SP-155059
(New)

SPECIAL PROVISIONS
FOR
SOUTH COURTESY DOCKS INCLUDING SHEET PILE WALL, COMPLETE

Des Moines County
EDP-0977(653)--7Y-29

Effective Date
June 15, 2021

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

155059.01 DESCRIPTION.

A. Summary.
This special provision includes floating dockage system, gangways and the dockage anchorage for all courtesy dockage at the south boat ramp. No alternative system shall be considered for this project without prior approval.

B. Submittals.

1. Three copies of design calculations signed and sealed by the Dockage Designer (or another Professional Engineer licensed in the State of Iowa, experienced in floating dock design) with an affidavit stating that "the structural details, specified materials and performance of the system under design loadings are in complete conformance with the design criteria".

2. Three copies of shop drawings and manufacturers' literature, signed and sealed by the Dockage Designer (or another Professional Engineer licensed in the State of Iowa, experienced in floating dock design) with an affidavit stating that "the structural details, specified materials and performance of the system under design loadings are in complete conformance with the design criteria". Shop drawings shall include all information necessary for the fabrication of component parts of the structure. All drawings shall be accurately and completely dimensioned. Drawings shall indicate all relevant sizes and shall show thicknesses, gauges, finishes, materials, etc., of all items shown. Indicate size of members, type and location of shop and field connections and the type, size, and extent of all welds. The following is a partial listing of details required for submittal:
- **a.** Cover sheet listing project, location, Contracting Authority, Manufacture, and all project design criteria.
- **b.** Plan view layout(s) showing location of all joints, framing, cleat layout, anchorage system, and all other dockage amenities.
- **c.** Typical sections at dock.
- **d.** Section and elevation of ramps/transitions.

e. Details of anchorage system.
f. Details of flotation unit.
g. Rub rails and/or moldings.
h. Structural computations and layout drawings for the interlocking sheet pile revetment wall shown on sheet UW.2.

3. Three copies of complete As-built Plans, including location of anchorage system.

4. Three copies of a complete Operations Manual, as a minimum, containing the following information:
a. Manufacturer's representative's name, address and phone number.
b. Location of anchorage and connections to dockage.
c. Complete discussion of system handling for the winter season and realignment for the boating season.
d. Plans, diagrams, installation instructions and parts lists.

C. Quality Assurance.

1. The Courtesy Dockage Manufacturer (herein referred to as the Manufacturer) shall have not less than 5 years continuous experience in the fabrication of floating dockage.

2. The Manufacturer shall demonstrate to the Contracting Authority successful floating dockage installations in a similar physical and natural environment.

3. The Dockage Designer shall be a Professional Engineer licensed in the State of Iowa and shall submit at least three references for marina floating dockage anchorage systems designed by him/her. The Engineer shall review references and has the right to refuse or reject the anchorage designer. Dockage manufacturing shall not commence until the Dockage Designer is approved by the Engineer.

4. The Manufacturer or the Contractor shall provide at least one person who shall be present during installation of this work who shall be thoroughly familiar with the type of materials being installed, the requirements of this work and who shall direct all work.

D. Warranty.
The guarantee for all materials except the flotation materials shall be for a period of 5 years from the date in which the completed work is turned over to and accepted by the Contracting Authority. The guarantee for the flotation materials shall be for a period of 10 years.

155059.02 MATERIAL.

A. System Description.

1. The complete floating dockage system, gangways and anchorage shall be designed in accordance with ASCE Report No. 50 (Report on Small Craft Harbors, latest edition) except as modified herein. Frequency of spacing and sizing of components of the Anchorage System shall be as required to satisfy the horizontal loading requirements and the structural integrity of the floating dockage system. The system shall also prevent torsion, racking and twisting by providing sufficient built-in torsion resistance and transfer of all loads.

2. River Levels.
a. The river water level at project site is subject to Mississippi River flows.
b. Dock System is subject to river currents.
c. The dockage system, gangways and anchorage shall be designed for a normal range of 517 to 528.5 with all facilities under full design loadings listed below.

d. During Mississippi River flood flows, the dockage system, gangways and anchorage attachment shall be designed for Mississippi River flood elevation (528.5) for removal.
e. Pile guides shall be designed to accommodate the swing of the dock system from the water level changes. Pile guides shall allow for easy removal and attachment of dock system to piles.
f. Manufacturer to provide transition plates as required.
g. Dock shall have guide system along sheet pile wall.

