

CHAPTER P3
FLSS/FLS/FHS ISOLATORS AND RESTRAINTS
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FLSS / FLS / FHS ISOLATORS/RESTRAINTS

RELEASE DATE: 10/20/03



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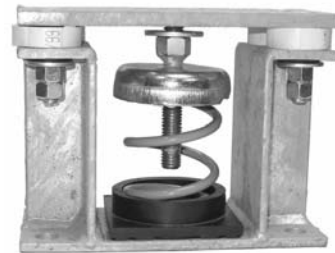
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Kinetics Model FLSS

Seismic control restrained spring vibration isolators consist of free-standing, large diameter, laterally stable steel springs assembled into welded steel housing assemblies that are designed to limit vertical movement of the isolated equipment if equipment loads are reduced or if the equipment is subjected to large external forces such as seismic events. The housings also provide a constant free and operating height to facilitate installation. Spring elements are complete with internal noise isolation pads and have an adjusting and leveling bolt as a part of the top load plate assembly. Large holes are provided in all isolators for bolting to the structure and to the supported equipment. To assure stability, the springs have a lateral spring stiffness greater than 1.2 times the rated vertical stiffness and are designed to provide a minimum of 50% overload capacity. FLSS springs are available with deflections to 4 inches (100 mm) and with load capacities to 11,800 lbs. (5364 kg) as standard products. Custom isolators with higher deflection and greater load capabilities are also available. Kinetics Model FLSS spring isolators are recommended for the isolation of vibration produced by equipment carrying a large fluid load which may be drained, such as boilers and chillers, and for the isolation of cooling towers, air-cooled condensers, etc., where motion due to wind loads must be minimized.



Specification

Vibration isolators shall be seismically rated restrained spring isolators for equipment that is subject to load variations and large external forces. Isolators shall consist of large diameter, laterally stable steel springs assembled into welded steel housing assemblies designed to limit movement of the supported equipment in all directions.

Housing assembly shall be of fabricated steel members and shall consist of a top load plate complete with adjusting and leveling bolts, adjustable vertical restraints, isolation washers, and a bottom plate with internal non-skid noise isolation pads and holes for anchoring of the housing to the supporting structure. Housing shall be electro-zinc plated or hot-dip galvanized for corrosion resistance. Housing shall be designed to provide a constant free and operating height within 1/8 inch (3 mm).

The isolator housing shall provide a minimum of 1g restraint in all directions if attached with through bolts. Spring elements shall be selected to provide static deflections as shown on the vibration isolation schedule or as indicated or required in the project documents. Springs shall be color coded or otherwise identified.

Spring elements shall have a lateral stiffness greater than 1.0 times the rated vertical stiffness and shall be designed to provide a minimum of 50% overload capacity. Spring elements shall be epoxy powder coated, and shall have a 1000-hour rating when tested in accordance with ASTM B-117.

FLSS ISOLATORS DESCRIPTION AND SPECIFICATION

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Kinetics Model FLS

Vibration isolators consist of free-standing large diameter laterally stable steel springs assembled into welded steel housing assemblies that are designed to limit vertical movement of the isolated equipment if equipment loads are reduced or if the equipment is subjected to large external forces. The housings also provide a constant free and operating height to facilitate installation. Spring elements are complete with internal noise isolation pads and have an adjusting and leveling bolt as a part of the top load plate assembly. Springs are epoxy powder coated, with a 1000-hour salt spray rating per ASTM B-117. Holes are provided in all isolators for bolting to the structure and to the supported equipment. The isolator can be welded to the structure as well. To assure stability, the springs have a lateral spring stiffness greater than 1.0 times the rated vertical stiffness, and are designed to provide a minimum of 50% overload capacity. FLS springs are available with deflections to 2.03 inches (52 mm) and with load capacities to 15,600 lbs. (7076 kg) as standard products. Custom isolators with higher deflection and greater load capabilities are also available. Kinetics Model FLS spring isolators are recommended for the isolation of vibration produced by equipment carrying a large fluid load which may be drained, such as boilers, cooling towers and chillers, and for the isolation of cooling towers, air-cooled condensers, etc., where motion due to wind loads must be minimized.



Specification

Vibration isolators for equipment which is subject to load variations and large external or torque forces shall consist of large diameter laterally stable steel springs assembled into welded steel housing assemblies designed to limit vertical movement of the supported equipment.

Housing assembly shall be of fabricated steel members and shall consist of a top load plate complete with adjusting and leveling bolts, vertical restraints, isolation washers, and a bottom plate with internal non-skid noise isolation pads and holes provided for anchoring to the supporting structure. Housing shall be hot dip galvanized for corrosion resistance. Housing should be designed to provide a constant free and operating height within 1/8 inch (0.06 mm).

Spring elements shall have a lateral stiffness greater than 1.0 times the rated vertical stiffness and shall be designed to provide a minimum of 50% overload capacity. Spring elements shall be epoxy powder coated, and shall have a 1000-hour rating when tested in accordance with ASTM B-117.

FLS ISOLATORS DESCRIPTION AND SPECIFICATION

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Kinetics Model FHS

Seismic control restrained spring isolators meet specifications for Kinetics Model FDS isolators and include a steel housing assembly to limit both lateral and vertical movement of the supported equipment during an earthquake without degrading the vibration isolation of the spring during normal equipment operating conditions. Standard FHS isolators incorporate a steel housing which encloses a neoprene snubber. Depending on the load and seismic zone, an optional steel load spreader plate to distribute the load among concrete anchors may be applied. A neoprene pad fitted in series with the spring is provided. Equipment attachment is by way of a bolt screwed downward through the equipment foot. Removal of the isolator for servicing can be easily accomplished as the isolator is not fitted with a protruding stud. In conformance with all current building code standards, the restraining system is designed to withstand a minimum 1.0g acceleration force. Motion is limited to approximately 0.2" in any direction.



Specification

Spring isolators shall be seismic control restrained spring isolators, incorporating a single or multiple coil spring element, having all of the characteristics of free-standing coil spring isolators as specified in the vibration isolation portion of this specification. Springs shall be restrained using a housing engineered to limit both lateral and vertical movement of the supported equipment during an earthquake without degrading the vibration isolation capabilities of the spring during normal equipment operating conditions.

Vibration isolators shall incorporate a steel housing and neoprene snubbing grommet system designed to limit motion to no more than 1/4" (6 mm) in any direction and to prevent any direct metal-to-metal contact between the supported member and the fixed restraint housing. The restraining system shall be designed to withstand the seismic design forces in any lateral or vertical direction without yield or failure. Where the capacity of the anchorage hardware in concrete is inadequate for the required seismic loadings, an adapter base plate to allow the addition of more or larger anchors will be fitted to fulfill these requirements. In addition to the primary isolation coil spring, the load path will include a minimum 1/4" (6 mm) thick neoprene pad.

Spring elements shall be color coded or otherwise easily identified. Springs shall have a lateral stiffness greater than 1.2 times the rated vertical stiffness and shall be designed to provide a minimum of 50% overload capacity. Non-welded spring elements shall be epoxy powder coated and shall have a minimum of a 1000-hour rating when tested in accordance with ASTM B-117.

To facilitate servicing, the isolator will be designed in such a way that the coil spring element can be removed without the requirement to lift or otherwise disturb the supported equipment.

FHS ISOLATORS DESCRIPTION AND SPECIFICATION

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FLSS 1" DEFLECTION SEISMIC ISOLATOR IP UNITS (INCHES AND POUNDS)

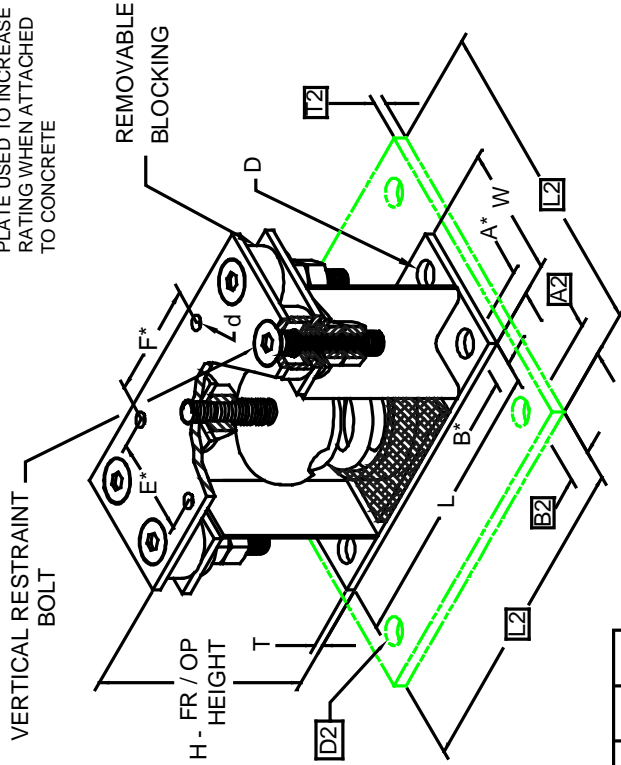
TYPE	L	W	T	A	B	D	E	F	d	H
1-250/3500	9.00	4.00	0.31	0.75	0.75	0.69	2.75	2.75	0.56	6.25

STANDARD RATINGS	TYPE	SIZE	COLOR		FREE HT.		O.D.		RATED LOAD		DEFL.
			OUTER	INNER	HT.	HT.	3.00	3.00	250	450	
FLSS	1-250	BLUE			4.20	3.00	3.00	1.79			
FLSS	1-450	GREEN			4.20	3.00	450	1.54			
FLSS	1-625	BLACK			4.20	3.00	625	1.44			
FLSS	1-800	GRAY			4.20	3.00	800	1.31			
FLSS	1-1000	RED			4.20	3.00	1000	1.15			
FLSS	1-1250	BROWN			4.20	3.00	1250	1.09			
FLSS	1-1700	ORANGE			4.20	3.00	1700	0.95			
FLSS	1-2200	ORANGE	GRAY		4.20	3.00	2200	1.00			
FLSS	1-2465	BLUE			4.20	3.00	2465	1.00			
FLSS	1-2865	BLUE	GRAY		4.20	3.00	2865	1.00			
FLSS	1-3500	BLUE	BROWN		4.20	3.00	3500	1.00			

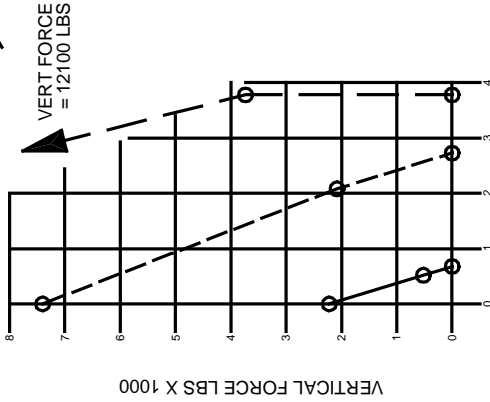
1-250/3500 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

1-250/3500 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

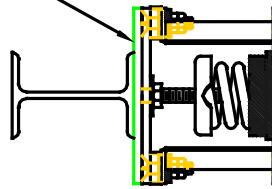


HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

WELDED TO STEEL ---
THROUGH BOLTED - - -
ANCHORED TO CONCRETE _____

IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

FLSS Submittal Drawings

DRAWING #S-01-22.11S – FLSS 1-250/3500

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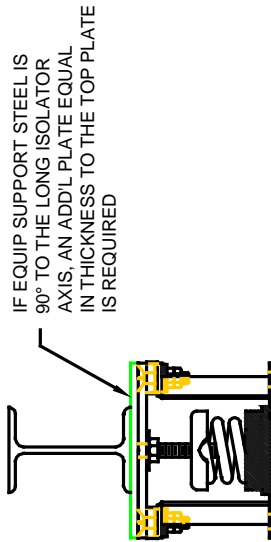
DOCUMENT:
P3.2.1-1
VISCMA MEMBER

FLSS 1" DEFLECTION SEISMIC ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
1-2500/7000	15.25	5.00	0.38	0.75	0.75	0.69	2.75	2.75	0.56	6.88

STANDARD RATINGS	TYPE	SIZE	COLOR		SPRING COIL		RATED	
			OUTER	INNER	FREE HT.	O.D.	LOAD	DEFL.
FLSS	1-2500	BROWN			4.20	3.00	2500	1.09
FLSS	1-3400	ORANGE			4.20	3.00	3400	0.95
FLSS	1-4400	ORANGE	GRAY		4.20	3.00	4400	1.00
FLSS	1-4930	BLUE	GRAY		4.20	3.00	4930	1.00
FLSS	1-5730	BLUE	GRAY		4.20	3.00	5730	1.00
FLSS	1-7000	BLUE	BROWN		4.20	3.00	7000	1.00

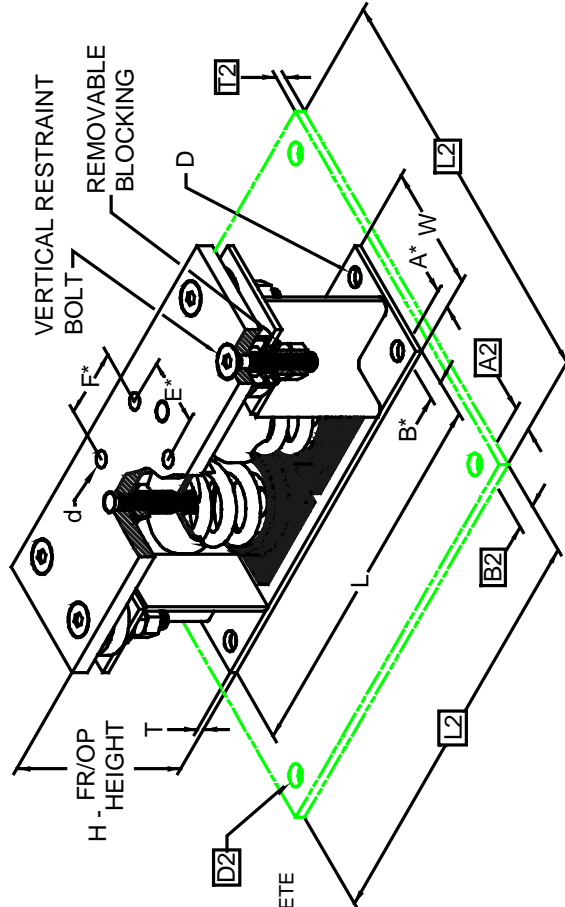
1-2500/7000 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE
(ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
1-2500/7000 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB



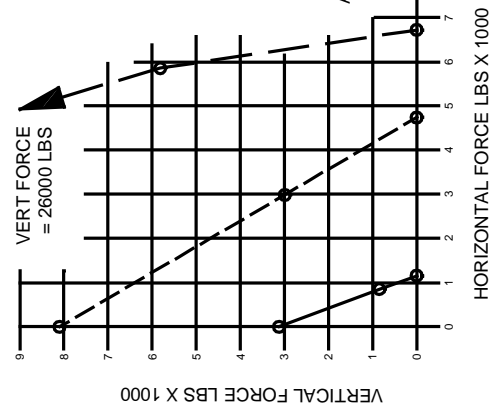
SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM K_v/K_y RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE



Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

- WELDED TO STEEL
- - - THROUGH BOLTED
- _____ ANCHORED TO CONCRETE

FLSS Submittal Drawings

DRAWING #S-01-22.12S – FLSS 1-2500/7000

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FLSS 1" DEFLECTION SEISMIC ISOLATOR

IP UNITS (INCHES AND POUNDS)

