



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR HCAI PREAPPROVAL OF  
MANUFACTURER'S CERTIFICATION (OPM)

OFFICE USE ONLY

APPLICATION #: OPM-0524

HCAI Preapproval of Manufacturer's Certification (OPM)

Type:  New  Renewal/Update

Manufacturer Information

Manufacturer: TCI, LLC

Manufacturer's Technical Representative: James Pomes

Mailing Address: W132 N10611 Grant Drive, Germantown, WI 53022

Telephone: (414) 357-2774

Email: jpomes@transcoil.com

Product Information

Product Name: HSD Harmonic Shield Passive Harmonic Filter

Product Type: Enclosed Passive Harmonic Electrical Filter

Product Model Number: HSD passive harmonic filters with part numbers ending in S.

General Description: Floor supported cabinets enclosing a passive harmonic filter.

Applicant Information

Applicant Company Name: TCI, LLC

Contact Person: Jesse Schubert

Mailing Address: W132 N10611 Grant Drive, Germantown, WI 53022

Telephone: (414) 357-2786

Email: jschubert@transcoil.com

Title: Sr. Mechanical Designer

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STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY





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**Registered Design Professional Preparing Engineering Recommendations**

Company Name: MRH STRUCTURAL ENGINEERS  
Name: Mohammad Hariri California License Number: S3545  
Mailing Address: 3400 Irvine Ave, Suite 101, Newport Beach, CA 92660  
Telephone: (714) 633-6302 Email: MRH@MRHSE.com

**HCAI Special Seismic Certification Preapproval (OSP)**

Special Seismic Certification is preapproved under OSP OSP Number: \_\_\_\_\_

**Certification Method**

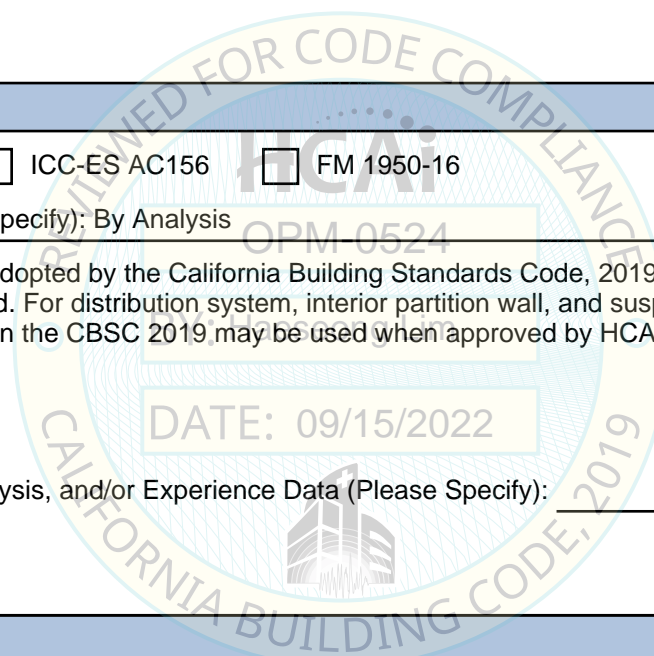
Testing in accordance with:  ICC-ES AC156  FM 1950-16  
 Other(s) (Please Specify): Specify): By Analysis

\*Use of criteria other than those adopted by the California Building Standards Code, 2019 (CBSC 2019) for component supports and attachments are not permitted. For distribution system, interior partition wall, and suspended ceiling seismic bracings, test criteria other than those adopted in the CBSC 2019 may be used when approved by HCAI prior to testing.

Analysis  
 Experience Data  
 Combination of Testing, Analysis, and/or Experience Data (Please Specify): \_\_\_\_\_

**HCAI Approval**

Date: 9/15/2022  
Name: Haeseong Lim Title: Senior Structural Engineer  
Condition of Approval (if applicable): \_\_\_\_\_



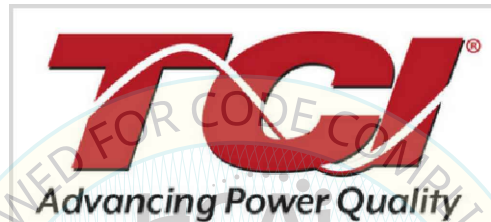
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## HSD, HarmonicShield Drive-Applied Harmonic Filter

OPM-0524

# Seismic Supports & Attachments

CALIFORNIA BUILDING CODE 2019 (CBC 2019)

### Proprietary Design

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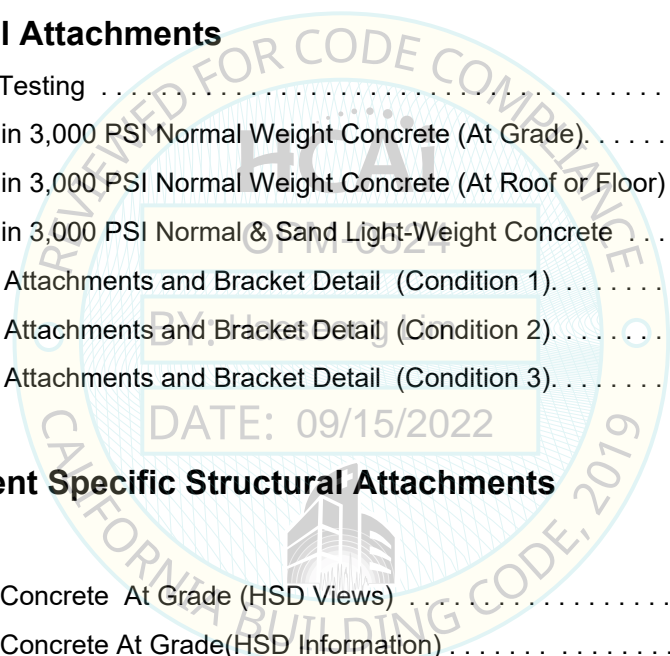
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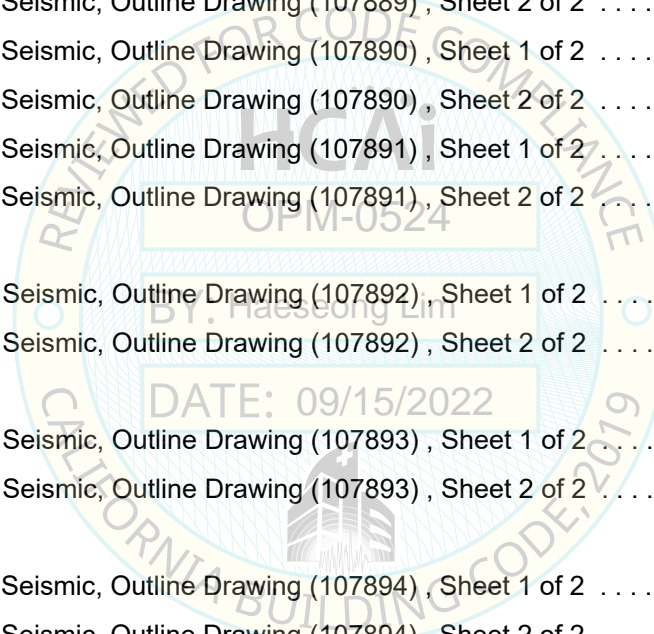
  
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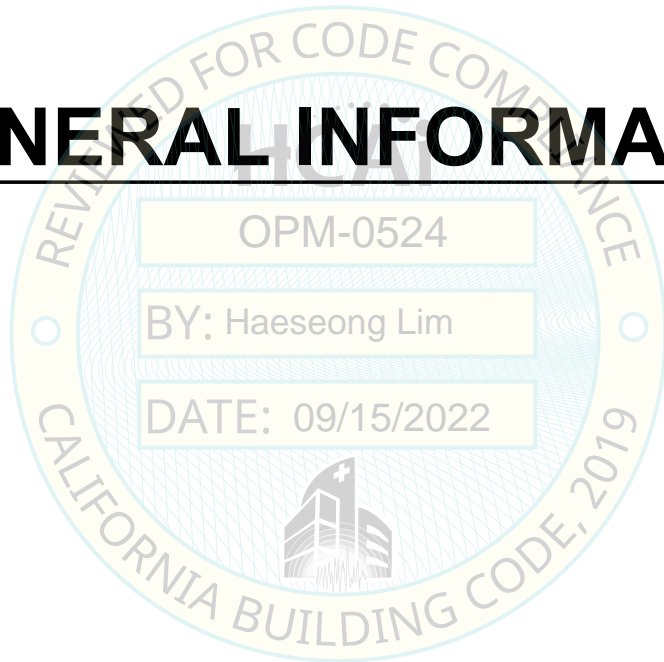
# SECTION 0

# GENERAL INFORMATION

OPM-0524

BY: Haeseong Lim

DATE: 09/15/2022



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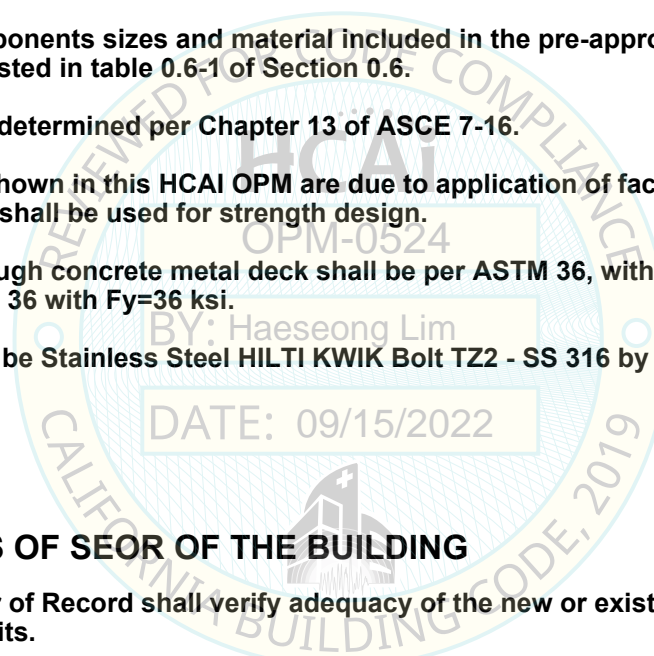
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**GENERAL INFORMATION**

**GENERAL INFORMATION**

**0.1 GENERAL NOTES**


1. This HCAI Preapproval of Manufacturer's Certification (OPM) is based on the CBC 2019. The demand (design forces) for use with this OPM shall be based on the CBC 2019.
2. The substrates included in this pre-approval are as follows:
  - a. Concrete Slab on Grade
  - b. Elevated Concrete Slab
  - c. Concrete Over Metal Deck
3. This pre-approval is for the seismic supports & attachments of the unit to the structure. It does not address other loads.
4. The ranges of components sizes and material included in the pre-approval are per construction drawings that are listed in table 0.6-1 of Section 0.6.
5. Seismic forces are determined per Chapter 13 of ASCE 7-16.
6. All anchor forces shown in this HCAI OPM are due to application of factored vertical and lateral loads per ASCE 7-16 and shall be used for strength design.
7. Bolts installed through concrete metal deck shall be per ASTM 36, with  $F_y=36$ ksi or ASTM F1554 Grade 36 with  $F_y=36$  ksi.
8. Anchor bolts shall be Stainless Steel HILTI KWIK Bolt TZ2 - SS 316 by HILTI, INC (ICC ESR-4266)



**0.2 RESPONSIBILITIES OF SEOR OF THE BUILDING**

1. Structural Engineer of Record shall verify adequacy of the new or existing structure to support the harmonic shield units.
2. Structural Engineer of Record shall provide and/or design additional members to resist the reactions,  $T_U$  and  $V_U$  at the anchor locations.
3. Structural Engineer of Record shall provide design for supporting structure to resist in-plane and out-of-plane anchor forces in any directions in addition to other code required loads and forces.
4. Structural Engineer of Record shall verify that the combination of  $S_{DS}$  &  $Z_h$  result in seismic forces ( $E_h$ ,  $E_v$ ) that are not greater than the values indicated in Section 5.0.

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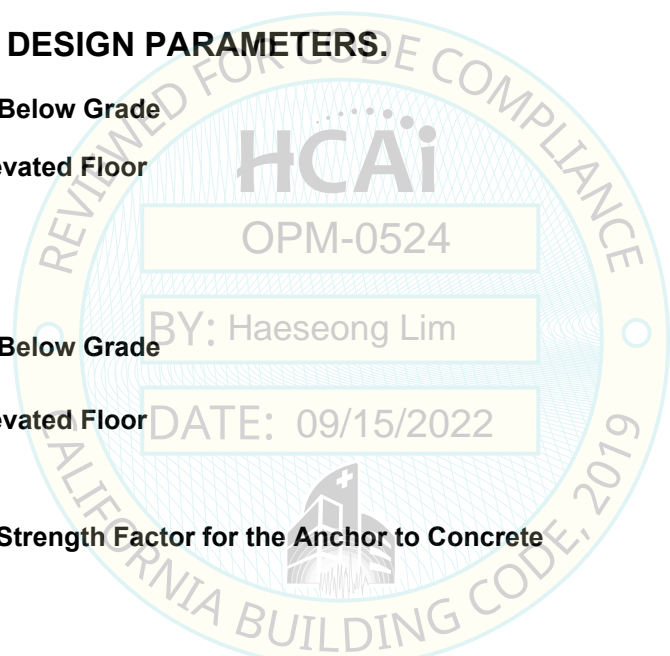
**0.3 BUILDING CODES, STANDARDS, & GUIDELINES**

This pre-approval conforms to the following:

- a. 2019 California Building Code (CBC 2019)
- b. American Society of Civil Engineers (ASCE 7-16)
- c. American Concrete Institute (ACI 318-14)

**0.4 SEISMIC BRACING DESIGN PARAMETERS.**

- a.  $S_{DS} = 2.5$  At or Below Grade  
 $S_{DS} = 2.0$  At Elevated Floor
- b.  $a_p = 2.5$
- c.  $R_p = 6.0$
- d.  $Z/h = 0.0$  At or Below Grade  
 $Z/h \leq 1.0$  At Elevated Floor
- e.  $I_p = 1.5$
- f.  $\Omega_o = 2.0$  Over-Strength Factor for the Anchor to Concrete



**0.5 TOTAL SEISMIC ANCHOR DESIGN FORCES**


**At or Below Grade**

- a. Total Seismic Horizontal Force:  $E_h = 1.13 W_p$  (LRFD)
- b. Total Seismic Vertical Force:  $E_v = 0.5 W_p$  (LRFD)

**At Elevated Floor**

- a. Total Seismic Horizontal Force:  $E_h = 1.50 W_p$  (LRFD)
- b. Total Seismic Vertical Force:  $E_v = 0.4 W_p$  (LRFD)

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**GENERAL INFORMATION**

**GENERAL INFORMATION (CONT.)**

**0.6 COMPONENT CATALOG NUMBER REFERENCE:**

**Table 0.6-1 - Component part number reference:**

Group	Catalog Number <sup>1,2,3,4,5</sup>	Weight (lbs.)	Mounting Flange (in.)		Mounting Flange Hole			Drawings (See Appendix "A")
			FWD <sup>6</sup>	FTH <sup>7</sup>	Locations (in.)		Size (in.)	
					ED <sub>x</sub> <sup>8</sup>	ED <sub>y</sub> <sup>9</sup>	FHD <sup>10</sup>	
<b>A</b>	HSD0003AWX123S	69	1.55	0.075	0.77	2.6	0.406	107886
	HSD0005AWX123S	69	1.55	0.075	0.77	2.6	0.406	107886
	HSD0008AWX123S	88	1.55	0.075	0.77	2.6	0.406	107886
	HSD0010AWX123S	88	1.55	0.075	0.77	2.6	0.406	107886
	HSD0015AWX123S	97	1.55	0.075	0.77	2.6	0.406	107887
	HSD0020AWX123S	102	1.55	0.075	0.77	2.6	0.406	107887
	HSD0025AWX123S	105	1.55	0.075	0.77	2.6	0.406	107887
	HSD0030AWX123S	116	1.55	0.075	0.77	2.6	0.406	107888
	HSD0040AWX123S	161	1.55	0.075	0.77	2.6	0.406	107888
	HSD0050AWX123S	161	1.55	0.075	0.77	2.6	0.406	107888
<b>B</b>	HSD0025AWX123S	105	1.55	0.135	0.77	3.4	0.406	107889
	HSD0030AWX123S	116	1.55	0.135	0.77	3.4	0.406	107889
	HSD0040AWX123S	161	1.55	0.135	0.77	3.4	0.406	107889
	HSD0050AWX123S	161	1.55	0.135	0.77	3.4	0.406	107889
	HSD0060AWX123S	207	1.55	0.135	0.77	3.4	0.406	107889
	HSD0075AWX123S	208	1.55	0.135	0.77	3.4	0.406	107890
	HSD0100AWX123S	262	1.55	0.135	0.77	3.4	0.406	107891
<b>C</b>	HSD0125AWX123S	336	2.25	0.135	1.00	3.4	0.531	107892
	HSD0150AWX123S	385	2.25	0.135	1.00	3.4	0.531	107892
<b>D</b>	HSD0200AWX123S	561	2.25	0.135	1.00	3.1	0.531	107893
	HSD0250AWX123S	563	2.25	0.135	1.00	3.1	0.531	107893
<b>E</b>	HSD0300AWX123S	858	2.25	0.179	1.125	1.7	0.656	107894
	HSD0350AWX123S	901	2.25	0.179	1.125	1.7	0.656	107894
	HSD0400AWX123S	1073	2.25	0.179	1.125	1.7	0.656	107894
	HSD0450AWX123S	1243	2.25	0.179	1.125	1.7	0.656	107894
	HSD0500AWX123S	1254	2.25	0.179	1.125	1.7	0.656	107894
	HSD0600AWX123S	1342	2.25	0.179	1.125	1.7	0.656	107894

**Footnotes:**

1. Position "A" Voltage, can be one of the following: A= 480V, B=240V, C=600V, D=208V, E=380V, H=440, J=415V, K=220V or L=400V
2. Position "X" Enclosure top, can one of the following: 1=Type 1 or 3=Type 3R.
3. Position "1" Contactor, can be one of the following: 0= no contactor, or 1= with contactor.
4. Position "2" Power lugs, can be one of the following: 0= no lugs, or 1= with lugs.
5. Position "3" Communication protocol, can be one of the following: 0=None, 1=Modbus RTU, 2=EtherNet/IP, 3=Current Sense Relay Control, 4=BACnet/IP or 5=Modbus TCP
6. Mounting Flange Width.
7. Mounting Flange Thickness.
8. Edge Distance in the X Direction.
9. Edge Distance in the Y Direction.
10. Edge Distance in the Z Direction.

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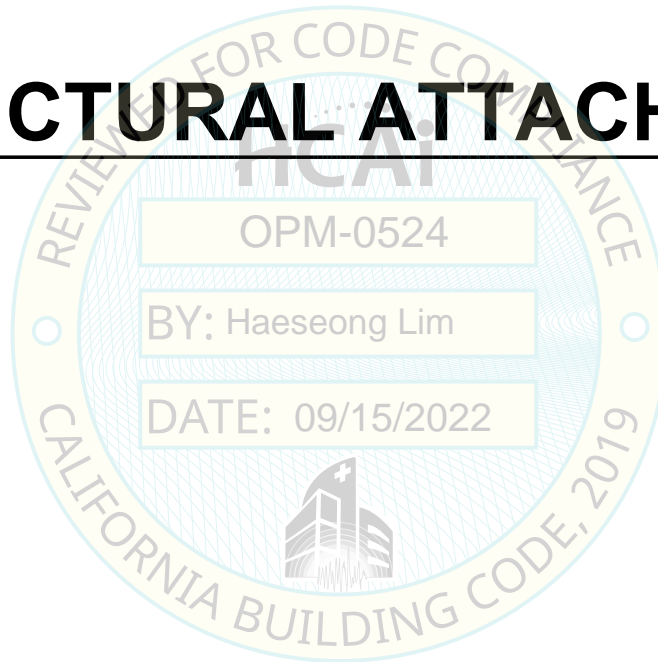
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# SECTION 1

# STRUCTURAL ATTACHMENTS



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## STRUCTURAL ATTACHEMENT

### POST-INSTALLED ANCHOR TESTING

1. All post-installed anchors shall be installed per their corresponding ICC research report.
2. All post-installed anchors shall be tested.
3. Test loads:
  - a. Load testing shall be performed after a minimum 24 hours elapsed since installation.
  - b. 100% of the all anchors shall be tested.

Required test loads shall be per the following Anchor Bolt Test Load Table:

Table 1-1 - Anchor Bolt Test Load Table		
Anchor Bolt (Stainless Steel)	Anchor Dia. (in.)	Installed Torque (ft.-lbs.)
KWIK BOLT TZ2 - SS 316	3/8"	30
KWIK BOLT TZ2 - SS 316	1/2"	40
KWIK BOLT TZ2 - SS 316	5/8"	60

4. Test acceptance criteria: acceptance criteria for post-installed anchors shall be based on ICC-ESR using criteria adopted in the 2019 CBC. Field test shall satisfy following minimum requirements.

Torque wrench method:

Anchors tested with a calibrated torque wrench must attain the specified torque within 1/2 turn of the nut.

Exceptions:

- a. Wedge or sleeve type:  
one quarter (1/4) turn of the nut for 3/8" sleeve anchor only.


5. The tension testing of the post-installed anchors shall be done in the presence of the project inspector and a report of the test results shall be submitted to the inspector of record, owner and the architect or engineer in responsible charge of project per CAC 7-149.

### BOLTS THROUGH CONCRETE METAL DECK REQUIREMENTS

1. Continuous inspection shall be provided for all bolts installed through concrete metal deck.
2. Bolts shall be TORQUED by 3/4 turn of the nuts after the snug tight (the snug-tight condition is defined as the tightness required to bring the connected piles into firm contact) condition is achieved, unless otherwise noted.
3. Through bolt holes shall be 1/16" larger than bolt size (Hole size = Bolt Size + 1/16") for concrete.
4. Through-Bolts in concrete shall receive special inspection and testing (through bolts with steel to steel connection in tension do not require tension testing) in accordance with requirements for post-installed anchors.

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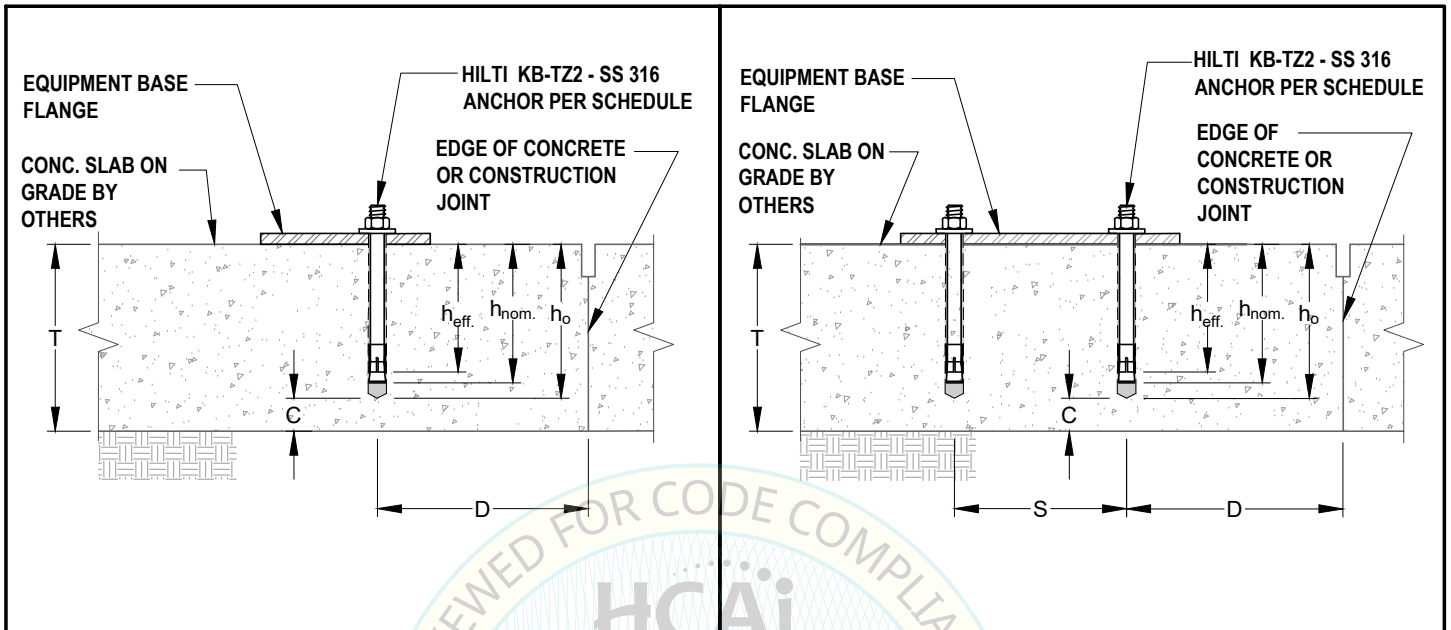
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**HILTI KB-TZ2 - SS 316 WEDGE IN 3,000 PSI NORMAL WEIGHT CONCRETE SLAB (AT GRADE)**




ANCHOR TYPE (STAINLESS STEEL)	ANCHOR DIA. (in)	'h <sub>eff</sub> ' MIN. EFFECTIVE EMBED.	'h <sub>nom</sub> ' NOMINAL EMBED.	'h <sub>o</sub> ' HOLE DEPTH	'C' MIN. COVER	'D' MIN. EDGE DISTANCE	'S' MIN. SPACING BETWEEN ANCHORS	'T' MIN. CONCRETE SLAB THK.	ICC APPROVAL
KWIK BOLT TZ2 - SS 316	3/8	2.5"	3"	3.25"	2"	12"	10"	5.5"	ESR-4266
KWIK BOLT TZ2 - SS 316	1/2	3.25"	3.75"	4.25"	2"	12"	10"	6.5"	ESR-4266
KWIK BOLT TZ2 - SS 316	5/8	4"	4.50"	4.75"	2"	12"	10"	7"	ESR-4266

**NOTES:**

1. KWIK BOLT TZ2 - SS 316 ANCHOR BOLTS SHALL BE INSTALLED IN STONE AGGREGATE CONCRETE HAVING A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT THE TIME OF INSTALLATION FOR ANCHORS IN CRACKED CONCRETE.
2. TORQUE TEST SHALL BE PERFORM FOR 100% THE EXPANSION TYPE ANCHORS AFTER A MINIMUM 24 HOURS HAVE ELAPSED SINCE INSTALLATION.
3. WHEN INSTALLING ANCHORS IN CONCRETE, LOCATE REINFORCING STEEL AND AVOID CUTTING OR DAMAGING REINFORCING STEEL.
4. WHEN INSTALLING ANCHORS IN PRESTRESSED CONCRETE, LOCATE PRESTRESSING STEEL AND AVOID DAMAGING PRESTRESSING STEEL.
5. FULL ENGAGEMENT OF NUTS AND WASHERS SHALL BE PROVIDED.
6. ANCHOR BOLTS, NUTS AND WASHERS SHALL NOT BE USED OR EXPOSED TO CORROSIVE ENVIRONMENTS AND CONDITIONS.

