



**SECTION 06610
STRUCTURAL REINFORCED POLYMER COMPOSITE
PEDESTRIAN BRIDGE DECK**

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the requirements for furnishing and installing all Structural Reinforced Polymer Composite Pedestrian Bridge Deck Panels (hereinafter referred as “panels”), including transportation, material and equipment necessary to complete the work. The Contractor’s work includes but is not limited to the following:

1. Supply and install Structural Reinforced Polymer Composite Deck Panel system complete with associated hardware.
2. Verify in the field all dimensions elevations and slopes required for the top surface of the panels and report to proper authority any discrepancy with contract drawings prior to fabrication.
3. Determine quantities of panels and types to complete the work.
4. Other appurtenant or related work, as specified herein, directed by the Engineer, or as shown on the drawings.

B. Related Sections: (if applicable)

1. Section 01400 Site Quality Requirements
2. Section 02110 Site Clearing
3. Section 02368 Steel ‘H’ Piling
4. Section 07900 Joint Sealants

1.2 REFERENCES

- A. 2001 American Railway Engineering and Maintenance-of-Way Association (A.R.E.M.A) Manual for Railway Engineering.
- B. 2002 Illinois Department of Transportation (I.D.O.T.) Standard Specifications for Road and Bridge Construction.
- C. Latest BOCA National Building Code.
- D. Latest Manual of Steel Construction of the American Institute of Steel Construction.



1.3 SUBMITTALS

- A. **MANUFACTURER'S DATA:** The Contractor shall submit copies, in accordance with SECTION 01330 – SUBMITTAL PROCEDURES, of the manufacturer's product data, specifications and instructions and service manual. Include laboratory test reports from a qualified independent testing facility.
- B. **SHOP DRAWINGS:** The Manufacturer shall prepare shop drawings for submittal in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. All shop drawings shall indicate detailing fabrication and installation (if applicable) including but not limited to the following:
 - 1. **Structural reinforced Polymer Composite Deck Panels:**
 - a. Panel type, dimension and cross-sections, size, composite internal flanges, tactile surface and slope(s) for drainage of rainwater
 - b. Detail field hardware, connections, bearing pads and joints including accessories.
 - c. Locations and details of openings, anchorage devices, connections, or any other items that are related to the fabrication of the panel.
 - d. Material test reports from Manufacturer indicating that materials proposed for use of the Structural Reinforced Polymer Deck Panel system are in compliance with the requirements and meet the properties indicated.
- C. **GUARANTEE:** Guarantee for no less than twenty five (25) years from the date of installation against structural fatigue, corrosion, spalling, or cracking. Any such panel that fails during the stipulated guarantee period shall be repaired or replaced at no additional cost to the owner.

1.4 QUALITY ASSURANCE

- A. **Installer Qualifications:** The Contractor shall engage an experienced installer who has completed installation of Structural Reinforced Polymer Composite Deck Panel System, complete with Monolithic Fusion Bonded Aggregate Deck Topping, design and extent to that indicated for this Project and with a five year record of successful in-service performance.
 - 1. Installer shall have full knowledge of quality procedures for work on this project, and shall be equipped to handle all panels and related materials on site. All site equipment shall remain clear on overhead electrical lines and shall be installed only during those time periods allowed in the contract documents.
 - 2. A schedule of erection equipment and erection progress shall be submitted prior to the start of work.



- B. Manufacturer's Qualifications: Firm experienced in producing Structural Reinforced Polymer Composite Deck Panels for applications similar to those indicated for this project and with a record of successful in-service performance as well as sufficient production capacity to produce required units without delaying the work.
 - 1. The Manufacturer shall have a minimum of five (5) years or structural composite polymer deck panel manufacturing experience plus personnel with a minimum of five (5) years cumulative direct supervisory experience in the manufacture of structural composite polymer deck panels.
- C. State of Illinois: "Accessibility Standards"
- D. Federal: "Americans with Disabilities Act"
- E. Pre-installation Conference: Conduct conference at Project site to comply with the requirements of the Conditions of the Contract and of Division 1 – General Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver panels to Project site in such quantities and at such times to ensure continuity of installation. Store panels at Project site in a location approved by Owner, and prevent cracking, distorting, warping, staining, or other physical damage.
- B. Deliver anchorage items that are to be embedded in other construction before starting such work. Review connections drawings as required for installation.