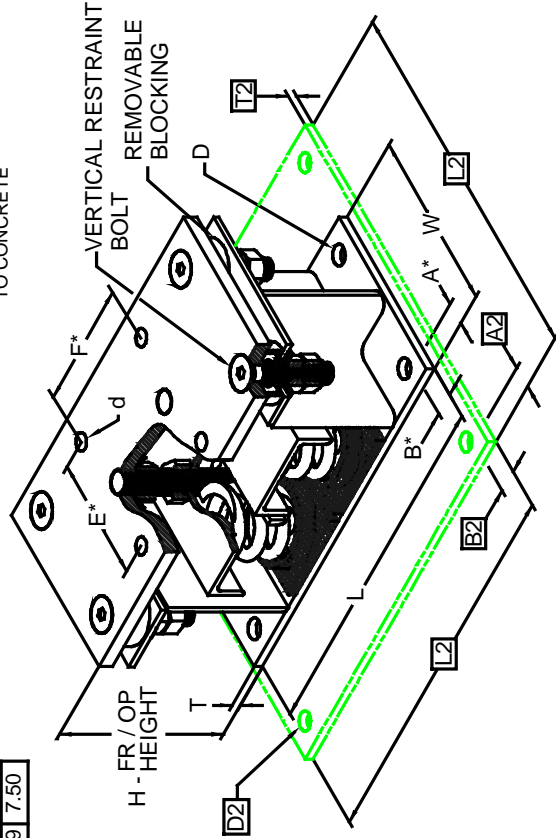
TYPE	L	W	T	A	B	D	E	F	d	H
1-5000/14000	15.75	8.00	0.50	1.00	1.00	0.81	5.50	5.50	0.69	7.50

STANDARD RATINGS	TYPE	SIZE	COLOR		FREE		RATED	
			OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLSS	1-5000	BROWN			4.20	3.00	5000	1.09
FLSS	1-6800	ORANGE			4.20	3.00	6800	0.95
FLSS	1-8800	ORANGE	GRAY		4.20	3.00	8800	1.00
FLSS	1-9860	BLUE			4.20	3.00	9860	1.00
FLSS	1-11460	BLUE	GRAY		4.20	3.00	11460	1.00
FLSS	1-14000	BLUE	BROWN		4.20	3.00	14000	1.00

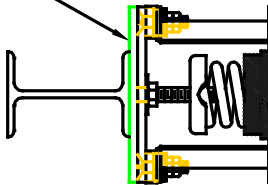
1-5000/14000 REQUIRES 0.75 DIA. x 4.75 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

1-5000/14000 ANCHOR BOLT TORQUE - 150 FT-LB, PULL TEST - 3625 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE

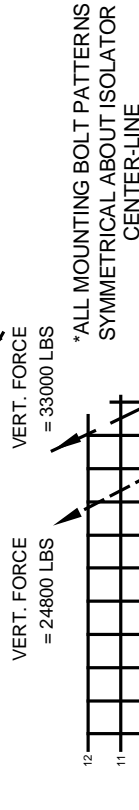


IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM K_v/k_y RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION



WELDED TO STEEL ---
THROUGH BOLTED - - -
ANCHORED TO CONCRETE _____

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLSS Submittal Drawings

DRAWING #S-01-22.13S – FLSS 1-5000/14000

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VISCMA MEMBER

FLSS 2" DEFLECTION SEISMIC ISOLATOR

IP UNITS (INCHES AND POUNDS)

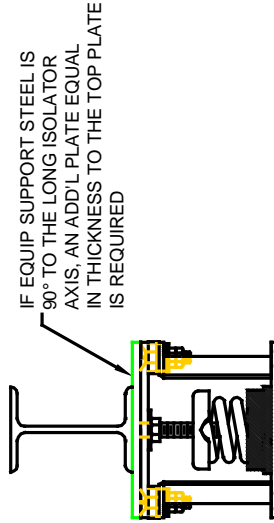
TYPE	L	W	T	A	B	D	E	F	d	H
2-100/1975	10.00	5.00	0.31	0.75	0.75	0.69	2.75	2.75	0.56	8.00

STANDARD RATINGS	TYPE	SIZE	COLOR		FREE SPRING COIL		RATED	
			OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLSS	2-100	GRAY			6.09	3.50	100	2.00
FLSS	2-250	BLUE			6.09	3.50	250	2.00
FLSS	2-500	GREEN			6.09	3.50	500	2.00
FLSS	2-750	BLACK			6.09	3.50	750	2.00
FLSS	2-995	ORANGE			6.09	3.50	995	2.00
FLSS	2-1400	GREEN			6.09	3.50	1400	2.01
FLSS	2-1600	RED			6.09	3.50	1600	2.00
FLSS	2-1975	RED			6.09	3.50	1975	1.98

2-100/1975 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE

(ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

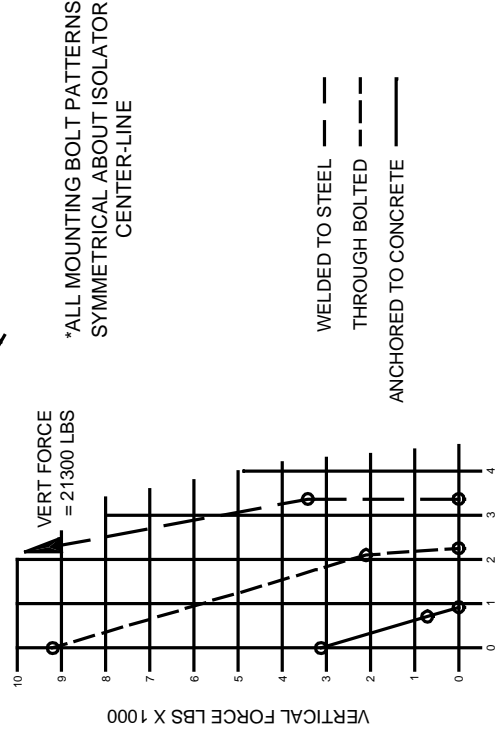
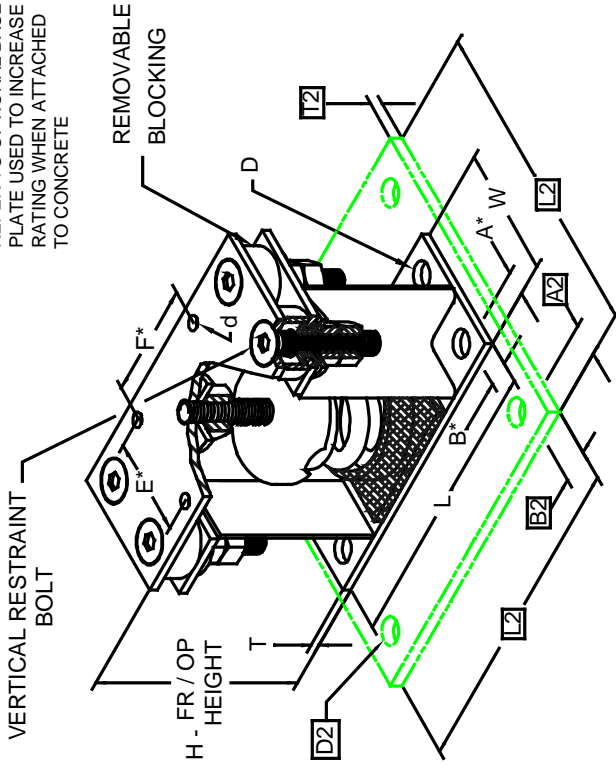
2-100/1975 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB



SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kv/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLSS Submittal Drawings

DRAWING #S-01-22.21S – FLSS 2-100/1975

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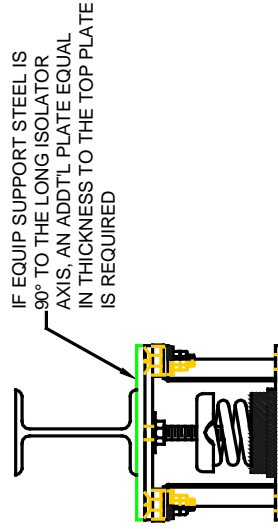
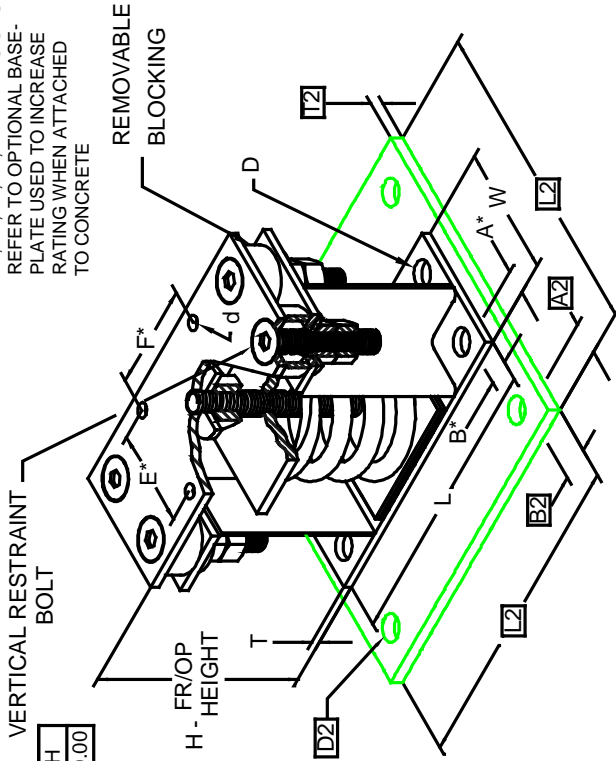
FLSS 2" DEFLECTION SEISMIC ISOLATOR IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
2-2000/4500	11.00	5.00	0.31	0.75	0.75	0.69	2.75	2.75	0.56	10.00

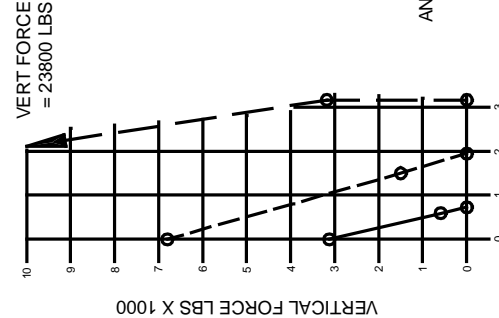
STANDARD RATINGS	TYPE	SIZE	COLOR		FREE HT.		O.D.		RATED	
			OUTER	INNER1	INNER2	HT.	5.00	DEFL.	LOAD	2.00
FLSS	2-2000	ORANGE				7.00	5.00	2000	2.00	
FLSS	2-2500	BLUE				7.00	5.00	2500	2.00	
FLSS	2-2750	BLUE		BLUE		7.00	5.00	2750	2.00	
FLSS	2-3025	BLUE		GREEN		7.00	5.00	3025	2.02	
FLSS	2-3250	BLUE		BLACK		7.00	5.00	3250	2.00	
FLSS	2-3500	BLUE		ORANGE		7.00	5.00	3500	2.00	
FLSS	2-3900	BLUE		ORANGE	GREEN	7.00	5.00	3900	2.00	
FLSS	2-4100	BLUE		RED		7.00	5.00	4100	2.00	
FLSS	2-4500	BLUE		RED	GREEN	7.00	5.00	4500	2.00	

2-2000/4500 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE
(ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
2-2000/4500 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE



HORIZONTAL FORCE LBS X 1000
Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- ISOLATORS MUST BE BOLTED OR WELDED TOP AND BOTTOM IN AN APPROVED MANNER
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

FLSS Submittal Drawings

DRAWING #S-01-22.22S – FLSS 2-2000/4500

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FLSS 2" DEFLECTION SEISMIC ISOLATOR

IP UNITS (INCHES AND POUNDS)

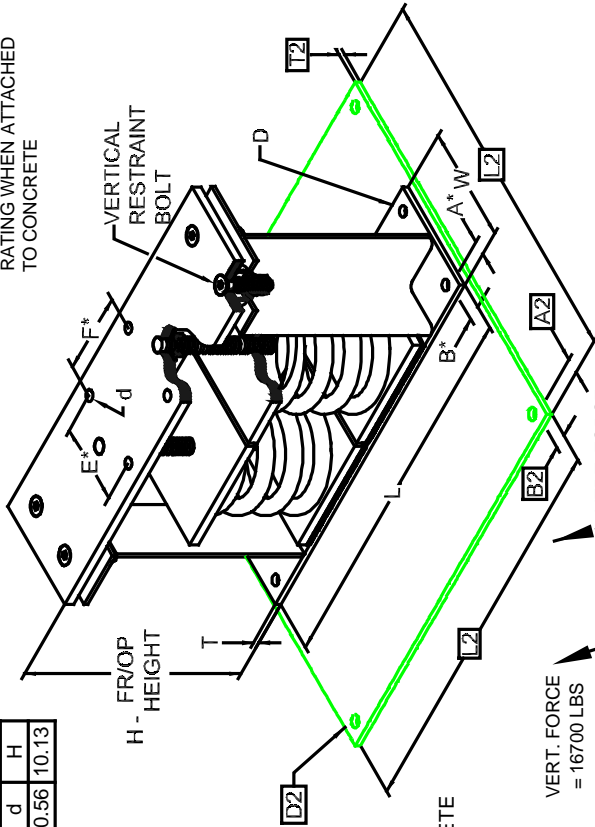
TYPE	L	W	T	A	B	D	E	F	d	H
2-4000/9000	17.50	6.00	0.50	0.75	0.75	0.69	2.75	2.75	0.56	10.13

STANDARD RATINGS	TYPE	SIZE	COLOR			FREE		RATED	
			OUTER	INNER1	INNER2	HT.	O.D.	LOAD	DEFL.
FLSS	2-4000	ORANGE				7.00	5.00	4000	2.00
FLSS	2-5000	BLUE				7.00	5.00	5000	2.00
FLSS	2-5500	BLUE				7.00	5.00	5500	2.00
FLSS	2-6050	BLUE	GREEN			7.00	5.00	6050	2.02
FLSS	2-6500	BLUE	BLACK			7.00	5.00	6500	2.00
FLSS	2-7000	BLUE	ORANGE			7.00	5.00	7000	2.00
FLSS	2-7800	BLUE	ORANGE	GREEN		7.00	5.00	7800	2.00
FLSS	2-8200	BLUE	RED			7.00	5.00	8200	2.00
FLSS	2-9000	BLUE	RED	GREEN		7.00	5.00	9000	2.00

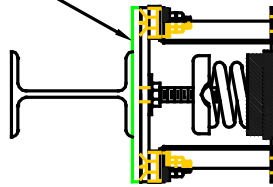
2-4000/9000 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

2-4000/9000 ANCHOR BOLT TORQUE - 75 FT-LB; PULL TEST - 2670 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE

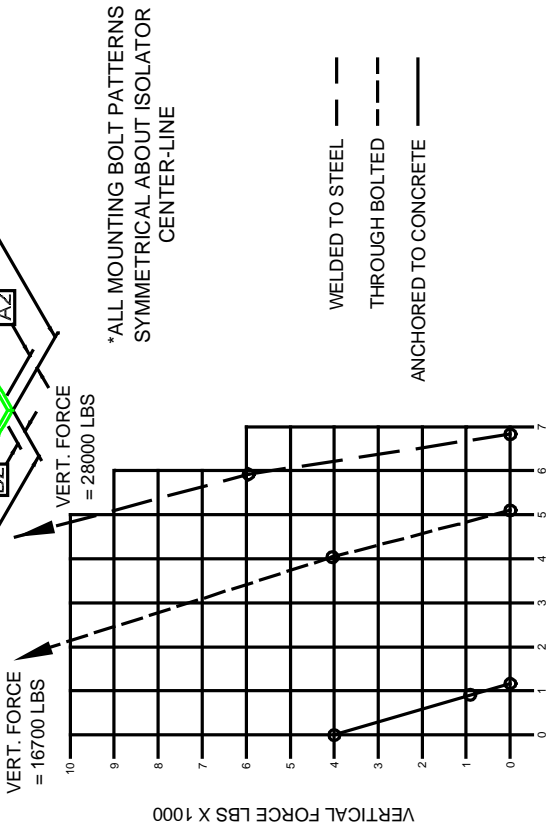


IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50 %.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