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Structural Engineer: Mohammad Hariri  
California SE No. S3545

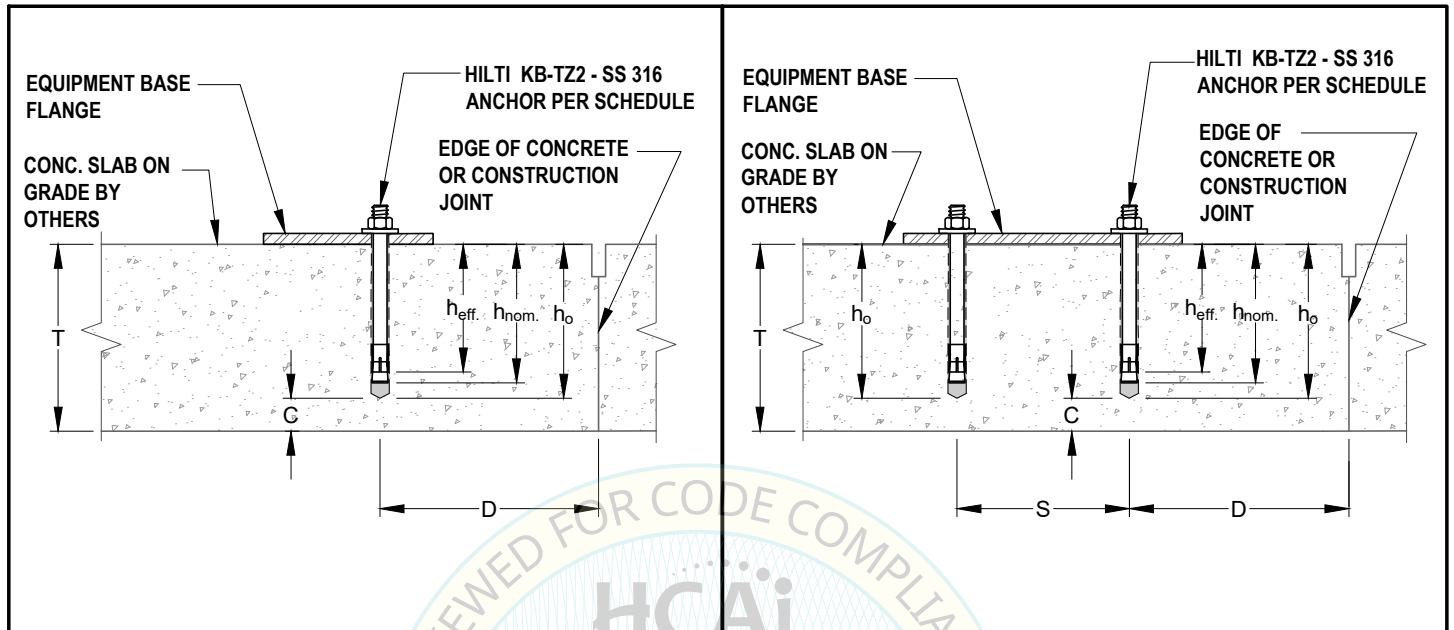
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**HILTI KB-TZ2 - SS 316 WEDGE IN 3,000 PSI NORMAL WEIGHT CONCRETE  
(AT ELEVATED FLOOR)**



ANCHOR TYPE (STAINLESS STEEL)	ANCHOR DIA. (in)	'h <sub>eff</sub> ' MIN. EFFECTIVE EMBED.	'h <sub>nom</sub> ' NOMINAL EMBED.	'h <sub>o</sub> ' HOLE DEPTH	'C' MIN. COVER	'D' MIN. EDGE DISTANCE	'S' MIN. SPACING BETWEEN ANCHORS	'T' MIN. CONCRETE SLAB THK.	ICC APPROVAL
KWIK BOLT TZ2 - SS 316	3/8	2.5"	3"	3.25"	1.75"	12"	10"	5"	ESR-4266
KWIK BOLT TZ2 - SS 316	1/2	3.25"	3.75"	4.25"	1.75"	12"	10"	6"	ESR-4266
KWIK BOLT TZ2 - SS 316	5/8	4"	4.5"	4.75"	1.75"	12"	10"	6.5"	ESR-4266

**NOTES:**

1. KWIK BOLT TZ2 - SS 316 ANCHOR BOLTS SHALL BE INSTALLED IN STONE AGGREGATE CONCRETE HAVING A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT THE TIME OF INSTALLATION FOR ANCHORS IN CRACKED CONCRETE .
2. TORQUE TEST SHALL BE PERFORM FOR 100% THE EXPANSION TYPE ANCHORS AFTER A MINIMUM 24 HOURS HAVE ELAPSED SINCE INSTALLATION.
3. WHEN INSTALLING ANCHORS IN CONCRETE, LOCATE REINFORCING STEEL AND AVOID CUTTING OR DAMAGING REINFORCING STEEL.
4. WHEN INSTALLING ANCHORS IN PRESTRESSED CONCRETE, LOCATE PRESTRESSING STEEL AND AVOID DAMAGING PRESTRESSING STEEL.
5. FULL ENGAGEMENT OF NUTS AND WASHERS SHALL BE PROVIDED.
6. ANCHOR BOLTS, NUTS AND WASHERS SHALL NOT BE USED OR EXPOSED TO CORROSIVE ENVIRONMENTS AND CONDITIONS.

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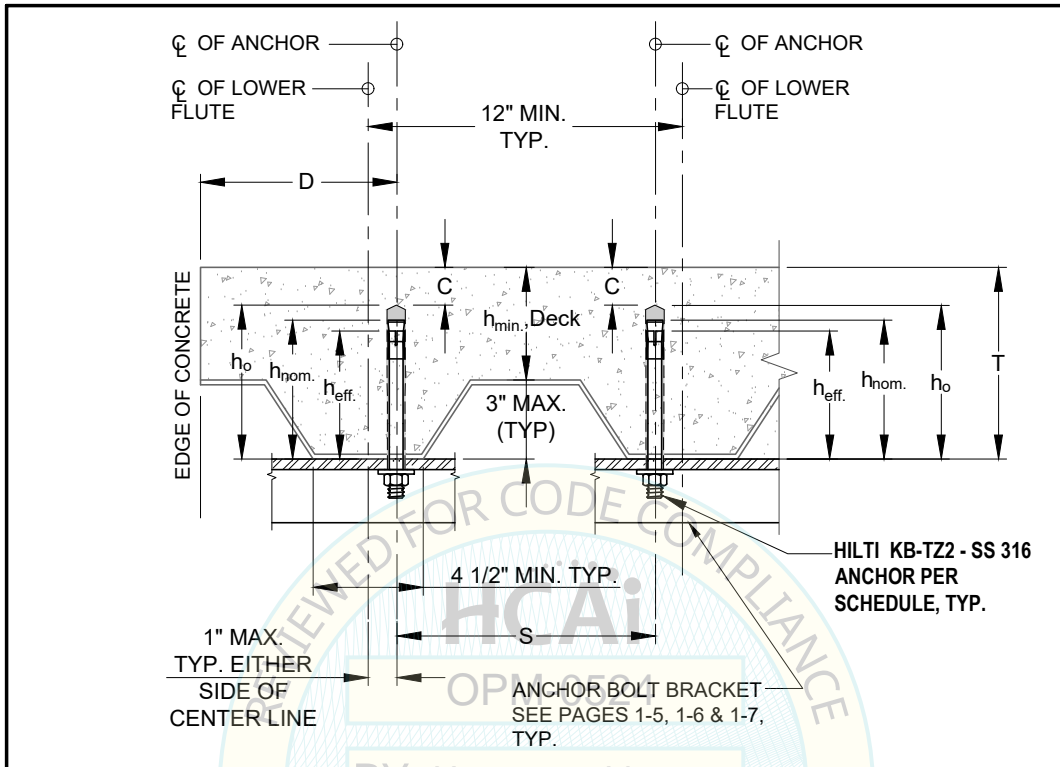
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**ATTACHMENT TO 3,000 PSI (MIN.) NORMAL OR SAND LIGHTWEIGHT CONCRETE OVER METAL DECK**




ANCHOR TYPE (STAINLESS STEEL)	ANCHOR DIA. (in)	'h <sub>eff</sub> ' MIN. EFFECTIVE EMBED.	'h <sub>nom</sub> ' NOMINAL EMBED.	'h <sub>o</sub> ' HOLE DEPTH	'C' MIN. COVER	'D' MIN. EDGE DISTANCE	'S' MIN. SPACING BETWEEN ANCHORS	'h <sub>min., Deck</sub> ' MIN. CONCRETE THK. OVER UPPER FLUTE	'T' MIN. CONCRETE SLAB THK.	ICC APPROVAL
KWIK BOLT TZ2 - SS 316	1/2"	3.25"	3.75"	4.25"	1.25"	12"	10"	3 1/4"	5.5"	ESR-4266

**NOTES:**

1. KWIK BOLT TZ2 - SS 316 ANCHOR BOLTS SHALL BE INSTALLED IN STONE AGGREGATE CONCRETE HAVING A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT THE TIME OF INSTALLATION FOR ANCHORS IN CRACKED CONCRETE .
2. TORQUE TEST SHALL BE PERFORM FOR 100% THE EXPANSION TYPE ANCHORS AFTER A MINIMUM 24 HOURS HAVE ELAPSED SINCE INSTALLATION.
3. WHEN INSTALLING ANCHORS IN CONCRETE, LOCATE REINFORCING STEEL AND AVOID CUTTING OR DAMAGING REINFORCING STEEL.
4. WHEN INSTALLING ANCHORS IN PRESTRESSED CONCRETE, LOCATE PRESTRESSING STEEL AND AVOID DAMAGING PRESTRESSING STEEL.
5. FULL ENGAGEMENT OF NUTS AND WASHERS SHALL BE PROVIDED.
6. ANCHOR BOLTS, NUTS AND WASHERS SHALL NOT BE USED OR EXPOSED TO CORROSIVE ENVIRONMENTS AND CONDITIONS.

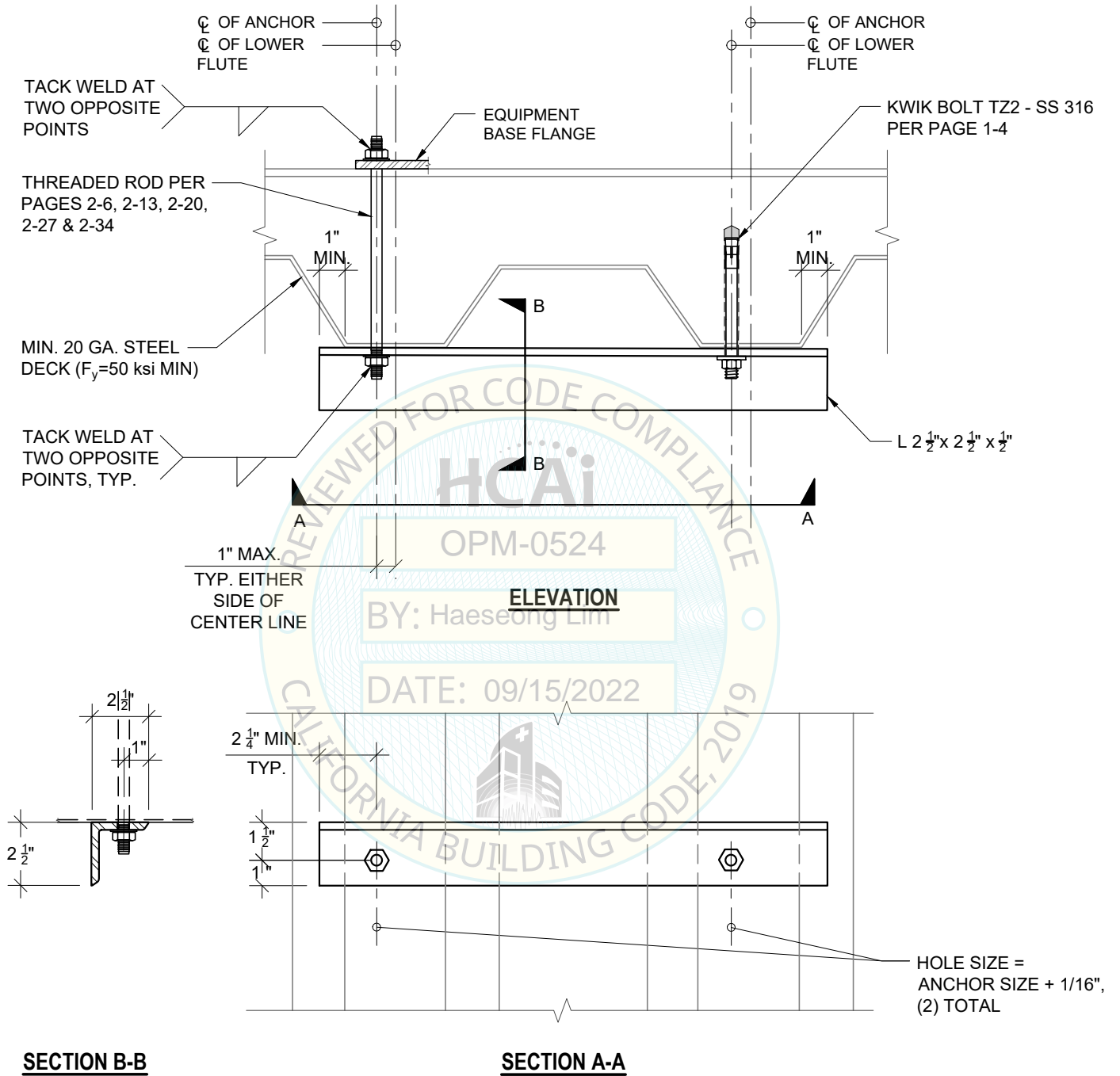
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**SEISMIC SUPPORTS AND ATTACHMENTS AND BRACKET DETAIL (CONDITION 1)**



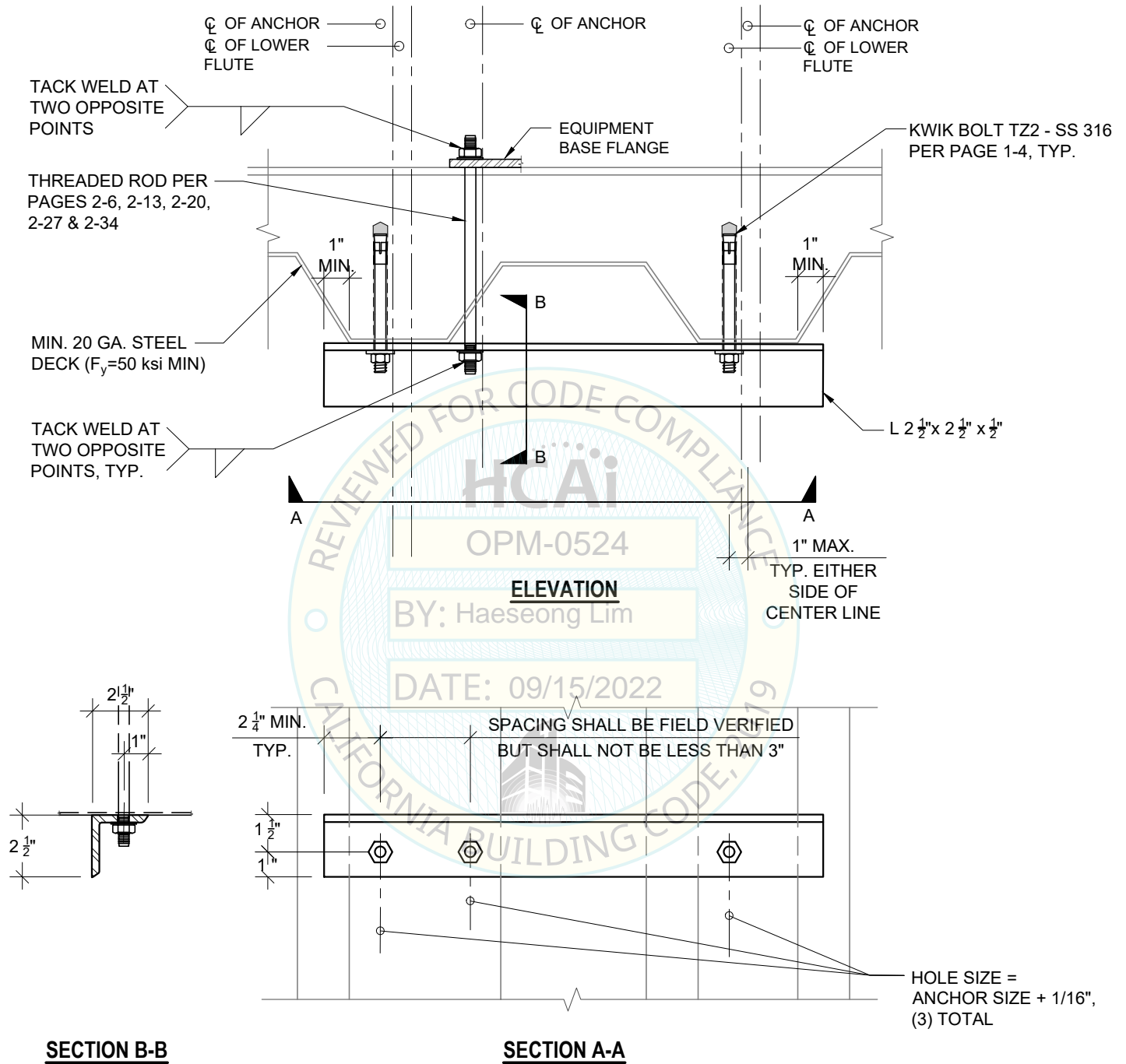
**BRACKET DETAIL (CONDITION 1)**

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**SEISMIC SUPPORTS AND ATTACHMENTS AND BRACKET DETAIL (CONDITION 2)**



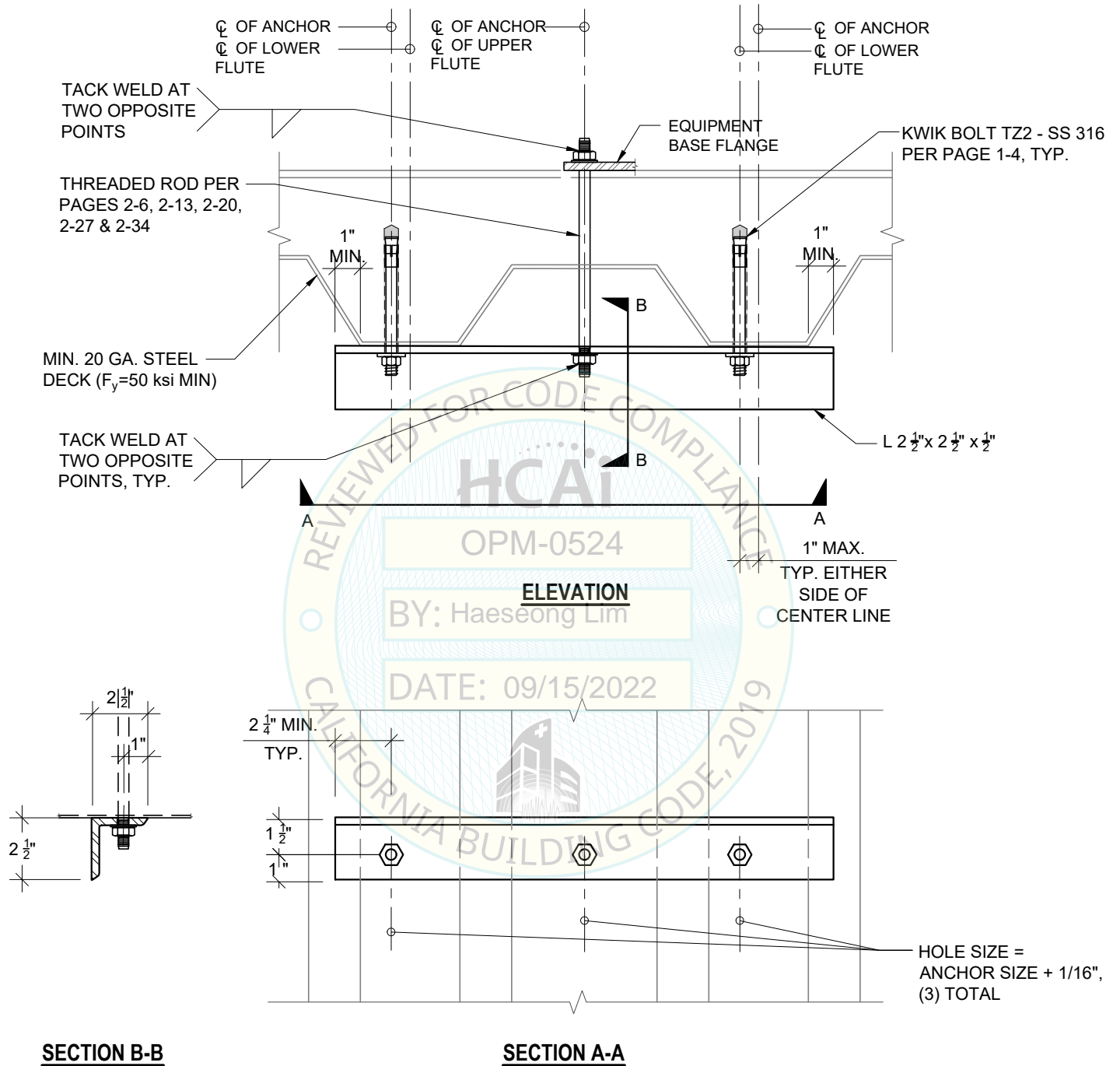
**BRACKET DETAIL (CONDITION 2)**

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**SEISMIC SUPPORTS AND ATTACHMENTS AND BRACKET DETAIL (CONDITION 3)**



**BRACKET DETAIL (CONDITION 3)**

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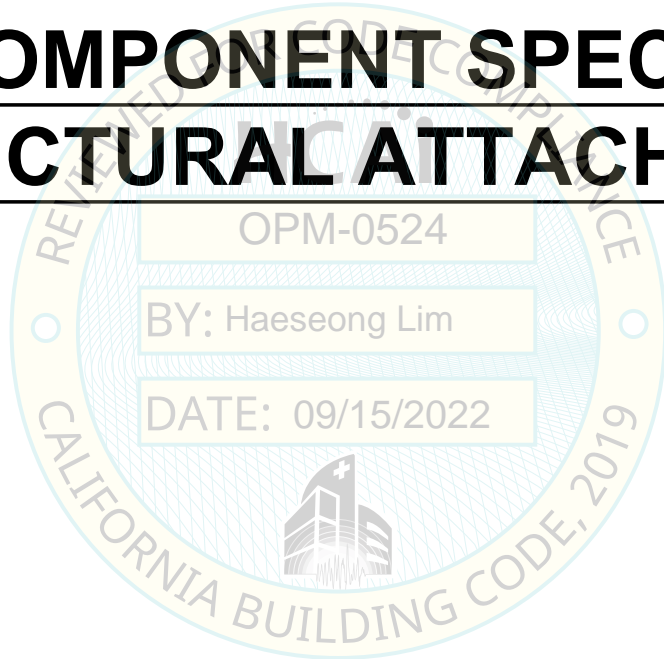
## SECTION 2

# COMPONENT SPECIFIC STRUCTURAL ATTACHMENTS

OPM-0524

BY: Haeseong Lim

DATE: 09/15/2022



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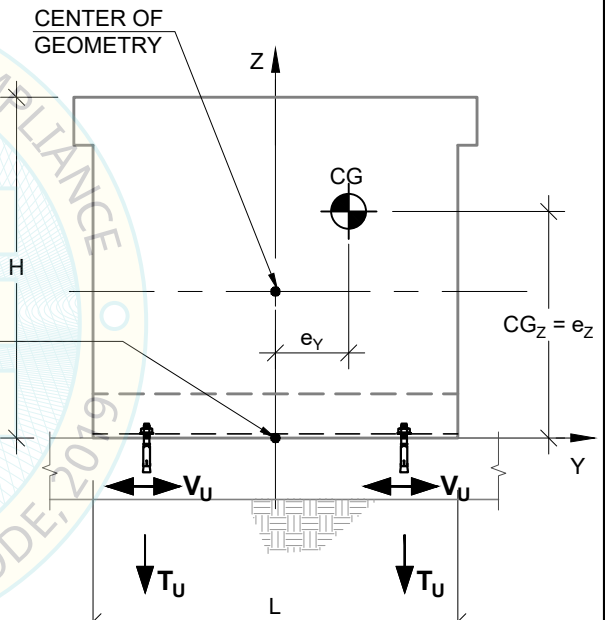
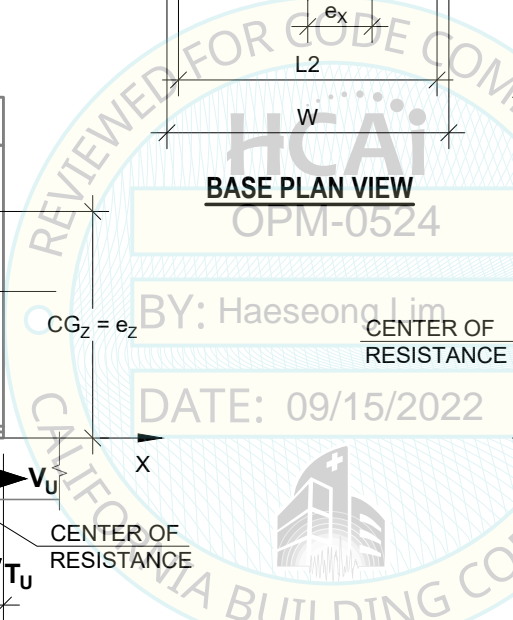
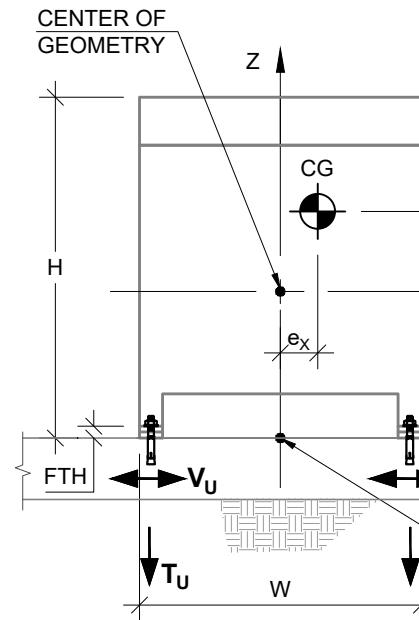
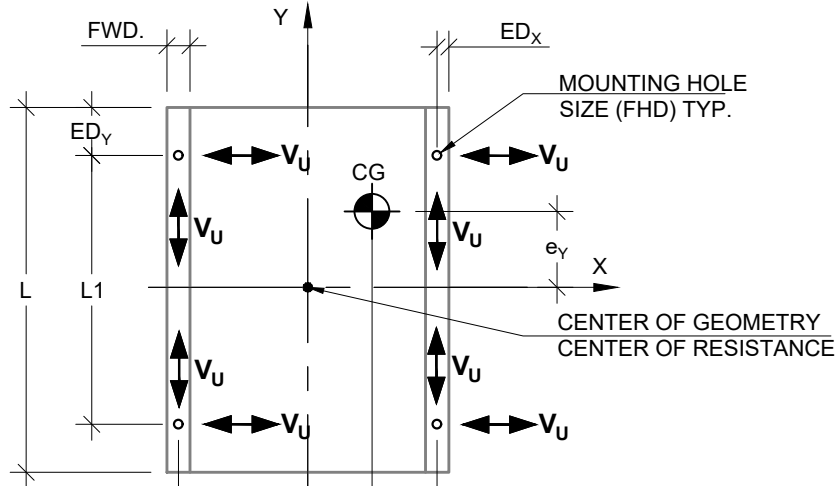
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HSD VIEWS - GROUP "A" (AT GRADE)

Equipment Data	
CG Location	: SEE TABLE A-1 ON SHEET 2-2
Unit Operating Weight	: SEE TABLE A-1 ON PAGE 2-2 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 Fy=50 ksi & Fu=65 ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.075" ED <sub>x</sub> = 0.775"




NOTES: FRONT VIEW

SIDE VIEW

1.  $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "A" TABLE A-1 ON PAGE 2-2.
2.  $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "A" TABLE A-1 ON PAGE 2-2.
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
5. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE A-1.
7. EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
9. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
10. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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 Structural Engineer: Mohammad Hariri  
 California SE No. S3545

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**HSD INFORMATION - GROUP "A" (AT GRADE)**


**Table A-1 - Group "A" (1)**

Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.)	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(3)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)
		L	W	H	L1	L2		CG <sub>z</sub>	e <sub>x</sub>	e <sub>y</sub>			
HSD0003AWX123S	69	15.3	15.2	25.6	10	13.6	12.6	0.40	0.55	12.60	(4) 3/8"	159	58
HSD0005AWX123S	69	15.3	15.2	25.6	10	13.6	12.6	0.40	0.65	12.60	(4) 3/8"	159	59
HSD0008AWX123S	88	15.3	15.2	25.6	10	13.6	13.9	0.30	0.45	13.90	(4) 3/8"	224	73
HSD0010AWX123S	88	15.3	15.2	25.6	10	13.6	13.9	0.30	0.45	13.90	(4) 3/8"	224	73
HSD0015AWX123S	97	15.3	15.2	25.6	10	13.6	14.0	0.10	0.25	14.00	(4) 3/8"	248	79
HSD0020AWX123S	102	15.3	15.2	25.6	10	13.6	14.0	0.00	0.25	14.00	(4) 3/8"	261	82
HSD0025AWX123S	105	15.3	15.2	25.6	10	13.6	13.8	0.20	0.15	13.80	(4) 3/8"	265	85
HSD0030AWX123S	116	15.3	15.2	25.6	10	13.6	13.4	0.10	0.15	13.40	(4) 3/8"	283	94
HSD0040AWX123S	161	15.3	15.2	25.6	10	13.6	12.1	0.60	0.85	12.10	(4) 3/8"	357	140
HSD0050AWX123S	161	15.3	15.2	25.6	10	13.6	11.8	0.80	0.45	11.80	(4) 3/8"	347	139

**FOOTNOTES:**

- SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
- SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
- T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
- V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.