3. Vertical Loading.
a. Dead load shall be the entire weight of the floating piers including access ramps and appurtenances.
b. Live load for flotation calculations shall be not less than 30 pounds per square foot for floating piers.
c. Piers at dead loading in the water shall maintain a free board of 21 inches to 24 inches. Design of free board shall be indicated in the shop drawings. The free board on the overall dock system shall not vary more than 1 inch from the approved drawings. On the main headwalk the slope shall not vary more than 1 inch in 10 feet. At the design load of dead load plus 30 pounds per square foot live load, a free board of not less than 10 inches shall be maintained. Extra flotation shall be installed at end sections as required to compensate for end reactions of ramps due to combined loading. Additional flotation shall be adequate to ensure that the piers shall maintain a uniform free board over the length of the pier.
d. In addition to the above, the end of the piers must be designed to withstand a 400 pound total live load 2 feet from the end without loss of free board of more than 4 inches.
e. Structural members, deck surfaces and ramps shall be designed with a uniform live load of 50 PSF. Maximum deflection under live and dead loading shall be 1/240 of the span.

4. Horizontal Loading.
a. Uniform wind load perpendicular to the headwalk; assume to be full wind on unshielded boats (15 psf).
b. Impact of the largest boat normally using that slip striking the end of the finger dock at a maximum angle of 10 degrees to the centerline of that finger dock at a velocity of 2 knots (3 feet per second) or less.
c. The structure and system shall be designed to withstand:
1) 3.5 foot wave from barge traffic on a periodic, but not continual, basis.
2) 2.5 foot recreational boat wake waves on a continual basis.

5. Docks shall be designed to prevent fatigue failure throughout the dock system connections, frames, and fasteners.

B. Materials.

1. Structural.
a. Decking lumber and side skirts shall pressure treated Southern Yellow Pine, No. 1 Prime, 2 by 6 inch nominal. Pressure treat boards and dimension lumber with waterborne preservative according to AWPA UC-4B or the applicable ICC-ES Evaluation Report.
b. Structural steel shall conform to the requirements of the standard specification for structural steel, ASTM A36. All steel for the floating dockage shall be zinc-coated (hot dipped) in accordance with the requirements of ASTM A123. Minimum zinc coating properties required are as follows:

Product Form	Minimum Weight (oz./Sq. ft.)	Minimum Thickness (mils.)
0.125 inch, 0.1875 inch Steel	2.0	3.0
0.25 inch and thicker	2.0	3.4

c. All steel structural members shall be zinc coated after fabrication. Minimal field cutting, welding or drilling will be allowed, if pre-approved by the Engineer. Steel surfaces exposed by cutting, welding or drilling shall be coated with a zinc rich cold galvanizing paint. All steel components associated with the anchorage system shall be galvanized.
d. Connection of the ramps to the bulkhead is the responsibility of the floating dockage manufacturer and shall be an embedded hinge with removable pin and transition plate.
e. Structural Aluminum components shall be 6000 Series Alloy.
f. Hardware - bolts, lag bolts, screws, flat washers and lock washers shall be of the type and size best suited for the intended use. Low carbon bolts shall conform to the requirements for Grade A bolts, ASTM A325 or A449. All fasteners and miscellaneous hardware shall be zinc or cadmium coated in accordance with the requirements of ASTM A153. Aluminum truss systems shall use Type 304 stainless steel connectors and shall isolate incompatible metals to mitigate electrolytic action.

2. Flotation.
a. Expanded polystyrene encased all around with suitable polyethylene.
b. Encasement Material shall meet the following requirements:
1) Rotomolded Linear Low Density Polyethylene or High Density Polyethylene appropriate for a marina environment.
2) Nominal thickness shall be 0.150 inch or greater.
3) Encasement shall be black, minimum 2% carbon black and UV stabilized.
c. Flotation material shall be closed cell polystyrene. Polystyrene shall have a minimum density of approximately 0.9 pounds per cubic foot. Water absorption shall be less than 3 pounds per cubic foot at 7 days when tested by the Hunt absorption test.
d. Flotation material shall completely fill the encasement. No voids or air gaps will be permitted.
e. Flotation units shall be manufactured in a fashion to allow full bearing of the float on the structural frame in both vertical and lateral directions. Lateral support by bolted connections only, through the encasement, will not be accepted.
f. Engineer reserves the right to test the flotation units at the job site.
g. Cleats shall be galvanized heavy-duty cast iron. Mounting bolts shall be recessed to prevent bolt heads from chafing lines.
h. Dock bumpers shall be a non-marring type, a minimum of 2 inches across consisting of extruded vinyl. The material shall be tough and tear-resistant and maintain flexibility to a temperature of 10°F. Color shall be UV stabilized black.