- WELDED TO STEEL
- - - THROUGH BOLTED
- _____ ANCHORED TO CONCRETE

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLSS Submittal Drawings

DRAWING #S-01-22.23S – FLSS 2-4000/9000

RELEASE DATE: : 2/01/05



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DOCUMENT:

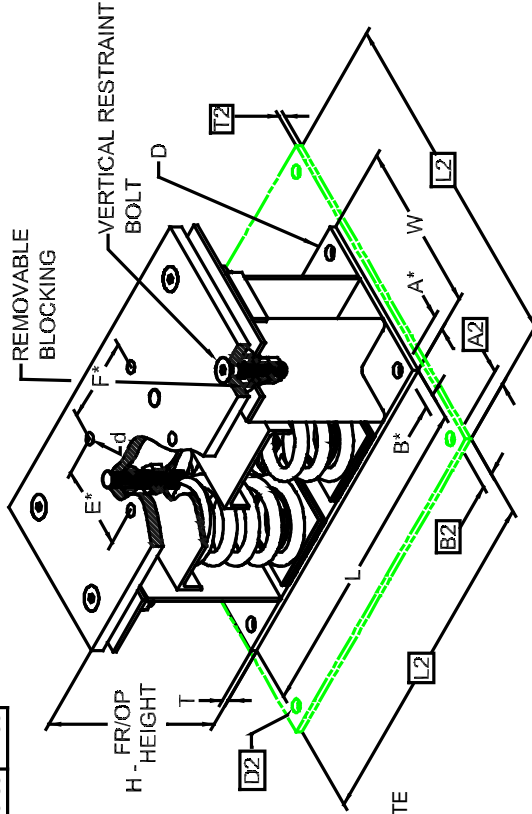
P3.2.1-6



FLSS 2" DEFLECTION SEISMIC ISOLATOR

TYPE	L	W	T	A	B	D	E	F	d	H
2-8000/18000	21.50	11.00	0.50	1.00	1.00	0.81	5.50	5.50	0.69	11.00

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE

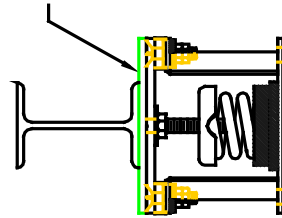


STANDARD RATINGS	TYPE	SIZE	COLOR			FREE		RATED	
			OUTER	INNER1	INNER2	HT.	O.D.	LOAD	DEFL.
FLSS	2-8000	ORANGE				7.00	5.00	8000	2.00
FLSS	2-10000	BLUE				7.00	5.00	10000	2.00
FLSS	2-11000	BLUE	BLUE			7.00	5.00	11000	2.00
FLSS	2-12100	BLUE	GREEN			7.00	5.00	12100	2.02
FLSS	2-13000	BLUE	BLACK			7.00	5.00	13000	2.00
FLSS	2-14000	BLUE	ORANGE			7.00	5.00	14000	2.00
FLSS	2-15600	BLUE	ORANGE	GREEN		7.00	5.00	15600	2.00
FLSS	2-16400	BLUE	BLUE	RED		7.00	5.00	16400	2.00
FLSS	2-18000	BLUE	BLUE	RED	GREEN	7.00	5.00	18000	2.00

2-8000/18000 REQUIRES 0.75 DIA. x 4.75 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

2-8000/18000 ANCHOR BOLT TORQUE - 150 FT-LB; PULL TEST - 3625 LB

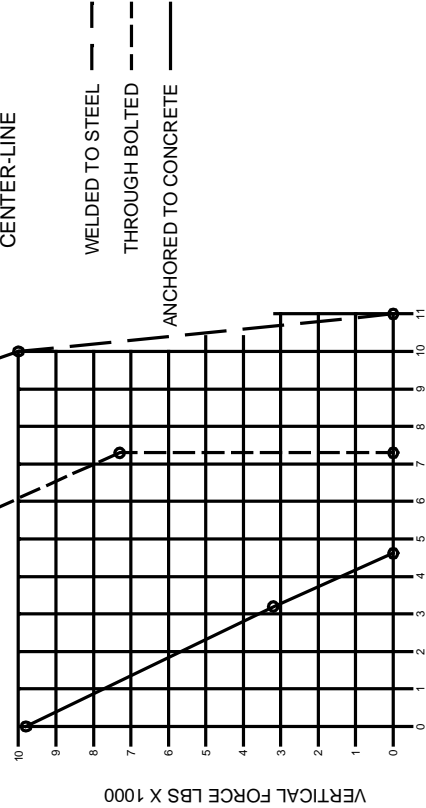
IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

VERT. FORCE = 24400 LBS
VERT. FORCE = 38000 LBS
*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE



HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLSS Submittal Drawings

DRAWING #S-01-22.24S – FLSS 2-8000/18000

RELEASE DATE: : 2/01/05



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DOCUMENT:

P3.2.1-7

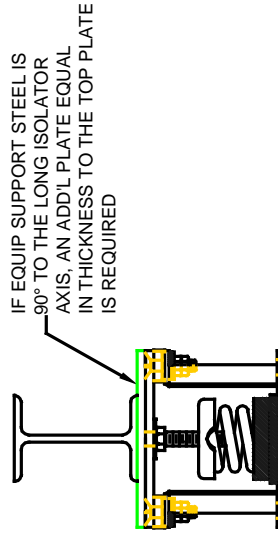


FLSS 4" DEFLECTION SEISMIC ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
4-100/1600	11.00	6.00	0.38	0.75	0.75	0.69	2.75	2.75	0.56	13.00

STANDARD RATINGS	TYPE	SIZE	SPRING COIL			RATED LOAD	DEFL.
			COLOR	O.D.	HT.		
FLSS	4-100	GRAY	10.00	5.63	100	4.00	4.00
FLSS	4-250	BLUE	10.00	5.63	250	4.00	4.00
FLSS	4-500	GREEN	10.00	5.63	500	4.00	4.00
FLSS	4-750	BLACK	10.00	5.63	750	4.00	4.00
FLSS	4-1000	RED	10.00	5.63	1000	4.00	4.00
FLSS	4-1250	BROWN	10.00	5.63	1250	4.00	4.00
FLSS	4-1600	ORANGE	10.00	5.63	1600	4.00	4.00

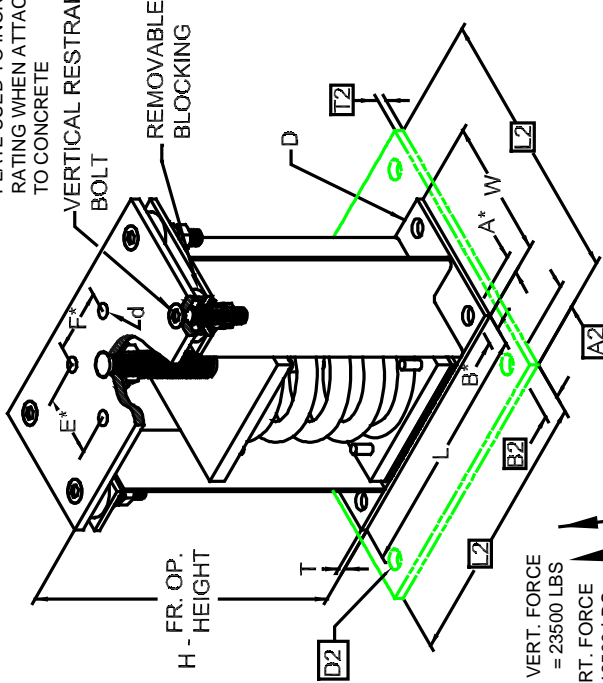
4-100/1600 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
4-100/1600 ANCHOR BOLT TORQUE - 75 FT.-LB, PULL TEST - 2670 LB



SPECIFICATIONS:

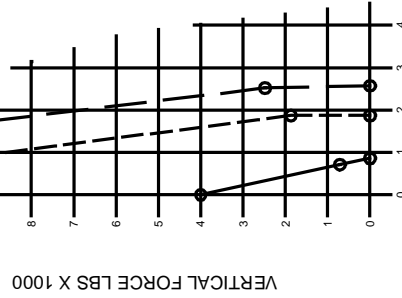
- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

VERT. FORCE = 23500 LBS
VERT. FORCE = 16500 LBS



WELDED TO STEEL ———
THROUGH BOLTED - - - -
ANCHORED TO CONCRETE ———

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLSS Submittal Drawings

DRAWING #S-01-22.41S – FLSS 4-100/1600

RELEASE DATE: : 2/01/05



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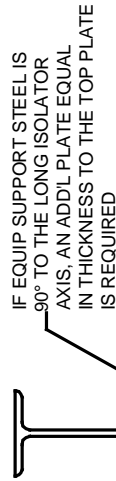
DOCUMENT:
P3.2.1-8
 VISCMA MEMBER

FLSS 4" DEFLECTION SEISMIC ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
4-2250/5800	16.25	8.00	0.50	1.00	1.00	0.69	5.50	5.50	0.69	15.00

STANDARD RATINGS	TYPE	SIZE	COLOR		SPRING COIL		RATED	
			OUTER	INNER	FREE HT.	O.D.	LOAD	DEFL.
FLSS	4-2250	BEIGE	BEIGE	BLUE	11.50	8.00	2250	4.00
FLSS	4-2500	BEIGE	BEIGE	BLUE	11.50	8.00	2500	4.00
FLSS	4-2750	BEIGE	BEIGE	GREEN	11.50	8.00	2750	4.00
FLSS	4-3000	BEIGE	BEIGE	BLACK	11.50	8.00	3000	4.00
FLSS	4-3250	BEIGE	BEIGE	RED	11.50	8.00	3250	4.00
FLSS	4-3500	BEIGE	BEIGE	BROWN	11.50	8.00	3500	4.00
FLSS	4-3850	BEIGE	BEIGE	ORANGE	11.50	8.00	3850	4.00
FLSS	4-4200	CHROME	CHROME	BLUE	11.50	8.00	4200	4.00
FLSS	4-4450	CHROME	CHROME	BLUE	11.50	8.00	4450	4.00
FLSS	4-4700	CHROME	CHROME	GREEN	11.50	8.00	4700	4.00
FLSS	4-4950	CHROME	CHROME	BLACK	11.50	8.00	4950	4.00
FLSS	4-5200	CHROME	CHROME	RED	11.50	8.00	5200	4.00
FLSS	4-5450	CHROME	CHROME	BROWN	11.50	8.00	5450	4.00
FLSS	4-5800	CHROME	CHROME	ORANGE	11.50	8.00	5800	4.00

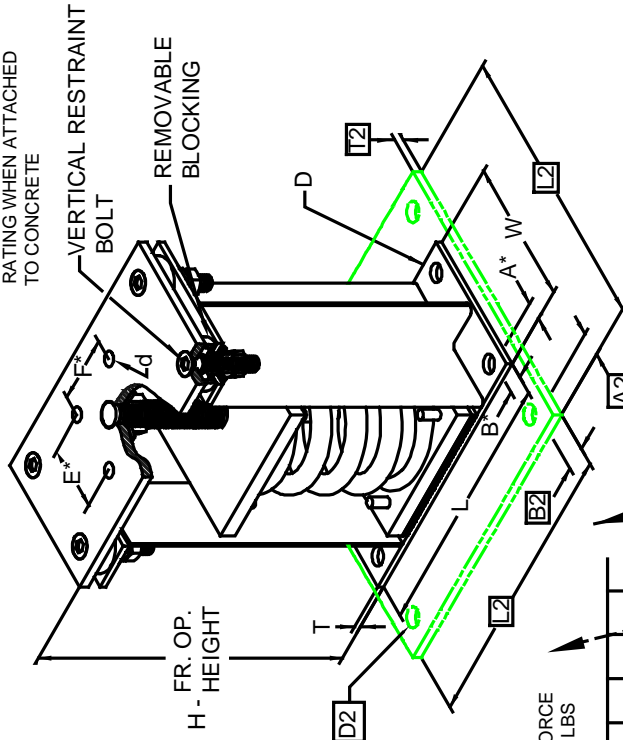
4-2250/5800 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSIMIN CONCRETE)
4-2250/5800 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB



SPECIFICATIONS:

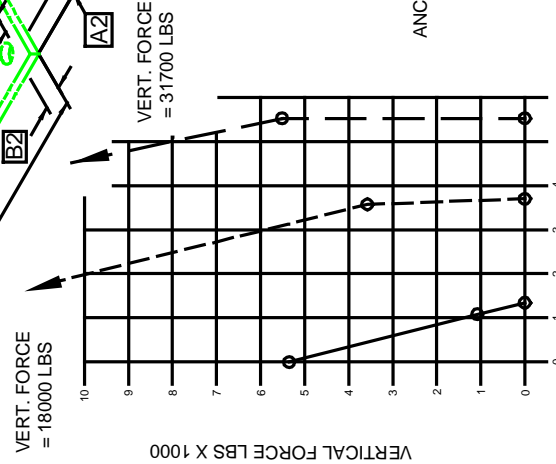
- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

- WELDED TO STEEL
- - - THROUGH BOLTED
- ANCHORED TO CONCRETE



HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLSS Submittal Drawings

DRAWING #S-01-22.42S – FLSS 4-2250/5800

RELEASE DATE: : 2/01/05



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P3.2.1-9
VISCMA MEMBER

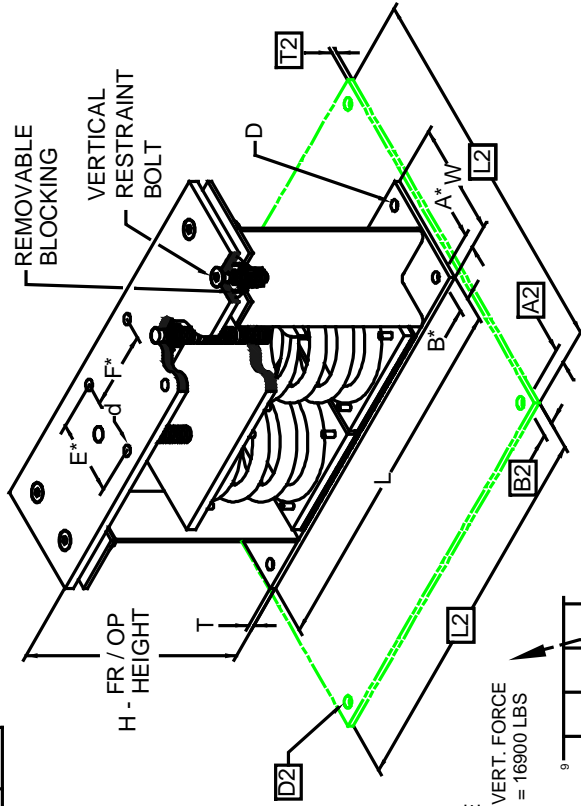
FLSS 4" DEFLECTION SEISMIC ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
4-5500/11600	26.00	8.00	0.50	1.00	1.00	0.69	5.50	5.50	0.69	15.25