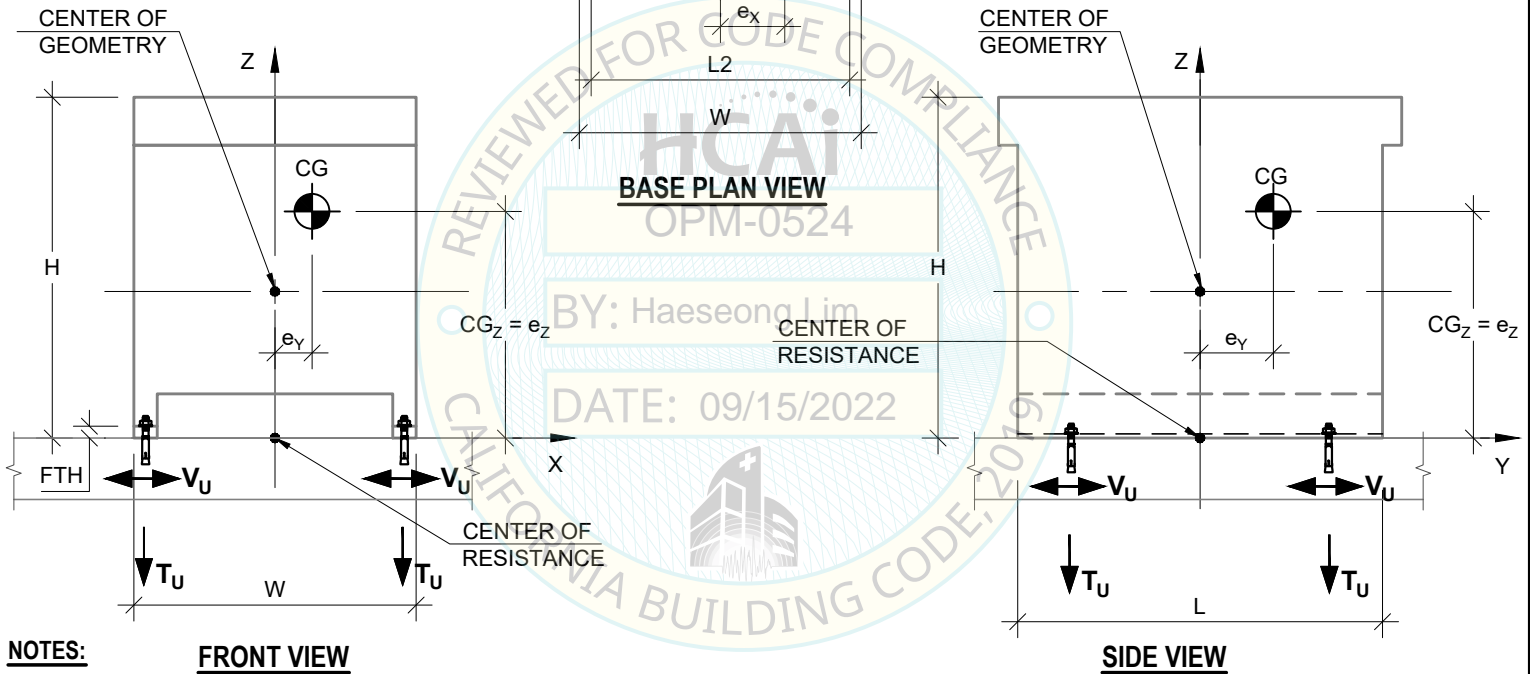
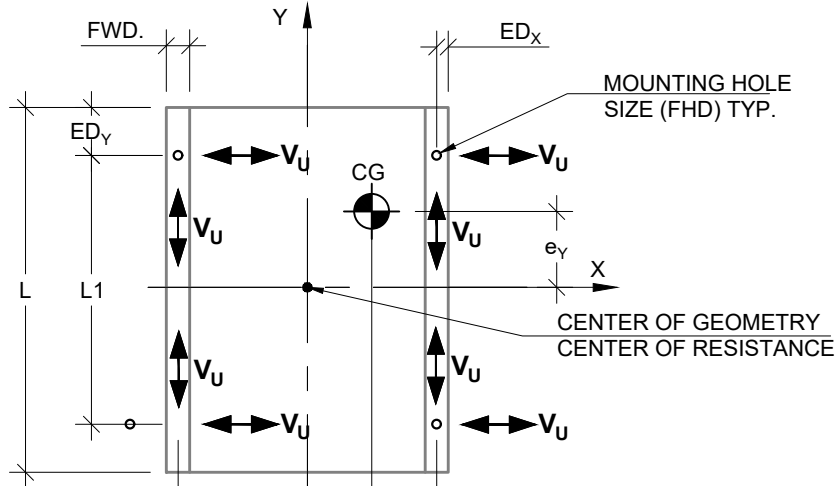
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HSD VIEWS - GROUP "A" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK

Equipment Data	
CG Location	: SEE TABLE A-2 ON SHEET 2-4
Unit Operating Weight	: SEE TABLE A-2 ON PAGE 2-4 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.075" $ED_x = 0.775$ "




NOTES: **FRONT VIEW**

**SIDE VIEW**

- $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "A" TABLE A-2 ON PAGE 2-4.
- $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "A" TABLE A-2 ON PAGE 2-4.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE A-2.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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**HSD INFORMATION - GROUP "A" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK**


**Table A-2 - Group "A" (1)**

Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0003AWX123S	69	15.3	15.2	25.6	10	13.6	12.6	0.40	0.55	12.60	(4) 3/8"	213	78
HSD0005AWX123S	69	15.3	15.2	25.6	10	13.6	12.6	0.40	0.65	12.60	(4) 3/8"	213	78
HSD0008AWX123S	88	15.3	15.2	25.6	10	13.6	13.9	0.30	0.45	13.90	(4) 3/8"	300	98
HSD0010AWX123S	88	15.3	15.2	25.6	10	13.6	13.9	0.30	0.45	13.90	(4) 3/8"	300	98
HSD0015AWX123S	97	15.3	15.2	25.6	10	13.6	14.0	0.10	0.25	14.00	(4) 3/8"	332	105
HSD0020AWX123S	102	15.3	15.2	25.6	10	13.6	14.0	0.00	0.25	14.00	(4) 3/8"	349	110
HSD0025AWX123S	105	15.3	15.2	25.6	10	13.6	13.8	0.20	0.15	13.80	(4) 3/8"	354	114
HSD0030AWX123S	116	15.3	15.2	25.6	10	13.6	13.4	0.10	0.15	13.40	(4) 3/8"	379	125
HSD0040AWX123S	161	15.3	15.2	25.6	10	13.6	12.1	0.60	0.85	12.10	(4) 3/8"	478	187
HSD0050AWX123S	161	15.3	15.2	25.6	10	13.6	11.8	0.80	0.45	11.80	(4) 3/8"	464	185

**FOOTNOTES:**

- SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
- SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
- T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
- V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.

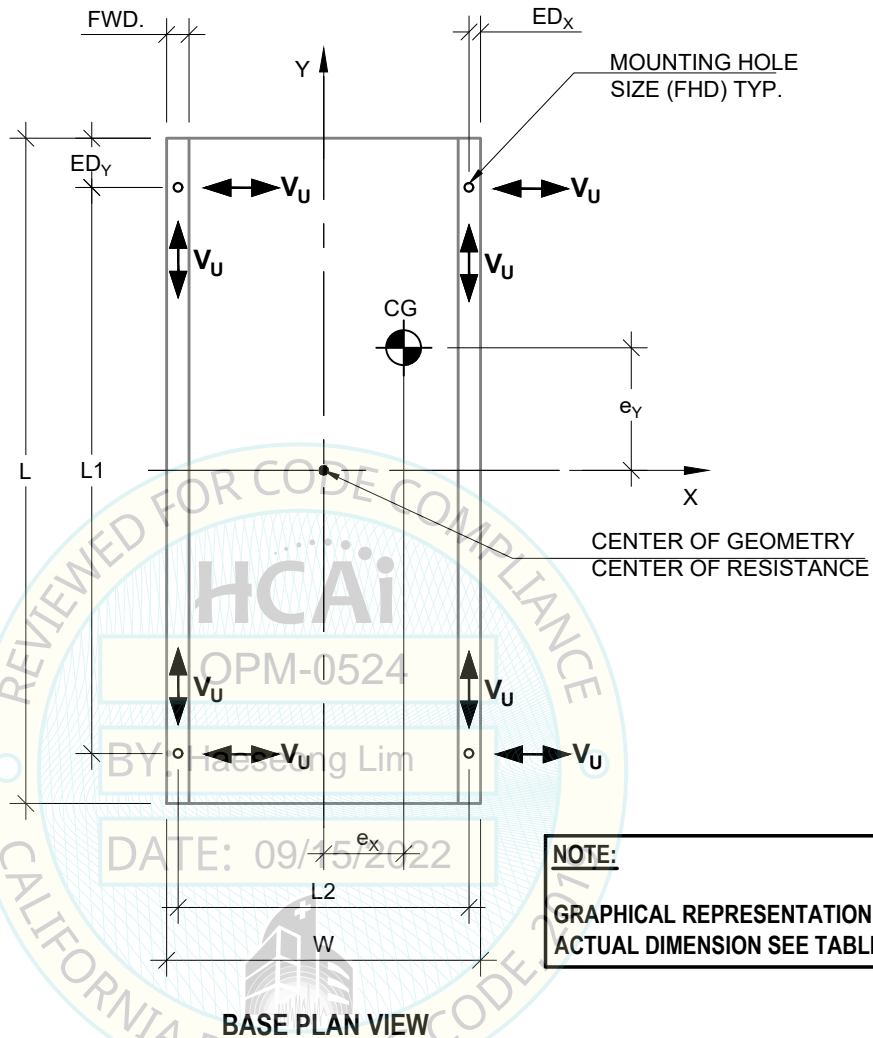
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HSD PLAN VIEW - GROUP "A" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK


Equipment Data	
CG Location	: SEE TABLE A-3 ON SHEET 2-7
Unit Operating Weight	: SEE TABLE A-3 ON PAGE 2-7 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.075" $ED_x = 0.775$ "



**NOTES:**

1.  $T_u$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "A" TABLE A-3 ON PAGE 2-7.
2.  $V_u$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "A" TABLE A-3 ON PAGE 2-7.
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
5. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE A-3.
7. EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
9. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
10. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

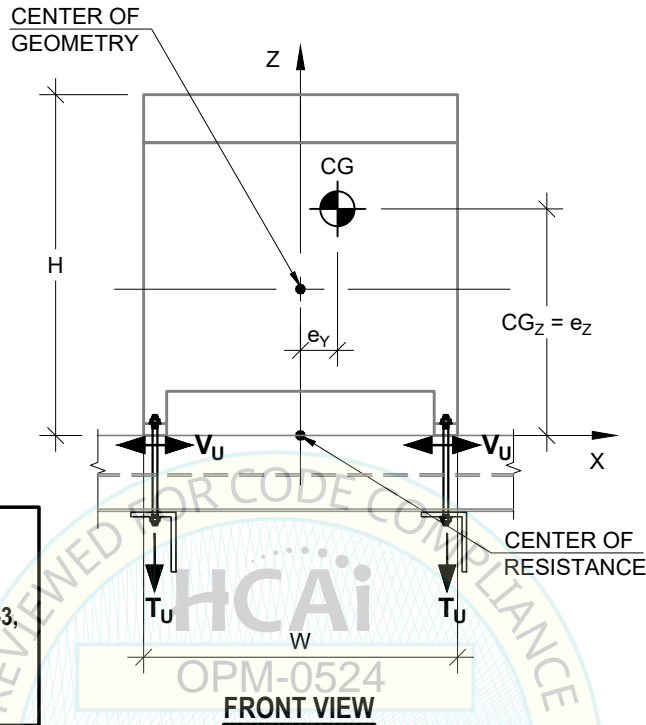
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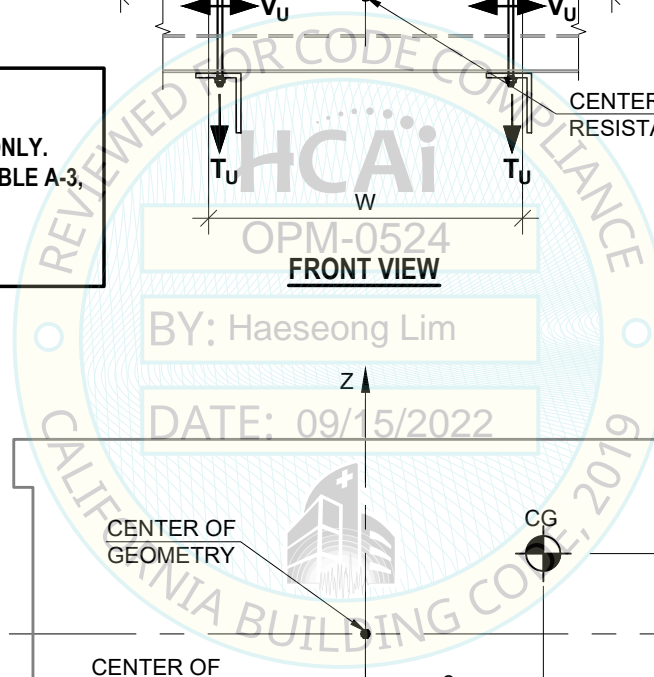
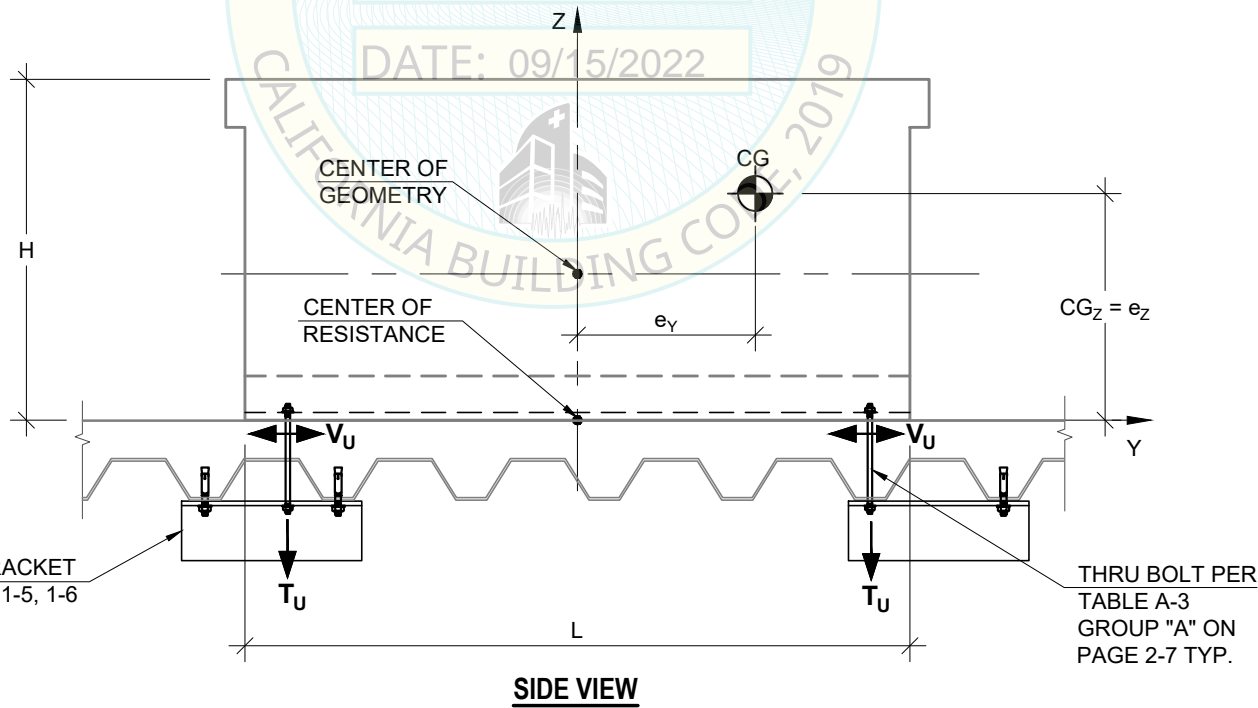
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HSD VIEWS - GROUP "A" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK

Equipment Data	
CG Location	: SEE TABLE A-3 ON SHEET 2-7
Unit Operating Weight	: SEE TABLE A-3 ON PAGE 2-7 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.075" $ED_x = 0.775$ "



- NOTES:**
1. GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE A-3, PAGE 2-7.
  2. SEE PAGE 2-5 FOR NOTES AND INFORMATION NOT SHOWN



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*MRH*  
Structural Engineer: Mohammad Hariri  
California SE No. S3545

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**HSD INFORMATION - GROUP "A" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK**


**Table A-3 - Group "A" (1)**

Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Anchor <sup>(3)</sup> Bolts (Thru Bolt) No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0003AWX123S	69	15.3	15.2	25.6	10	13.6	12.6	0.40	0.55	12.60	(4) 3/8"	213	78
HSD0005AWX123S	69	15.3	15.2	25.6	10	13.6	12.6	0.40	0.65	12.60	(4) 3/8"	213	78
HSD0008AWX123S	88	15.3	15.2	25.6	10	13.6	13.9	0.30	0.45	13.90	(4) 3/8"	300	98
HSD0010AWX123S	88	15.3	15.2	25.6	10	13.6	13.9	0.30	0.45	13.90	(4) 3/8"	300	98
HSD0015AWX123S	97	15.3	15.2	25.6	10	13.6	14.0	0.10	0.25	14.00	(4) 3/8"	332	105
HSD0020AWX123S	102	15.3	15.2	25.6	10	13.6	14.0	0.00	0.25	14.00	(4) 3/8"	349	110
HSD0025AWX123S	105	15.3	15.2	25.6	10	13.6	13.8	0.20	0.15	13.80	(4) 3/8"	354	114
HSD0030AWX123S	116	15.3	15.2	25.6	10	13.6	13.4	0.10	0.15	13.40	(4) 3/8"	379	125
HSD0040AWX123S	161	15.3	15.2	25.6	10	13.6	12.1	0.60	0.85	12.10	(4) 3/8"	478	187
HSD0050AWX123S	161	15.3	15.2	25.6	10	13.6	11.8	0.80	0.45	11.80	(4) 3/8"	464	185

**FOOTNOTES:**

- SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
- SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
- T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
- V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.

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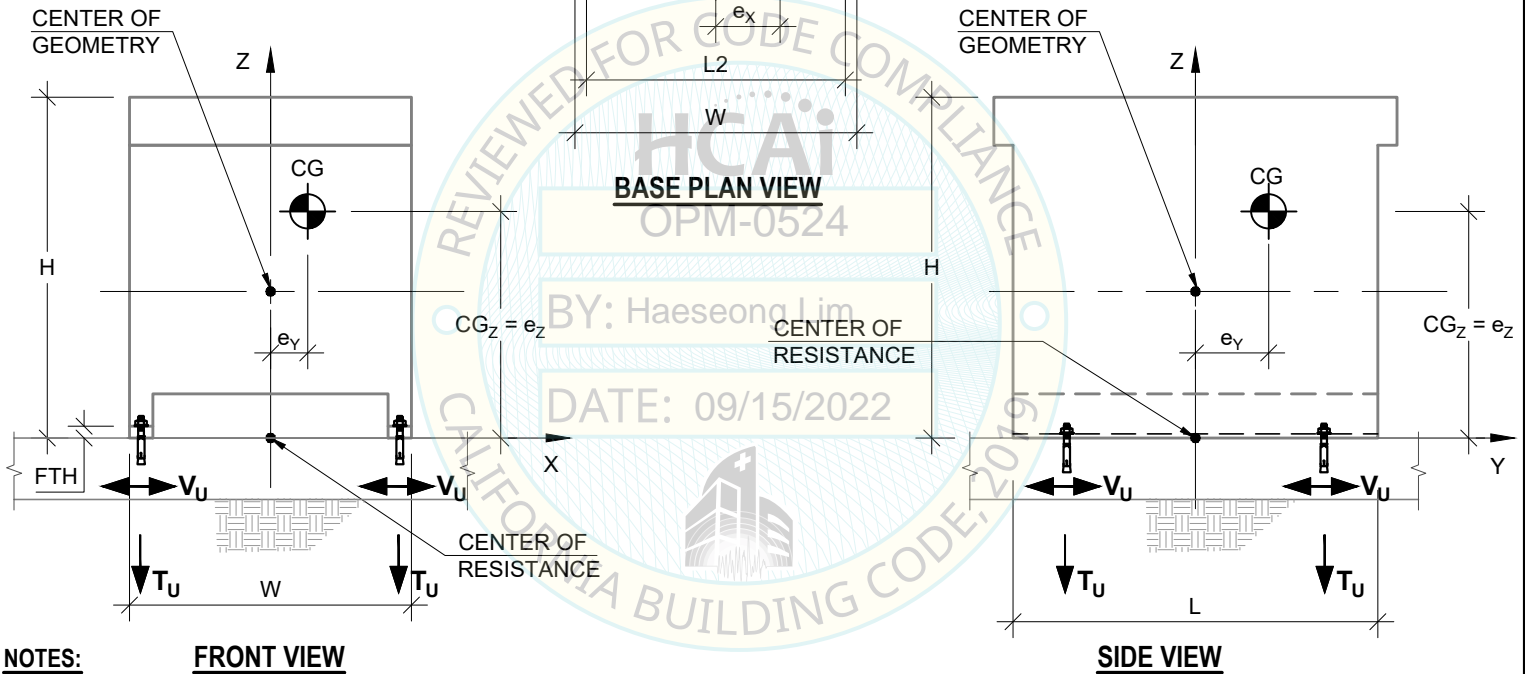
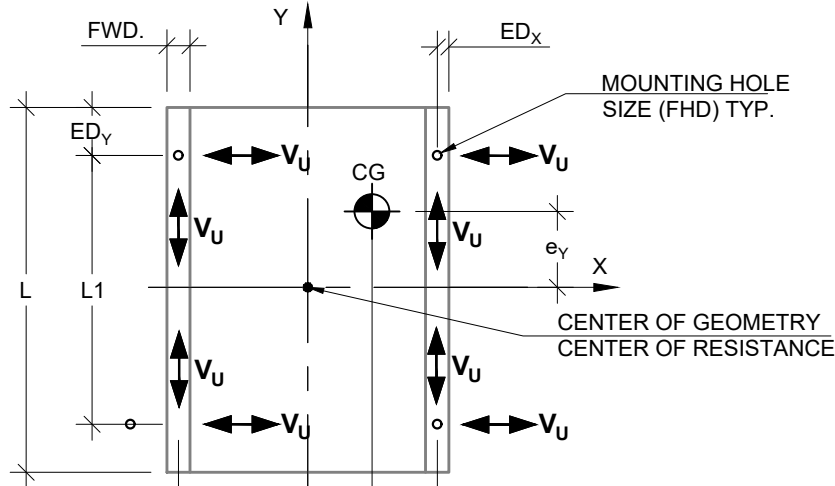
  
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HSD VIEWS - GROUP "B" (AT GRADE)

Equipment Data	
CG Location	: SEE TABLE B-1 ON SHEET 2-9
Unit Operating Weight	: SEE TABLE B-1 ON PAGE 2-9 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 Fy=50 ksi & Fu=65 ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.135" ED <sub>x</sub> = 0.775"




NOTES: FRONT VIEW

SIDE VIEW

- $T_u$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "B" TABLE B-1 ON PAGE 2-9.
- $V_u$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "B" TABLE B-1 ON PAGE 2-9.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE B-1.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS (ED<sub>x</sub> & ED<sub>y</sub>) AND SIZE (FHD).

