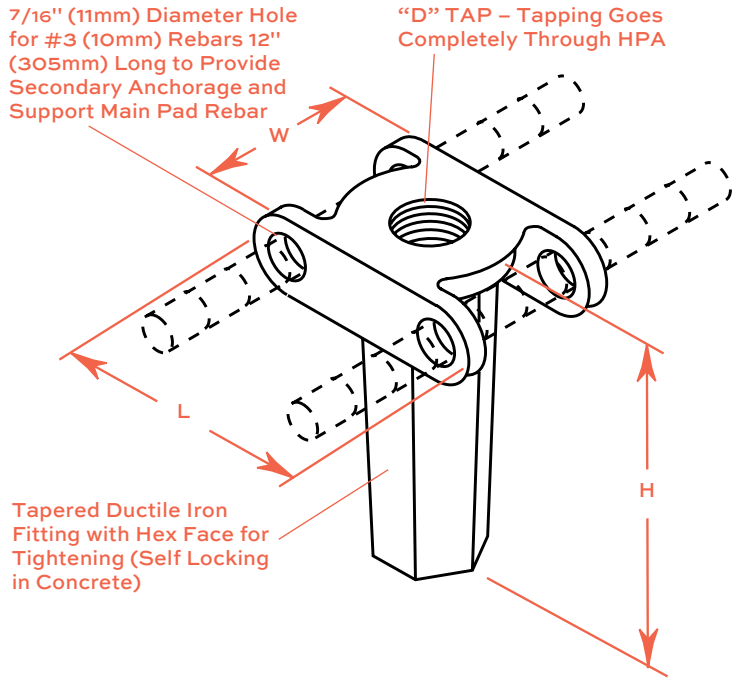
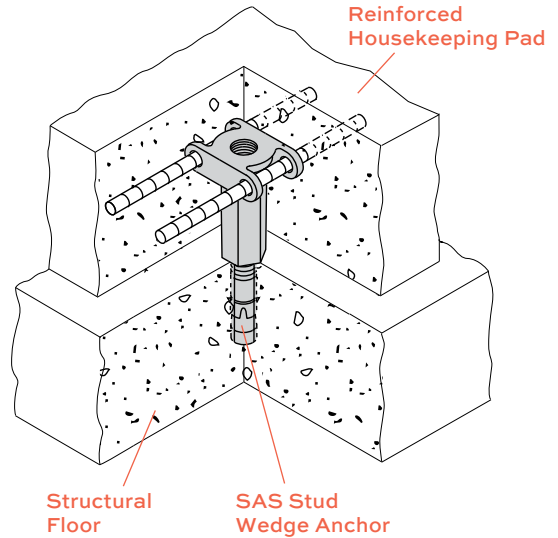


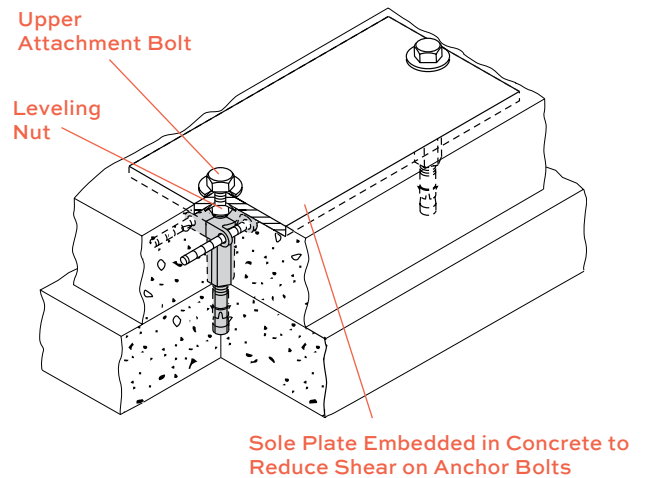
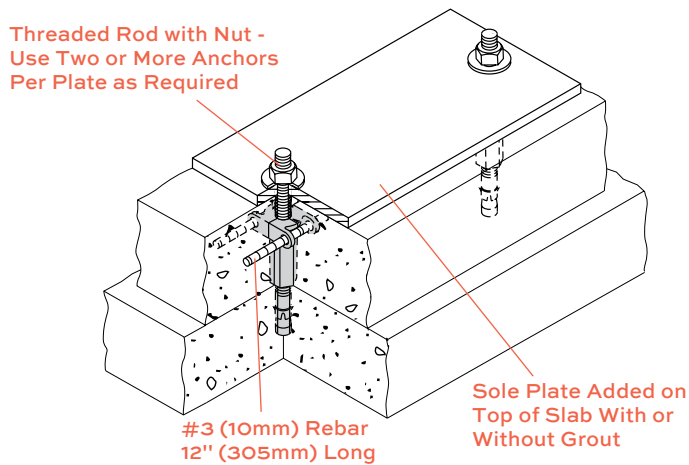
SEISMIC HOUSEKEEPING PAD ANCHORS