PART 2 PRODUCTS

2.1 STRUCTURAL REINFORCED POLYMER COMPOSITE DECK PANEL SYSTEM

- A. Available Manufacturers for the Structural Reinforced Polymer Composite Deck Panel System: Subject to compliance with requirements, fabricators offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Armor-Deck Transit Platform System as fabricated by Engineered Plastics, Inc. 100-300 International Drive, Williamsville, NY 14221 ATTN: Ken Szekely 1-800-682-2525.
- B. Tensile Modulus of Elasticity: ASTM D 638 - 570,000 psi
- C. Compressive Strength: ASTM C 109 - 5000 psi
- D. Bond Strength: ACI 503R - 100% substrate failure
- E. Freeze Thaw Resistance: ASTM C 666 - Pass (no change)
- F. Wet Skid Resistance: ASTM E 274 - Minimum 40



- G. Tensile Strength: ASTM C 307 - Minimum 1200 psi
- H. Flexural Strength: ASTM C 580 - Minimum 1000 psi
- I. Tensile Adhesion: ACI 503R - 250 psi pull off

2.2 MONOLITHIC FUSION BONDED AGGREGATE DECK TOPPING

- A. This “Diamond Hard” vitrified polymer composite, is fabricated as one component of the Structural Reinforced Polymer Composite Deck Panel System: Subject to compliance with requirements, fabricators offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Monolithic Diamond-Tek granite wearing surface as fabricated by Engineered Plastics, Inc. 100-300 International Drive, Williamsville, NY 14221 ATTN: Ken Szekely 1-800-682-2525
- B. Epoxy Resin: Use only one brand and type of epoxy resin throughout Project, unless otherwise approved by the engineer.
- C. Aggregate Percentages:
 - Silica Sand 25-30% - 12-40 mesh
 - Granite Stone 40-45% - 6-20 mesh
 - Alumina Trihydrate 15% - 15 micron.

2.3 CONNECTION MATERIALS AND FINISHES

- A. Galvanized Steel: As provided by Structural Reinforced Polymer Composite Deck Panel manufacturers.
- B. Bolts and Studs: ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); nickel-plated nuts; connecting rod; and flat, unhardened steel washers.
- C. Accessories: Provide as required to install panels.

2.4 CAULKING/EXPANSION MATERIALS (if applicable) EMSEAL Expandable AST HI Acrylic Expanded Sealant

2.4 BEARING PADS

- A. Provide size of pads for panels as follows:



1. Elastomeric Pads: AASHTO M 251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, Durometer 60
- B. Subject to compliance with requirements, elastomeric pads that may be incorporated to the project include but is not limited to the following:
 1. J.V.I. Inc., 7550 Linder Avenue, Skokie, Illinois (847) 675-1560.

2.6 FABRICATION

- A. Tooling: Accurately construct tooling of sufficient strength to withstand pressures due to molding operations, and temperature changes. Maintain tooling to provide completed panels or shapes, lines and dimensions indicated, within manufacturer's tolerances specified.
- B. Built-In Anchorages: Accurately position built-in anchorage devices as per detailed fabrication drawings. Locate anchorages where they do not affect the position of the main reinforced composite internal "I" beams.
- C. Cast-in Openings: Openings larger than 5 inches in diameter or 5 inches square according to final shop drawings. Smaller holes may be field cut or drilled by trades requiring them without cutting "I" beams and if acceptable to engineer.
- D. Top Surface Finish: The Monolithic Fusion Bonded Aggregate Deck Topping surface of the panels shall be a non-skid granite wearing surface meeting ASTM C-1028 Standards for non slip finish. Samples to be submitted to owner for approval.
- E. Tolerances: Panel fabrication shall not exceed the following tolerances criteria.
 - a. Panel length $\pm 1/8$ inch
 - b. Panel width $\pm 1/8$ inch
 - c. Panel squareness 0.002 radians (2:1000)
 - d. Panel camber: $\pm 1/8$ inch in length or width
 - e. Panel thickness: $\pm 1/16$ inch
 - f. Draft on sides and ends of panel $\pm 1/16$ inch
- F. Finish Structural Reinforced Polymer Composite Deck Panels as follows:
 - a. Finish along surfaces in contact with each other. Normal plant-run finish that produces an exposed surface smooth finish.
- G. Expansion Joints (if applicable): Emseal expansion material to be used between structural reinforced polymer composite deck panels and adjacent surfaces.
- H. Cleaning and Protection:



1. Protect panels against damage during construction period to comply with Structural Reinforced Polymer Composite manufacturer's directions.
 - a. Protect Deck Panel against damage from rolling loads for initial period following installation by covering with plywood or hardboard, using dollies to move stationary equipment across planks.
 - b. Cover Deck Panel surface with undyed, untreated building paper or plastic until inspection substantial completion.

2.7 PLANT QUALITY CONTROL EVALUATIONS

- A. A qualified Testing and Inspection Agency will evaluate the Structural Reinforced Polymer Composite Panel for manufacturer's quality control, testing methods and test results.
 1. Allow an independent (owners) Testing and Inspection Agency access to material storage areas, Structural Reinforced Polymer Composite Panels production equipment, materials placement, and curing facilities.
 2. Cooperate with the independent (owners) Testing and Inspection Agency and provide samples of materials and other items as may be requested for additional testing and evaluation.
 3. Allow the independent (owners) Testing and Inspection Agency to be present during the testing of the Structural Reinforced Polymer Composite Panels.
- B. Structural Reinforced Polymer Composite Panels will be considered potentially deficient if they fail to comply with specified requirements, including, but not limited to the following:
 1. Test results fail to meet design strengths
 2. Curing and protection of panels fail to meet requirements
 3. Panels are damaged during handling and erecting.
- C. Structural Reinforced Polymer Composite Panel Testing:
 1. Full scale load and material testing shall be performed by the Manufacturer's Testing and Inspection Agency.
 2. Uniform Design Load Tests based on 125 pounds per square foot (Live Load = 100 pounds per square foot plus snow load = 25 pounds per square foot).
 3. Concentrated Design Load Tests based on snow removal equipment vehicles = 10,000 pounds, with a wheel base of 13'-0" longitudinal and 6'-6" transverse.
 4. Uniform Ultimate Load Test to determine the margin of safety above the design load the panel can withstand, based on 650 pounds per square foot of failure, whichever comes first.
 5. Coefficient of Friction/Slip Resistance Test using standard test method ASTM-C 1028-89, the combined wet/dry static coefficient of friction not to be less than 0.80.
 6. Abrasion Resistance Test using test method ASTM C 1353 -96.



7. When there is evidence that the strength or durability of panels may be deficient or may not meet requirements, the engineer shall appoint a testing and inspection agency to obtain, prepare and test samples obtained from completed Structural Reinforced Polymer Composite Panels to determine design strengths and to perform structural evaluation or other necessary analysis.
- D. Test results will be made in writing on the same day that tests are made, with copies to the engineer, contractor, and fabricator. Test reports will include the Project identification name and number, date, name and Structural Reinforced Polymer Composite Panel fabricator, name of testing agency; identification letter, name and identification of plank or panels represented by tests; test strengths, and type of break, and direction of applied load with respect to the top surface of panel
 - E. Dimensional Tolerances: Panels having dimensions smaller or greater than tolerance limits may be rejected.
 1. Panels having dimensions outside the specified tolerances will be rejected if the appearance or function of the structure is adversely affected or if larger dimensions interfere with other construction.
 2. Repair or remove and replace rejected units, as required by the owner, to meet construction conditions.
 - F. Defective Work: Panels not conforming to requirements, including strength, durability requirements, manufacturing tolerances, and finishes, are unacceptable. Remove rejected panels and replace with panels conforming to requirements

PART 3 EXECUTION

3.1. EXAMINATION

- A. Examine substrates and conditions for compliance with requirements, including installation tolerances, true and level bearing surfaces, and other conditions affecting performance of the panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Installation to be performed in accordance with manufacturers installation instructions.

3.3 CLEANING



- A. Clean exposed surfaces of planks after erection to remove markings, dirt and stains.
 - 1. Wash and rinse according to precast composite fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
 - 2. Do not use cleaning materials or processes that could change the appearances of exposed composite finishes.

PART 4 MEASUREMENT AND PAYMENT (NOT USED)

END OF SECTION