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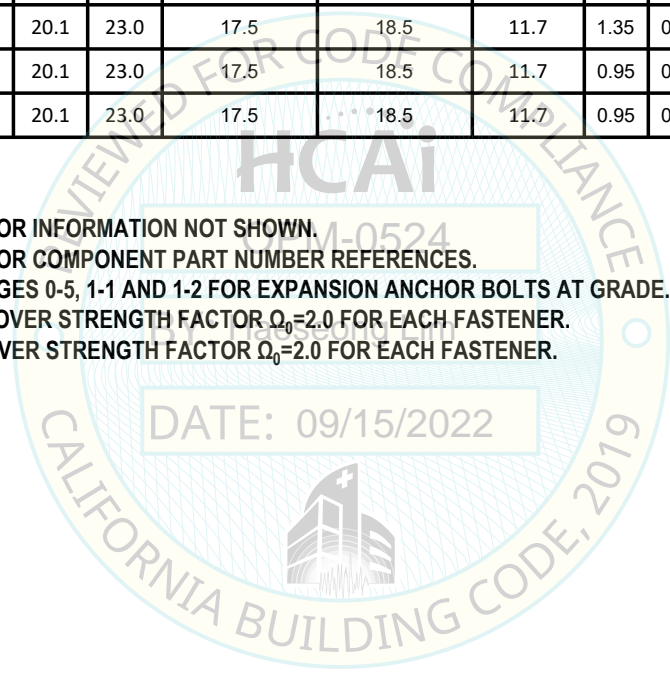
**HSD INFORMATION - GROUP "B" (AT GRADE)**

**Table B-1 - Group "B" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0025AWX123S	105	24.3	20.1	23.0	17.5	18.5	10.9	0.15	0.35	10.90	(4) 3/8"	149	85
HSD0030AWX123S	116	24.3	20.1	23.0	17.5	18.5	11.1	0.05	0.15	11.10	(4) 3/8"	167	93
HSD0040AWX123S	161	24.3	20.1	23.0	17.5	18.5	10.5	0.75	0.95	10.50	(4) 3/8"	226	137
HSD0050AWX123S	161	24.3	20.1	23.0	17.5	18.5	10.3	1.05	0.05	10.30	(4) 3/8"	219	134
HSD0060AWX123S	207	24.3	20.1	23.0	17.5	18.5	11.7	1.35	0.15	11.70	(4) 3/8"	328	175
HSD0075AWX123S	208	24.3	20.1	23.0	17.5	18.5	11.7	0.95	0.95	11.70	(4) 3/8"	332	179
HSD0100AWX123S	262	24.3	20.1	23.0	17.5	18.5	11.7	0.95	0.45	11.70	(4) 3/8"	413	221

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



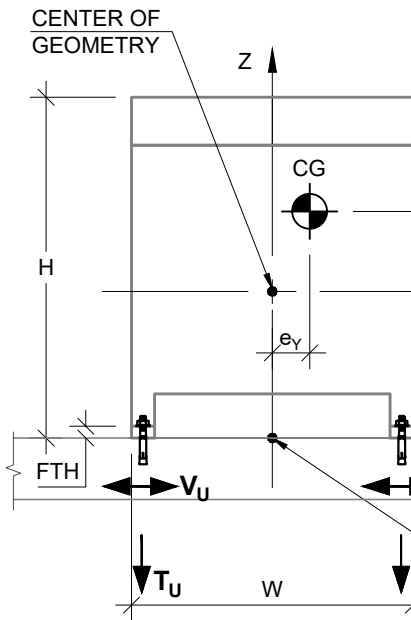
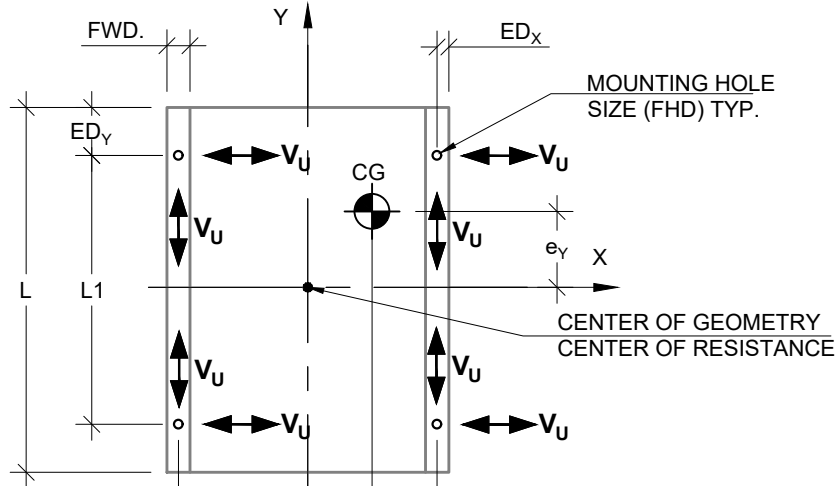
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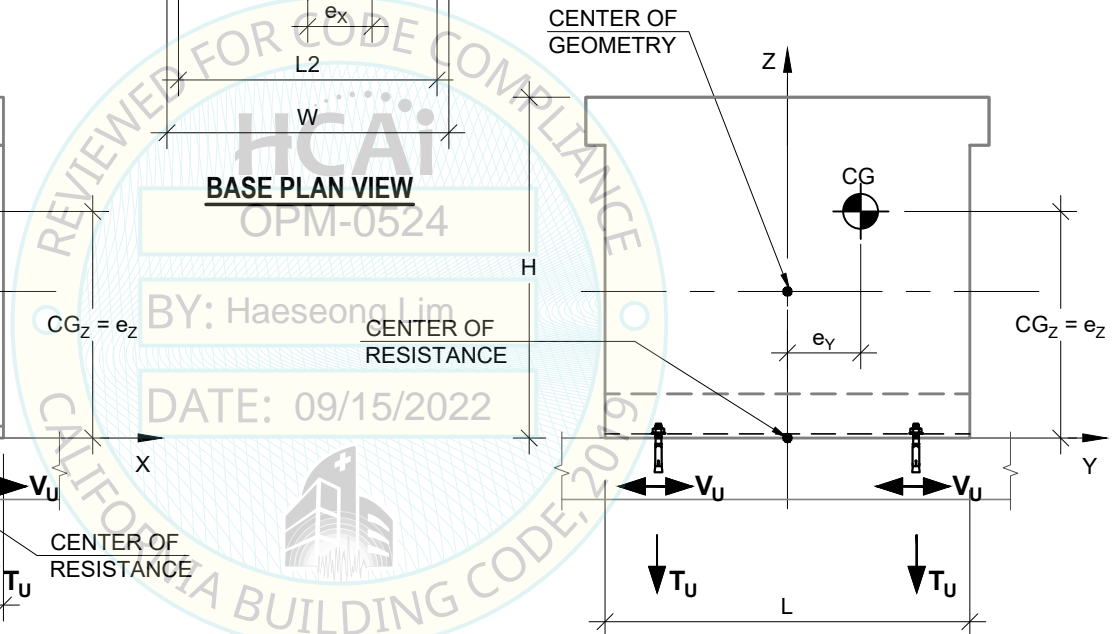
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HSD VIEWS - GROUP "B" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK

Equipment Data	
CG Location	: SEE TABLE B-2 ON SHEET 2-11
Unit Operating Weight	: SEE TABLE B-2 ON PAGE 2-11 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.135" $ED_x = 0.775$ "



FRONT VIEW




SIDE VIEW

NOTES:

- $T_u$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "B" TABLE B-2 ON PAGE 2-11.
- $V_u$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "B" TABLE B-2 ON PAGE 2-11.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE B-2.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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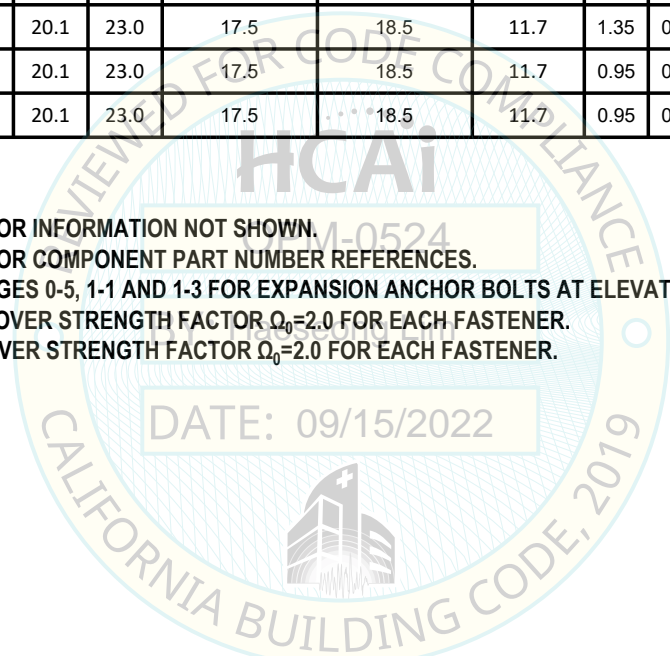
**HSD INFORMATION - GROUP "B" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK**

**Table B-2 - Group "B" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in.)	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Anchor <sup>(3)</sup> Bolts (Thru Bolt) No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0025AWX123S	105	24.3	20.1	23.0	17.5	18.5	10.9	0.15	0.35	10.90	(4) 3/8"	200	114
HSD0030AWX123S	116	24.3	20.1	23.0	17.5	18.5	11.1	0.05	0.15	11.10	(4) 3/8"	224	124
HSD0040AWX123S	161	24.3	20.1	23.0	17.5	18.5	10.5	0.75	0.95	10.50	(4) 3/8"	304	183
HSD0050AWX123S	161	24.3	20.1	23.0	17.5	18.5	10.3	1.05	0.05	10.30	(4) 3/8"	294	179
HSD0060AWX123S	207	24.3	20.1	23.0	17.5	18.5	11.7	1.35	0.15	11.70	(4) 3/8"	441	234
HSD0075AWX123S	208	24.3	20.1	23.0	17.5	18.5	11.7	0.95	0.95	11.70	(4) 3/8"	445	239
HSD0100AWX123S	262	24.3	20.1	23.0	17.5	18.5	11.7	0.95	0.45	11.70	(4) 3/8"	554	294

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



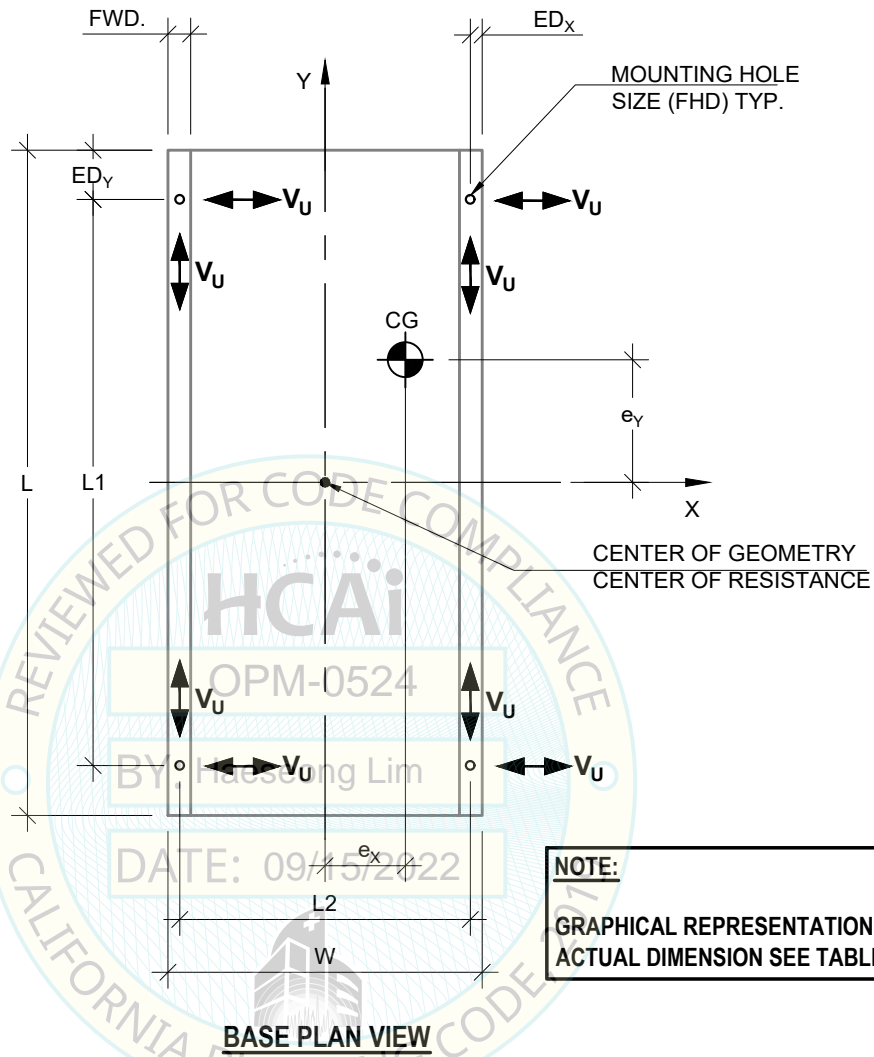
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 California SE No. S3545

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HSD PLAN VIEW - GROUP "B" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK

Equipment Data	
CG Location	: SEE TABLE B-3 ON SHEET 2-14
Unit Operating Weight	: SEE TABLE B-3 ON PAGE 2-14 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 Fy=50 ksi & Fu=65 ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.135" ED <sub>x</sub> = 0.775"




**NOTE:**  
GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE B-3, PAGE 2-14.

**NOTES:**

1.  $T_u$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "B" TABLE B-3 ON PAGE 2-14.
2.  $V_u$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "B" TABLE B-3 ON PAGE 2-14.
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
5. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE B-3.
7. EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
9. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
10. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS (ED<sub>x</sub> & ED<sub>y</sub>) AND SIZE (FHD).

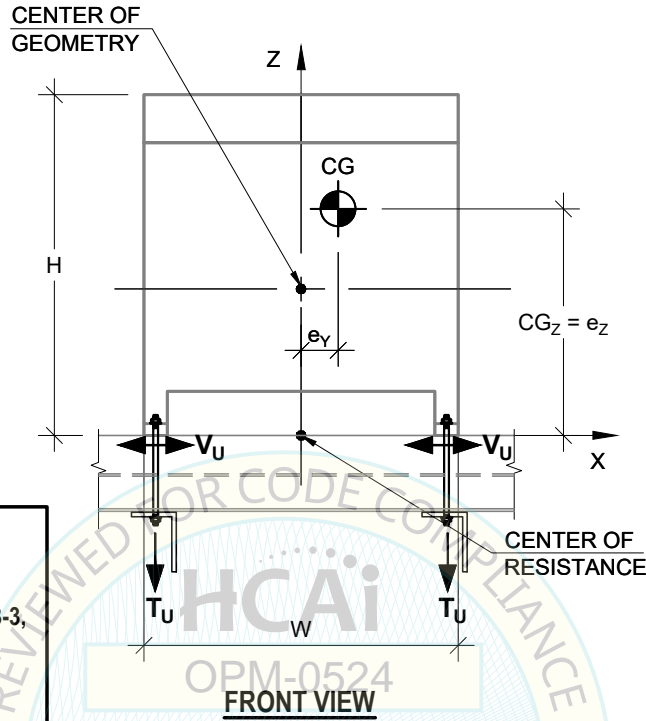
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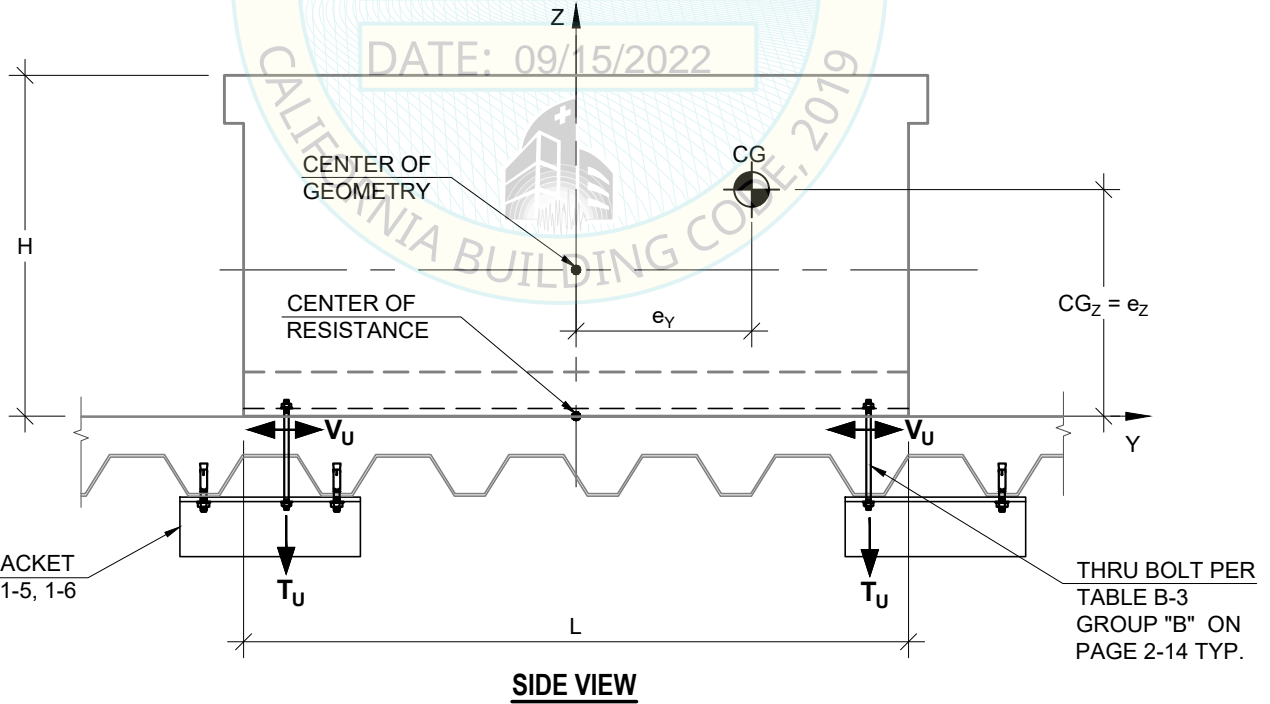
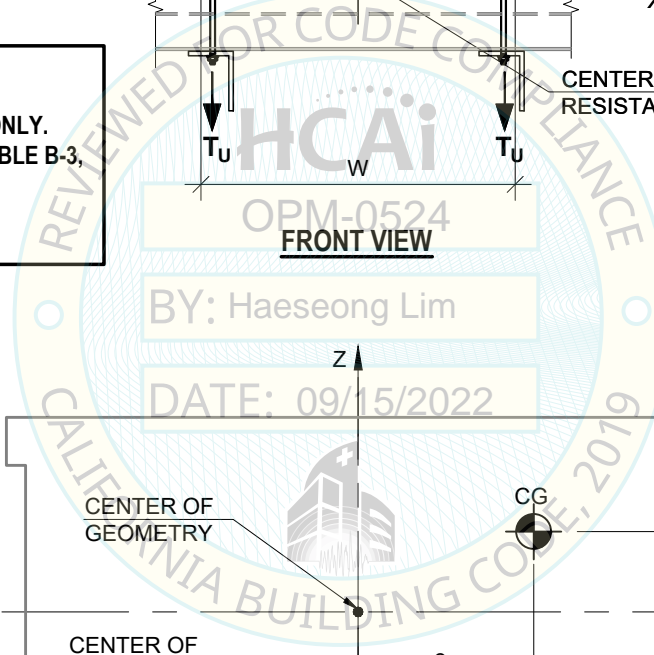
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HSD VIEWS - GROUP "B" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK

Equipment Data	
CG Location	: SEE TABLE B-3 ON SHEET 2-14
Unit Operating Weight	: SEE TABLE B-3 ON PAGE 2-14 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 1.550" FTH = 0.135" $ED_x = 0.775$ "



- NOTES:**
1. GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE B-3, PAGE 2-14.
  2. SEE PAGE 2-12 FOR NOTES AND INFORMATION NOT SHOWN



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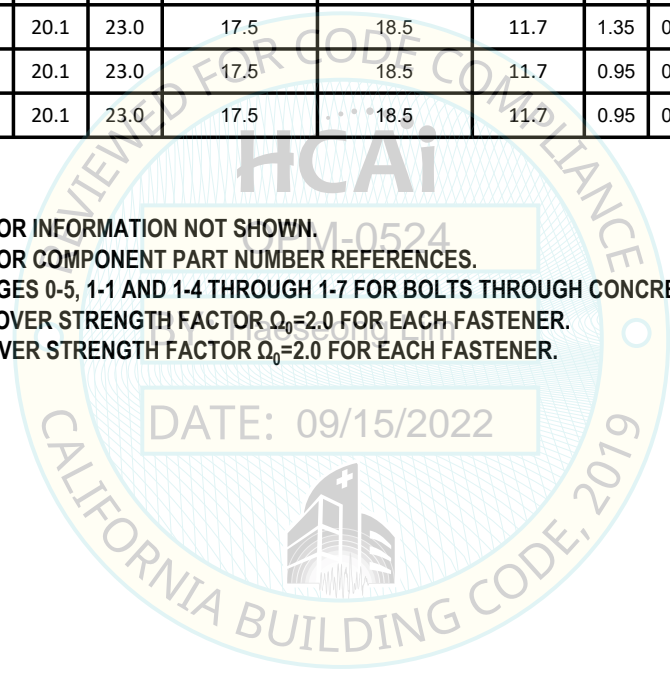
**HSD INFORMATION - GROUP "B" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK**

**Table B-3 - Group "B" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in.)	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Anchor <sup>(3)</sup> Bolts (Thru Bolt) No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0025AWX123S	105	24.3	20.1	23.0	17.5	18.5	10.9	0.15	0.35	10.90	(4) 3/8"	200	114
HSD0030AWX123S	116	24.3	20.1	23.0	17.5	18.5	11.1	0.05	0.15	11.10	(4) 3/8"	224	124
HSD0040AWX123S	161	24.3	20.1	23.0	17.5	18.5	10.5	0.75	0.95	10.50	(4) 3/8"	304	183
HSD0050AWX123S	161	24.3	20.1	23.0	17.5	18.5	10.3	1.05	0.05	10.30	(4) 3/8"	294	179
HSD0060AWX123S	207	24.3	20.1	23.0	17.5	18.5	11.7	1.35	0.15	11.70	(4) 3/8"	441	234
HSD0075AWX123S	208	24.3	20.1	23.0	17.5	18.5	11.7	0.95	0.95	11.70	(4) 3/8"	445	239
HSD0100AWX123S	262	24.3	20.1	23.0	17.5	18.5	11.7	0.95	0.45	11.70	(4) 3/8"	554	294

**FOOTNOTES:**

- SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
- SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
- T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
- V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



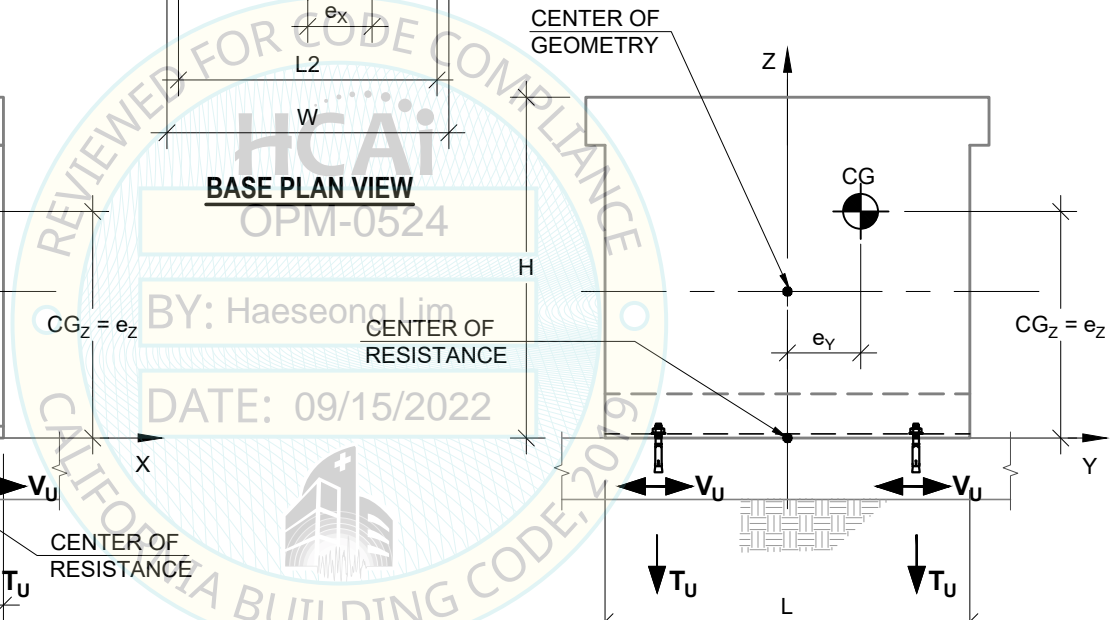
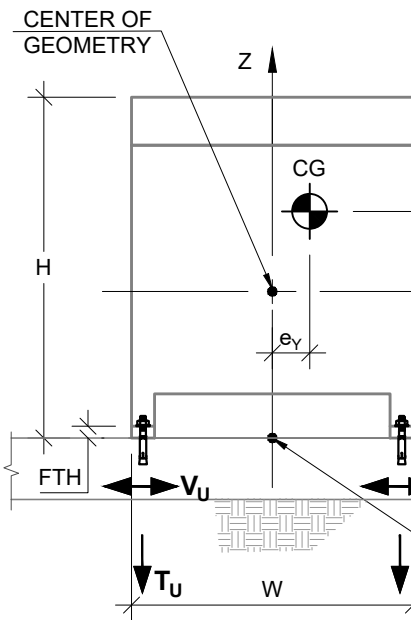
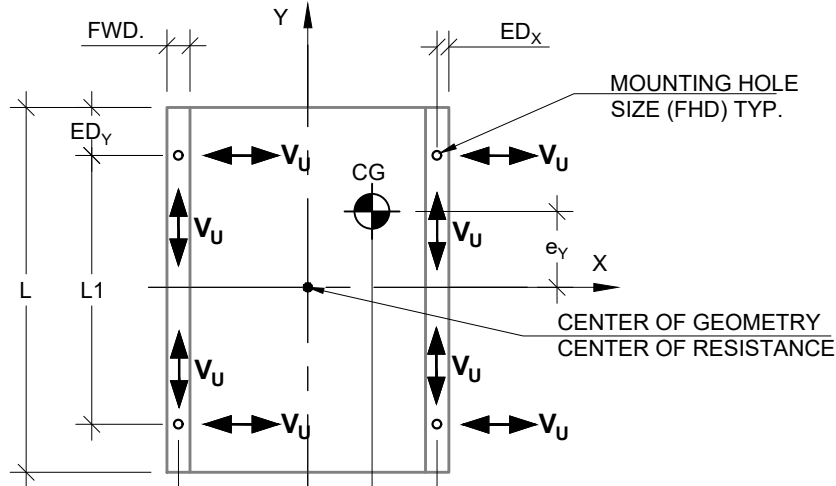
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 California SE No. S3545

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HSD VIEWS - GROUP "C" (AT GRADE)

Equipment Data	
CG Location	: SEE TABLE C-1 ON SHEET 2-16
Unit Operating Weight	: SEE TABLE C-1 ON PAGE 2-16 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 Fy=50 ksi & Fu=65 ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" ED <sub>x</sub> = 1.250"




