

**MECHANICAL INSTALLATION**

**GENERAL NOTES**

All work shall be performed in accordance with The American Association of State Highway and Transportation Officials LRFD Movable Highway Bridge Design Specifications (AASHTO), 2nd Edition (2007). All items specified in the plans shall be considered to be followed by the phrase "or approved equal" unless otherwise specified on the plans.

The Contractor shall provide all material, equipment, tools, and labor to purchase/fabricate, transport, rehabilitate, install/erect, align/adjust, paint, lubricate, and test all mechanical machinery to provide a complete and operable bridge and drive system as described on the following sheets.

The information and directions given in these mechanical notes cover general situations. Every item in these mechanical notes can be considered to be followed by the phrase "unless otherwise specified on the plans." All dimensions and details shall be verified at the site before proceeding with any work to avoid causing conflicts and any subsequent delay in work.

The Engineer shall be notified immediately for clarification whenever any portion of the work is not clearly or accurately defined.

**SHOP WORK:**

Remove all burrs and break all sharp edges on fabricated parts.

**FINISHED MATING SURFACES:**

Finished mating surfaces shall be as noted in "Fits and Surface Finishes" and shall be protected from corrosion by a coating of a wax based corrosion preventative treatment.

**FITS AND SURFACE FINISHES:**

When not included on the plans, shall be as shown below, or vendor's recommended specifications, whichever is more rigorous.

Surface finishes are given as the roughness height in micro-inches.

PART	FIT	FINISH
Machinery base on steel	-	125
Shaft journals	RC6	8
Journal bushing	RC6	16
Split bushing in base	LC1	125
Turned bolts in finished holes	LC6	63
Sliding bearings	RC6	32
Machinery parts in fixed contact	-	-

The above fits for cylindrical parts shall also apply to the major dimensions of non-cylindrical parts. Unspecified machinery surfaces shall be 125 micro-inch finish.

**TEMPLATES:**

Templates shall be fabricated for all machinery bases secured to existing steel. The template shall be fabricated from the existing support base and used to assure proper positioning of new anchor bolts.

**TOLERANCES:**

All tolerances shall be as shown on the plans. Where not shown, tolerances shall be as follows: fractions: +/- 1/32"; decimals +/- 0.010"; angles +/- 0.5 degree.

**MECHANICAL PARTS/EQUIPMENT:**

All material for new fabricated parts and all manufactured equipment provided by the Contractor shall be new and shall conform to ASTM and other standards as shown on the plans or an approved equal.

The weight of each item (fabricated or manufactured) shall be shown on the shop drawings.

The Contractor shall verify the final dimensions of all commercial products from certified drawings provided by the manufacturer prior to producing shop drawings.

If the Contractor proposes to use material or equipment other than detailed on the drawings, any redesign of the structure or any other part of the mechanical layout, all such redesign, and all new drawings required, shall, with the approval of the Engineer, be prepared by the Contractor at no additional cost.

**FASTENERS:**

Standard mechanical machinery bolts:

Bolts for fastening mechanical machinery together or to bases shall be heavy hex high strength structural bolts. Bolts shall come complete with one heavy hex nut (ASTM A563 Grade C), one hardened steel flat washer (ASTM F436), and one extra duty lock washer.

**MATERIAL:**

ASTM A325 or ASTM A449, Type 3, finished hex bolts.

**TURNED BOLTS AND STUDS:**

Shank shall be straight within 0.001" per inch length.

Bolts shall be manufactured to ANSI B18.2.1, hex cap screws (finished hex bolts).

Surface discontinuities shall be in accordance with ASTM F788.

Break sharp edges 0.010" - 0.015"

MATERIAL: ASTM A449, Type 3.

Each bolt/stud shall be marked as A449 on top of bolt head or top of the stud and may be raised or depressed at the option of the manufacturer.

All turned bolts/studs shall have two hardened steel washers which conform to ASTM F436, Type 1.

Threads of turned bolts/studs shall not be in the shear plane of the parts to be fastened.

**SHIMS:**

**FIELD ASSEMBLED MACHINERY:**

The Contractor shall use shims supplied by IDOT for each component assembly for all machinery which requires leveling and alignment in the field. Shims shall be placed to provide full contact between machinery and mount/support.

