where the material in the drum cannot be maintained at 60°F (16°C) or higher, drum heaters must be utilized to facilitate easier pumping of the liquid components by the transfer pumps.

- E. Utilize an approved air or mechanical purge plural component gun equipped with either a cone or flat tip. Utilize a mix module and tip combination that provides the desired spray pattern for the particular application.
- F. Prior to spray application, mix the Part A and B components separately with a clean power-mixer of sufficient size to thoroughly mix the contents of the container.
- G. **ELASTUFF 310** applied at the rate of one (1) gallon per 100 sq. ft. (.4 l/m²) of the combined Part A and Part B will theoretically yield 16.0 dry mils (406 dry microns).
- H. **ELASTUFF 310** shall be applied in a minimum of two separate coats. Each coat shall be applied at the rate of 1.5 to 2 gallons per 100 sq. ft. (.6 to .8 l/m²), resulting in a total minimum thickness of 20 to 30 mils (508 to 762 microns) per coat. During the application of each coat, thickness tests shall be made every 100 sq. ft. (10 m²) using a wet film thickness gauge. Areas containing rough textured concrete, or concrete exhibiting sharp peaks or ridges, will require an extra pass of coating to ensure the minimum required dry film thickness is attained on the peaks and edges.
- I. The applicator must periodically check the number of gallons used compared to the area coated. If adequate material has not been used according to UNITED'S published recommendations or project specifications, adjust accordingly and apply additional material to previously coated areas.
- J. Additional coats of **ELASTUFF 310** should be applied within 48 hours of the previous coat, however, as long as the surface remains clean, additional coats can be applied as long as there is chemical cure occurring within the membrane, which is normally 3 to 5 days. The applied membrane shall be allowed to cure for approximately 2 hours prior to application of any topcoat.
- K. **ELASTUFF 310** is self-flashing at natural termination points such as expansion joints, corners, edges, counter-flashings, tank wall caps, etc. Coated areas that do not tie into a natural termination must be saw-cut around the perimeter to a minimum of ¼" (6 mm) in width by ¼" (6 mm) in depth. The coating shall then be applied so as to flow into and terminate at the saw cut. Tape off the opposite side of the saw cut so that no overspray occurs beyond this point. Cut material at the tape line with a razor knife in order to leave a straight, clean edge.
- L. The **ELASTUFF 310** coating installation must be inspected as soon as practical to ensure that all surfaces have been uniformly coated and are free of holidays. Protrusions and non-cementitious fixtures shall be specifically identified by the drawings as to whether or not they are to be coated. The Coating Manufacturer shall recommend the appropriate primer for each different non-cementitious material.
- M. The coating system shall terminate at, and shall not be extended over expansion joints. Inspect expansion joints to ensure that they are sound and are isolated from the coating membrane.

2.05 TECHNICAL REQUIREMENTS

- A. The bond of all elements of the system to each other – the bond of the **Uni-Tile Sealer LV** or **Primer 302 LV** to the substrate, and the bond of the **ELASTUFF 310** to any subsequent topcoat – must all be adequate and unaffected by subsequent temperature effects and fluctuations.
- B. The **ELASTUFF 310** System will withstand cracking within the concrete substrate up to crack widths of ¼" (6 mm) at temperatures between -20°F and 160°F (-29°C and 71°C).
- C. Mass water will not penetrate the membrane under the pressures that typically occur on bridge decks or traffic decks.
- D. Chloride Ions will not pass through the **ELASTUFF 310** waterproof membrane under normal service conditions.
- E. The system will not be damaged by automobile fluids, such as battery acid, motor oil, gasoline, diesel fuel or highway de-icing salts.
- F. The cure rate of the system components becomes progressively slower at low temperatures. The corresponding time to achieve full cure will also be extended accordingly.
- G. The waterproofing system is durable and will remain effective provided that it is not damaged during subsequent resurfacing procedures.

PART III – EXECUTION

3.01 CLEANUP

- A. Maintain work and work areas in a clean, safe condition at all times during coating installation. Remove excess materials, trash and debris from the jobsite daily.
- B. At the completion of the project, clean area of any spills, containers and debris, leaving jobsite in a clean condition.

3.02 FINAL INSPECTION

Upon completion of the coating system installation, the Coating Manufacturer's Representative, Owner's Representative, Architect and/or Engineer and Applicator shall make a final inspection to determine the dry film thickness of the fluid-applied, 100% solids polyurea membrane and to verify that the system is free from voids and/or pinholes. Any defects shall be noted, duly marked and immediately repaired prior to acceptance.



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