NOTES: FRONT VIEW

SIDE VIEW

1.  $T_u$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "C" TABLE C-1 ON PAGE 2-16.
2.  $V_u$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "C" TABLE C-1 ON PAGE 2-16.
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
5. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE C-1.
7. EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
9. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
10. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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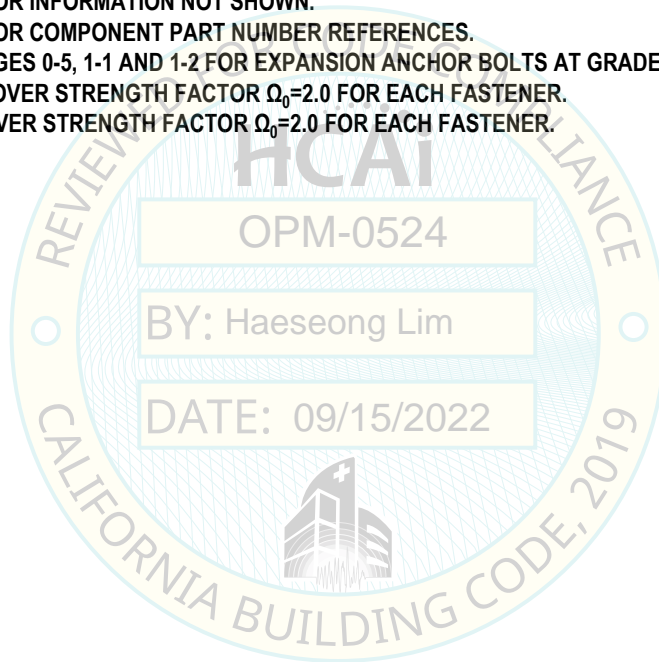
**HSD INFORMATION - GROUP "C" (AT GRADE)**

**Table C-1 - Group "C" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.)	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		CG <sub>z</sub>	e <sub>x</sub>	e <sub>y</sub>			
HSD0125AWX123S	336	24.3	20.3	40.4	17.5	18.6	18.6	0.15	0.95	18.60	(4) 1/2"	864	280
HSD0150AWX123S	385	24.3	20.3	40.4	17.5	18.6	18.6	0.35	0.55	18.60	(4) 1/2"	985	318

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



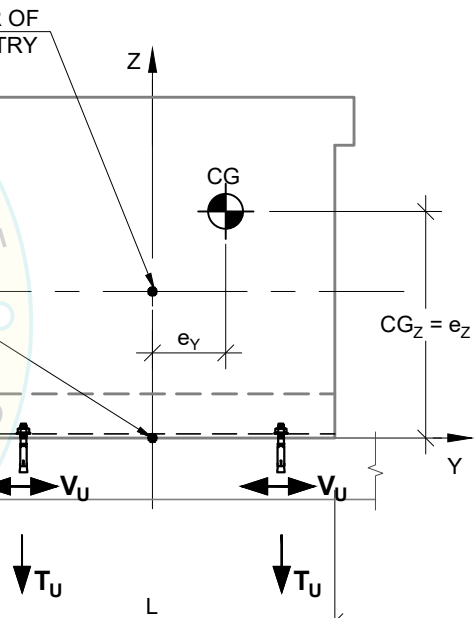
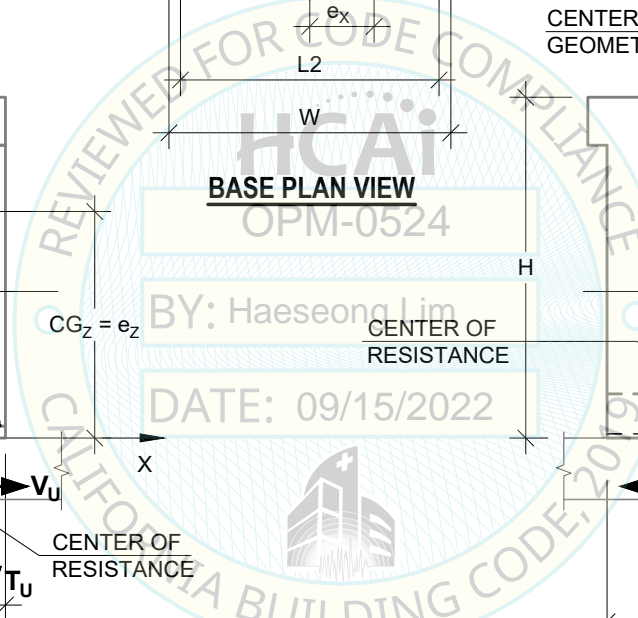
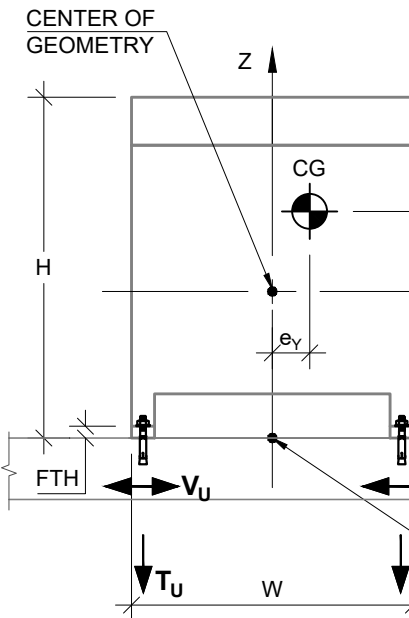
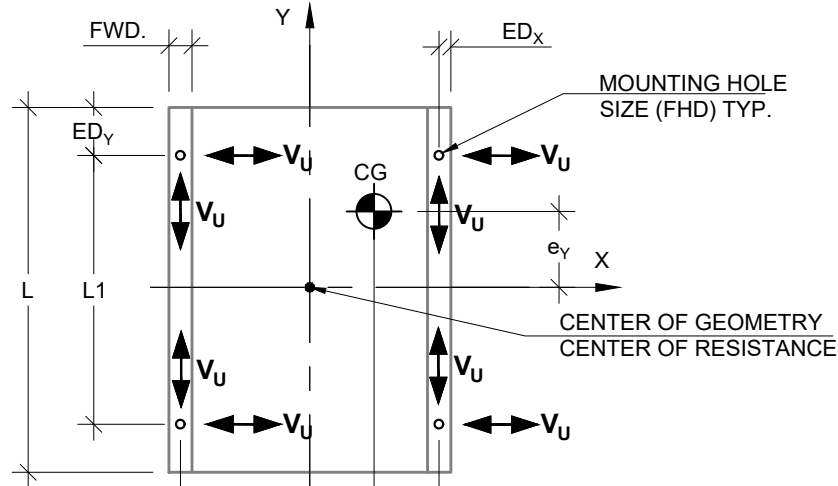
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HSD VIEWS - GROUP "C" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK

Equipment Data	
CG Location	: SEE TABLE C-2 ON SHEET 2-18
Unit Operating Weight	: SEE TABLE C-2 ON PAGE 2-18 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" $ED_x = 1.250"$




NOTES: FRONT VIEW

SIDE VIEW

- $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "C" TABLE C-2 ON PAGE 2-18.
- $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "C" TABLE C-2 ON PAGE 2-18.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE C-2.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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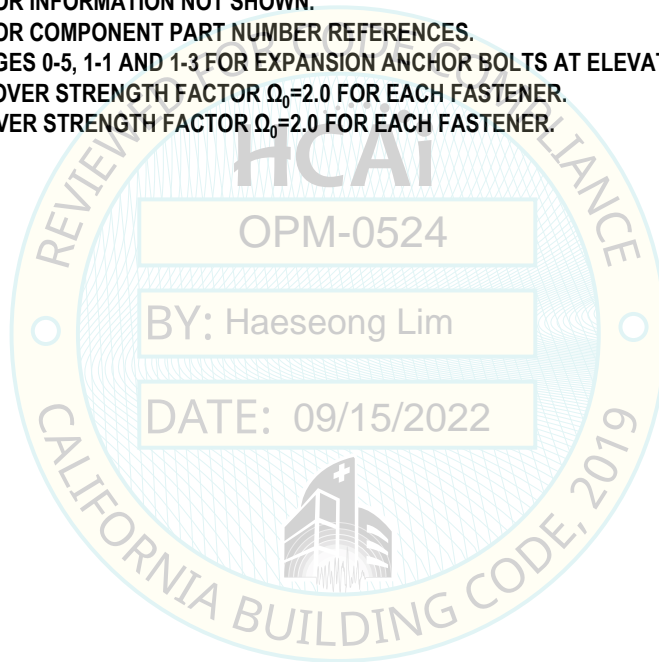
**HSD INFORMATION - GROUP "C" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK**

**Table C-2 - Group "C" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in.)	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0125AWX123S	336	24.3	20.3	40.4	17.5	18.6	18.6	0.15	0.95	18.60	(4) 1/2"	1157	373
HSD0150AWX123S	385	24.3	20.3	40.4	17.5	18.6	18.6	0.35	0.55	18.60	(4) 1/2"	1318	423

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR  $\Omega_0=2.0$  FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR  $\Omega_0=2.0$  FOR EACH FASTENER.



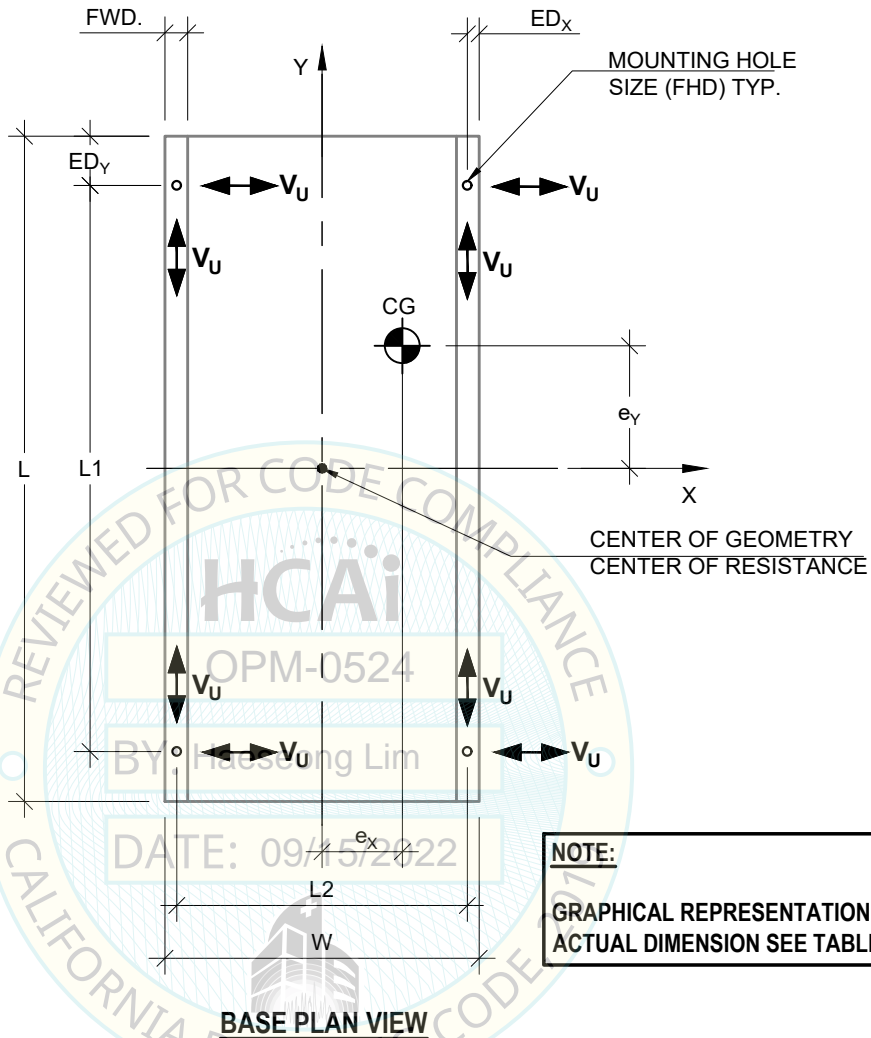
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HSD PLAN VIEW - GROUP "C" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK

Equipment Data	
CG Location	: SEE TABLE C-3 ON SHEET 2-21
Unit Operating Weight	: SEE TABLE C-3 ON PAGE 2-21 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 Fy=50 ksi & Fu=65 ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" ED <sub>x</sub> = 1.250"




**NOTE:**  
GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE C-3, PAGE 2-21.

**NOTES:**

1.  $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "C" TABLE C-3 ON PAGE 2-21.
2.  $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "C" TABLE C-3 ON PAGE 2-21.
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
5. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE C-3.
7. EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
9. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
10. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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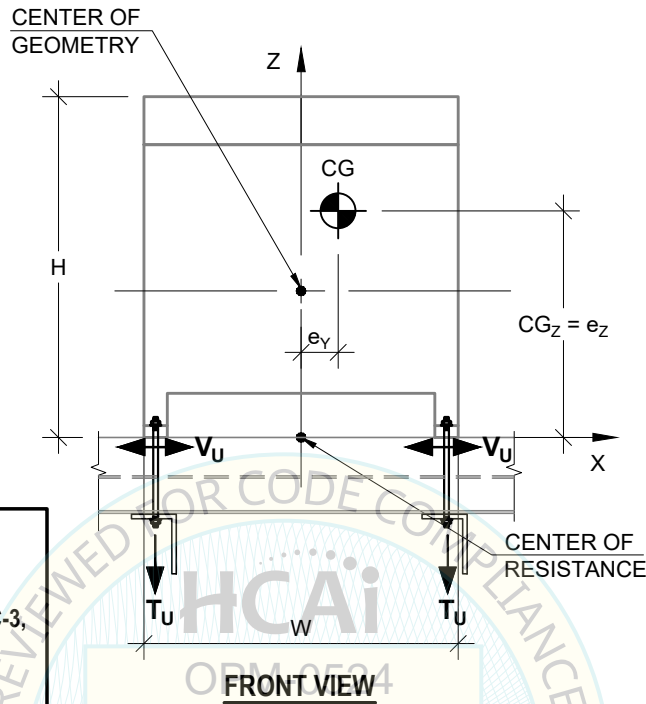
  
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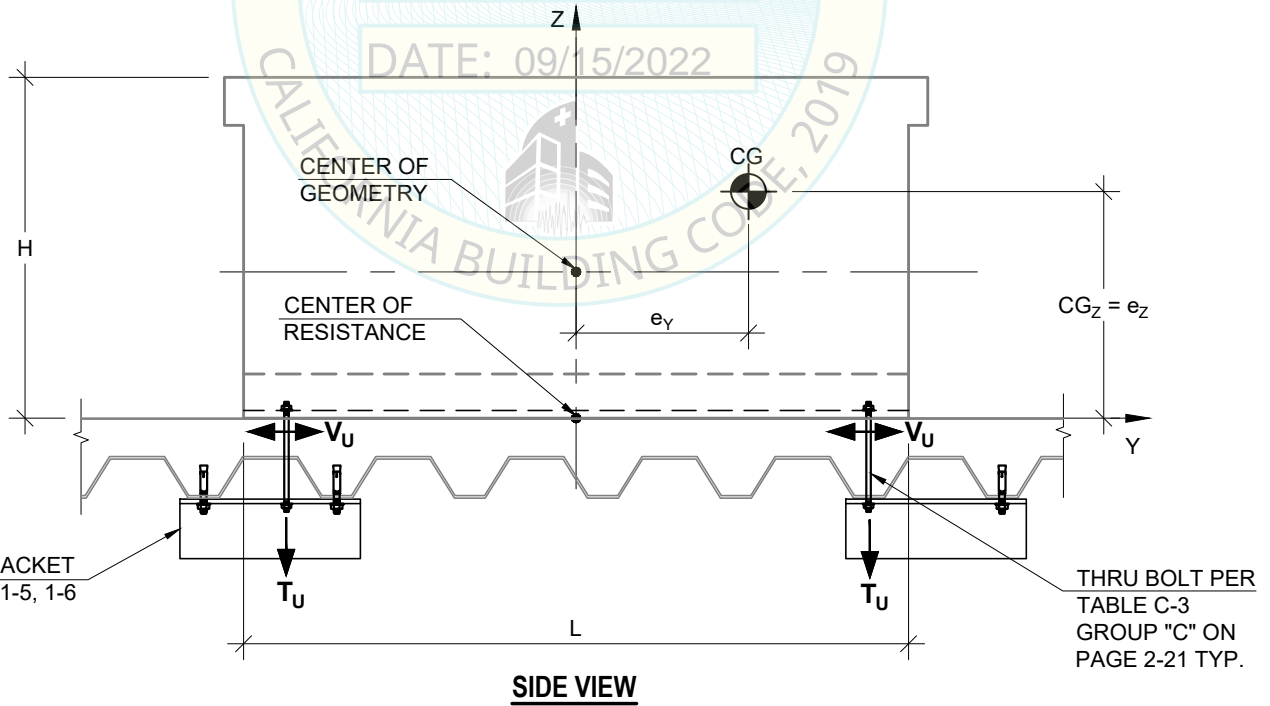


HSD VIEWS - GROUP "C" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK


Equipment Data	
CG Location	: SEE TABLE C-3 ON SHEET 2-21
Unit Operating Weight	: SEE TABLE C-3 ON PAGE 2-21 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" $ED_x = 1.250"$



- NOTES:**
1. GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE C-3, PAGE 2-21.
  2. SEE PAGE 2-19 FOR NOTES AND INFORMATION NOT SHOWN



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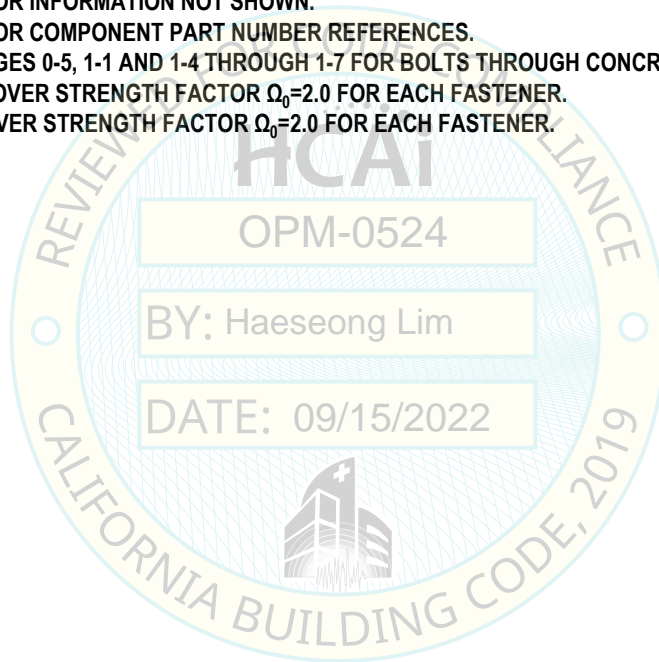
HSD INFORMATION - GROUP "C" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK

Table C-3 - Group "C" (1)


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in.)	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Anchor <sup>(3)</sup> Bolts (Thru Bolt) No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0125AWX123S	336	24.3	20.3	40.4	17.5	18.6	18.6	0.15	0.95	18.60	(4) 1/2"	1157	373
HSD0150AWX123S	385	24.3	20.3	40.4	17.5	18.6	18.6	0.35	0.55	18.60	(4) 1/2"	1318	423

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR  $\Omega_0=2.0$  FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR  $\Omega_0=2.0$  FOR EACH FASTENER.



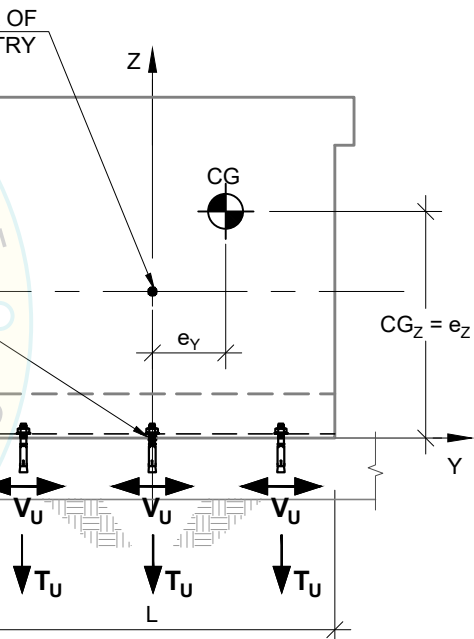
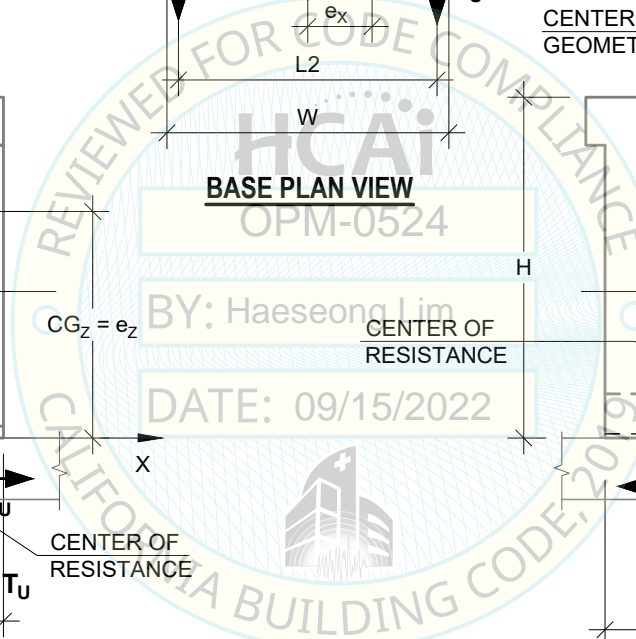
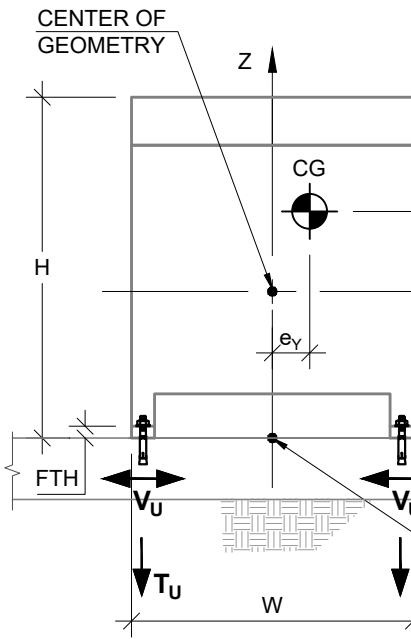
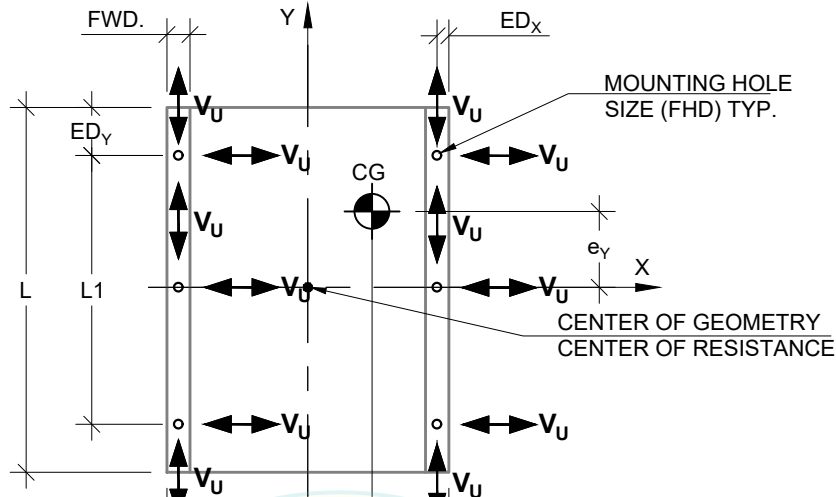
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HSD VIEWS - GROUP "D" (AT GRADE)

Equipment Data	
CG Location	: SEE TABLE D-1 ON SHEET 2-23
Unit Operating Weight	: SEE TABLE D-1 ON PAGE 2-23 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" $ED_x = 1.250"$




NOTES: FRONT VIEW

SIDE VIEW

- $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "D" TABLE D-1 ON PAGE 2-23.
- $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "D" TABLE D-1 ON PAGE 2-23.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE D-1.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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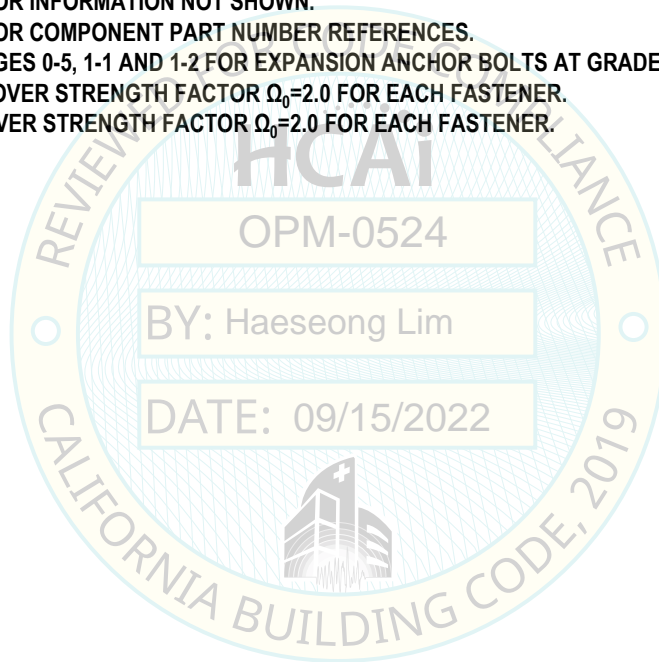
**HSD INFORMATION - GROUP "D" (AT GRADE)**

**Table D-1 - Group "D" (1)**

Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in.)	Distance between End Anchors along X-axis (in.)	CG Height (in.)	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0200AWX123S	561	30.1	28.2	37.0	24	25.5	17.0	0.40	1.75	17.00	(6) 1/2"	688	321
HSD0250AWX123S	563	30.1	28.2	37.0	24	25.5	17.0	0.30	0.85	17.00	(6) 1/2"	684	311