Shim packs shall be neatly trimmed to the dimensions of the assembled parts and drilled for all bolts that pass through the shims.

In general, total shim thickness available shall be no less than equal to twice the nominal thickness shown on the drawings, and sufficient varying thicknesses shall be furnished to secure 0.010-inch variations of the shim allowance including one shim equal to the full allowance. Shims shall be shown in detail on the shop drawings.

**FIELD WORK:**

**MACHINERY INSTALLATION:**

All machinery components, including all fabricated and commercial items, which have been delivered to the field, but have not been installed, shall be protected against rust and corrosion by any means agreed upon between the Contractor and the Engineer. Machinery pieces shall be frequently inspected and if rust or corrosion is found the Contractor shall take immediate steps to clean and protect equipment.

All machinery shall be installed by those competent and skilled in the type of work involved. Installers shall be provided with all the necessary measuring and leveling instruments as may be required.

All machinery shall be laid out to a tolerance of 1/32".

All parts aligned with shim packs shall be precisely adjusted and aligned to the limits of the capabilities of the shim packs.

At the time of the field installation, the rust inhibiting grease coating on mechanical parts that have finished mating surfaces shall be completely removed by an approved solvent such as gasoline or benzene. Once the installation of the entire mechanism is completed, painted surfaces of the mechanism shall be touched-up and painted in accordance with IDOT Standard Specification Section 506. Unpainted, finished mating surfaces that slide during operation shall then be cleaned of all dirt, rust, and incidental paint, and coated with the proper lubricating grease specified by the Fabricator. Unpainted, finished mating surfaces that do not slide during operation will be protected from corrosion by the top coat of the paint system.

**BOLTS:**

Torques for the various grades of bolts shall be proportioned to their strength and shall be indicated on the erection drawings.

**MACHINERY BOLTS:**

Field drilled holes shall be used only where indicated on the plans. Field drilled holes not indicated on the plans must be approved by the Engineer. No flame cut holes will be allowed.

Field drilled bolt holes in structural steel for mounting machinery shall, in general, be drilled from the solid after final alignment of the machinery. Sufficient erection holes, sub drilled 1/4" undersize for temporary bolts/studs, may be used for erection and alignment of the machinery. When the machinery is aligned in its final position, full size holes for permanent turned bolts/studs shall be sub-drilled and reamed, full size bolts/studs installed, and temporary bolts/studs removed.

**MACHINERY INSTALLATION, ADJUSTMENTS, AND TESTING:**

Prior to pick up of any machinery from the Fabricator, the Contractor shall submit a detailed installation and alignment procedure to the Engineer for approval.

The Contractor shall provide the necessary mechanical technicians as well as all the tools and labor required to perform installation procedures.

**INSPECTION:**

After the Contractor has completed the machinery installation, an inspection shall be arranged with representatives of the Engineer. Written notice shall be provided ten (10) days prior to the date of the inspection. The Contractor shall provide mechanical technicians as well as all the tools and labor necessary to make any necessary adjustments.

**COUNTERWEIGHT TRUNNION BEARING ALIGNMENT:**

**EXISTING ALIGNMENT:**

Contractor shall accurately (within 0.002") survey with x-y-z position of each counterweight trunnion journal center (8 total). This must be taken PRIOR to jacking.

**NO-LOAD ALIGNMENT:**

Contractor shall obtain the same survey data as "Existing Alignment", except after jacking of the counterweight and support of the lift span. New counterweight trunnion bearings shall be installed utilizing the alignment data gathered. The Contractor shall submit all findings and detailed alignment procedures so the newly installed bearings will run freely when the dead load is re-applied. The detailed alignment procedure must take into account the existing condition of the buckled outboard northwest tower column and provide a procedure for alignment of the new bearing after the tower column is repaired.



USER NAME *	DESIGNED	AMB	REVISED
	CHECKED	GF	REVISED
PLOT SCALE *	DRAWN	DTP	REVISED
PLOT DATE *	CHECKED	GF	REVISED

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

MECHANICAL INSTALLATION GENERAL NOTES  
STRUCTURE NO. 086-0001

SHEET NO. 11 OF 15 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
757	(20) 1	PIKE/SCOTT	17	13
			CONTRACT NO. 72F75	
ILLINOIS FED. AID PROJECT				