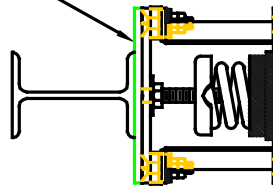
STANDARD RATINGS	TYPE	SIZE	COLOR		FREE		RATED	
			OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLSS	4-5500	BEIGE	GREEN	11.50	8.00	5500	4.00	
FLSS	4-6000	BEIGE	BLACK	11.50	8.00	6000	4.00	
FLSS	4-6500	BEIGE	RED	11.50	8.00	6500	4.00	
FLSS	4-7000	BEIGE	BROWN	11.50	8.00	7000	4.00	
FLSS	4-7700	BEIGE	ORANGE	11.50	8.00	7700	4.00	
FLSS	4-8400	CHROME		11.50	8.00	8400	4.00	
FLSS	4-8900	CHROME	BLUE	11.50	8.00	8900	4.00	
FLSS	4-9400	CHROME	GREEN	11.50	8.00	9400	4.00	
FLSS	4-9900	CHROME	BLACK	11.50	8.00	9900	4.00	
FLSS	4-10400	CHROME	RED	11.50	8.00	10400	4.00	
FLSS	4-10900	CHROME	BROWN	11.50	8.00	10900	4.00	
FLSS	4-11600	CHROME	ORANGE	11.50	8.00	11600	4.00	

4-5500/11600 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
4-5500/11600 ANCHOR BOLT TORQUE - 75 FT.-LB, PULL TEST - 2670 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED

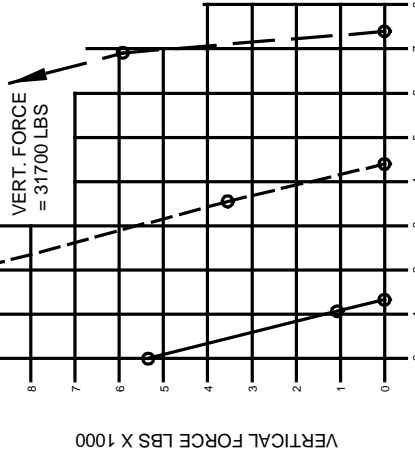


SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

VERT. FORCE = 16900 LBS



WELDED TO STEEL ---
THROUGH BOLTED - - -
ANCHORED TO CONCRETE _____

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLSS Submittal Drawings

DRAWING #S-01-22.43S – FLSS 4-5500/11600

RELEASE DATE: : 2/01/05



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FLSS 4" DEFLECTION SEISMIC ISOLATOR

IP UNITS (INCHES AND POUNDS)

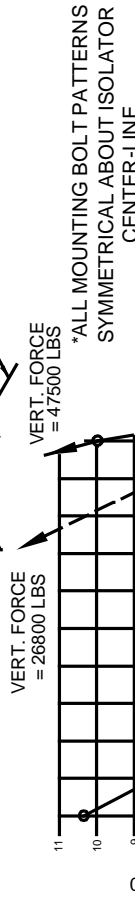
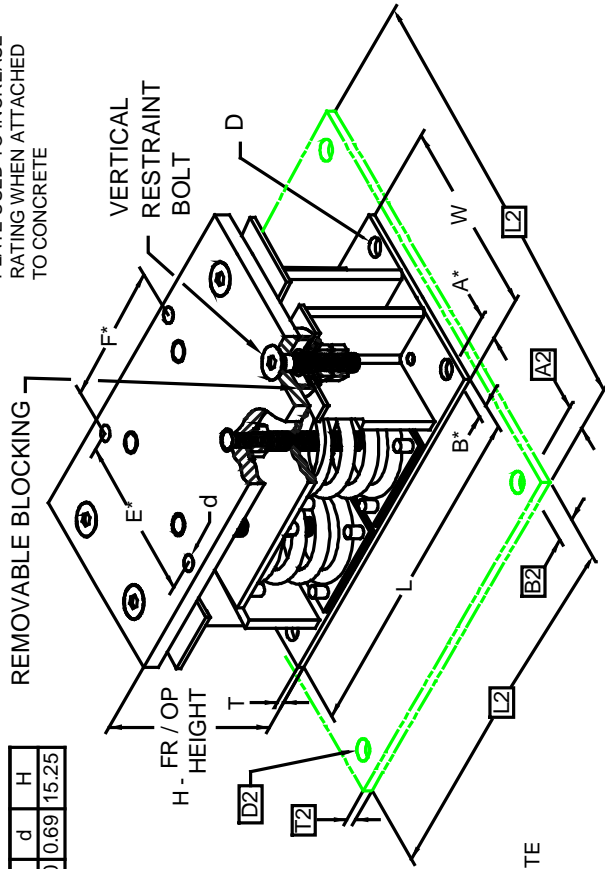
TYPE	L	W	T	A	B	D	E	F	d	H
4-11000/23200	27.00	17.00	0.75	1.00	1.00	0.81	9.00	9.00	0.69	15.25

STANDARD RATINGS	COLOR		FREE		RATED		
	SIZE	OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLSS	4-11000	BEIGE	GREEN	11.50	8.00	11000	4.00
FLSS	4-12000	BEIGE	BLACK	11.50	8.00	12000	4.00
FLSS	4-13000	BEIGE	RED	11.50	8.00	13000	4.00
FLSS	4-14000	BEIGE	BROWN	11.50	8.00	14000	4.00
FLSS	4-15400	BEIGE	ORANGE	11.50	8.00	15400	4.00
FLSS	4-16800	CHROME	ORANGE	11.50	8.00	16800	4.00
FLSS	4-17800	CHROME	BLUE	11.50	8.00	17800	4.00
FLSS	4-18800	CHROME	GREEN	11.50	8.00	18800	4.00
FLSS	4-19800	CHROME	BLACK	11.50	8.00	19800	4.00
FLSS	4-20800	CHROME	RED	11.50	8.00	20800	4.00
FLSS	4-21800	CHROME	BROWN	11.50	8.00	21800	4.00
FLSS	4-23200	CHROME	ORANGE	11.50	8.00	23200	4.00

4-11000/23200 REQUIRES 0.75 DIA. x 4.75 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

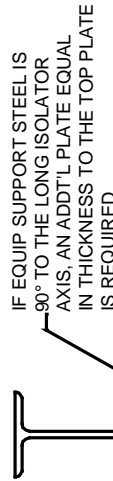
4-11000/23200 ANCHOR BOLT TORQUE - 150 FT-LB, PULL TEST - 3625 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.



SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- ISOLATORS MUST BE BOLTED OR WELDED TOP AND BOTTOM IN AN APPROVED MANNER
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

FLSS Submittal Drawings

DRAWING #S-01-22.44S – FLSS 4-11000/23200

RELEASE DATE: 2/01/05



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DOCUMENT:

P3.2.1-11



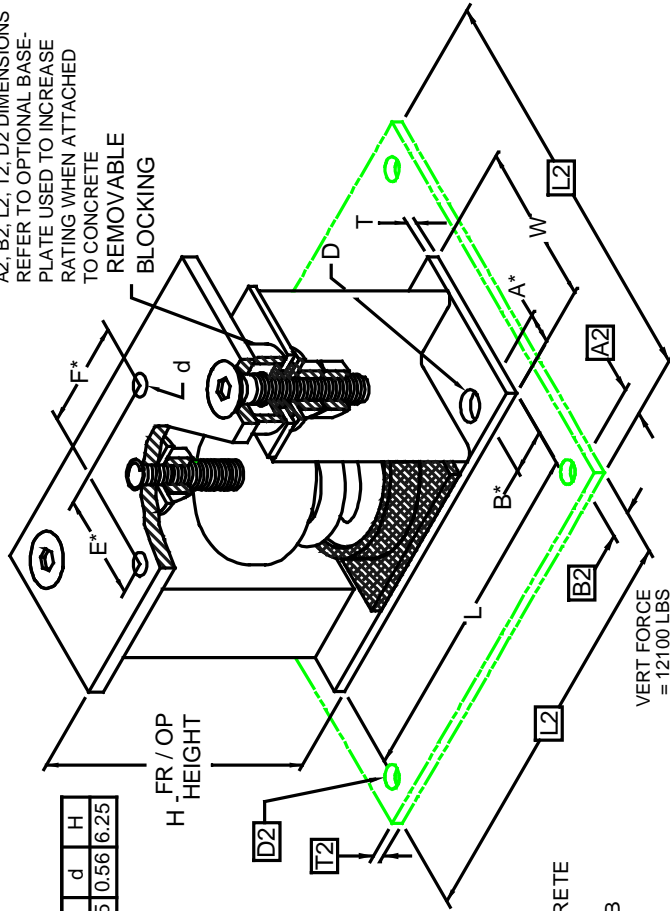
FLS 1" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
1-250/3500	8.75	4.00	0.25	0.75	1.13	0.69	2.75	2.75	0.56	6.25

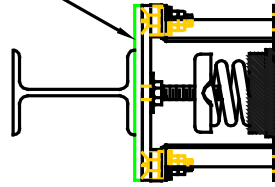
STANDARD RATINGS	TYPE	SIZE	COLOR		SPRING COIL		RATED	
			OUTER	INNER	FREE HT.	O.D.	LOAD	DEFL.
FLS	1-250	BLUE	4.20	3.00	4.20	3.00	250	1.79
FLS	1-450	GREEN	4.20	3.00	4.20	3.00	450	1.54
FLS	1-625	BLACK	4.20	3.00	4.20	3.00	625	1.44
FLS	1-800	GRAY	4.20	3.00	4.20	3.00	800	1.31
FLS	1-1000	RED	4.20	3.00	4.20	3.00	1000	1.15
FLS	1-1250	BROWN	4.20	3.00	4.20	3.00	1250	1.09
FLS	1-1700	ORANGE	4.20	3.00	4.20	3.00	1700	0.95
FLS	1-2200	ORANGE	4.20	3.00	4.20	3.00	2200	1.00
FLS	1-2465	BLUE	4.20	3.00	4.20	3.00	2465	1.00
FLS	1-2865	BLUE	4.20	3.00	4.20	3.00	2865	1.00
FLS	1-3500	BLUE	4.20	3.00	4.20	3.00	3500	1.00

1-250/3500 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
1-250/3500 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB

A2, B2, L2, T2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE REMOVABLE BLOCKING



IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50 %.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION



WELDED TO STEEL ---
THROUGH BOLTED - - -
ANCHORED TO CONCRETE ———

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLS Submittal Drawings

DRAWING #S-01-22.11 – FLS 1-250/3500

RELEASE DATE: 02/01/05



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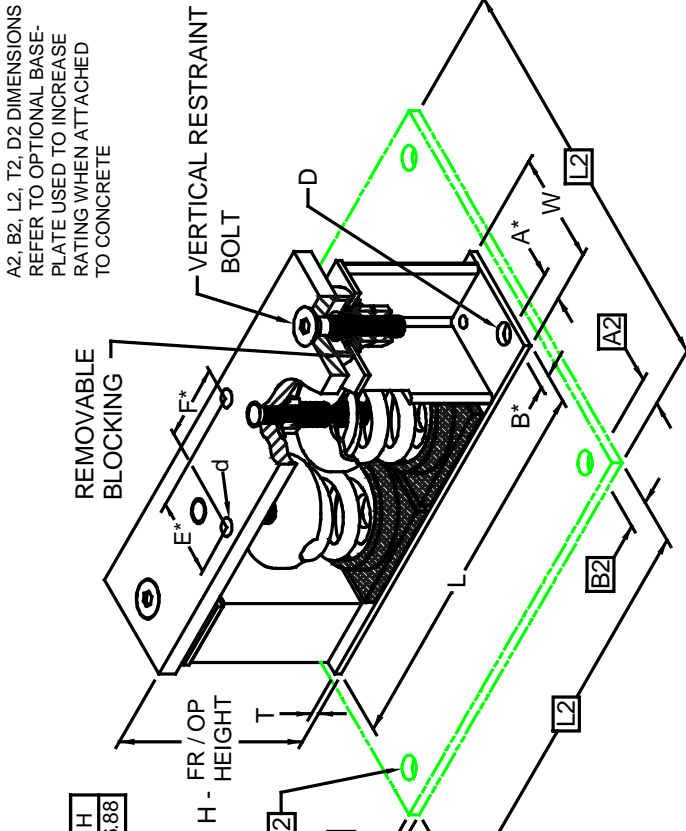
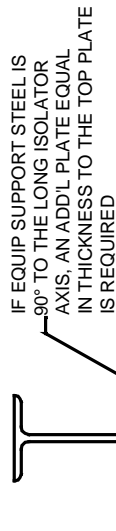
DOCUMENT:
P3.2.2-1
VISCMA MEMBER

FLS 1" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
1-2500/7000	14.00	4.00	0.38	1.00	0.50	0.69	2.75	2.75	0.56	6.88

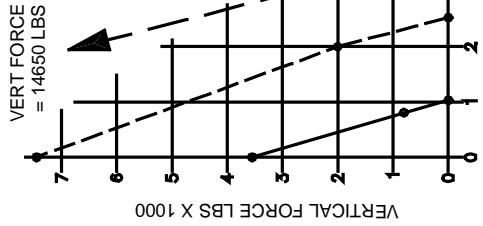
STANDARD RATINGS	TYPE	SIZE	COLOR		FREE		RATED	
			OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLS	1-2500	BROWN			4.20	3.00	2500	1.09
FLS	1-3400	ORANGE			4.20	3.00	3400	0.95
FLS	1-4400	ORANGE	GRAY		4.20	3.00	4400	0.50
FLS	1-4930	BLUE			4.20	3.00	4930	0.50
FLS	1-5730	BLUE	GRAY		4.20	3.00	5730	0.50
FLS	1-7000	BLUE	BROWN		4.20	3.00	7000	0.50

1-2500/7000 REQUIRES 0.62 DIA x 4.00 MIN EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
1-2500/7000 ANCHOR BOLT TORQUE - 75 FT-LB; PULL TEST - 2670 LB



A2, B2, L2, T2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE

*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE



HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

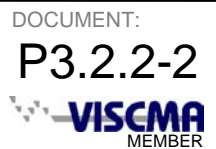
FLS Submittal Drawings

DRAWING #S-01-22.12 – FLS 1-2500/7000

RELEASE DATE: 02/01/05



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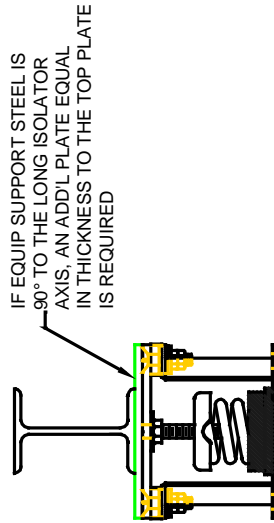


FLS 1" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
1-5000/14000	16.50	8.00	0.38	1.00	2.00	0.81	5.50	5.50	0.69	7.50

STANDARD RATINGS	SPRING COIL				RATED	
	TYPE	SIZE	COLOR	FREE HT.	O.D.	LOAD
FLS	1-5000	BROWN	4.20	3.00	5000	1.09
FLS	1-6800	ORANGE	4.20	3.00	6800	0.95
FLS	1-8800	ORANGE GRAY	4.20	3.00	8800	1.00
FLS	1-9860	BLUE	4.20	3.00	9860	1.00
FLS	1-11460	BLUE GRAY	4.20	3.00	11460	1.00
FLS	1-14000	BLUE BROWN	4.20	3.00	14000	1.00

