

**ITEM 10599.2202 M – SPAN LOCK MACHINERY**

**DESCRIPTION**

Under this item, the Contractor shall furnish, install, adjust, paint, test and place in operation the new Span Lock Machinery. The components include but are not limited to:

1. Lock Bar Operator – R4 (4 of each)
2. Receiving Sockets (4 of each)
3. Front Guides (4 of each)

Details and arrangements of the Span Lock Machinery systems are shown on the Contract Plans or specified herein.

The work shall include installing and aligning the operators, as well as control instrumentation that is to be supplied under the Bridge Electrical Work item. The work under this item shall be in accordance with the requirements specified in “Special Note - General Specification for Bridge Machinery”.

The Contractor shall coordinate the Span Lock Machinery installation with all other bridge machinery items, electrical work and structural work, as well as navigational and vehicular traffic closures and restrictions.

**MATERIALS**

**GENERAL**

The materials used to fabricate the Span Lock Machinery components shall be in accordance with the requirements specified in “Special Note - General Specifications for Bridge Machinery”. Unless shown differently on the Contract Plans, the materials shall be as follows:

Lock Bar	Alloy Steel Forging	ASTM A 668M Class K
Receiving Socket and Guide	Carbon Steel Casting	ASTM A 27M Gr. 485-250
Receiving Socket and Guide Shoes	Bronze Casting	ASTM B22 UNS No. C86300
Shims	Stainless Steel Plate, Sheet	ASTM A 240M Type 304

**LOCK BAR OPERATOR**

Operator gearing shall consist of double reduction generated helical gears of heat-treated alloy steel. Anti-friction bearings shall be used throughout. The unit shall be provided with a removable hand crank for manual operation and a removable protection cover for the shaft end.

Operation of the lock bar shall take approximately fifteen (15) seconds to complete its 560mm (22 inch) stroke at its approximate travel speed of 38mm (1.5 inches) per second. The operator shall be designed to deliver a thrust of 39,142 N (8,800 lbs) to the lock bar at 50 % of the stall torque of the motor.

A two pole, snap-action limit switch, shall govern travel by the lock bar in each direction. These shall provide two normally open and two normally closed contacts for each length of travel. An AC snap-action interlock switch shall be provided. When properly wired to the motor controller circuits, and when the protective cover is removed, the interlock switch shall interrupt the power to the lock bar motor for maintenance or manual operation.

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A high starting torque, induction type frame 145 motor shall be used. The motor shall have a speed of 1800 rpm, and be wired for 3 phase, 60 hertz, 240/480 volts and have a 15 minute duty rating in which temperature shall not exceed 55°C. Class B insulation shall be used. The totally enclosed non-ventilating, squirrel cage, ball bearing motor shall have a steel frame and end bell.

The adjustable motor mounted magnetic disc type brake shall be rated at 20 N-m (15 ft lb) minimum torque for intermittent service and include a manual release.

All parts of the operator shall be designed in accordance with the American Association of State Highway and Transportation Officials, 1988 Standard Specifications for Movable Highway Bridges, 1992 and 1993 Revisions, Paragraph 2.5.22.

### **LUBRICATION**

Upon approval the Contractor shall provide the following quantities of additional lubricants for the Span Lock Machinery, which shall be stored at the site:

- |    |                  |                     |
|----|------------------|---------------------|
| 1. | Gear Reducer Oil | 208 liters (55 gal) |
| 2. | Bearing Grease   | 23 kg (50 lb)       |

The lubricant for each type of machinery component shall be kept separately in clearly marked containers. All measures shall be taken to prevent lubricant contamination.

### **SPARE PARTS**

Upon approval, the Contractor shall provide the following spare parts for the Span Lock Machinery, which shall be stored at the site:

1. Two (2) Receiving Socket Shoes in accordance with the Contract Plans, Drawing No. M-7
2. Two (2) Front Guide Shoes in accordance with the Contract Plans, Drawing No. M-7
3. Eight (8) M20 Socket/Guide Shoe Studs in accordance with the Contract Plans, Drawing No. M-7

### **CONSTRUCTION DETAILS**

Span Lock Machinery shall be installed on the south bascule leaves. Lock bar receiving sockets shall be installed in the toe floorbeams of the north bascule leaves.

### **SHOP INSPECTION**

All Span Lock Machinery components shall be assembled to assure proper fits and verify tolerances specified on the Plans. Assemblies requiring disassembly shall be match-marked and documented so that the machinery can be reassembled at the bridge site.

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### **FIELD TESTING**

When the mechanical components and electrical equipment are ready for final testing, the Contractor shall submit to the Engineer a testing procedure and schedule in accordance with the requirements specified in “Special Note - General Specification for Bridge Machinery, General Construction Details – Field Testing.”

Each test run shall verify that the Span Lock Machinery is in proper working order and fully meets the requirements of the Plans and Specifications. If any tests show that the Span Lock Machinery components are defective or inadequate, or function improperly, the Contractor shall make all corrections, adjustments or replacements required before final acceptance at no additional cost.

### **METHOD OF MEASUREMENT**

Payment of Item “Span Lock Machinery” shall be made on a lump sum basis.

### **BASIS OF PAYMENT**

The lump sum price bid for Item “Span Lock Machinery” shall cover the cost of furnishing all material, labor and equipment necessary for the manufacturing, erecting, testing, adjusting, lubricating, painting and all incidental work for a complete installation.

The Contractor shall submit to the Engineer a detailed breakdown of costs under this item. The Engineer shall evaluate this breakdown, and shall have the authority to revise the breakdown as, in his judgement, may be required to make the various components of work conform to their true values.

The Contractor shall agree that the detailed breakdown shall not become effective until it has been approved by the Engineer.

The approved detailed breakdown shall be used as a basis of payment for the progress payments. The progress payments for Item “Span Lock Machinery” shall be made in accordance with NYS Standard Specifications, NYSDOT standard payment practices and in the following manner:

1. Upon completion and acceptance by the NYSDOT of Shop Fabrication, Shop Inspection, Shop Testing, Delivery and Storage of materials, the Contractor will be paid 30% of the bid price for the item.
2. Upon completion and acceptance by the NYSDOT of the West Span Lock Machinery Installation, Alignment, Bolting, and Protection of materials during construction, the Contractor will be paid 10% of the bid price for the item.
3. Upon completion and final acceptance by the NYSDOT of the West Span Lock Machinery Inspection and Field Testing at the end of construction, the Contractor shall be paid 20% of the bid price for the item.
4. Upon completion and acceptance by the NYSDOT of the East Span Lock Machinery Installation, Alignment, Bolting, and Protection of materials during construction, the Contractor will be paid 10% of the bid price for the item.

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5. Upon completion and final acceptance by the NYSDOT of the East Span Lock Machinery Inspection and Field Testing at the end of construction, the Contractor shall be paid 20% of the bid price for the item.
6. Upon completion of training and receipt and acceptance of approved Operating and Maintenance Manuals, the Contractor will be paid the remaining 10% of the bid price for the item.