PRIMARY FUNCTION HOUSEKEEPING PAD ANCHOR



HOUSEKEEPING PAD AND (SECONDARY FUNCTION) SOLE PLATE ANCHOR



TYPE HPA DIMENSIONS

Type & Size	SAS Stud Anchor Capacity in 3000 lb (20 Mpa) Concrete				L		W		H		D Tap
	Shear Load (lb)	(kg)	Tension Load (lb)	(kg)	(in)	(mm)	(in)	(mm)	(in)	(mm)	
HPA-1/2	1055	480	1073	487	21/8	54	11/4	32	3	75	1/2UNC
HPA-5/8	2845	1290	1451	657	23/8	60	11/2	38	3	75	5/8UNC
HPA-3/4	3870	1755	1665	756	23/4	70	13/4	44	3	75	3/4UNC

A major cause of equipment restraint failure is the breaking up of housekeeping pads. Virtually all housekeeping pads are poured independently after completion of the structure. In many cases there is no mechanical attachment to the structural floor and the pad itself may not be reinforced.

The floor diaphragm vibrates vertically and under resonant conditions generates more than 1g. This tosses the pad and the machine attached

to it. As the pad crashes back, it breaks up and the equipment loses all anchorage.

Since housekeeping pad sizes and locations are not established until after a machine room floor is poured there is no way to cast in rebar pad stirrups. There is an undefined engineering area as to who should design and what type of cast in restraints should be used. In designing the HPA anchor system we have assumed the responsibility as part of our system certification.

The HPA anchor is manufactured in three sizes and has three anchoring capacities. The inverted hexagonal pyramid is self-locking in the housekeeping pad and has provision for passing 2 #3 rebars through the holes on top for positioning the pad reinforcement system. The number of anchors that are needed depend on the HPA size and the vertical rating of the SAS stud anchor as listed.

If there are no overturning moments and we assume an upward force of 2g, the combined anchorage would equal the weight of the equipment plus the housekeeping pad. If there are vertical snubbers attached to the pad, HPA anchors should be clustered near that snubber.

TYPICAL PUMP FOUNDATION

Housekeeping Pad 6 ft x 6 ft x 4" (1.8m) x (1.8m) x (102mm)	= 1800 lb (816 kg)
Pump & Motor	= 4000 lb (1814 kg)
Concrete Inertia Base	= 2000 lb (907 kg)
	<u>7800 lb (3537 kg)</u>

Assume 4 - 1500 lb (680 kg) equipment snubbers

Use 8 - 1/2" (13mm) HPA

Use 4 - Additional 1/2" (13mm) HPA down center of pad.

INSTALLATION PROCEDURE

1. Lay out perimeter of housekeeping pad.
2. Drill 12- 1/2" (13mm) holes in the structural floor 3" (76mm) deep in the HPA locations shown on the drawing. If you hit rebar, shift the location.
3. Insert the 12- SAS 1/2" (13mm) anchors and place a 1/2" (13mm) standard washer over the stud.
4. Screw the small end of the HPA anchor on to the stud and tighten it hard with an adjustable or pipe wrench.
5. Insert the 12" (305mm) long #3 (10mm) rebars through the tops.
6. Tie the reinforcing bars in place as shown on the drawing.
7. Complete the forms and pour the housekeeping pad, preferably with isolator, snubber or equipment anchor bolts in place to avoid the need to drill in anchors.

