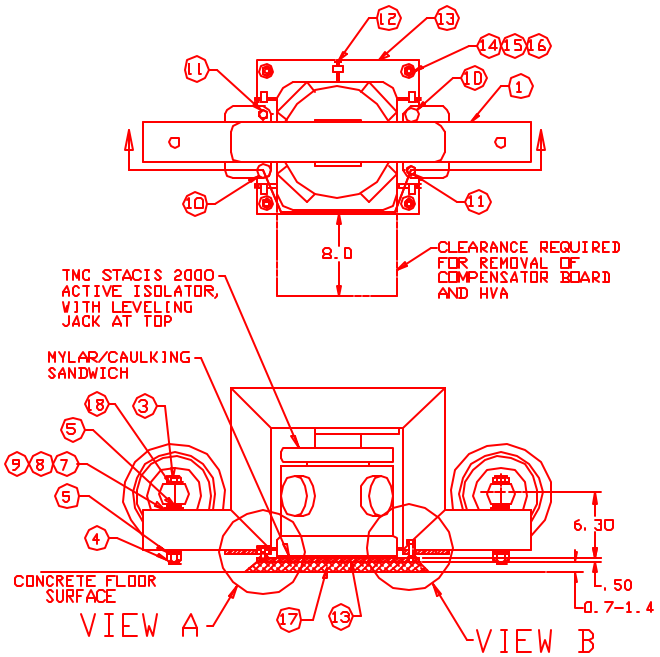
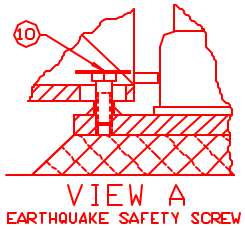
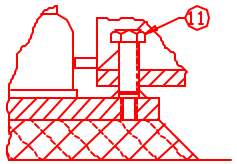
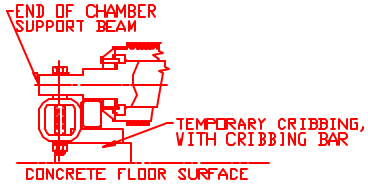






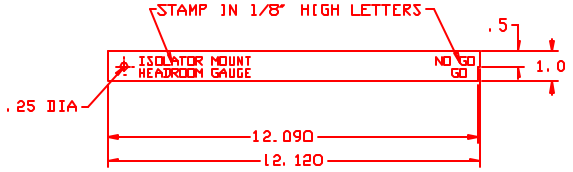


(NO SKETCH NEEDED)

3 X 2 X 3/16 STRUCTURAL TUBING X 84" LONG

-1 CRIBBING BAR

ONE REQUIRED; MAT'L: A500 GR B



-2 HEADROOM GAUGE

1 REQUIRED; MAT'L: 6061-T6 ALUMINUM, 1/8" THK

INSTALLATION PROCEDURE:

1. FIRST CHAMBER: SETUP LEVEL & MEASURE RELATIVE ELEVATIONS OF SUPPORT BEAM CENTERLINES. IF SUPPORT BEAM CENTERLINES ARE NOT WITHIN +/- .015" OF EACH OTHER, CONFIRM THAT ADJUSTMENTS WILL NOT DAMAGE BELLOWS, THEN ADJUST TO SUIT (NOTE: THIS ADJUSTMENT SHOULD BE MADE SUCH AS TO MINIMIZE BELLOWS OFFSETS). MINIMIZATION MEASUREMENTS MAY REQUIRE ENTERING CHAMBER, OR SPECIAL FIXTURING).
2. INSTALL CRIBBING UNDER SUPPORT BEAM ENDS ON SIDE WHERE DUAL ISOLATOR BRACKET WILL BE INSTALLED, REMOVE OBSOLETE SUPPORTS. CAUTION!! DON'T DROP BEAMS, OR MOVE THEM MORE THAN 0.060"; THAT COULD DESTOY BELLOWS. RETURN BEAM ELEVATIONS TO THOSE AT THE END OF STEP 1.
3. MARK OFF AREAS TO BE GROUTED & REMOVE TILE & MASTIC, THIS APPLIES TO BOTH SIDES OF CHAMBER.
4. LAYOUT GROUT PLATE ANCHOR BOLTS; DRILL & INSTALL 1/2" ANCHORS (ITEM 14), WITH AN INBEDMENT OF 2 1/4". NOTE THAT THE EAST INPUT CHAMBER REQUIRES THE RIGHT CLIP PLATE AT THE SW CORNER, AND THE SOUTH INPUT CHAMBER REQUIRES THE LEFT CLIP PLATE AT THE NE CHAMBER; THESE SPECIAL GROUT PLATES HAVE A UNIQUE BOLT PATTERN (SEE D000206).
5. INSTALL GROUT PLATES WITH TAPE SEALING TAPPED HOLES. USING WASHERS AND NUTS ABOVE AND BELOW PLATES. ADJUST ANCHOR NUTS TO LEVEL EACH ONE INDIVIDUALLY TO +/- 0.010"/FT.
6. MEASURE RELATIVE ELEVATION OF EACH GROUT PLATE & SET AT 6.30" BELOW THE AVERAGE BEAM CENTERLINE ELEVATION FOR THAT CHAMBER.
7. REPEAT LEVELING & ADJUSTMENT OF ELEVATION PER STEPS 4 & 5 ABOVE TO ACHIEVE PLATES LEVEL AND ELEVATIONS WITHIN +/- 0.03" OF TARGET VALUE SIMULTANEOUSLY. GAP FOR GROUT IS EXPECTED TO BE BETWEEN 0.7" AND 1.4".
8. BUILD DAMS & POUR GROUT; ALLOW TO CURE, FOLLOWING MANUFACTURER'S RECOMMENDATIONS.
9. BOLT DUAL ISOLATOR BRACKET TO ENDS OF SUPPORT BEAMS, IN VERTICAL PLANE (SEE SKETCH ABOVE FOR COMPONENTS AND SEQUENCE). CHECK HEADROOM WITH GAUGE FOR PROPER FIT ("GO" FITS, "NO GO" DOESN'T FIT) AND ADJUST FIT WITH BOLT SHIMS AS REQUIRED.
10. INSTALL 2 JACK SCREWS (ITEM 11) IN BRACKET LOWER PADS & TURN TO RAISE THE BEAMS A MINIMUM AMOUNT FOR CRIBBING REMOVAL. REMOVE CRIBBING, THEN LOWER BRACKET WITH JACK SCREWS FOR PROPER FIT WITH HEADROOM GAUGE.
11. LOWER LEVELNG JACKS AT STASIS 2000 TOPS TO -.020" (LOVEST POSITION, WITH TOTAL JACK HEIGHT OF 1.41") ON THE ISOLATOR MOUNTS.
12. SLIDE ISOLATOR MOUNTS & MYLAR SANDWICH BASES INTO POSITION (0.10" VERTICAL CLEARANCE IS EXPECTED), ALIGNED WITH UPPER PAD.
13. RAISE LEVELING JACKS TO CONTACT THE BOTTONS OF THE BRACKET UPPER PADS, WITHOUT LIFTING BRACKET.
14. GRADUALLY AND SERUENCIALLY RAISE JACK SCREWS AND RAISE LEVELING JACKS WHILE CHECKING WITH HEADROOM GAUGE TO TRANSFER THE LOAD FROM THE JACK SCREWS TO THE ISOLATION MOUNTS, WHILE MINIMIZING THE LIFTING/LOWERING OF THE BRACKET. THE MYLAR SANDWICH AND THE ISOLATOR ARE EXPECTED TO COMPRESS 0.20"-0.25". BACK OFF THE JACK SCREWS UNTIL THEY CLEAR THE GROUT PLATE BY 0.12".
15. SETUP CRIBBING TO SUPPORT TWO SUPPORT BEAMS ON SINGLE MOUNT SIDE OF CHAMBER; REMOVE OBSOLETE SUPPORTS.
16. REPEAT STEPS 9-15 FOR THE SINGLE ISOLATOR BRACKET.
17. RE-CHECK ELEVATIONS OF SUPPORT BEAMS-THESE SHOULD BE WITHIN +/- 0.015" OF EACH OTHER. IF NOT, ADJUST AS NECESSARY.
18. INSTALL EARTHQUAKE SAFETY SCREWS (ITEM 10) WITH 1/8" VERT. GAP; MARK, REMOVE & GRIND HEAD FLAT, 3/8" OFF CENTER; REINSTALL.
19. REPEAT ITEMS 1-18 FOR THE REMAINDER OF THE CHAMBERS PLANNED.
20. FOR OPERATION, INSTALL THE PUSH SCREWS (ITEM 12) AND CONFIRM THAT THEY CLEAR THE ISOLATORS BY 0.1" OR MORE.