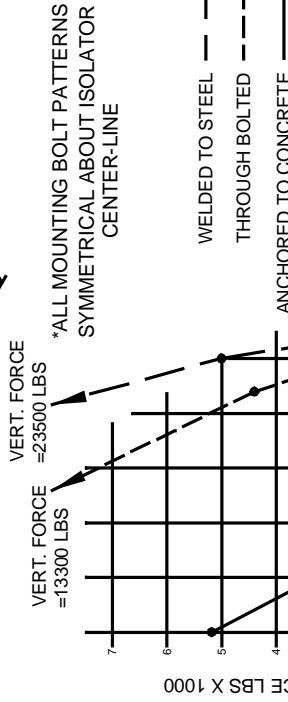
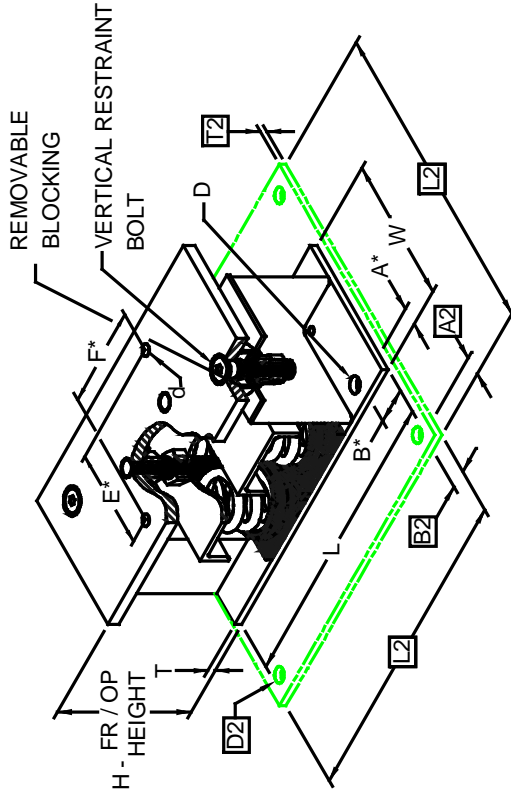
1-5000/14000 REQUIRES 0.75 DIA. x 4.75 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
1-5000/14000 ANCHOR BOLT TORQUE - 150 FT-LB, PULL TEST - 3625 LB



SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLS Submittal Drawings

DRAWING #S-01-22.13 – FLS 1-5000/14000

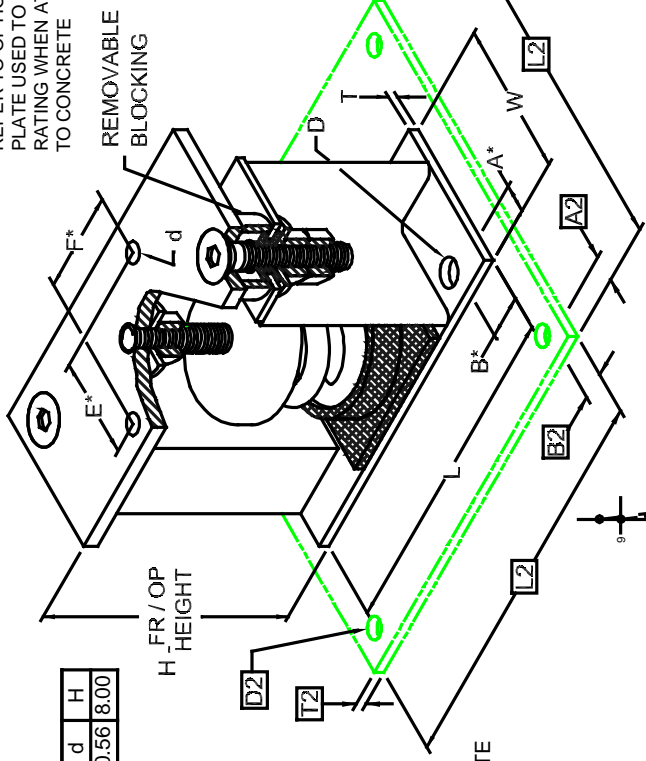
RELEASE DATE: 02/01/05



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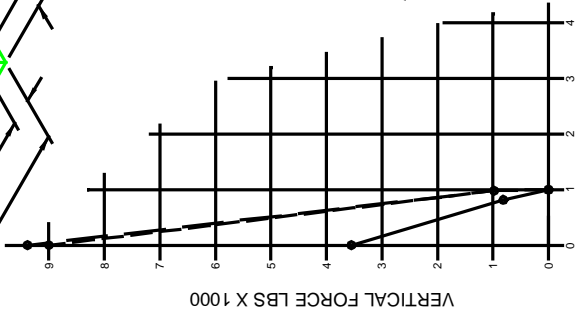
DOCUMENT:
P3.2.2-3
 VISCMA MEMBER

A2, B2, L2, T2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

WELDED TO STEEL - - -
 THROUGH BOLTED - - - -
 ANCHORED TO CONCRETE - - - -



HORIZONTAL FORCE LBS X 1000

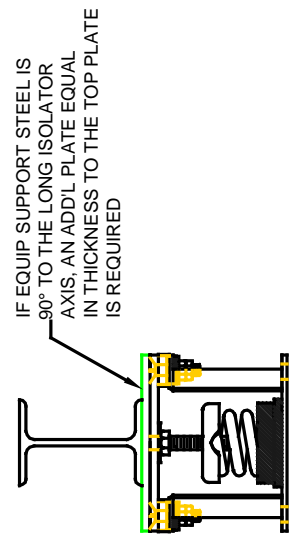
Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLS 2" DEFLECTION ISOLATOR
 IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
2-100/1975	9.00	5.00	0.25	0.75	0.75	0.69	2.75	2.75	0.56	8.00

STANDARD RATINGS	SPRING COIL				O.D.	LOAD	DEFL.
	TYPE	SIZE	COLOR	FREE HT.			
FLS 2-100	GRAY			6.09	3.50	100	2.00
FLS 2-250	BLUE			6.09	3.50	250	2.00
FLS 2-500	GREEN			6.09	3.50	500	2.00
FLS 2-750	BLACK			6.09	3.50	750	2.00
FLS 2-995	ORANGE			6.09	3.50	995	2.00
FLS 2-1400	ORANGE GREEN			6.09	3.50	1400	2.01
FLS 2-1600	RED			6.09	3.50	1600	2.00
FLS 2-1975	RED GREEN			6.09	3.50	1975	1.98

2-100/1975 REQUIRES 0.62 DIA X 4.00 MIN EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
 2-100/1975 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

FLS Submittal Drawings

DRAWING #S-01-22.21 – FLS 2-100/1975

RELEASE DATE: 02/01/05



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DOCUMENT:
P3.2.2-4
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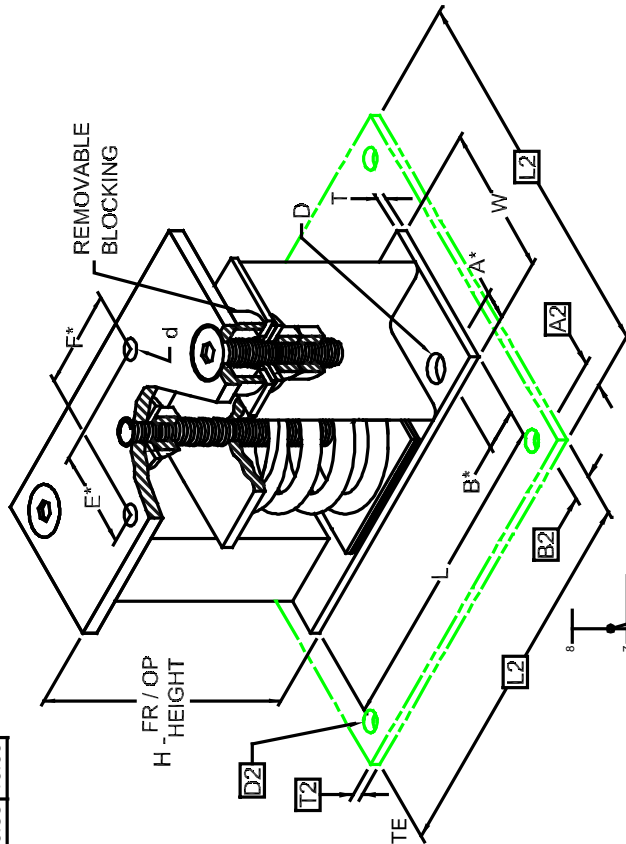
FLS 2" DEFLECTION ISOLATOR IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
2-2000/4500	10.75	5.00	0.25	0.75	1.38	0.69	2.75	2.75	0.56	10.00

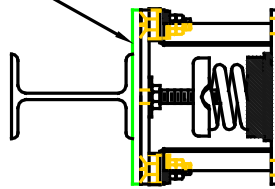
STANDARD RATINGS		SPRING COIL				FREE		RATED	
TYPE	SIZE	OUTER	INNER1	INNER2	HT.	O.D.	LOAD	DEFL.	
FLS	2-2000	ORANGE			7.00	5.00	2000	2.00	
FLS	2-2500	BLUE			7.00	5.00	2500	2.00	
FLS	2-2750	BLUE			7.00	5.00	2750	2.00	
FLS	2-3025	BLUE	GREEN		7.00	5.00	3025	2.02	
FLS	2-3250	BLUE	BLACK		7.00	5.00	3250	2.00	
FLS	2-3500	BLUE	ORANGE		7.00	5.00	3500	2.00	
FLS	2-3900	BLUE	ORANGE	GREEN	7.00	5.00	3900	2.00	
FLS	2-4100	BLUE	RED		7.00	5.00	4100	2.00	
FLS	2-4500	BLUE	RED	GREEN	7.00	5.00	4500	2.00	

2-2000/4500 REQUIRES 0.62 DIA x 4.00 MIN EMBED ANCHORS IN CONCRETE
(ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
2-2000/4500 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE

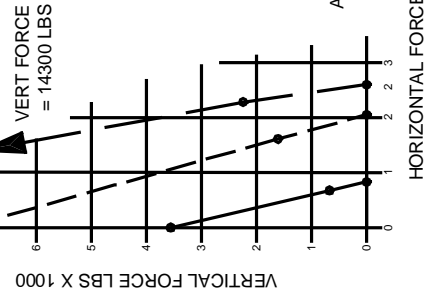


IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

- WELDED TO STEEL
- - - THROUGH BOLTED
- ANCHORED TO CONCRETE

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLS Submittal Drawings

DRAWING #S-01-22.22 – FLS 2-2000/4500

RELEASE DATE: 02/01/05



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DOCUMENT:

P3.2.2-5



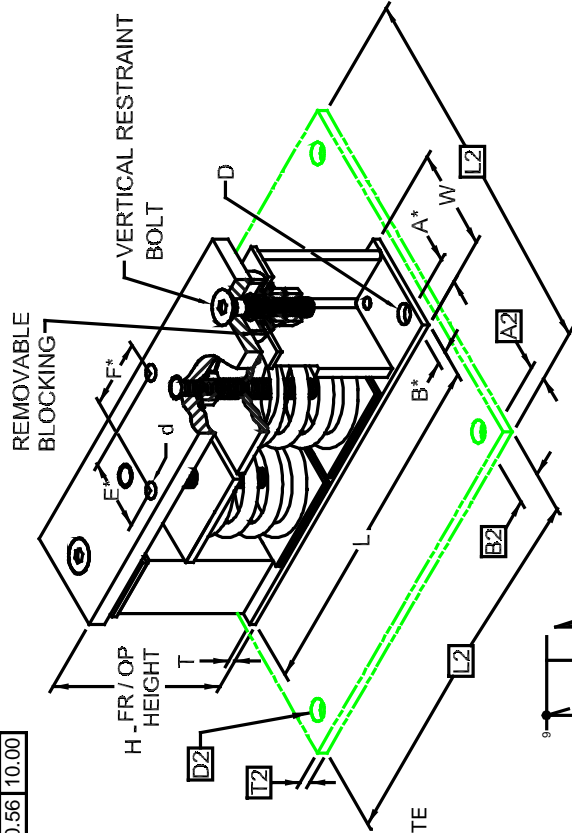
FLS 2" DEFLECTION ISOLATOR IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
2-4000/9000	17.50	6.00	0.38	1.25	1.00	0.69	2.75	2.75	0.56	10.00

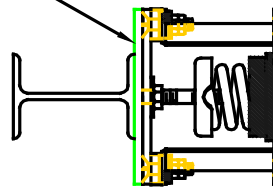
STANDARD RATINGS	SPRING COIL				FREE		RATED		
	TYPE	SIZE	OUTER	INNER1	INNER2	HT.	O.D.	LOAD	DEFL.
FLS	2-4000	ORANGE				7.00	5.00	4000	2.00
FLS	2-5000	BLUE				7.00	5.00	5000	2.00
FLS	2-5500	BLUE		BLUE		7.00	5.00	5500	2.00
FLS	2-6050	BLUE		GREEN		7.00	5.00	6050	2.02
FLS	2-6500	BLUE		BLACK		7.00	5.00	6500	2.00
FLS	2-7000	BLUE		ORANGE		7.00	5.00	7000	2.00
FLS	2-7800	BLUE		ORANGE	GREEN	7.00	5.00	7800	2.00
FLS	2-8200	BLUE		RED	RED	7.00	5.00	8200	2.00
FLS	2-9000	BLUE		RED	GREEN	7.00	5.00	9000	2.00

2-4000/9000 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
2-4000/9000 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE

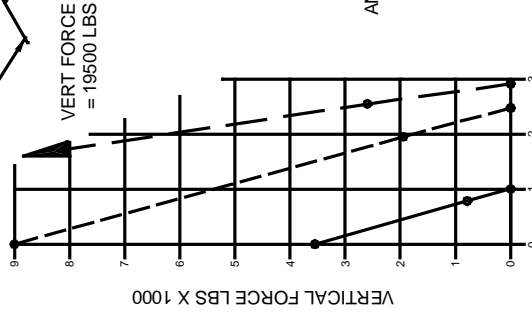


IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM K_x/K_y RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION



HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

- WELDED TO STEEL
- - - THROUGH BOLTED
- _____ ANCHORED TO CONCRETE

FLS Submittal Drawings

DRAWING #S-01-22.23 – FLS 2-4000/9000

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DOCUMENT:

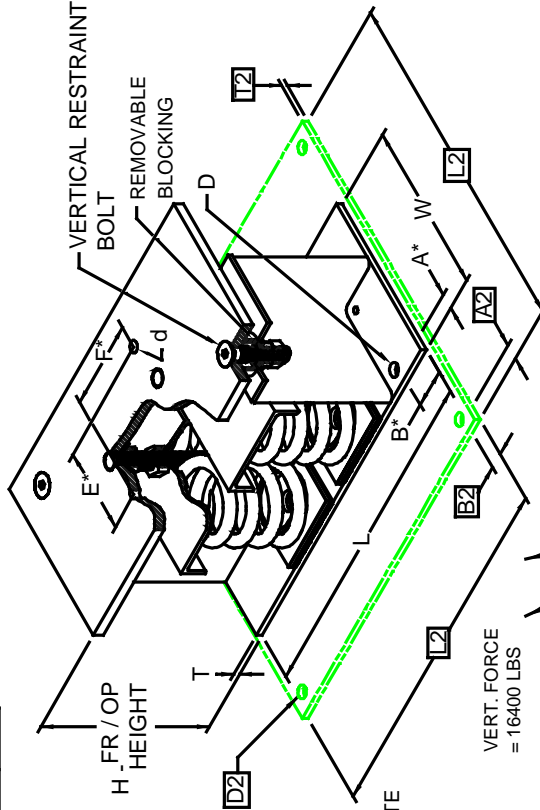
P3.2.2-6



FLS 2" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
2-8000/18000	21.50	11.00	0.38	1.50	1.50	1.06	5.50	5.50	0.69	11.00

