BASES

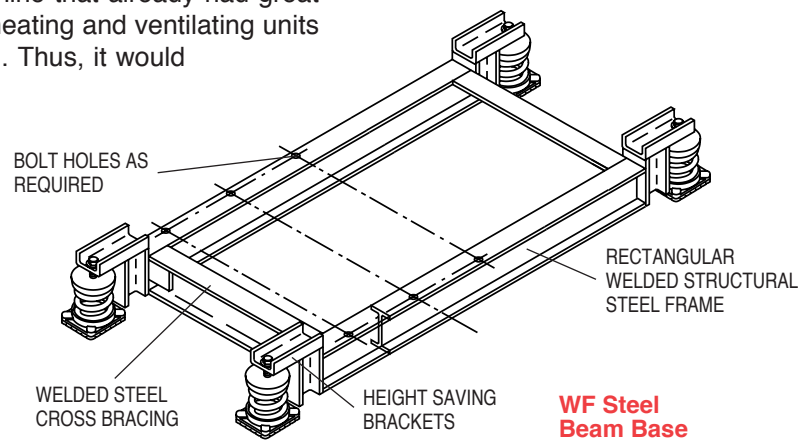
Our very early specifications merely called for “sufficient base rigidity” to handle belt tension and keep the drive in alignment. There had been no criteria for base stiffness or design and every vendor had his own version of what might be minimally acceptable as there never was a unified code. Pump bases have torque and bending problems that can ruin bearings, couplings and pump seals. Before we extended pump bases to support elbows, many installations were short circuited with suction and discharge dog legs to the floor. We discussed this problem with a number of structural people as well as acoustical specialists and found that using beams with a depth equal to 1/10th of the span is a good broad working rule that can be readily checked in the submittal stage. We have manufactured thousands of these bases and find the design highly satisfactory as to appearance, rigidity and keeping base resonance high. The 14”(350mm) limit on beam depth came about because experience has shown that the 1/10th requirement is too severe on very large bases. For example, in the 1965 specification, without this limitation, we encountered situations where the distance between chiller legs was twenty feet(6000mm). Thus, the specification was calling for 24 inch(600mm) beams under a machine that already had great structural rigidity. In other situations, heating and ventilating units might be as long as 15 feet(4500mm). Thus, it would seem that 18”(450mm) beams should be used, but these were completely excessive as the whole unit might only weigh eight thousand pounds(3636 kilo). The 14”(350mm) limitation makes the specification more practical.

BASES (SADDLES and BRACKETS)

A complete steel base is not required for equipment such as Absorption Machines, Reciprocating Compressors, Shell Mounted Centrifugal Compressors, H&V units, etc. Steel members improve stability, lower operating heights and in the case of H&V units prevent distortion of sheet metal legs or base angles. The use of saddles and brackets represents a cost saving compared to the complete bases in Specification J. We have called for Specification K in the Selection Guide for all locations without J or L bases when B or D mountings have 21/2”(65mm) deflection or more to improve appearance and reduce elevation. Never use independent cross members in Seismic Zones, because of rotational failure. Always use complete bases.

SPECIFICATION J

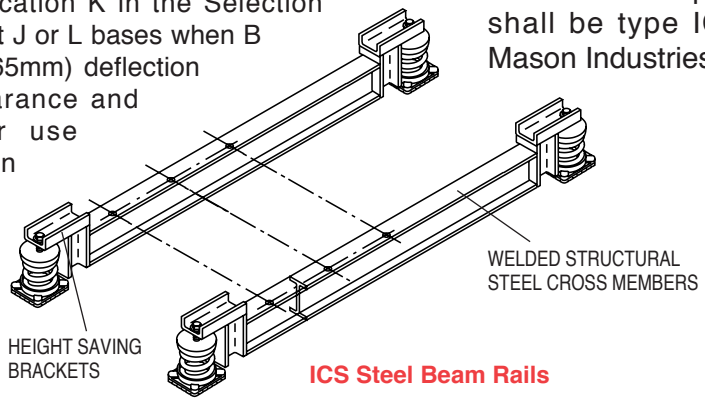
Vibration isolation manufacturer shall furnish integral structural steel bases. Rectangular bases are preferred for all equipment. Centrifugal refrigeration machines and pump bases may be T or L shaped. Pump bases for split case pumps shall be large enough to support suction and discharge elbows. All perimeter members shall be steel beams with a minimum depth equal to 1/10 of the longest dimension of the base. Base depth need not exceed 14”(350mm) provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Height saving brackets shall be employed in all mounting locations to provide a base clearance of 1”(25mm). Bases shall be type WF as manufactured by Mason Industries, Inc.



WF Steel Beam Base

SPECIFICATION K

Vibration isolation manufacturer shall provide steel members welded to height saving brackets to cradle equipment having legs or bases that do not require a complete supplementary base. Members shall have sufficient rigidity to prevent distortion of equipment. Inverted saddles shall be type ICS, as manufactured by Mason Industries, Inc.