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



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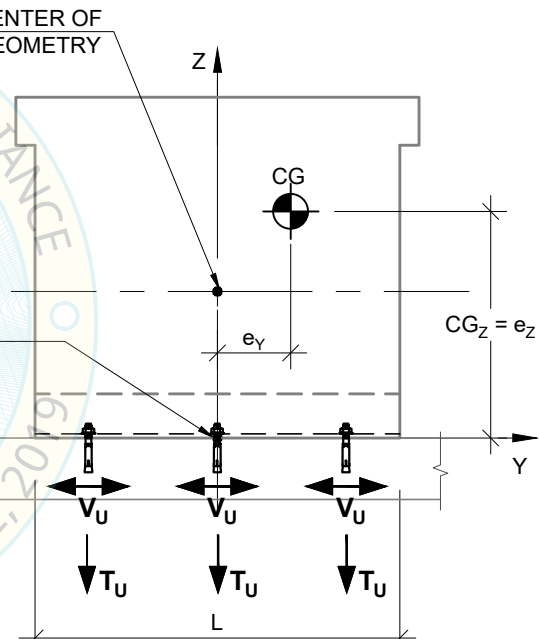
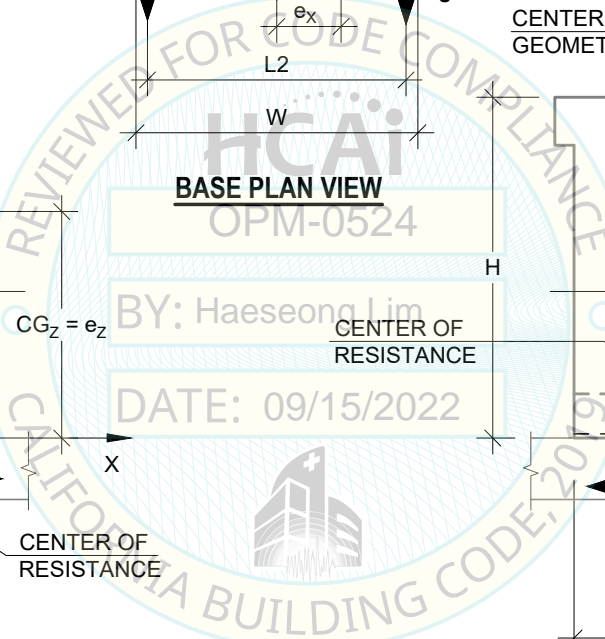
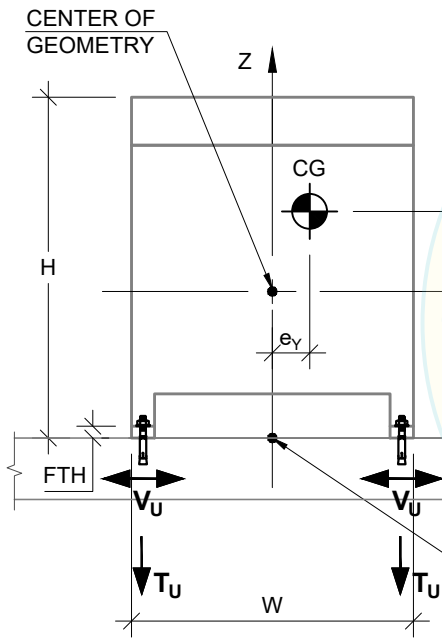
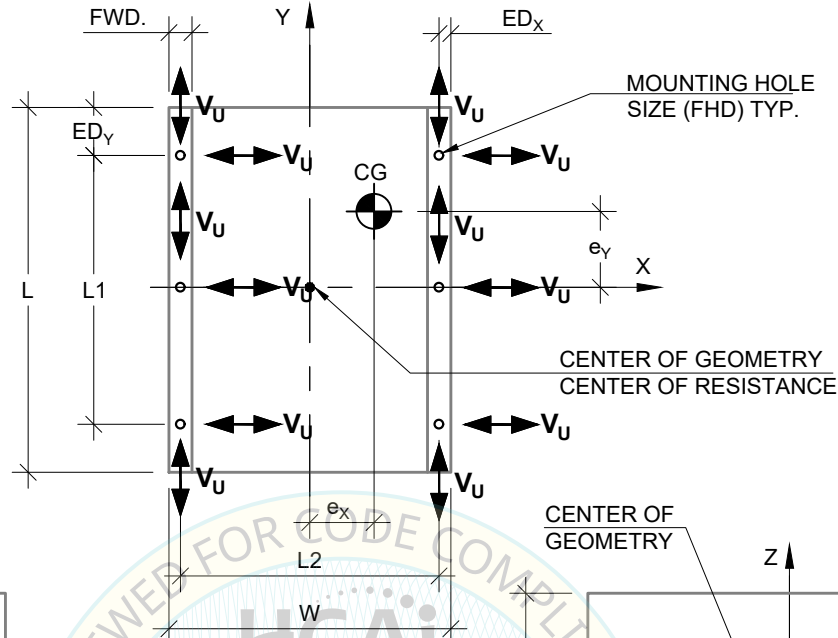
**2-23**

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HSD VIEWS - GROUP "D" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK

Equipment Data	
CG Location	: SEE TABLE D-2 ON SHEET 2-25
Unit Operating Weight	: SEE TABLE D-2 ON PAGE 2-25 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" $ED_x = 1.250"$




NOTES: FRONT VIEW

SIDE VIEW

- $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "D" TABLE D-2 ON PAGE 2-25.
- $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "D" TABLE D-2 ON PAGE 2-25.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE D-2.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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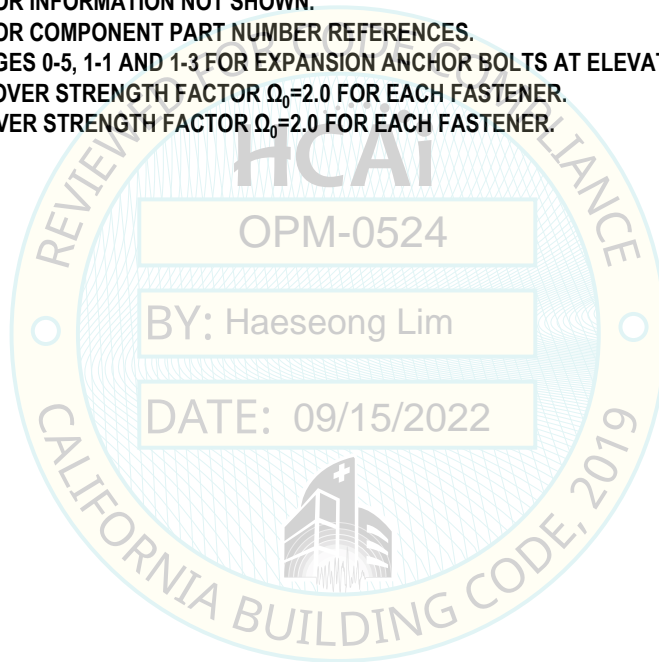
**HSD INFORMATION - GROUP "D" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK**

**Table D-2 - Group "D" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0200AWX123S	561	30.1	28.2	37.0	24	25.5	17.0	0.40	1.75	17.00	(6) 1/2"	920	429
HSD0250AWX123S	563	30.1	28.2	37.0	24	25.5	17.0	0.30	0.85	17.00	(6) 1/2"	915	414

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR  $\Omega_0=2.0$  FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR  $\Omega_0=2.0$  FOR EACH FASTENER.



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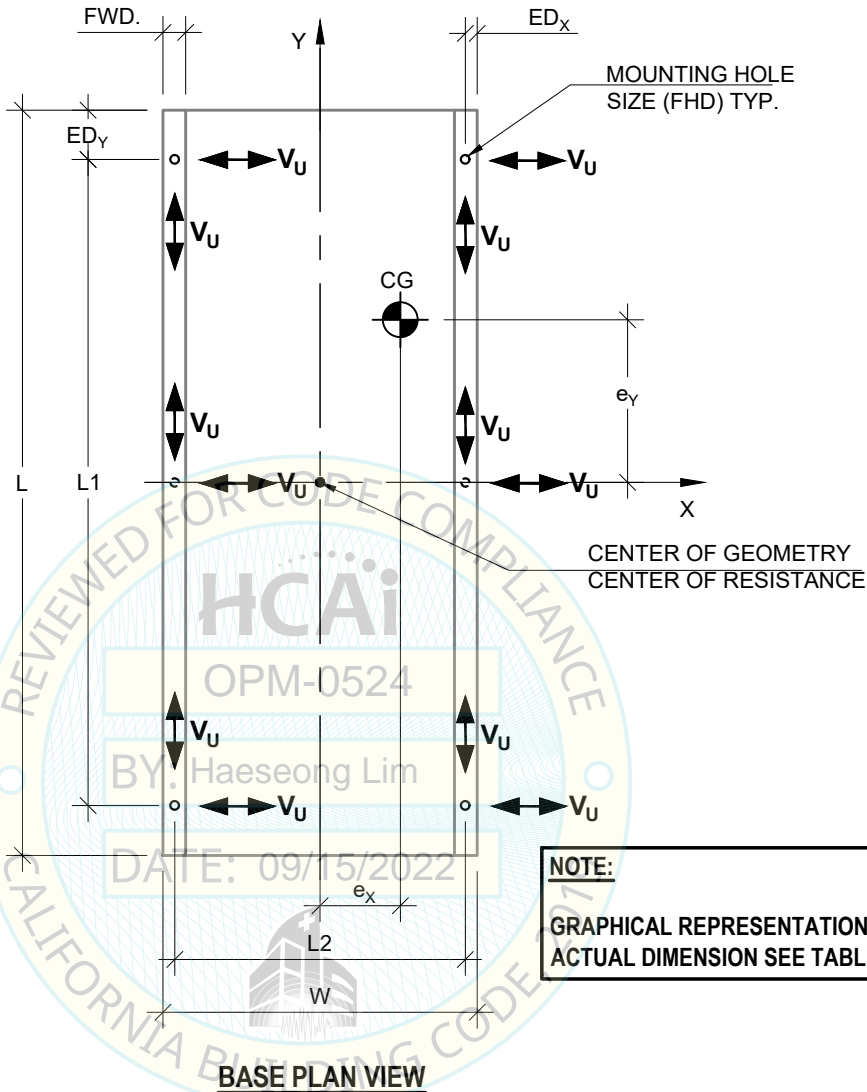
  
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HSD PLAN VIEW - GROUP "D" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK

Equipment Data	
CG Location	: SEE TABLE D-3 ON SHEET 2-28
Unit Operating Weight	: SEE TABLE D-3 ON PAGE 2-28 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" $ED_x = 1.250$ "




**NOTE:**  
GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE D-3, PAGE 2-28.

**NOTES:**

1.  $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "D" TABLE D-3 ON PAGE 2-28.
2.  $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "D" TABLE D-3 ON PAGE 2-28.
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
5. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE D-3.
7. EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
9. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
10. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

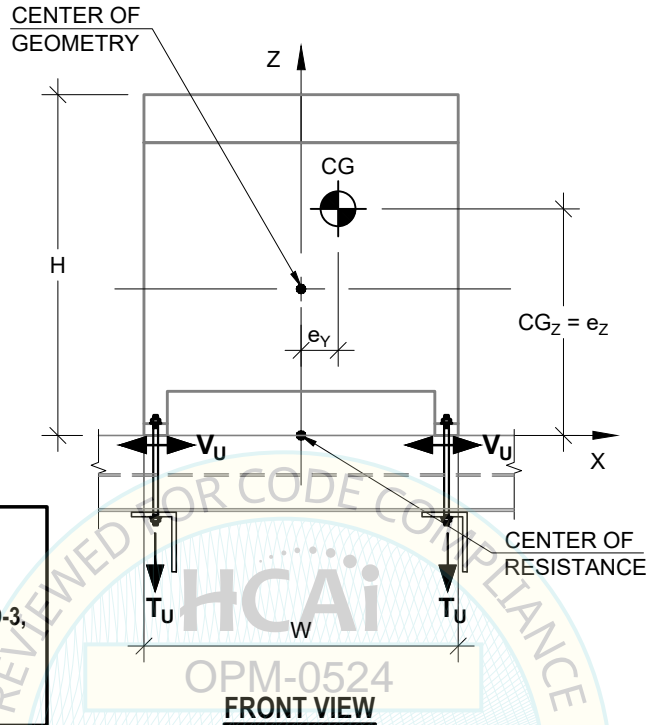
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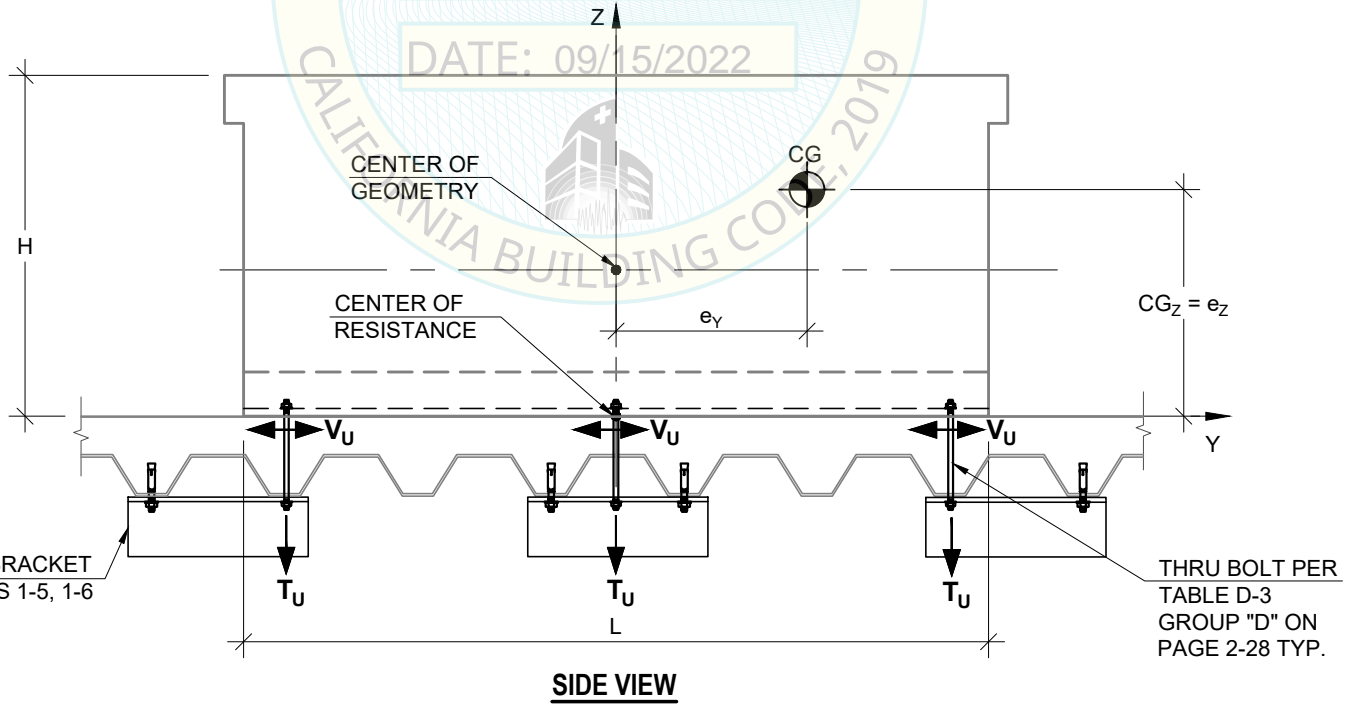
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HSD VIEWS - GROUP "D" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK


Equipment Data	
CG Location	: SEE TABLE D-3 ON SHEET 2-28
Unit Operating Weight	: SEE TABLE D-3 ON PAGE 2-28 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.135" $ED_x = 1.250"$



- NOTES:**
1. GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE D-3, PAGE 2-28.
  2. SEE PAGE 2-26 FOR NOTES AND INFORMATION NOT SHOWN



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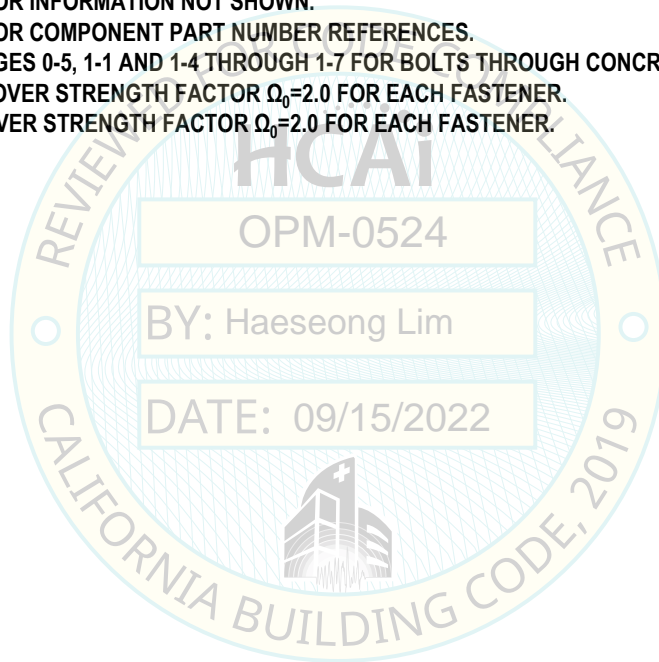
**HSD INFORMATION - GROUP "D" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK**

**Table D-3 - Group "D" (1)**

Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Anchor <sup>(3)</sup> Bolts (Thru Bolt) No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0200AWX123S	561	30.1	28.2	37.0	24	25.5	17.0	0.40	1.75	17.00	(6) 1/2"	920	429
HSD0250AWX123S	563	30.1	28.2	37.0	24	25.5	17.0	0.30	0.85	17.00	(6) 1/2"	915	414

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



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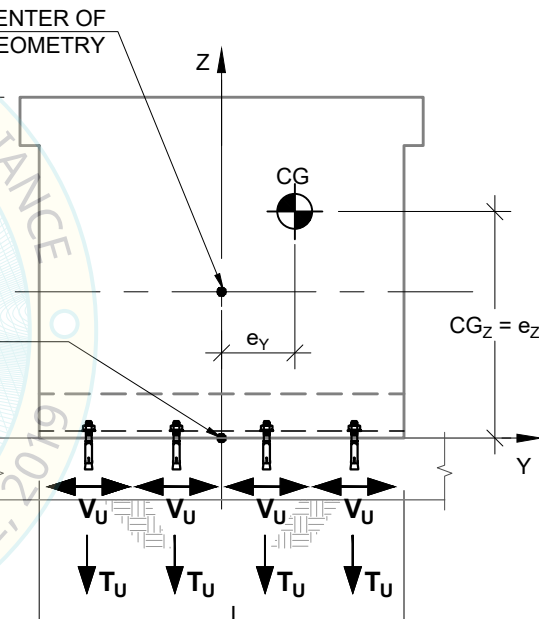
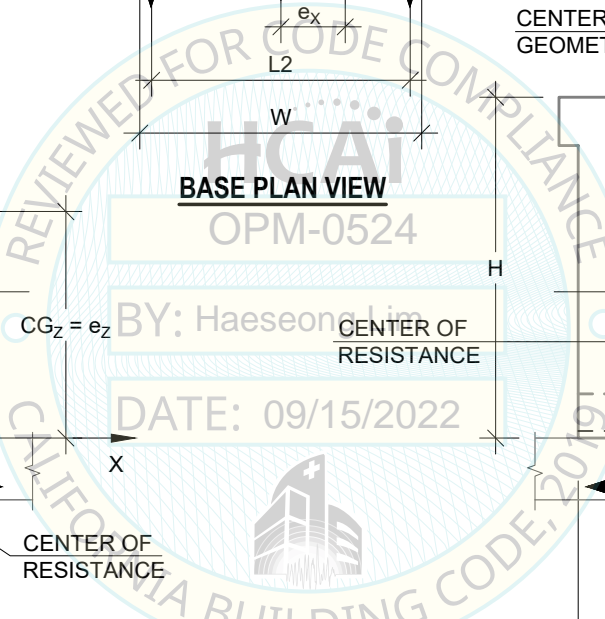
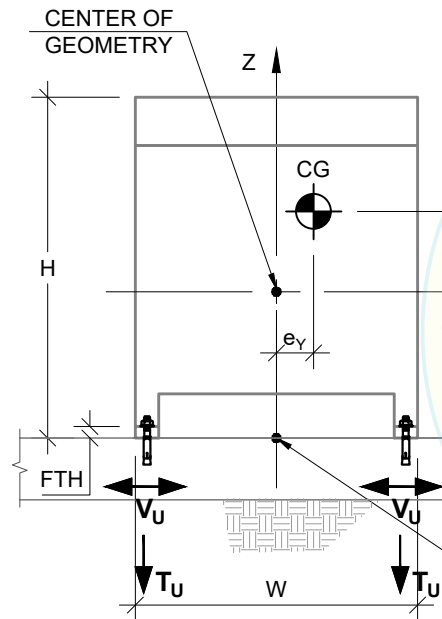
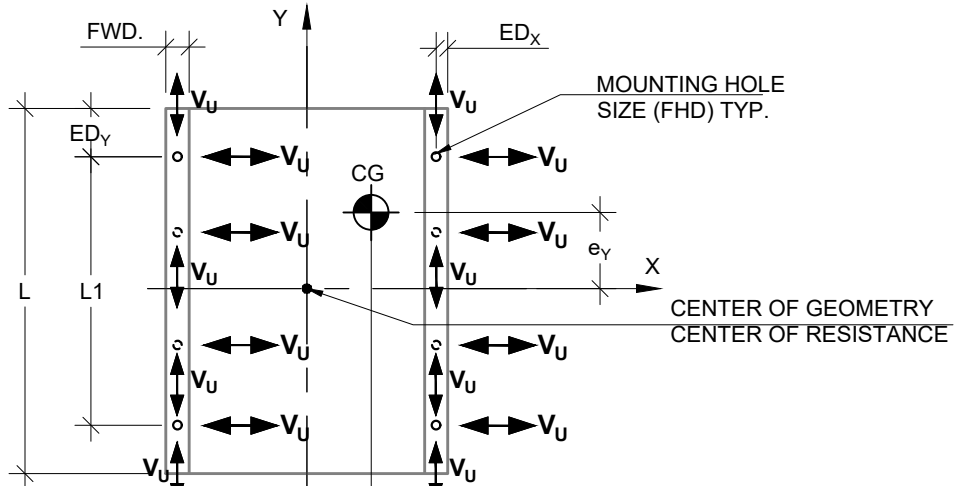
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HSD VIEWS - GROUP "E" (AT GRADE)


Equipment Data	
CG Location	: SEE TABLE E-1 ON SHEET 2-30
Unit Operating Weight	: SEE TABLE E-1 ON PAGE 2-30 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 Fy=50 ksi & Fu=65 ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.179" ED <sub>x</sub> = 1.125"



NOTES:

1.  $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "E" TABLE E-1 ON PAGE 2-30.
2.  $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "E" TABLE E-1 ON PAGE 2-30.
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
5. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE E-1.
7. EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
9. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
10. SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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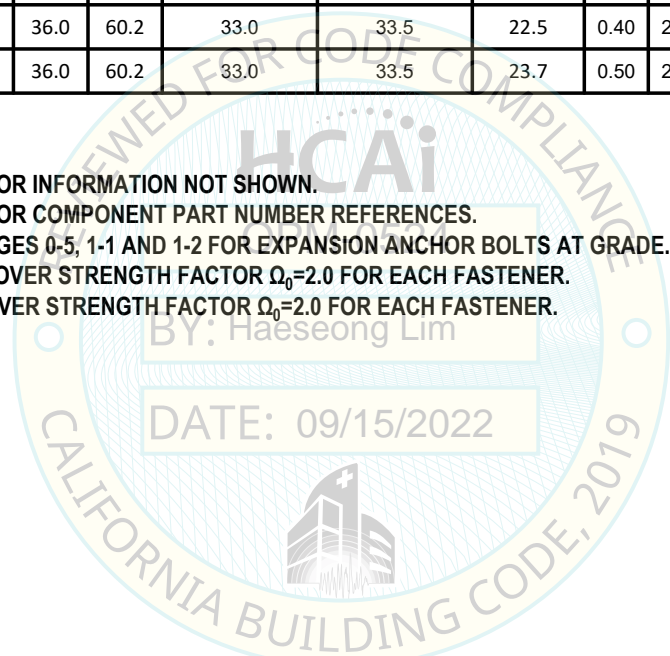
**HSD INFORMATION - GROUP "E" (AT GRADE)**

**Table E-1 - Group "E" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in.)	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0300AWX123S	858	36.2	36.0	60.2	33.0	33.5	23.7	2.30	2.20	23.70	(8) 5/8"	949	389
HSD0350AWX123S	901	36.2	36.0	60.2	33.0	33.5	22.9	2.80	1.70	22.90	(8) 5/8"	961	408
HSD0400AWX123S	1073	36.2	36.0	60.2	33.0	33.5	22.8	0.00	2.50	22.80	(8) 5/8"	1125	459
HSD0450AWX123S	1243	36.2	36.0	60.2	33.0	33.5	22.5	0.30	2.60	22.50	(8) 5/8"	1289	538
HSD0500AWX123S	1254	36.2	36.0	60.2	33.0	33.5	22.5	0.40	2.60	22.50	(8) 5/8"	1301	544
HSD0600AWX123S	1342	36.2	36.0	60.2	33.0	33.5	23.7	0.50	2.10	23.70	(8) 5/8"	1458	575

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-2 FOR EXPANSION ANCHOR BOLTS AT GRADE.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



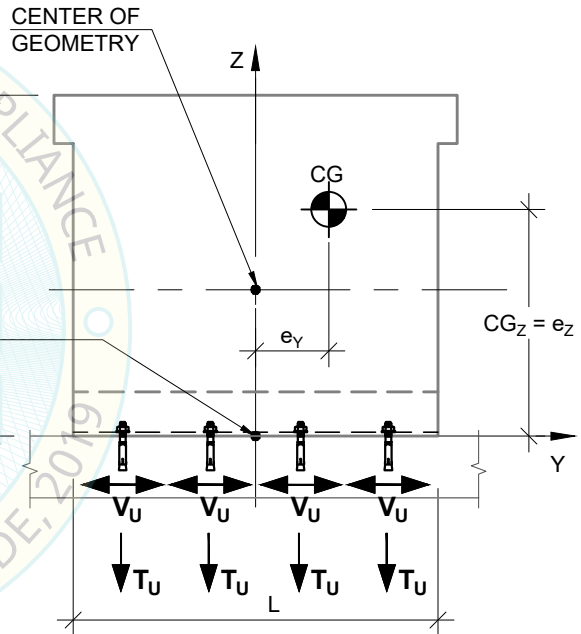
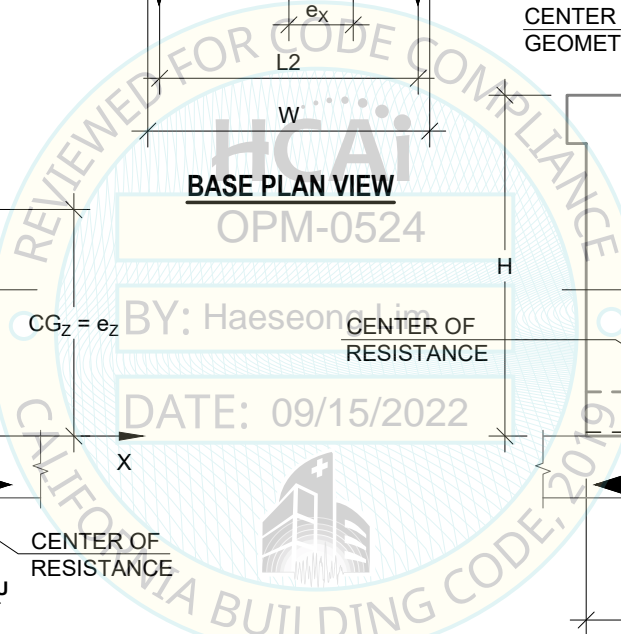
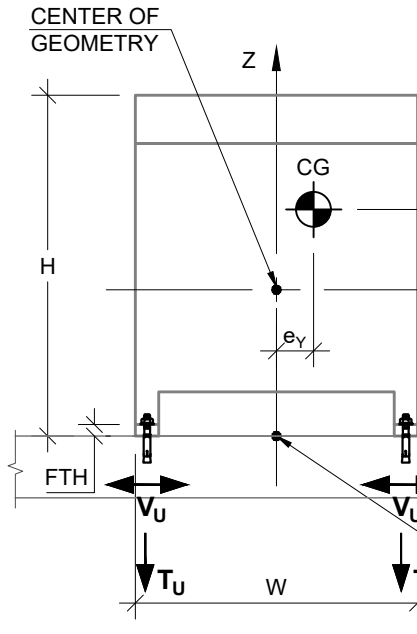
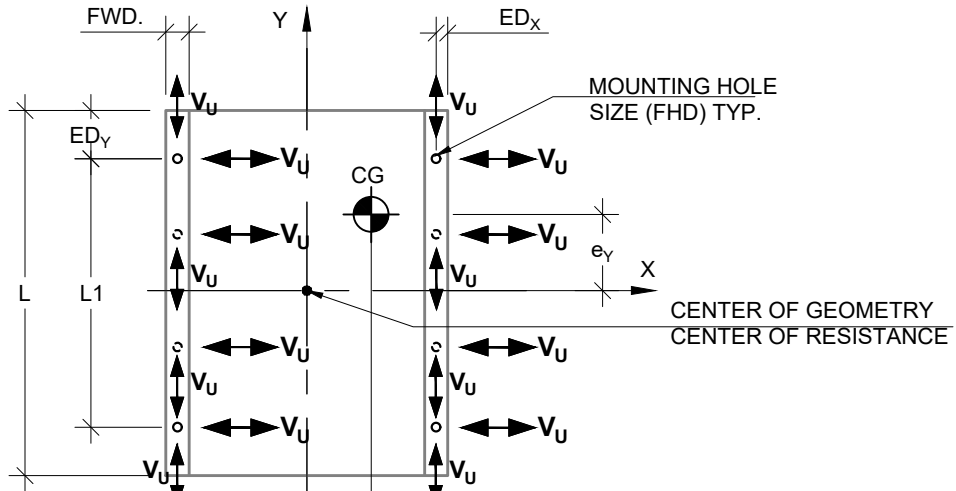
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HSD VIEWS - GROUP "E" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK

Equipment Data	
CG Location	: SEE TABLE E-2 ON SHEET 2-32
Unit Operating Weight	: SEE TABLE E-2 ON PAGE 2-32 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.179" $ED_x = 1.125$ "



NOTES:

- $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "E" TABLE E-2 ON PAGE 2-32.
- $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "E" TABLE E-2 ON PAGE 2-32.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE E-2.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

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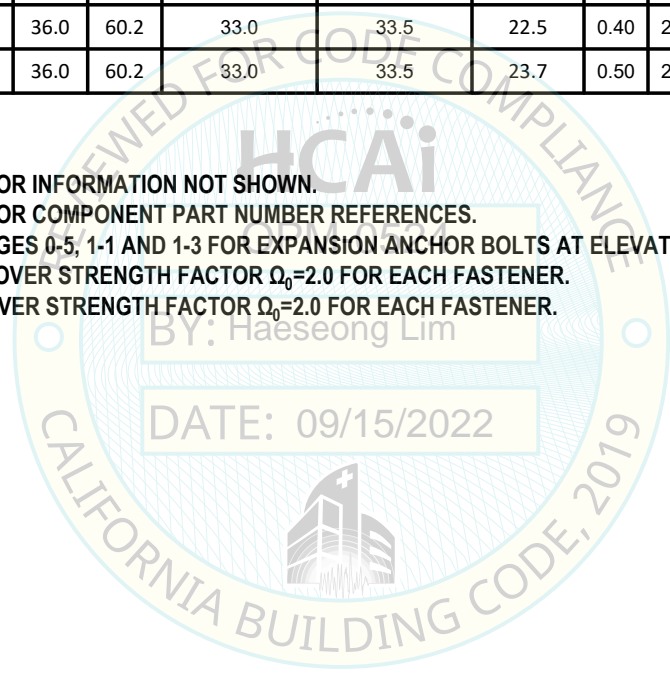
**HSD INFORMATION - GROUP "E" (AT ELEVATED FLOOR)  
SOLID CONCRETE DECK**

**Table E-2 - Group "E" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Expansion <sup>(3)</sup> Anchor Bolts No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0300AWX123S	858	36.2	36.0	60.2	33.0	33.5	23.7	2.30	2.20	23.70	(8) 5/8"	1267	518
HSD0350AWX123S	901	36.2	36.0	60.2	33.0	33.5	22.9	2.80	1.70	22.90	(8) 5/8"	1285	545
HSD0400AWX123S	1073	36.2	36.0	60.2	33.0	33.5	22.8	0.00	2.50	22.80	(8) 5/8"	1504	612
HSD0450AWX123S	1243	36.2	36.0	60.2	33.0	33.5	22.5	0.30	2.60	22.50	(8) 5/8"	1723	717
HSD0500AWX123S	1254	36.2	36.0	60.2	33.0	33.5	22.5	0.40	2.60	22.50	(8) 5/8"	1739	726
HSD0600AWX123S	1342	36.2	36.0	60.2	33.0	33.5	23.7	0.50	2.10	23.70	(8) 5/8"	1949	767

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-3 FOR EXPANSION ANCHOR BOLTS AT ELEVATED FLOORS.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



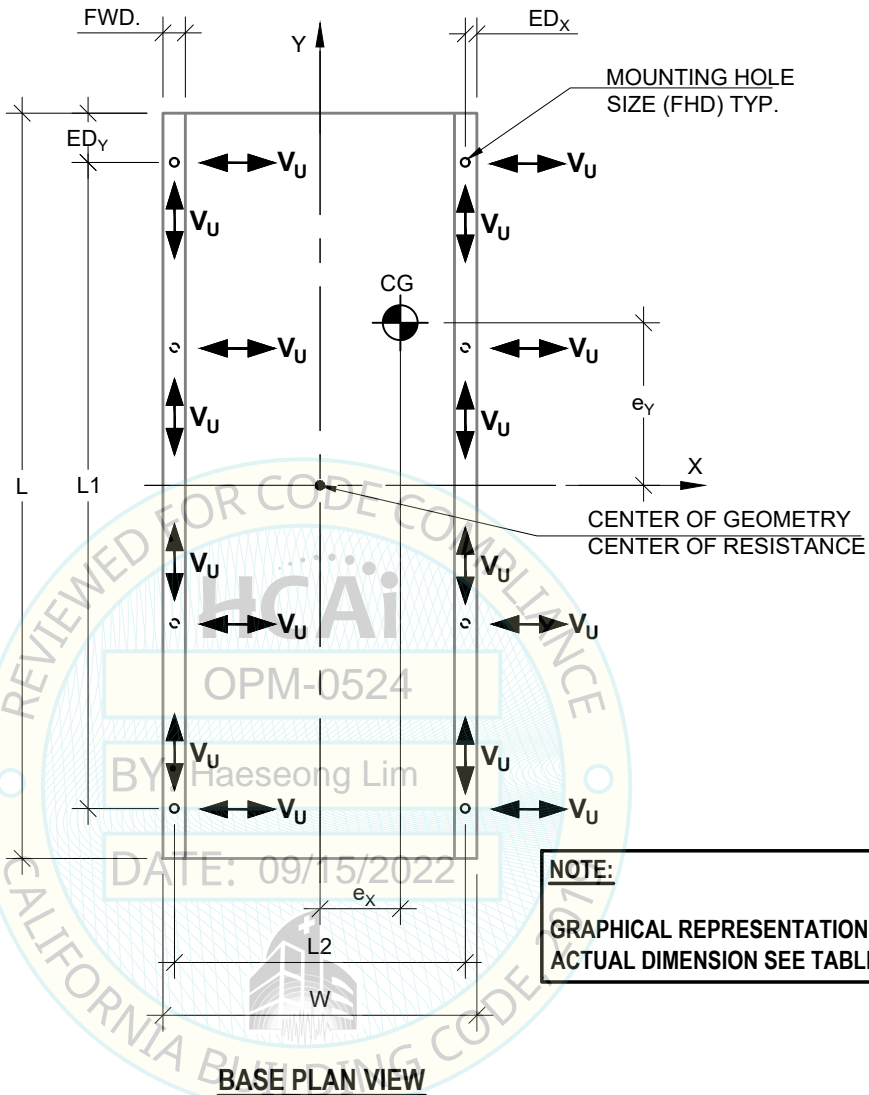
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HSD PLAN VIEW - GROUP "E" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK

Equipment Data	
CG Location	: SEE TABLE E-3 ON SHEET 2-35
Unit Operating Weight	: SEE TABLE E-3 ON PAGE 2-35 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.179" $ED_x = 1.125$ "




**NOTE:**  
GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE E-3, PAGE 2-35.

**NOTES:**

- $T_U$  = TENSION FORCE FOR EACH FASTENER, PER GROUP "E" TABLE E-3 ON PAGE 2-35.
- $V_U$  = SHEAR FORCE FOR EACH FASTENER, PER GROUP "E" TABLE E-3 ON PAGE 2-35.
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 0.2 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN IN TABLE E-3.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT WITHIN MAXIMUM DIMENSIONS.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 15 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE WIDTH (FWD) AND MOUNTING FLANGE THICKNESS (FTH).
- SEE TABLE 0.6-1 IN SECTION 0.6 FOR MOUNTING FLANGE HOLE LOCATIONS ( $ED_x$  &  $ED_y$ ) AND SIZE (FHD).

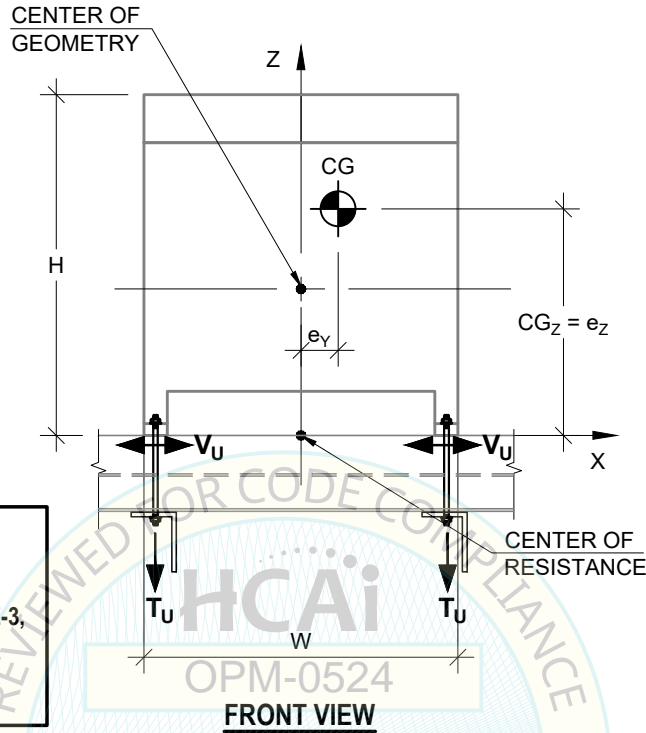
**M.R.H. STRUCTURAL ENGINEERS, INC.**  
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NEWPORT BEACH, CA 92660  
TEL: (949) 690-2751 EMAIL: MRH@MRHSE.COM

  
Structural Engineer: Mohammad Hariri  
California SE No. S3545

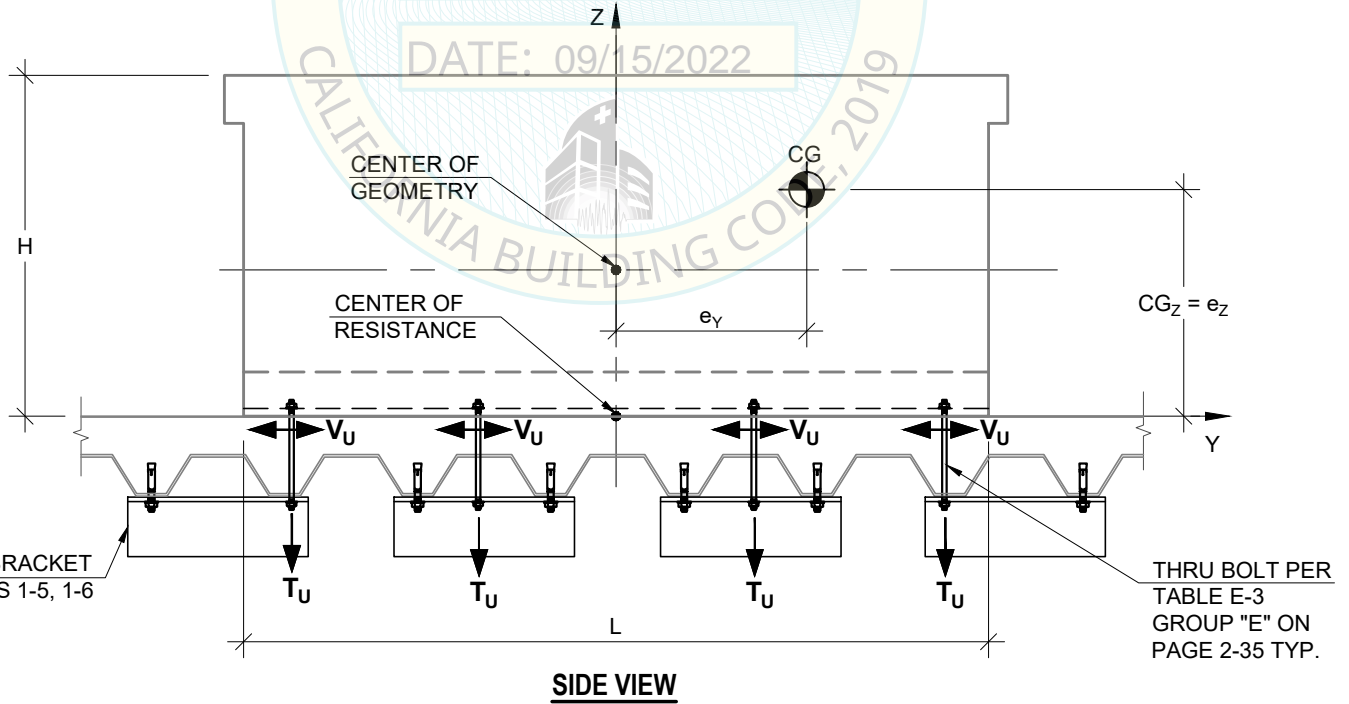
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**2-33**  
DATE:  
August 17, 2022

HSD VIEWS - GROUP "E" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK


Equipment Data	
CG Location	: SEE TABLE E-3 ON SHEET 2-35
Unit Operating Weight	: SEE TABLE E-3 ON PAGE 2-35 FOR $W_p$ @ CG
Bottom Flange Material	: ASTM A-1011, Grade 50 $F_y=50$ ksi & $F_u=65$ ksi
Bottom Flange Dimensions	: FWD = 2.250" FTH = 0.179" $ED_x = 1.125$ "



- NOTES:**
1. GRAPHICAL REPRESENTATION ONLY. FOR ACTUAL DIMENSION SEE TABLE E-3, PAGE 2-35.
  2. SEE PAGE 2-33 FOR NOTES AND INFORMATION NOT SHOWN



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**Structural Engineer: Mohammad Hariri**  
California SE No. S3545

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**2-34**  
DATE:  
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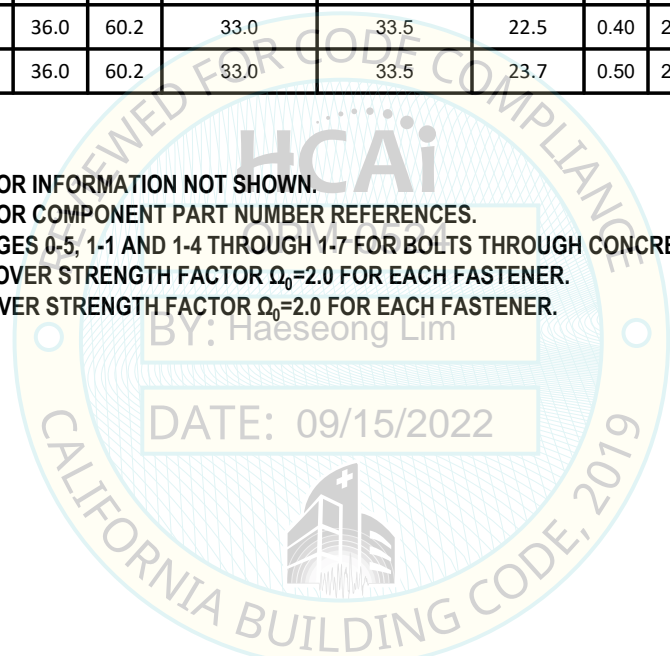
**HSD INFORMATION - GROUP "E" (AT ELEVATED FLOOR)  
CONCRETE FILLED METAL DECK**

**Table E-3 - Group "E" (1)**


Catalog Number <sup>(2)</sup>	Weight (lbs.) [W <sub>p</sub> ]	Equipment Dimensions (in)			Distance between End Anchors along Y-axis (in).	Distance between End Anchors along X-axis (in.)	CG Height (in.) CG <sub>z</sub>	Eccentricities (in.)			Anchor <sup>(3)</sup> Bolts (Thru Bolt) No. & Size	T <sub>U</sub> <sup>(4)</sup> LRFD (lbs.)	V <sub>U</sub> <sup>(5)</sup> LRFD (lbs.)
		L	W	H	L1	L2		e <sub>x</sub>	e <sub>y</sub>	e <sub>z</sub>			
HSD0300AWX123S	858	36.2	36.0	60.2	33.0	33.5	23.7	2.30	2.20	23.70	(8) 5/8"	1267	518
HSD0350AWX123S	901	36.2	36.0	60.2	33.0	33.5	22.9	2.80	1.70	22.90	(8) 5/8"	1285	545
HSD0400AWX123S	1073	36.2	36.0	60.2	33.0	33.5	22.8	0.00	2.50	22.80	(8) 5/8"	1504	612
HSD0450AWX123S	1243	36.2	36.0	60.2	33.0	33.5	22.5	0.30	2.60	22.50	(8) 5/8"	1723	717
HSD0500AWX123S	1254	36.2	36.0	60.2	33.0	33.5	22.5	0.40	2.60	22.50	(8) 5/8"	1739	726
HSD0600AWX123S	1342	36.2	36.0	60.2	33.0	33.5	23.7	0.50	2.10	23.70	(8) 5/8"	1949	767

**FOOTNOTES:**

1. SEE TABLE 0.6-1 ON SHEET 0-6 FOR INFORMATION NOT SHOWN.
2. SEE TABLE 0.6-1 ON SHEET 0-6 FOR COMPONENT PART NUMBER REFERENCES.
3. SEE NOTES AND DETAILS ON PAGES 0-5, 1-1 AND 1-4 THROUGH 1-7 FOR BOLTS THROUGH CONCRETE FILLED METAL DECK.
4. T<sub>U</sub> = TENSION FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.
5. V<sub>U</sub> = SHEAR FORCE INCLUDES OVER STRENGTH FACTOR Ω<sub>0</sub>=2.0 FOR EACH FASTENER.



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**Structural Engineer: Mohammad Hariri**  
 California SE No. S3545

PAGE:  
**2-35**  
 DATE:  
 August 17, 2022

# APPENDIX A

**M.R.H.** STRUCTURAL ENGINEERS, INC.

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**A-0**

DATE:

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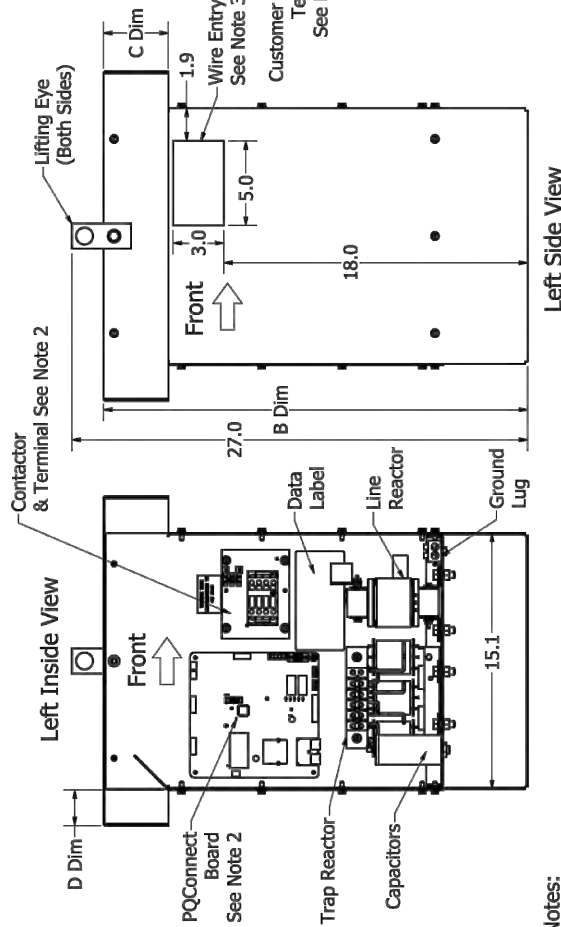
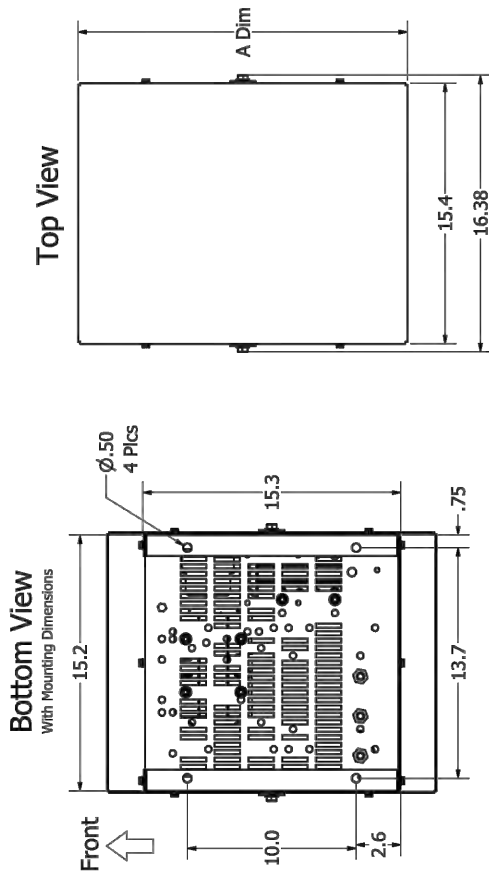
**FOR REFERENCE ONLY**

# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC

Catalog Number	HP	Volts	Phase	Hz	Contactors	Weight (lbs)
*HSD0003AWX023S	3	480	3	60	Without	66
*HSD0003AWX123S	3	480	3	60	With	69
*HSD0003CWX023S	3	600	3	60	Without	66
*HSD0003CWX123S	3	600	3	60	With	69
*HSD0005AWX023S	5	480	3	60	Without	66
*HSD0005AWX123S	5	480	3	60	With	69
*HSD0005CWX023S	5	600	3	60	Without	66
*HSD0005CWX123S	5	600	3	60	With	69
*HSD0008AWX023S	8	480	3	60	Without	85
*HSD0008AWX123S	8	480	3	60	With	88
*HSD0008CWX023S	8	600	3	60	Without	85
*HSD0008CWX123S	8	600	3	60	With	88
*HSD0010AWX023S	10	480	3	60	Without	85
*HSD0010AWX123S	10	480	3	60	With	88
*HSD0010CWX023S	10	600	3	60	Without	85
*HSD0010CWX123S	10	600	3	60	With	88

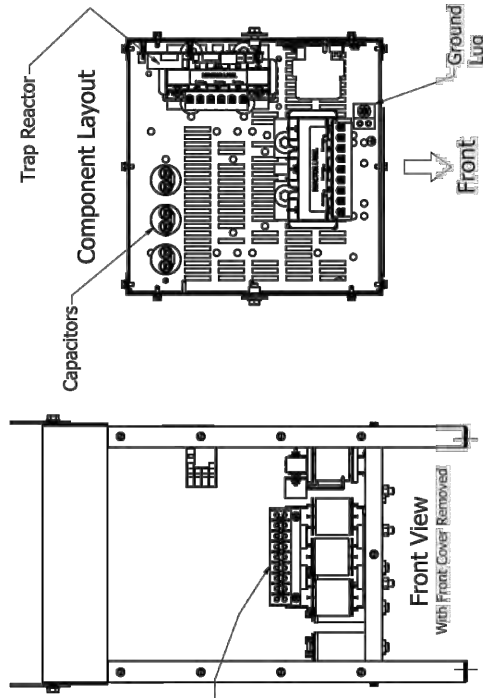
\*Refer to sheet 2 for nomenclature breakdown.

Dimension Table					
Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim	"D" Dim
Type 1	16.8	25.6	1.8		.8
Type 3R	19.5	25.1	3.8		2.1



**Notes:**

- Refer to manual for wire size and torque.
- PQConnect, contactor and terminal are optional.
- Preferred wire entry area.
- See sheet 2 for max height center of gravity (CG) dimensions.
- Enclosure is shown with a Type 3R top.
- Use only hubs or fittings that comply with UL514B for Type 3R applications
- Installation must meet all national and local codes.
- Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
- Enclosure corrosion protection in accordance with UL, R/C (DTW2).