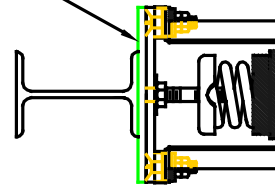
A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



STANDARD RATINGS	TYPE	SIZE	COLOR		FREE HT.		RATED	
			OUTER	INNER1	INNER2	O.D.	LOAD	DEFL.
FLS 2-8000	2-8000	ORANGE			7.00	5.00	8000	2.00
FLS 2-10000	2-10000	BLUE			7.00	5.00	10000	2.00
FLS 2-11000	2-11000	BLUE		BLUE	7.00	5.00	11000	2.00
FLS 2-12100	2-12100	BLUE		GREEN	7.00	5.00	12100	2.02
FLS 2-13000	2-13000	BLUE		BLACK	7.00	5.00	13000	2.00
FLS 2-14000	2-14000	BLUE		ORANGE	7.00	5.00	14000	2.00
FLS 2-15600	2-15600	BLUE		ORANGE	7.00	5.00	15600	2.00
FLS 2-16400	2-16400	BLUE		RED	7.00	5.00	16400	2.00
FLS 2-18000	2-18000	BLUE		RED	7.00	5.00	18000	2.00

2-8000/18000 REQUIRES 0.75 DIA. x 4.75 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
2-8000/18000 ANCHOR BOLT TORQUE - 150 FT-LB, PULL TEST - 3625 LB

IF EQUIP SUPPORT STEEL IS 90° TO THE LONG ISOLATOR AXIS, AN ADD'L PLATE EQUAL IN THICKNESS TO THE TOP PLATE IS REQUIRED



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEMENT NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50 %.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION



- WELDED TO STEEL
- - - THROUGH BOLTED
- _____ ANCHORED TO CONCRETE

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLS Submittal Drawings

DRAWING #S-01-22.24 – FLS 2-8000/18000

RELEASE DATE: 02/01/05



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DOCUMENT:
P3.2.2-7
VISCMA MEMBER

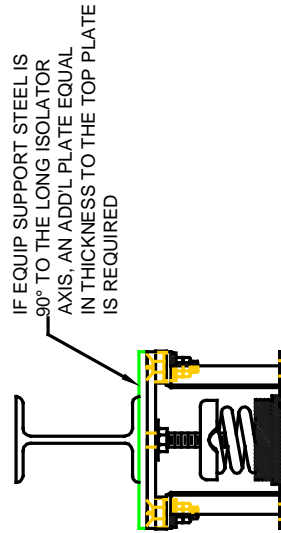
FLS 4" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
4-100/1600	10.75	6.00	0.25	0.75	0.75	0.69	2.75	2.75	0.56	13.00

STANDARD RATINGS	TYPE	SIZE	SPRING COIL			RATED LOAD	DEFL.
			COLOR	O.D.	HT.		
FLS	4-100	GRAY	5.63	10.00	100	4.00	
FLS	4-250	BLUE	5.63	10.00	250	4.00	
FLS	4-500	GREEN	5.63	10.00	500	4.00	
FLS	4-750	BLACK	5.63	10.00	750	4.00	
FLS	4-1000	RED	5.63	10.00	1000	4.00	
FLS	4-1250	BROWN	5.63	10.00	1250	4.00	
FLS	4-1600	ORANGE	5.63	10.00	1600	4.00	

4-100/1600 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

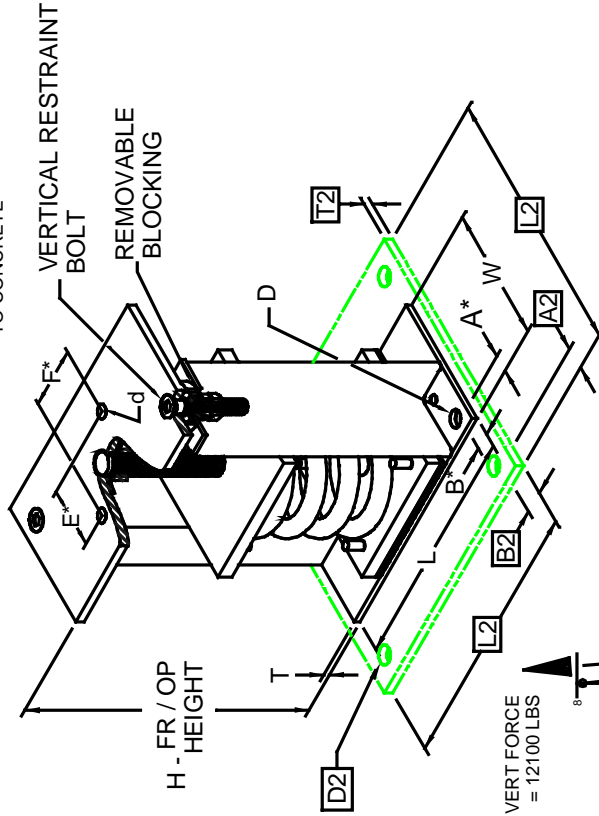
4-100/1600 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB



SPECIFICATIONS:

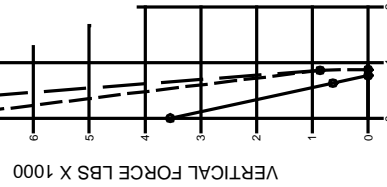
- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

VERT FORCE = 12100 LBS



HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLS Submittal Drawings

DRAWING #S-01-22.41 – FLS 4-100/1600

RELEASE DATE: 02/01/05



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DOCUMENT:
P3.2.2-8
 VISCMA MEMBER

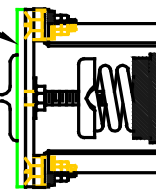
FLS 4" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
4-2250/5800	15.50	8.00	0.25	0.75	1.75	0.69	5.50	5.50	0.69	14.88

STANDARD RATINGS	TYPE	SIZE	COLOR		FREE		RATED	
			OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLS	4-2250	BEIGE	BEIGE	BLUE	11.50	8.00	2250	4.00
FLS	4-2500	BEIGE	BEIGE	BLUE	11.50	8.00	2500	4.00
FLS	4-2750	BEIGE	BEIGE	GREEN	11.50	8.00	2750	4.00
FLS	4-3000	BEIGE	BEIGE	BLACK	11.50	8.00	3000	4.00
FLS	4-3250	BEIGE	BEIGE	RED	11.50	8.00	3250	4.00
FLS	4-3500	BEIGE	BEIGE	BROWN	11.50	8.00	3500	4.00
FLS	4-3850	BEIGE	BEIGE	ORANGE	11.50	8.00	3850	4.00
FLS	4-4200	CHROME	CHROME		11.50	8.00	4200	4.00
FLS	4-4450	CHROME	BLUE		11.50	8.00	4450	4.00
FLS	4-4700	CHROME	GREEN		11.50	8.00	4700	4.00
FLS	4-4950	CHROME	BLACK		11.50	8.00	4950	4.00
FLS	4-5200	CHROME	RED		11.50	8.00	5200	4.00
FLS	4-5450	CHROME	BROWN		11.50	8.00	5450	4.00
FLS	4-5800	CHROME	ORANGE		11.50	8.00	5800	4.00

4-2250/5800 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE
(ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
4-2250/5800 ANCHOR BOLT TORQUE - 75 FT-LB, PULL TEST - 2670 LB

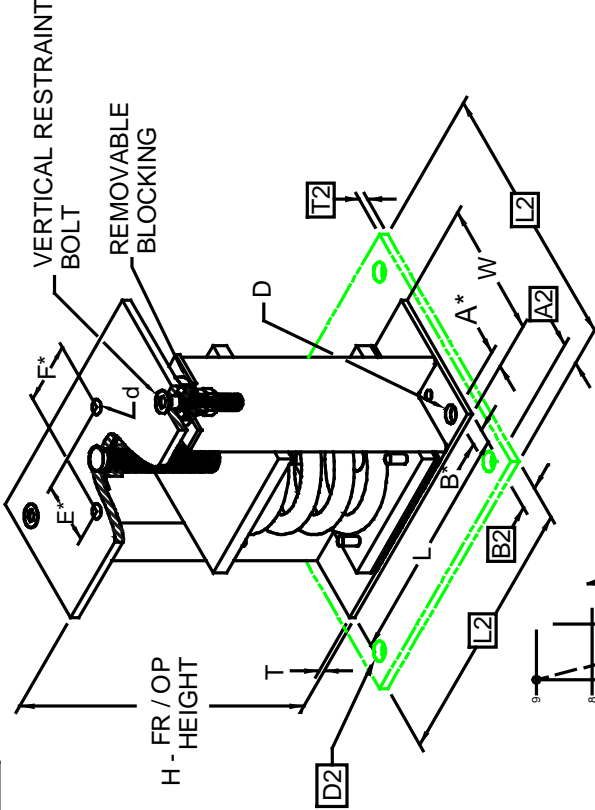
IF EQUIP SUPPORT STEEL IS
90° TO THE LONG ISOLATOR
AXIS, AN ADD'L PLATE EQUAL
IN THICKNESS TO THE TOP PLATE
IS REQUIRED



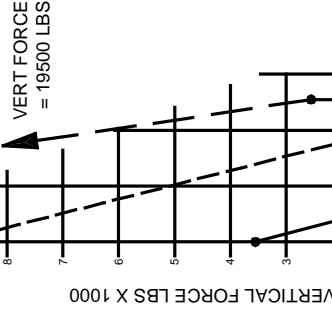
SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE



WELDED TO STEEL ---
THROUGH BOLTED - - -
ANCHORED TO CONCRETE _____

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FLS Submittal Drawings

DRAWING #S-01-22.42 – FLS 4-2250/5800

RELEASE DATE: 02/01/05



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P3.2.2-9
VISCMA MEMBER

FLS 4" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

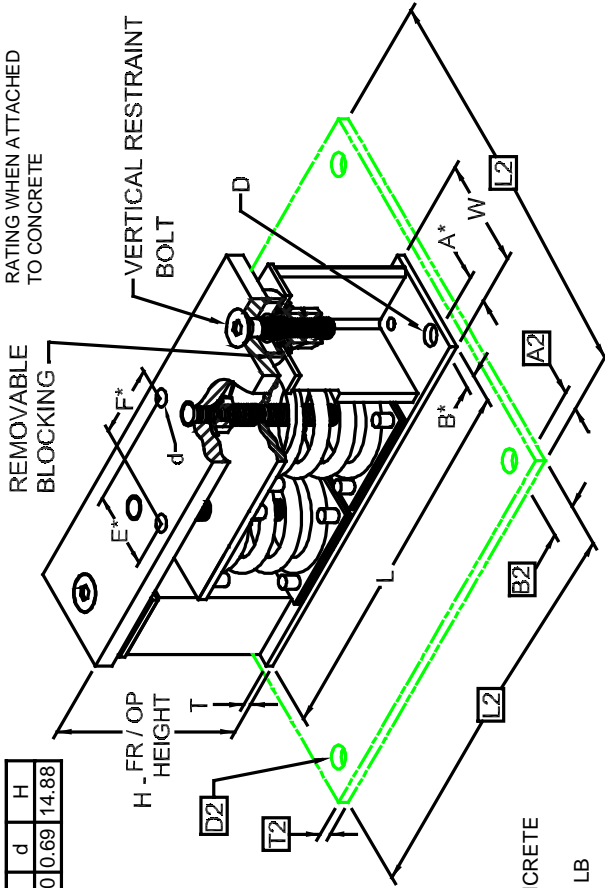
TYPE	L	W	T	A	B	D	E	F	d	H
4-5500/11600	25.50	8.00	0.38	1.13	1.75	0.81	5.50	5.50	0.69	14.88

STANDARD RATINGS	TYPE	SIZE	COLOR		FREE		RATED	
			OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLS	4-5500	BEIGE	GREEN	11.50	8.00	5500	4.00	
FLS	4-6000	BEIGE	BLACK	11.50	8.00	6000	4.00	
FLS	4-6500	BEIGE	RED	11.50	8.00	6500	4.00	
FLS	4-7000	BEIGE	BROWN	11.50	8.00	7000	4.00	
FLS	4-7700	BEIGE	ORANGE	11.50	8.00	7700	4.00	
FLS	4-8400	CHROME		11.50	8.00	8400	4.00	
FLS	4-8900	CHROME	BLUE	11.50	8.00	8900	4.00	
FLS	4-9400	CHROME	GREEN	11.50	8.00	9400	4.00	
FLS	4-9900	CHROME	BLACK	11.50	8.00	9900	4.00	
FLS	4-10400	CHROME	RED	11.50	8.00	10400	4.00	
FLS	4-10900	CHROME	BROWN	11.50	8.00	10900	4.00	
FLS	4-11600	CHROME	ORANGE	11.50	8.00	11600	4.00	

4-5500/11600 REQUIRES 0.62 DIA. x 4.00 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

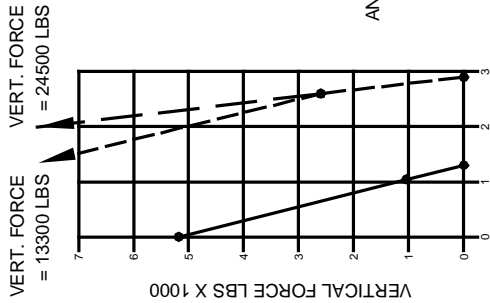
4-5500/11600 ANCHOR BOLT TORQUE - 75 FT-LB; PULL TEST - 2670 LB

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



VERT. FORCE = 13300 LBS
VERT. FORCE = 24500 LBS

*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE



--- WELDED TO STEEL
--- THROUGH BOLTED
--- ANCHORED TO CONCRETE

HORIZONTAL FORCE LBS X 1000

Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.