MAINTENANCE:

1. ONE MONTH AFTER INSTALLATION, AND EVERY SIX MONTHS THEREAFTER, CHECK FOR PROPER HEADROOM GAUGE FIT; IF NEEDED, ADJUST THE LEVELING JACKS TO ACHIEVE PROPER FIT.

McMASTER-CARR CATALOG NUMBERS ARE SHOWN AS #XXXXXXXXX.
QUANTITIES SHOWN ARE FOR 4 CHAMBERS, WITH 2 STASIS UNITS EACH

ITEM	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	QTY
13	D000211-2	HEADROOM GAUGE	6061 AL	22
1	D000811-1	CRIBBING BAR	HR STEEL	81
1L	D000208-2	GROUT PLATE, LEFT CLIP	304 SS	80
1	D000208-2	GROUT PLATE, RIGHT CLIP	304 SS	16
16	#90018A027	7/8" FLAT WASHER, SAE STD.	ZN/STEEL	38
12	#7853T24	BOM FAIL, STD. ANCHORING CEMENT	--	17
9G	#90473A029	1/8"-13 HEX NUT, GR 8	ZN/STEEL	16
9G	#90108A039	1/2" FLAT WASHER, USS STANDARD	ZN/STEEL	18
4B	#92620A150	1/8"-13 X 4.75" CONCRETE ANCHOR	ZN/STEEL	34
10	D000208-1	GROUT PLATE, SYMMETRICAL	304 SS	32
6G	#92620A550	1/4"-20 X 2" HEX HD CAP SCREW	ZN/STEEL	16
1G	#92620A714	1/2"-13 X 1.25" HEX HD CAP SCREW	ZN/STEEL	32
3G	#98670A886	3/8"-16 X 1.25" PH NORWAY BOLT	ZN/STEEL	10
1G	#90884A396	1" ID X .015" STEEL SHIM WSHR	A(S) 1010	7
1G	#90884A436	1" ID X .031" STEEL SHIM WSHR	A(S) 1010	8
1G	#90884A478	1" ID X .062" STEEL SHIM WSHR	A(S) 1010	7
3B	#9113TA100	7/8" SPHERICAL WASHER SET	CS HT STEEL	3
1G	#90473A242	7/8"-9 HEX NUT, GR 2	ZN/STEEL	4
1G	#91126A899	7/8"-9 x 8" HEX BOLT, GR 2	ZN/STEEL	3
4	D000187-2	DUAL ISOLATOR BRACKET	A500 GR B	2
4	D000187-1	SINGLE ISOLATOR BRACKET	A500 GR B	1

PARTS LIST

DRAWN	L. Jones	7/6/01
CHECKED		
ENG APPR.		
MFG APPR.		

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES; TOLERANCES: FRACTIONAL ±1/64, ANGULAR ±1°, TWO PLACE DECIMAL ±.01, THREE PLACE DECIMAL ±.005; INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994; DO NOT SCALE DRAWING

LIGO PROJECT

INSTALLATION FIXTURES & PROCEDURE 40M ACTIVE ISOLATORS

SIZE: E | DRAWING NUMBER: D000211-B | SHEET 1 OF 1