ICS Steel Beam Rails

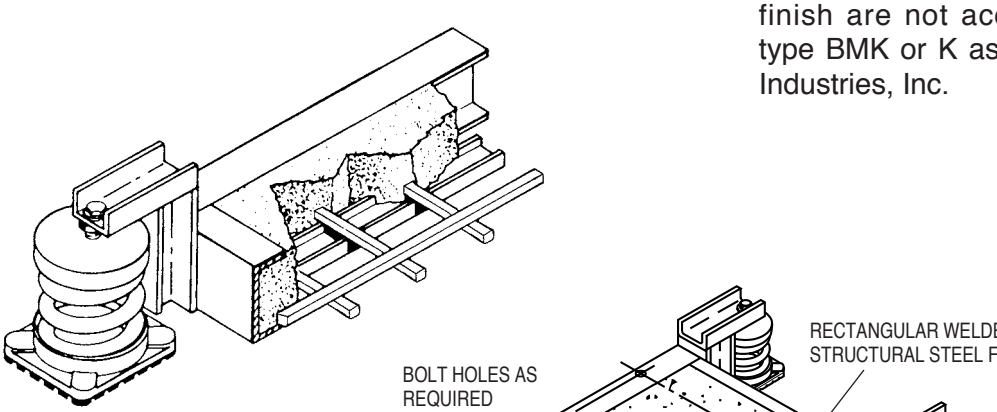
BASES

Concrete bases are recommended under pumps as they are more rigid and a better choice in maintaining alignment. They need not be selected for the additional mass that is needed under highly unbalanced machines such as slow speed horizontal or vertical compressors. If the building can handle the added weight, floating concrete installations always look better and the shielding reduces air borne noise transmission. The K designs are a neat way of building these bases as the contractor receives a complete package consisting of a steel form with reinforcing bars and anchor bolt templates in place ready for pouring. Concrete foundations need not have quite the same depths as steel bases since stiffness is provided by the entire width. Therefore, we have reduced the depth requirement to 1/12th the longest dimension. We have limited the mandatory depth to 12 inches(300mm), as compared to our older specification which had no depth limit. If the vibration manufacturer feels that the 12 inch depth is not sufficient, he may increase it at his option. An open ended requirement of 1/12th of the longest dimension led to thicknesses that were completely impractical on long bases where there was no particular alignment, inertial or loading problem.

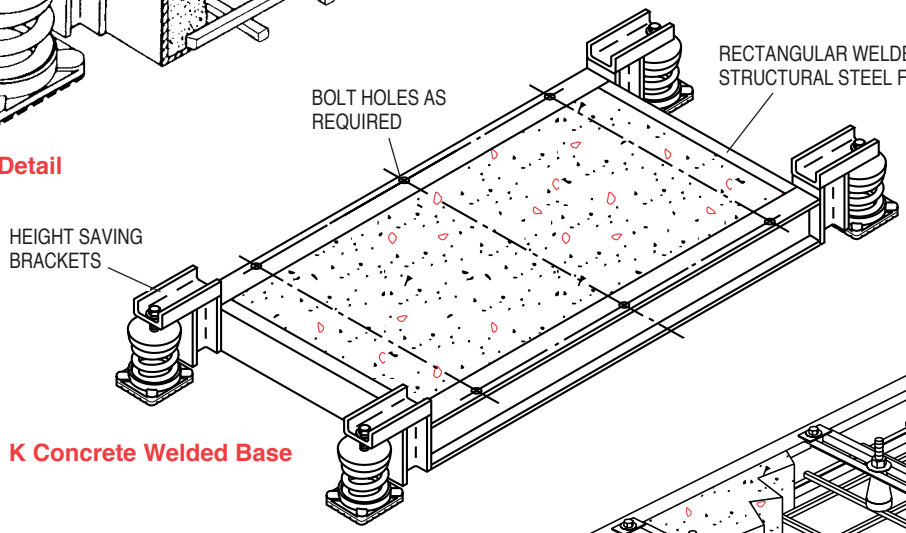
The steel form may be bolted or welded, structural or formed metal if it does not deform during the pour. When the concrete hardens, the structural strength and rigidity is provided by the reinforcement and has little or nothing to do with the perimeter steel.

SPECIFICATION L

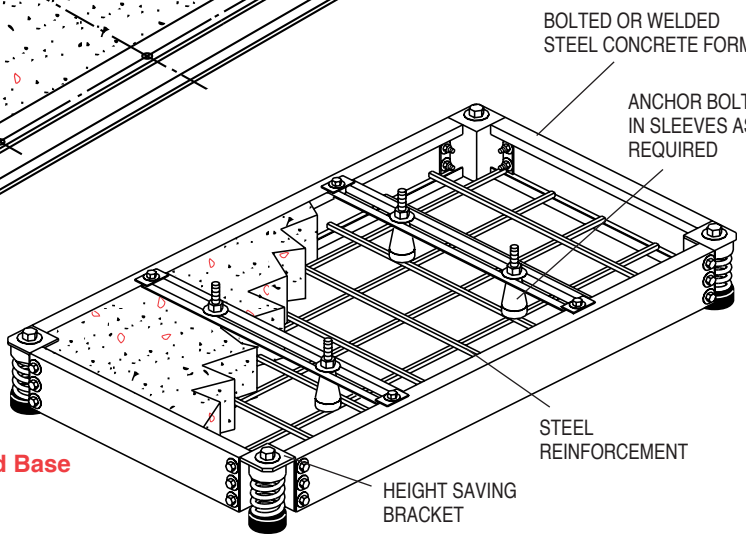
Vibration isolation manufacturer shall furnish rectangular steel concrete pouring forms for floating concrete bases. Bases for split case pumps shall be large enough to provide support for suction and discharge elbows. Bases shall be a minimum of 1/12 of the longest dimension of the base but not less than 6”(150mm). The base depth need not exceed 12”(300mm) unless specifically recommended by the base manufacturer for mass or rigidity. Forms shall include minimum concrete reinforcing consisting of 1/2”(12mm) bars welded in place on 6”(150mm) centers running both ways in a layer 11/2”(40mm) above the bottom. Forms shall be furnished with steel templates to hold the anchor bolt sleeves and anchor bolts while concrete is being poured. Height saving brackets shall be employed in all mounting locations to maintain a 1”(25mm) clearance below the base. Wooden formed bases leaving a concrete rather then a steel finish are not acceptable. Base shall be type BMK or K as manufactured by Mason Industries, Inc.



Base Detail



K Concrete Welded Base



BMK Concrete Bolted Base