SPECIFICATIONS:

- VERTICALLY AND Laterally RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

FLS Submittal Drawings

DRAWING #S-01-22.43 – FLS 4-5500/11600

RELEASE DATE: 02/01/05



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DOCUMENT:
P3.2.2-10
VISCMA MEMBER

FLS 4" DEFLECTION ISOLATOR
IP UNITS (INCHES AND POUNDS)

TYPE	L	W	T	A	B	D	E	F	d	H
4-11000/23200	27.00	17.00	0.75	1.00	1.00	0.81	9.00	9.00	0.69	15.00

STANDARD RATINGS	TYPE	SIZE	COLOR		FREE SPRING COIL		RATED	
			OUTER	INNER	HT.	O.D.	LOAD	DEFL.
FLS	4-11000	GREEN	BEIGE	GREEN	11.50	8.00	11000	4.00
FLS	4-12000	BLACK	BEIGE	BLACK	11.50	8.00	12000	4.00
FLS	4-13000	RED	BEIGE	RED	11.50	8.00	13000	4.00
FLS	4-14000	BROWN	BEIGE	BROWN	11.50	8.00	14000	4.00
FLS	4-15400	ORANGE	BEIGE	ORANGE	11.50	8.00	15400	4.00
FLS	4-16800	CHROME	CHROME	BLUE	11.50	8.00	16800	4.00
FLS	4-17800	CHROME	CHROME	BLUE	11.50	8.00	17800	4.00
FLS	4-18800	CHROME	CHROME	GREEN	11.50	8.00	18800	4.00
FLS	4-19800	CHROME	CHROME	BLACK	11.50	8.00	19800	4.00
FLS	4-20800	CHROME	CHROME	RED	11.50	8.00	20800	4.00
FLS	4-21800	CHROME	CHROME	BROWN	11.50	8.00	21800	4.00
FLS	4-23200	CHROME	CHROME	ORANGE	11.50	8.00	23200	4.00

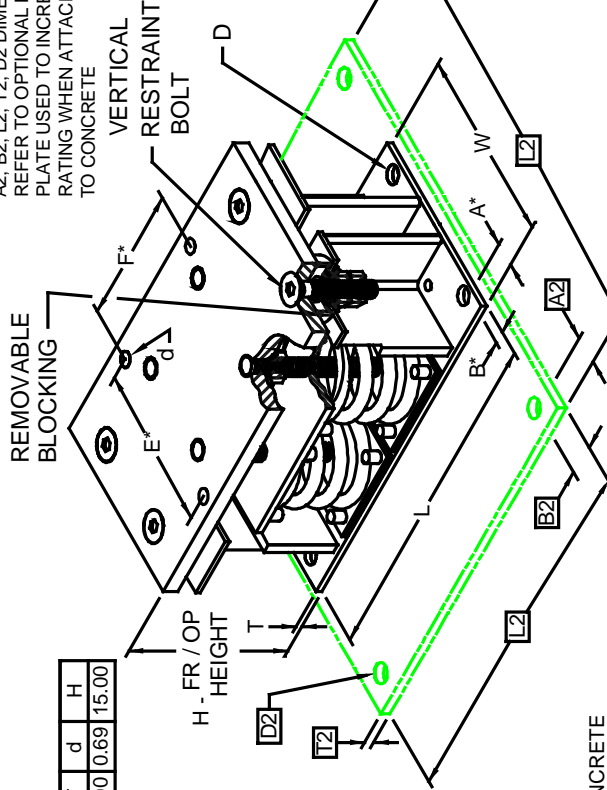
4-11000/23200 REQUIRES 0.75 DIA. x 4.75 MIN. EMBED ANCHORS IN CONCRETE (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
4-11000/23200 ANCHOR BOLT TORQUE - 150 FT-LB, PULL TEST - 3625 LB



SPECIFICATIONS:

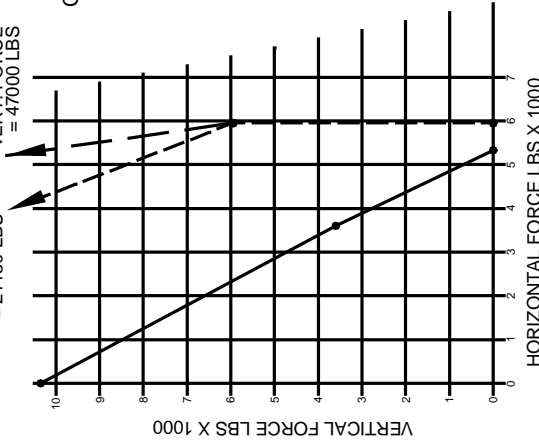
- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- MINIMUM COIL OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- HOUSINGS MAY BE USED FOR BLOCKING DURING EQUIPMENT ERECTION

A2, B2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASE-PLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



VERT. FORCE = 21150 LBS

VERT. FORCE = 47000 LBS



Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

- WELDED TO STEEL
- - - THROUGH BOLTED
- _____ ANCHORED TO CONCRETE

*ALL MOUNTING BOLT PATTERNS SYMMETRICAL ABOUT ISOLATOR CENTER-LINE

FLS Submittal Drawings

DRAWING #S-01-22.44 – FLS 4-11000/23200

RELEASE DATE: 02/01/05



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DOCUMENT:
P3.2.2-11
VISCMA MEMBER

FHS 1" DEFLECTION SEISMIC ISOLATOR

TYPE	L	W	H	D	Z	T	A	E
1-35/805	7.32	3.00	5.86	0.44	0.50	0.38	0.69	1.50
1-250/2200	9.56	5.00	7.36	0.81	0.62	0.38	0.88	2.50
1-2465/3500	9.56	5.00	7.36	0.81	0.62	0.38	0.88	2.50

I-P UNITS (INCHES AND POUNDS)

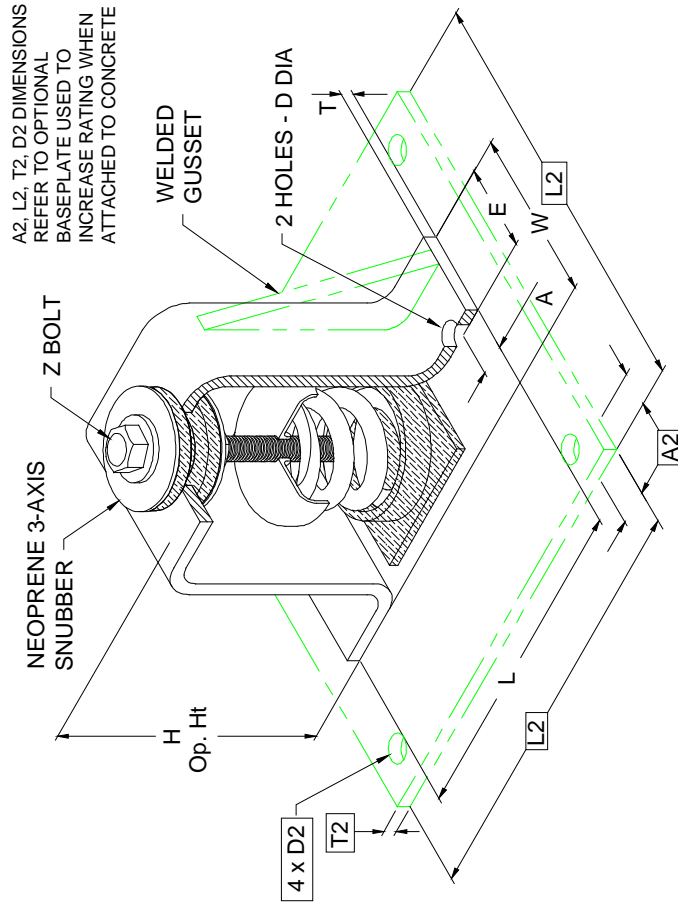
STANDARD RATINGS		COIL	NOMINAL FREE HT	O.D.	CAPACITY
TYPE	SIZE				
1-35/805	1-35	BLUE	3.00	1.75	35
	1-70	GREEN	3.00	1.75	70
	1-120	GRAY	3.00	1.75	120
	1-220	BROWN	3.00	1.75	220
	1-370	ORANGE	3.00	1.75	370
	1-500	BEIGE	3.00	1.75	500
	1-600	CHROME	3.00	1.75	600
	1-700	BGE/WHT	3.00	1.75	700
	1-805	CHR/WHT	3.00	1.75	800
1-250/2200	1-250	BLUE	4.00	3.00	250
	1-450	GREEN	4.00	3.00	450
	1-625	BLACK	4.00	3.00	625
	1-800	GRAY	4.00	3.00	800
	1-1000	RED	4.00	3.00	1000
	1-1250	BROWN	4.00	3.00	1250
	1-1700	ORANGE	4.00	3.00	1700
	1-2200	ORG/GRY	4.00	3.00	2200
1-2465/3500 *	1-2465	BLUE	4.00	3.00	2465
	1-2865	BLU/GRY	4.00	3.00	2865
	1-3500	BLU/BRN	4.00	3.00	3500

* INCLUDES WELDED GUSSET AS SHOWN

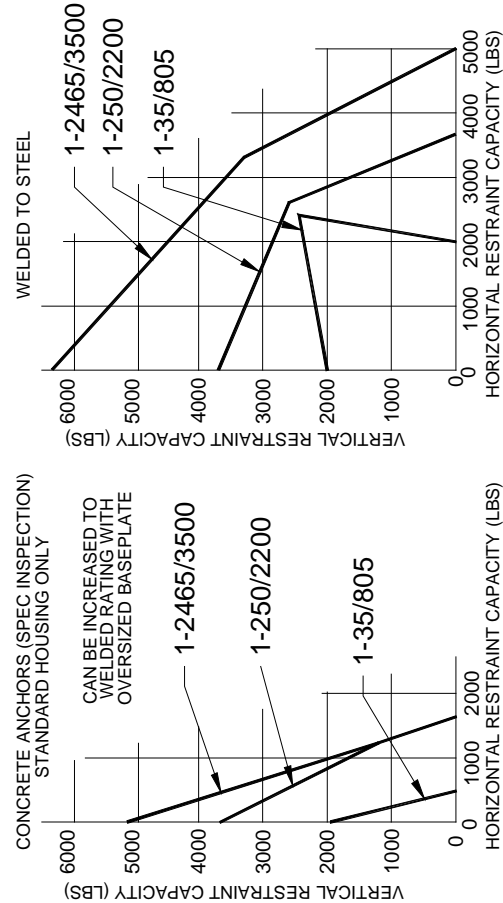
1-35/805 REQUIRES 0.38 DIA x 2.50 MIN EMBED ANCHORS IN CONCRETE
 1-250/3500 REQUIRES 0.75 DIA x 4.75 MIN EMBED ANCHORS IN CONCRETE
 (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
 1-35/805 ANCHOR BOLT TORQUE - 25 FT LB, PULL TEST - 1210 LB
 1-250/3500 ANCHOR BOLT TORQUE - 150 FT LB, PULL TEST - 3625 LB

SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- 0.25 NOMINAL CLEARANCE IN SNUBBING ELEMENTS.
- MINIMUM OVERLOAD OF 50%.
- MINIMUM K_v/K_y RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- OSHPD APPROVAL NUMBER R-0433



A2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASEPLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FHS Submittal Drawings

DRAWING # S-01.35-1A – FHS 1-35/805 1-250/2200 1-2465/3500

RELEASE DATE: 11/3/03



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DOCUMENT:
P3.2.3-1

FHS 2" DEFLECTION SEISMIC ISOLATOR

TYPE	L	W	H	D	Z	T	A	E
2-100/1600	10.38	5.00	8.72	0.69	0.50	0.50	0.75	2.50
2-1975	10.38	5.00	8.72	0.69	0.50	0.50	0.75	2.50
2-2000/4500	11.50	6.00	11.13	1.06	0.75	0.50	0.88	3.00

I-P UNITS (INCHES AND POUNDS)

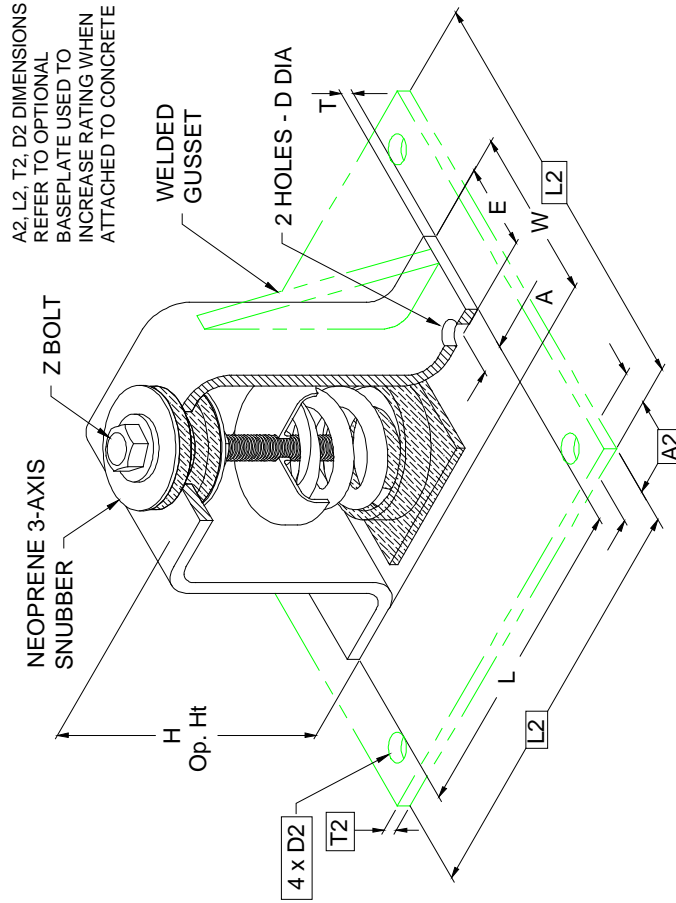
STANDARD RATINGS		COIL	NOMINAL FREE HT	O.D.	CAPACITY
TYPE	SIZE				
2-100/1600	2-100	GRAY	5.75	3.50	100
	2-250	BLUE	5.75	3.50	250
	2-500	GREEN	5.75	3.50	500
	2-750	BLACK	5.75	3.50	750
	2-995	ORANGE	5.75	3.50	995
	2-1400	ORG/GRN	5.75	3.50	1400
	2-1600	RED	5.75	3.50	1600
2-1975 *	2-1975	RED/GRN	5.75	3.50	1975
2-2000/4500*	2-2000	ORANGE	7.00	5.00	2000
	2-2500	BLUE	7.00	5.00	2500
	2-2750	BLU/BLU	7.00	5.00	2750
	2-3025	BLU/GRN	7.00	5.00	3025
	2-3500	BLU/ORG	7.00	5.00	3500
	2-3900	BLU/ORG/GRN	7.00	5.00	3900
	2-4100	BLU/RED	7.00	5.00	4100
	2-4500	BLU/RED/GRN	7.00	5.00	4500

* INCLUDES WELDED GUSSET AS SHOWN

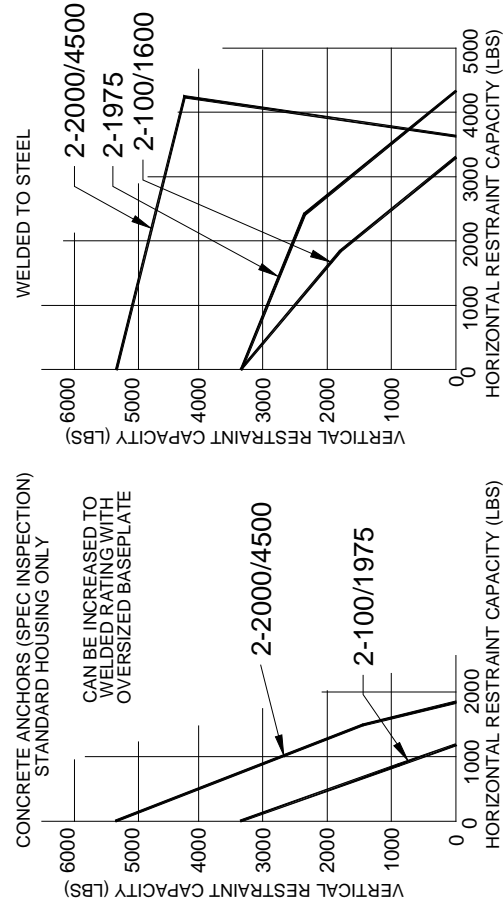
2-100/1975 REQUIRES 0.62 DIA x 4.0 MIN EMBED ANCHORS IN CONCRETE
 2-2000/4500 REQUIRES 1.0 DIA x 6.0 MIN EMBED ANCHORS IN CONCRETE
 (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)
 2-100/1975 ANCHOR BOLT TORQUE - 75 FT LB, PULL TEST - 2670 LB
 2-2000/4500 ANCHOR BOLT TORQUE - 200 FT LB, PULL TEST - 5310 LB

SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- 0.25 NOMINAL CLEARANCE IN SNUBBING ELEMENTS.
- MINIMUM OVERLOAD OF 50%.
- MINIMUM K_v/K_y RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- OSHPD APPROVAL NUMBER R-0433