3. Dock Anchorage.
a. Dockage anchoring system shall be driven steel pipe piles as shown on the plans. Pile design shall be reviewed and approved by the Manufacturer under conditions similar to this project.
b. Attachment method for all pile guides shall allow for easy removal of pile guide in order for yearly removal of floating docks for winterization as well as removal during flood stages of the river. Removal of pile guide from the dock must be able to be accomplished without entering the water.

4. Rub Strips and Corner Guards.
a. Non-marring vinyl, PVC or resilient rubber. Color shall be UV stabilized black. Material shall be tough and tear-resistant and maintain flexibility to a temperature of 10 degrees Fahrenheit.
b. Rub strip manufacturer: Edge pro 5002, as manufactured by Dimex Corp., Marietta, OH, phone 800-334-3776, or equal.
c. Continuous rub strips shall be installed around all docks, unless otherwise shown on plans.
d. Outside corners shall be protected by molded corner guards and not by mitering or bending extruded rub strips.
e. Corner guard manufacturers:

1) Dock Boxes Unlimited, Inc. (www.dockboxes.com), Dock Corner Bumper Model UC30600B.
2) K&R Manufacturing Company, Camdenton, MA (www.krmfg.com), Model CB I.
3) Floating Docks Mfg, Co., Indianapolis, IN. Corner Bumper Size 10
4) Other approved equal.

5. Other Materials.
All other materials, not specifically described, but required for a complete and proper installation of floating dockage, shall be designed in accordance with ASCE Report No. 50 (Report on Small Craft Harbors, latest edition) except as modified herein.

155059.03 CONSTRUCTION.

A. General.

1. Dockage units shall be equipped with nominal 2 inch by 6 inch timber side-skirts which provide complete enclosure of the pier framing, with not less than 12 inches of skirt in the vertical dimension. The timber skirt shall be positively fastened to the pier frame on maximum 4 feet centers.

2. Timber decking shall be fastened to the structural frame with bolts or screws. Nails will not be permitted. There shall be at least one fastener at every structural cross support with two at the end of each board. Fasteners shall be of a protected metal compatible with the material in the structural frame. Screw holes shall be predrilled through deck boards and substructure.

3. Deck planks shall be placed perpendicular to the longitudinal axis of the main headwalk and with bark side down.

4. All joints and connections between floating structures must be capable of transmitting all loads and forces imposed upon the structures. Connections shall not protrude above the level of the deck.

5. Structures are to be factory assembled in the largest possible shippable units. Modular structures must be designed for quick and easy assembly and disassembly with a minimum of bolts and connectors.

6. Continuous dock bumpers shall be provided around all docks. Corners shall be protected by molded corner guards and not by mitering or bending the extruded vinyl guards.

B. Workmanship.

1. Piers shall be completely prefabricated by the pier manufacturer and delivered ready for direct unloading into the water. All workmanship shall be first class in all respects. Any units not representing a finished and acceptable appearance will be rejected.

2. All finished steel or aluminum members shall be free from twists, bends, distortions and open joints. All steel or aluminum construction shall be free of sharp edges and burrs. Ends of exposed steel members shall be rounded or beveled. All coping and mitering shall be done with care. Projecting materials and burrs that would prevent bearing of the various members on each other shall be removed.

3. All drilling and cutting of steel done after galvanizing (if approved by the Engineer) shall be painted with a zinc dust content paint. All welds over galvanized material shall be thoroughly cleaned and coated with two coats of cold galvanizing compound.

4. All welding shall conform to the requirements of the AWS. Welds shall be a solid and homogeneous part of the metals joined and shall be free from pits or scale and shall be of full areas and length required to develop the required strength for the intended use.

5. All bolts, nuts and washers shall be set square with connecting structural members and the nuts shall be drawn up tight. Lock washers or other devices or techniques shall be used to prevent nuts from loosening after being properly tightened.

6. Deck screws shall be set so the heads are just below the wood surface without splintering the wood. Lumber shall be counterbored wherever projecting bolt heads or nuts may damage boats or provide a hazard to pier users. A chalk line shall be used to align all screw and fastener heads in straight and parallel rows along the entire pier. Chalk lines shall be removed prior to acceptance.

7. Edges of all exposed wood members shall be slightly beveled to ease sharp corners and preclude wood splinters from forming.

8. Ends of boards shall be aligned with no variation in length from one board to the next.

155059.04 METHOD OF MEASUREMENT.

South Courtesy Docks and Sheet Pile Revetment is a lump sum bid item and will not be measured for payment.

155059.05 BASIS OF PAYMENT.

A. Payment for South Courtesy Docks, Complete will be at the lump sum contract price.

B. This payment shall be full compensation for the complete dockage system (including but not limited to, sheet pile revetment wall, all courtesy dockage systems, guide piles, abutments, and all materials, labor, and tools required to furnish and install a complete dockage system).