A2, L2, T2, D2 DIMENSIONS REFER TO OPTIONAL BASEPLATE USED TO INCREASE RATING WHEN ATTACHED TO CONCRETE



Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FHS Submittal Drawings

DRAWING # S-01.35-2A – FHS 2-100/1600 2-1975 2-2000/4500

RELEASE DATE: 11/3/03



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DOCUMENT:

P3.2.3-2



FHS 4" DEFLECTION SEISMIC ISOLATOR

TYPE	L	W	H	D	Z	T	A	E
4-100/1600	12.25	7.00	13.85	0.69	0.62	0.50	0.81	3.50
4-2250/5800	14.76	10.00	16.00	1.06	0.88	0.50	0.94	5.00

I-P UNITS (INCHES AND POUNDS)

STANDARD RATINGS		COIL	NOMINAL FREE HT	O.D.	CAPACITY
TYPE	SIZE				
4-100/1600	4-100	GRAY	10.00	5.63	100
	4-250	BLUE	10.00	5.63	250
	4-500	GREEN	10.00	5.63	500
	4-750	BLACK	10.00	5.63	750
	4-1000	RED	10.00	5.63	1000
	4-1250	BROWN	10.00	5.63	1250
	4-1600	ORANGE	10.00	5.63	1600
2-2250/5800 *	4-2250	BEIGE	11.50	8.00	2250
	4-2500	BGE/BLU	11.50	8.00	2500
	4-2750	BGE/GRN	11.50	8.00	2750
	4-3000	BGE/BLK	11.50	8.00	3000
	4-3250	BGE/RED	11.50	8.00	3250
	4-3500	BGE/BRN	11.50	8.00	3500
	4-3850	BGE/ORG	11.50	8.00	3850
	4-4200	CHROME	11.50	8.00	4200
	4-4450	CHR/BLU	11.50	8.00	4450
	4-4700	CHR/GRN	11.50	8.00	4700
	4-4950	CHR/BLK	11.50	8.00	4950
	4-5200	CHR/RED	11.50	8.00	5200
	4-5450	CHR/BRN	11.50	8.00	5450
	4-5800	CHR/ORG	11.50	8.00	5800

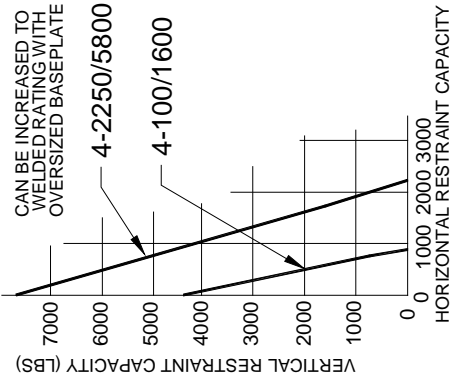
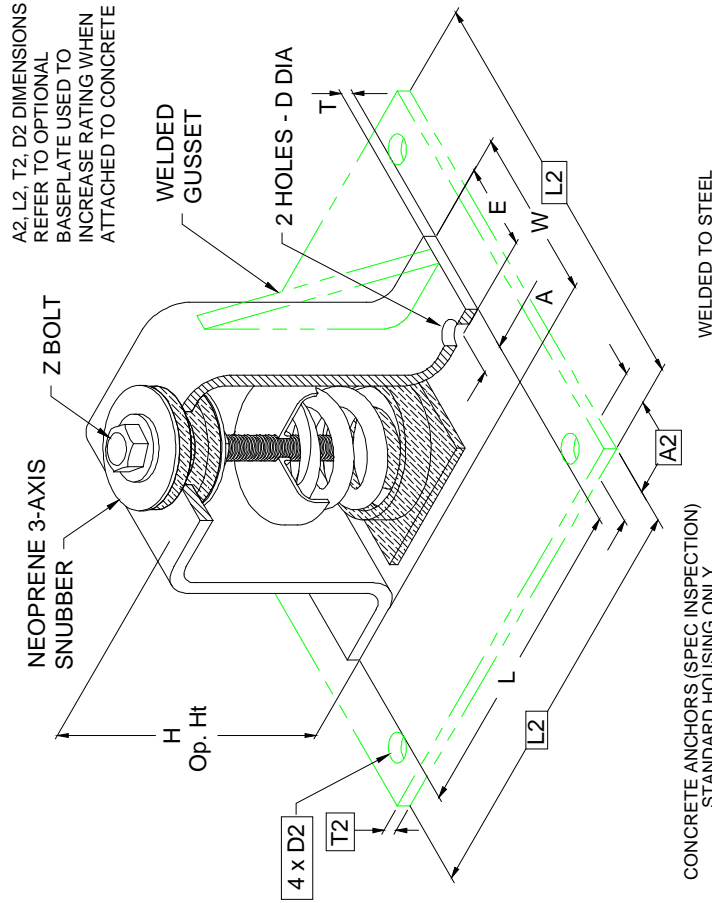
* INCLUDES WELDED GUSSET AS SHOWN

4-100/1600 REQUIRES 0.62 DIA x 4.0 MIN EMBED ANCHORS IN CONCRETE
 4-2250/5800 REQUIRES 1.0 DIA x 9.0 MIN EMBED ANCHORS IN CONCRETE
 (ALLOWABLE LOADS BASED ON 3000 PSI MIN CONCRETE)

4-100/1600 ANCHOR BOLT TORQUE - 75 FT LB, PULL TEST - 2670 LB
 4-2250/5800 ANCHOR BOLT TORQUE - 200 FT LB, PULL TEST - 5310 LB

SPECIFICATIONS:

- VERTICALLY AND LATERALLY RESTRAINED SPRING ISOLATOR WITH CONSTANT FREE AND OPERATING HEIGHT AND REPLACEABLE NEOPRENE SNUBBING ELEMENTS.
- 0.25 NOMINAL CLEARANCE IN SNUBBING ELEMENTS.
- MINIMUM OVERLOAD OF 50%.
- MINIMUM Kx/Ky RATIO OF 1.0.
- ALL ELEMENTS SAFE AT SOLID LOADING.
- POWDER COATED COILS AND HOT DIPPED GALVANIZED BRACKET
- OSHPD APPROVAL NUMBER R-0433



Computed horiz and vert seismic load combinations must fall within the restraint capacity envelope. Contact KNC for bolted to steel data.

FHS Submittal Drawings

DRAWING # S-01.35-3A – FHS 4-100/1600 4-2250/5800

RELEASE DATE: 11/3/03



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DOCUMENT:
P3.2.3-3

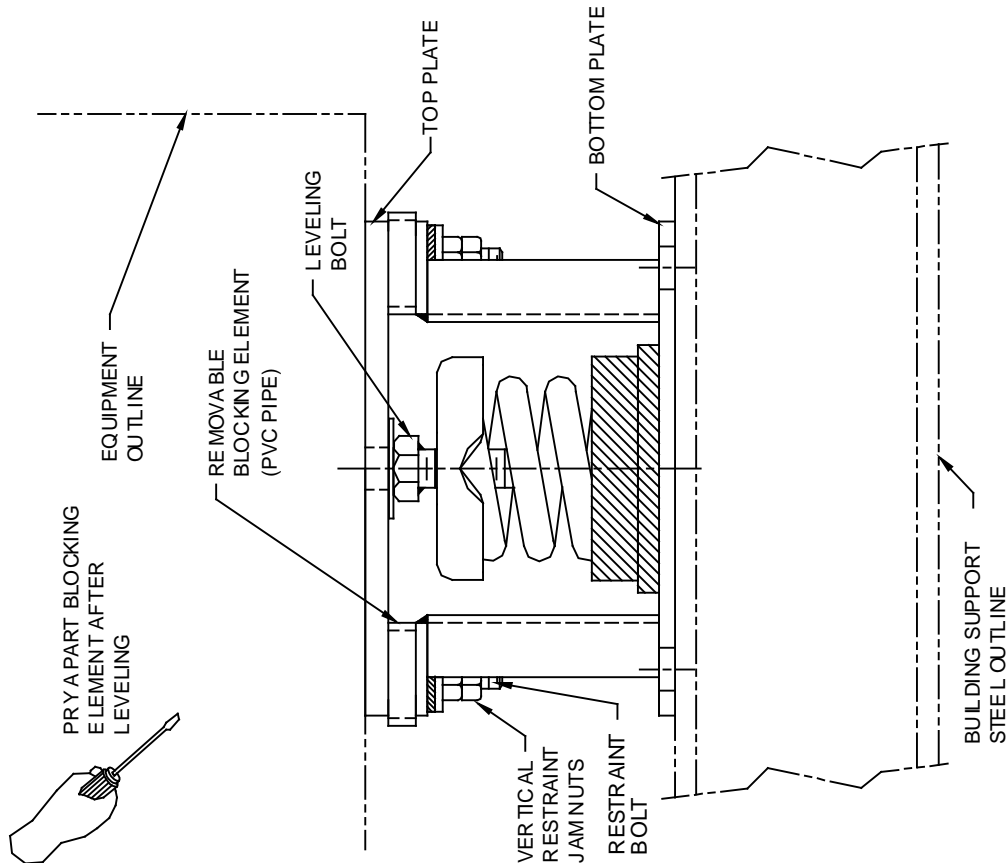
INSTALLATION INSTRUCTIONS

KINETICS MODEL (FLS & FLSS) SPRING ISOLATOR

NOTE:

KINETICS NOISE CONTROL SUGGESTS THAT MODEL FLS & FLSS ISOLATORS BE ON THE JOBSITE PRIOR TO ARRIVAL OF THE EQUIPMENT.

1. COORDINATE THE LOCATION OF EACH ISOLATOR WITH THE APPROPRIATE SUBMITTAL DRAWING AND WITH THE COLOR CODE CHART PROVIDED FOR THE SPRINGS.
2. PLACE THE ISOLATORS IN THEIR PROPER LOCATION AND ATTACH BOTTOM PLATE TO THE BUILDING SUPPORT STEEL.
3. SET THE EQUIPMENT FOOT, BRACKET OR SUPPORT STEEL ON TOP OF THE ISOLATORS AND ATTACH TO THE FLS TOP PLATE PER PROJECT SPECIFICATIONS.
4. LOOSEN THE VERTICAL RESTRAINT JAM NUTS TO THE END OF THE RESTRAINT BOLTS.
5. IN TURN, ROTATE THE LEVELING BOLTS COUNTER-CLOCKWISE SEVERAL COMPLETE TURNS ON EACH ISOLATOR UNTIL THE BLOCKING ELEMENT CAN BE REMOVED BY PRYING APART WITH A SCREWDRIVER. IT WILL BE NECESSARY TO MAKE SEVERAL CIRCUITS OF THE ISOLATORS IN ORDER TO UNIFORMLY RAISE THE EQUIPMENT. DO NOT ATTEMPT TO PLACE ALL THE WEIGHT ON ANY ONE ISOLATOR, THIS MAY RESULT IN DAMAGE TO THE ISOLATOR.
6. DO NOT ATTEMPT TO MOVE ISOLATORS Laterally WITH THE WEIGHT OF THE EQUIPMENT ON THEM. IF IT IS NECESSARY TO MOVE THE EQUIPMENT, REMOVE THE EQUIPMENT FROM THE ISOLATORS FIRST. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN DAMAGE TO THE ISOLATORS.
7. WHEN THE EQUIPMENT IS LEVEL PER THE EQUIPMENT MANUFACTURER'S TOLERANCE, TIGHTEN THE VERTICAL RESTRAINING NUTS FINGER TIGHT, THE BACK OFF ONE FULL TURN. LOCK THE BOLTS WITH JAM NUTS PROVIDED.
8. DISCARD ALL BLOCKING ELEMENTS.



FLSS / FLS Installation Instructions

Drawing # SS-900915

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INSTALLATION INSTRUCTIONS FOR TYPE FHS KINETICS SPRING ISOLATION MOUNT

1. COORDINATE THE LOCATION OF EACH ISOLATOR WITH THE APPROPRIATE SUBMITTAL DRAWING.
2. REMOVE THE ATTACHMENT BOLT AND ONE WASHER FROM THE TOP OF THE LEVELING NUT. INSERT IT INTO THE EQUIPMENT BRACKET (IT IS NOT NECESSARY TO INSTALL THE SPRING AT THIS POINT)
3. ALIGN THE EQUIPMENT AND CENTER THE ISOLATOR

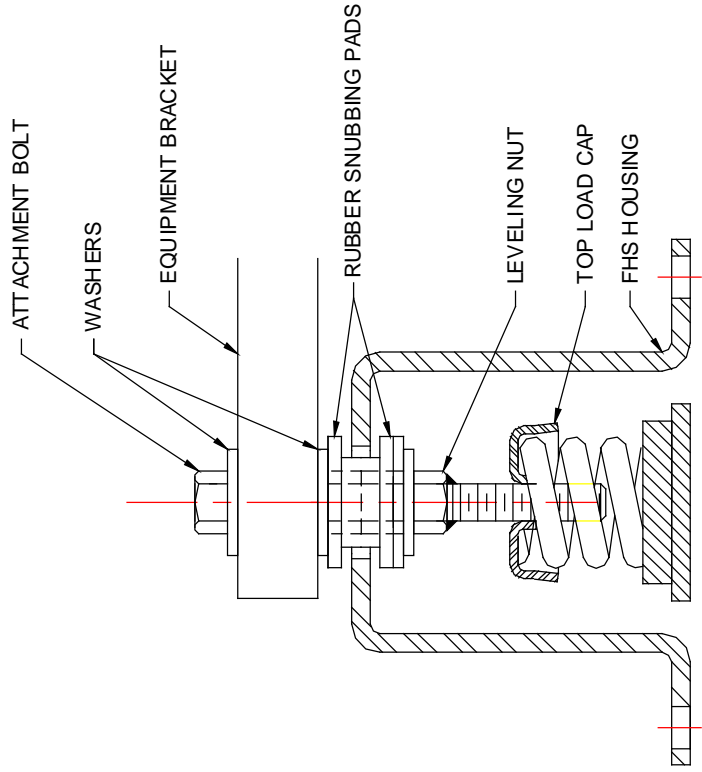
4. RAISE THE EQUIPMENT OR EQUIPMENT BASE AND INSTALL THE ISOLATOR ANCHORS IN THE FLOOR.
5. LOCATE THE SPRINGS AND LOWER THE EQUIPMENT. NOTE

6. INSTALL ANCHOR NUTS TO FIRMLY ATTACH THE FHS HOUSING TO THE FLOOR OR HOUSEKEEPING PAD.
7. LOOSELY BOLT EQUIPMENT TO THE ISOLATOR USING THE ATTACHMENT BOLT.

8. ADJUST THE ISOLATOR BY TURNING THE LEVELING NUT CCW UNTIL THE FHS HOUSING TOP PLATE IS CENTERED BETWEEN THE RUBBER SNUBBING PADS ON THE LEVELING SCREW.

9. IN A SIMILAR MANNER, CONTINUE WITH THE ADJUSTMENT OF THE REMAINING ISOLATORS.
10. TIGHTEN THE ADJUSTMENT BOLT, THUS BOLTING THE SPRING TO THE SUPPORTED EQUIPMENT AND LOCKING THE LEVELING BOLT AGAINST TURNING

11. DO NOT ATTEMPT TO MOVE THE ISOLATORS LATERALLY WITH THE WEIGHT OF THE EQUIPMENT ON THEM. IF IT IS NECESSARY TO MOVE THE EQUIPMENT, REMOVE THE WEIGHT FROM THE ISOLATORS BY RAISING THE EQUIPMENT BEFORE MOVING.



INSTALLATION
DRAWING

FHS Installation Instructions

Drawing # SS-960892

RELEASE DATE: 11/3/03



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