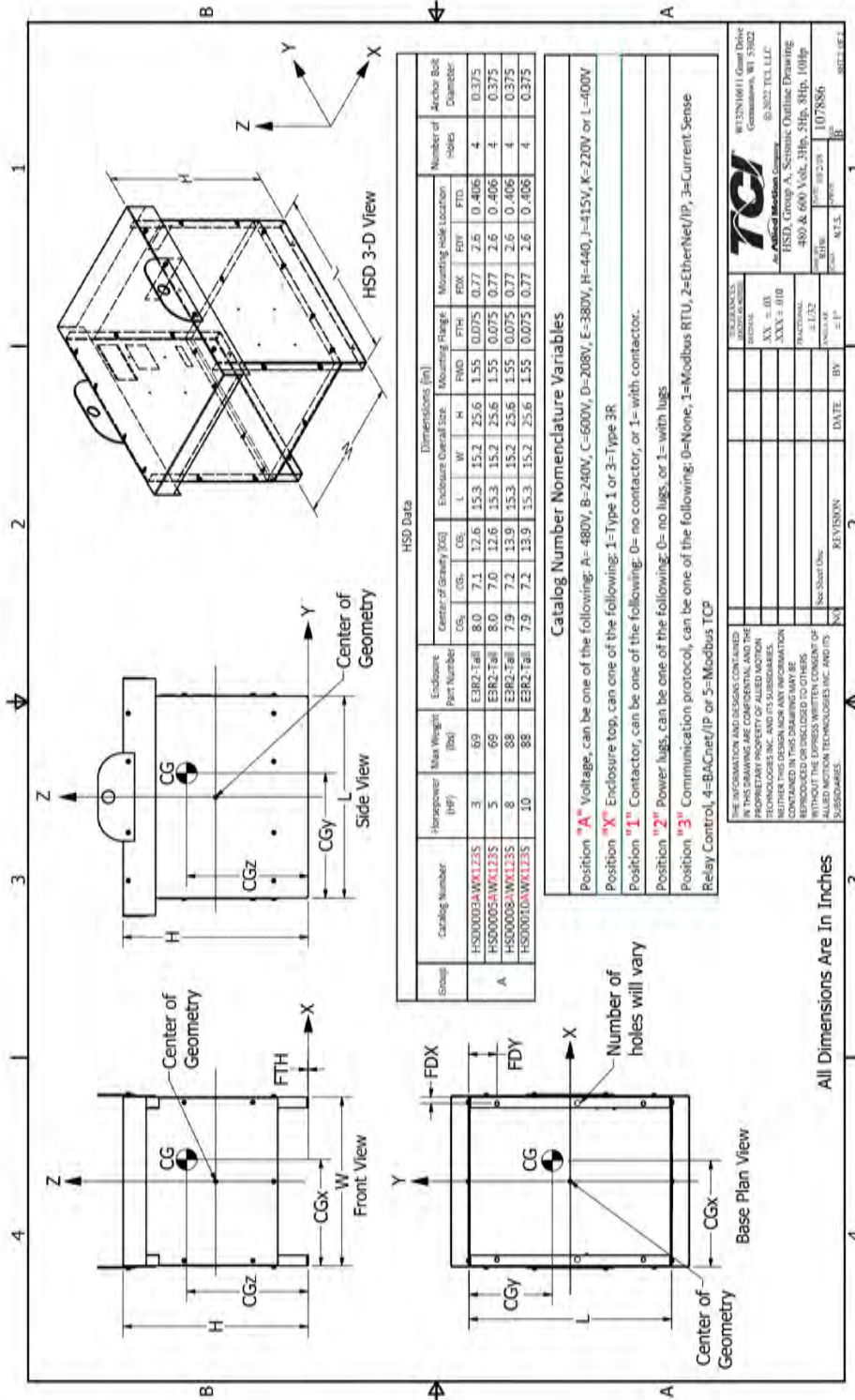
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Structural Engineer: Mohammad Harii  
 California SE No. S3545

PAGE: **A-1**  
 DATE: August 17, 2022





HSD Data

Group	Catalog Number	Horsepower (HP)	Max Weight (lbs)	Enclosure Part Number	Dimensions (in)				Mounting Holes Location	Anchor Bolt Diameter							
					L	W	H	FTH									
A	HSD00003A-WK1235	3	69	E3R2-Tall	8.0	7.1	12.6	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375
	HSD00005A-WK1235	5	69	E3R2-Tall	8.0	7.0	12.6	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375
	HSD00008A-WK1235	8	88	E3R2-Tall	7.9	7.2	13.9	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375
	HSD00010A-WK1235	10	88	E3R2-Tall	7.9	7.2	13.9	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375

**Catalog Number Nomenclature Variables**

Position "A" Voltage, can be one of the following: A= 480V, B=240V, C=600V, D=208V, E=380V, H=440, J=415V, K=220V or L=400V

Position "X" Enclosure top, can be one of the following: 1=Type 1 or 3=Type 3R

Position "1" Contactor, can be one of the following: 0= no contactor, or 1= with contactor.

Position "2" Power lugs, can be one of the following: 0= no lugs, or 1= with lugs

Position "3" Communication protocol, can be one of the following: 0=None, 1=Modbus RTU, 2=EtherNet/IP, 3=Current Sense Relay Control, 4=BACnet/IP or 5=Modbus TCP

TCI  
 An Applied Motion Company  
 8125N16411 Grand Dale  
 Germansville, WI 5302  
 80.2022 TCI, LLC

REVISIONS

NO.	REVISION	DATE	BY	APP.
1				

See Start Date: 10/7/2018  
 107886

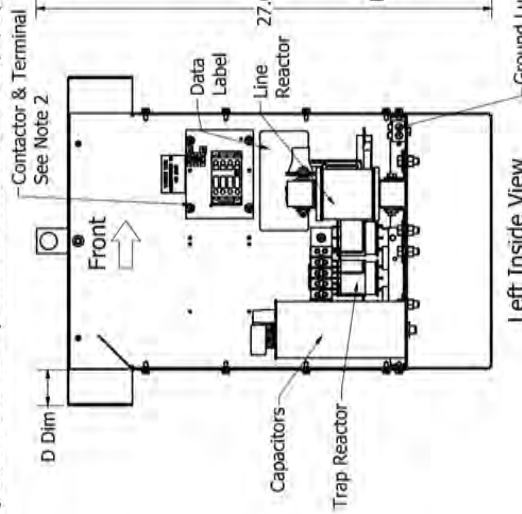
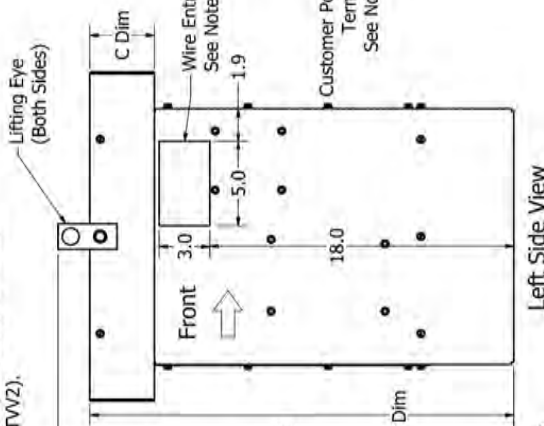
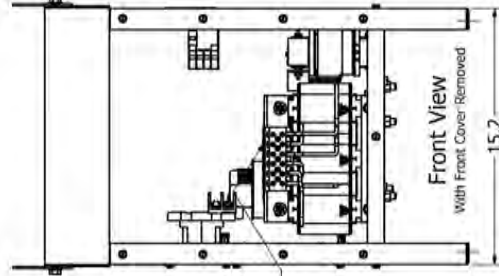
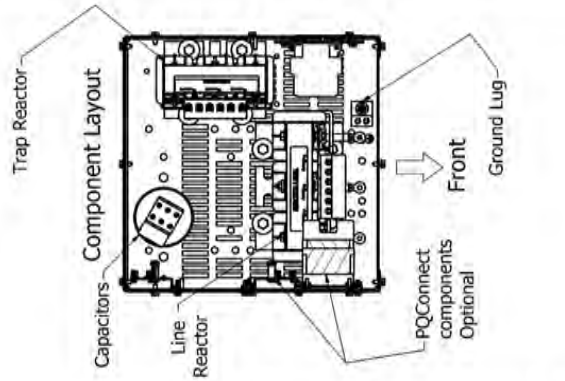
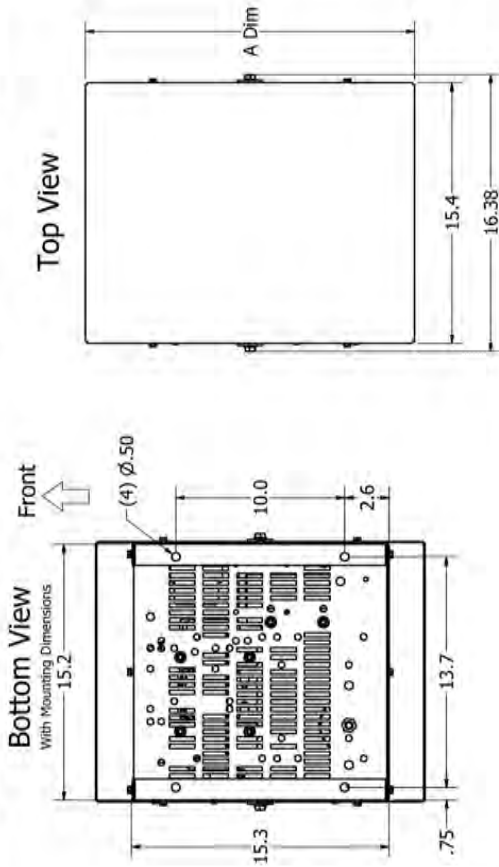
All Dimensions Are In Inches

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 Structural Engineer: Mohammad Hari  
 California SE No. S3545

PAGE: **A-2**  
 DATE: August 17, 2022

# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI, LLC



Catalog Number	HP	Volts	Phase	Hz	Contactor	Weight (lbs)
*HSD0015AWX023S	15	480	3	60	Without	94
*HSD0015AWX123S	15	480	3	60	With	97
*HSD0015CWX023S	15	600	3	60	Without	94
*HSD0015CWX123S	15	600	3	60	With	97
*HSD0020AWX023S	20	480	3	60	Without	99
*HSD0020AWX123S	20	480	3	60	With	102
*HSD0020CWX023S	20	600	3	60	Without	99
*HSD0020CWX123S	20	600	3	60	With	102
*HSD0025AWX023S	25	480	3	60	Without	102
*HSD0025AWX123S	25	480	3	60	With	105

\*Refer to sheet 2 for nomenclature breakdown.

- Notes:
- 1.) Refer to manual for wire size and torque.
  - 2.) PQConnect, contactor and terminal are optional.
  - 3.) Preferred wire entry area.
  - 4.) See sheet 2 for max height center of gravity (CG) dimensions.
  - 5.) Enclosure is shown with a Type 3R top.
  - 6.) Use only hubs or fittings that comply with UL514B for Type 3R applications
  - 7.) Installation must meet all national and local codes.
  - 8.) Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
  - 9.) Enclosure corrosion protection in accordance with UL, R/C (DTWV2).

REV	DATE	BY	CHK	DESCRIPTION
01	02/18/22	RV	RV	REVISED TO ADD PENDING CHANGES
02	02/23/22	RV	RV	REVISED TO ADD PENDING CHANGES

NO.	DESCRIPTION	DATE	BY	CHK
1	ISSUED FOR CONSTRUCTION	02/23/22	RV	RV
2	REVISED TO ADD PENDING CHANGES	02/23/22	RV	RV

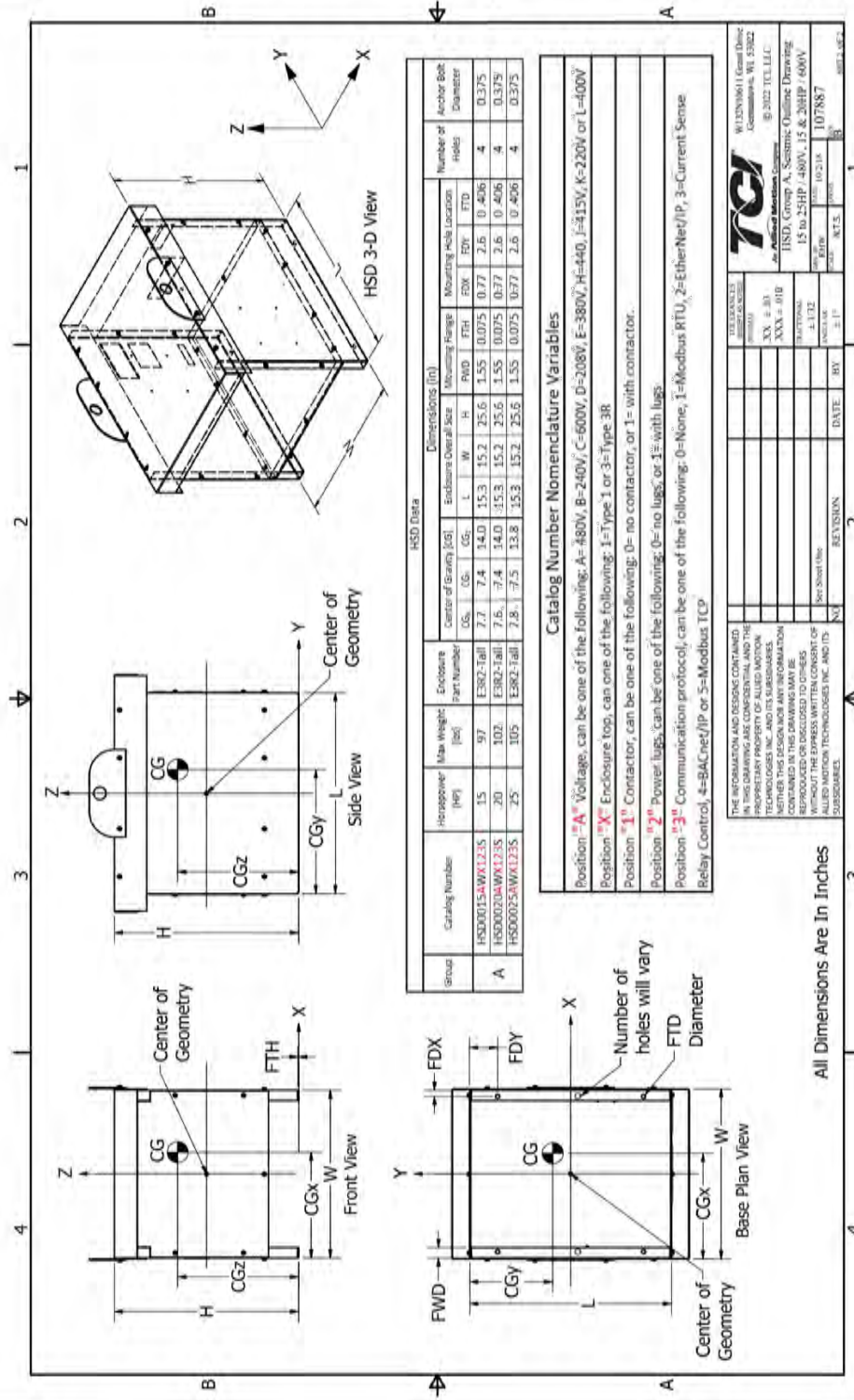
NO.	DESCRIPTION
1	ISSUED FOR CONSTRUCTION
2	REVISED TO ADD PENDING CHANGES

Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim
Type 1	16.8	25.6	1.8	.8
Type 3R	19.5	25.1	3.8	2.1

**M.R.H. STRUCTURAL ENGINEERS, INC.**  
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 NEWPORT BEACH, CA 92660  
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*MRH*  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

PAGE: **A-3**  
 DATE: August 17, 2022



**HSD Data**

Group	Catalog Number	horsepower (Hp)	Max Weight (lbs)	Enclosure Part Number	Dimensions (in)												Number of Anchor Bolt Holes	
					Center of Gravity (CG)				Mounting Range				Mounting Hole Locations					
					CGx	CGy	CGz	L	W	H	FWD	FDX	FTH	FDY	FTD	FTD		
	HSD00015AWX12.5S	15	97	E382-1all	7.7	7.4	14.0	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0	406	4	0.375
A	HSD00020AWX12.5S	20	102	E382-1all	7.6	7.4	14.0	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0	406	4	0.375
A	HSD00025AWX12.5S	25	105	E382-1all	7.8	7.5	13.8	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0	406	4	0.375

**Catalog Number Nomenclature Variables**

Position "**A**" Voltage, can be one of the following: A=480V, B=240V, C=600V, D=208V, E=380V, H=440, J=415V, K=220V or L=100V  
 Region "**X**" Enclosure top, can one of the following: 1=Type 1 or 3=Type 3R  
 Position "**1**" Contactor, can be one of the following: 0= no contactor, or 1= with contactor.  
 Position "**2**" Power lugs, can be one of the following: 0= no lugs, or 1= with lugs  
 Position "**3**" Communication protocol, can be one of the following: 0=None, 1=Modbus RTU, 2=EtherNet/IP, 3=Current Sense Relay Control, 4=BACnet/IP or 5=Modbus TCP

TEL: (920) 266-1111 FAX: (920) 266-1112  
 WWW.TCILEVEL.COM  
 XXX # 3/1  
 XXXX # 010  
 DATE: 10/21/14  
 INCHES: 1/8" TO 1-1/2"  
 SHEET: 1 OF 1  
 DESIGNED BY: R.C.L.S.  
 REVISED BY: N.V.  
 DATE: 10/21/14  
 DWG NO: 107887

**All Dimensions Are In Inches**

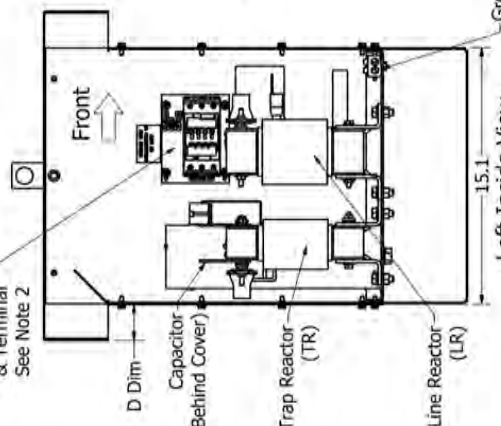
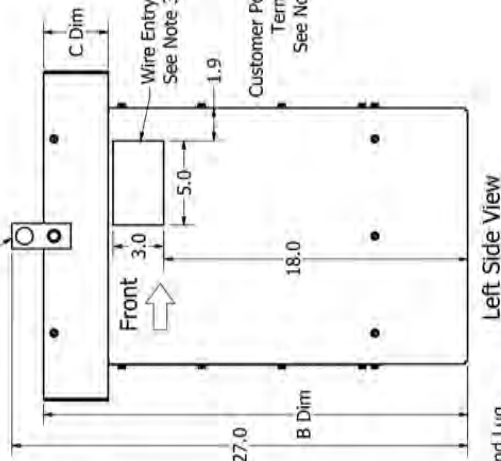
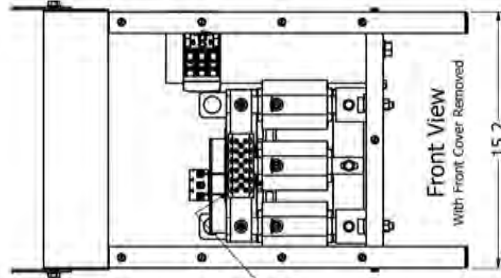
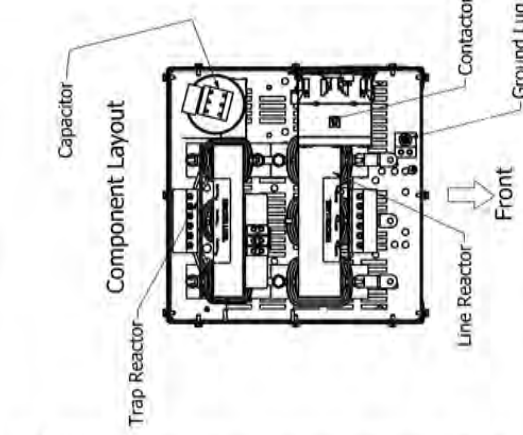
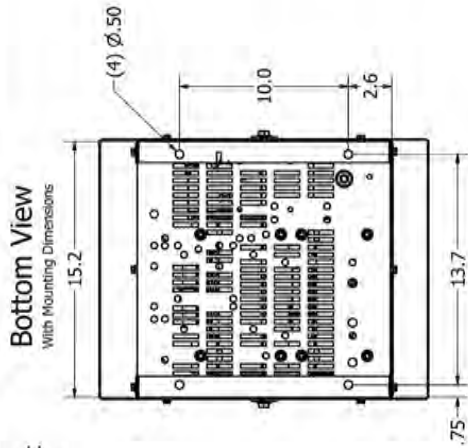
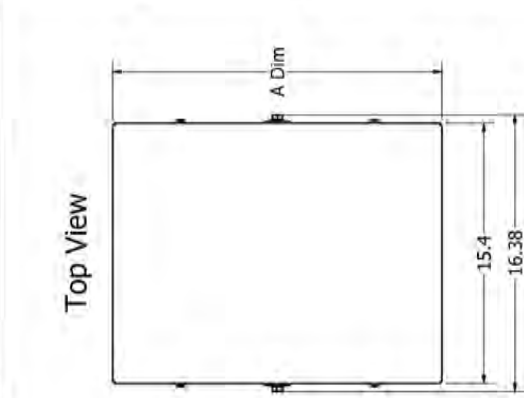
**M.R.H. STRUCTURAL ENGINEERS, INC.**  
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**Structural Engineer: Mohammad Hariri**  
 California SE No. S3545

PAGE: **A-4**  
 DATE: August 17, 2022



# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC



Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim
Type 1R	16.8	25.6	1.8	.8
Type 3R	19.5	25.1	3.8	2.1

REV	DESCRIPTION	DATE	BY	CHKD	APP'D
1	ISSUE FOR PRODUCTION	08/17/22	MRH		
2	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
3	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
4	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
5	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
6	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
7	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
8	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
9	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		
10	REVISED TO ADD DIMENSIONS FOR TYPE 3R	08/17/22	MRH		

Catalog Number	HP	Volts	Phase	Hz	Contactors	Weight (lb)
*HSD0025CW0205	25	600	3	60	Without	102
*HSD0025CW1205	25	600	3	60	With	105
*HSD0030AW0205	30	480	3	60	Without	113
*HSD0030AW1205	30	480	3	60	With	116
*HSD0030CW0205	30	600	3	60	Without	113
*HSD0030CW1205	30	600	3	60	With	116
*HSD0040AW0205	40	480	3	60	Without	158
*HSD0040AW1205	40	480	3	60	With	161
*HSD0040CW0205	40	600	3	60	Without	158
*HSD0040CW1205	40	600	3	60	With	161
*HSD0050AW0205	50	480	3	60	Without	158
*HSD0050AW1205	50	480	3	60	With	161
*HSD0050CW0205	50	600	3	60	Without	158
*HSD0050CW1205	50	600	3	60	With	161

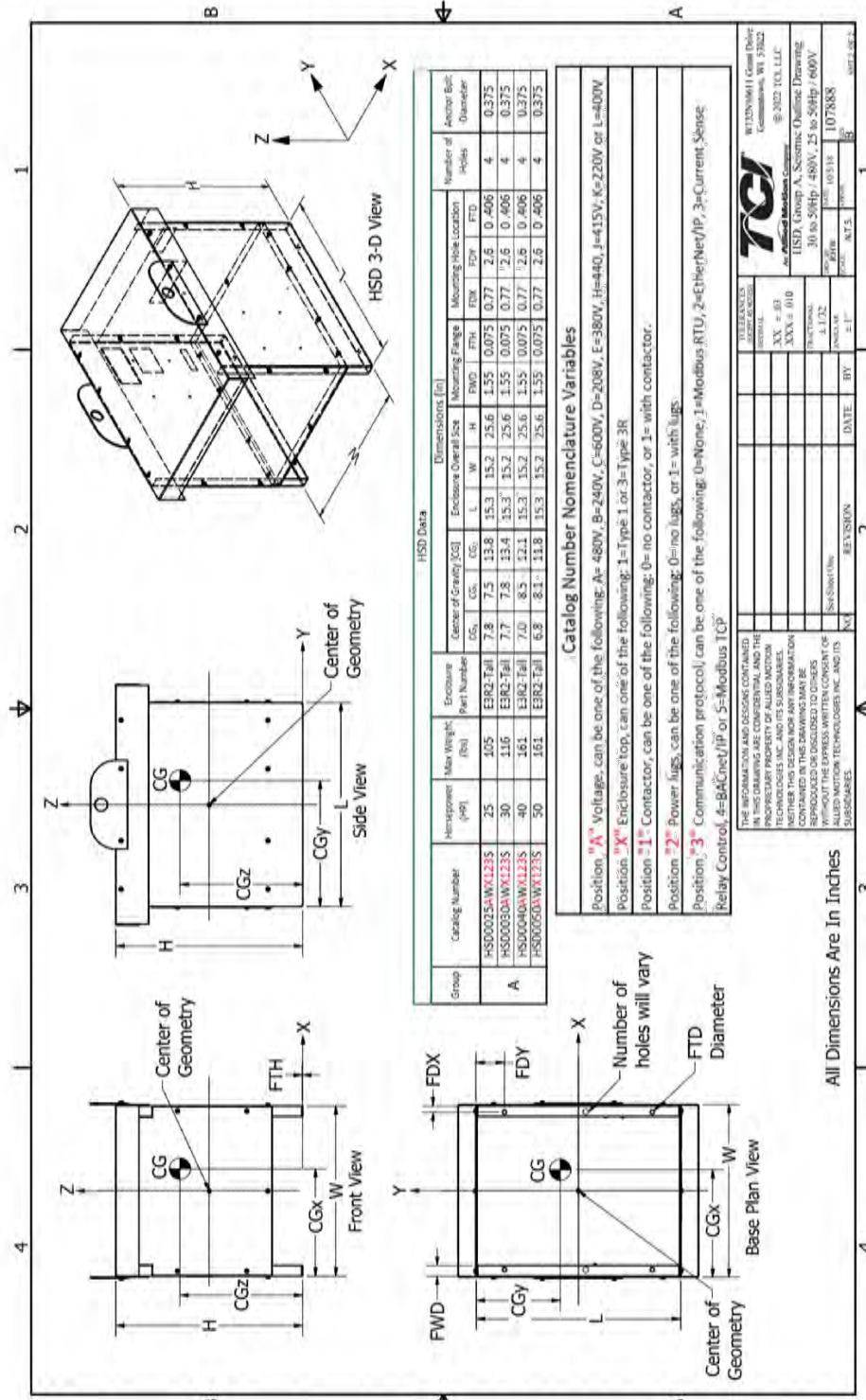
\*Refer to sheet 2 for nomenclature breakdown.

- Notes:
- Refer to manual for wire size and torque.
  - Contactors and terminal are optional.
  - Preferred wire entry area.
  - See sheet 2 for max height center of gravity (CG) dimensions.
  - Enclosure is shown with a Type 3R top.
  - Use only hubs or fittings that comply with UL514B for Type 3R applications.
  - Installation must meet all national and local codes.
  - Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
  - Enclosure corrosion protection in accordance with UL, R/C (DTW2).

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**MRH**  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

PAGE: **A-5**  
 DATE: August 17, 2022



**HSD Data**

Group	Catalog Number	Manufacturer (MFR)	Min Weight (lbs)	Enclosure Part Number	Dimensions (in)						Number of Holes	Anchor Bolt Diameter					
					CGx	CGy	CGz	L	W	H			FWD	FDY	FTD		
A	HSD00025AWX123S	25	405	EIR2-Tall	7.8	7.5	13.8	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375
	HSD00030AWX123S	30	116	EIR2-Tall	7.7	7.8	13.4	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375
	HSD00040AWX123S	40	161	EIR2-Tall	7.0	8.5	12.1	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375
	HSD00050AWX123S	50	161	EIR2-Tall	6.8	8.1	11.8	15.3	15.2	25.6	1.55	0.075	0.77	2.6	0.406	4	0.375

**Catalog Number Nomenclature Variables**

Position "A": Voltage, can be one of the following: A= 480V, B=240V, C=600V, D=208V, E=380V, H=440, I=415V, K=220V or L=400V  
 Position "X": Enclosure top, can one of the following: 1=Type 1 or 3=Type 3R  
 Position "1": Contactor, can be one of the following: 0=no contactor, or 1= with contactor.  
 Position "2": Power lugs, can be one of the following: 0=no lugs, or 1= with lugs.  
 Position "3": Communication protocol, can be one of the following: 0=None, 1=Modbus RTU, 2=EtherNet/IP, 3=Current Sense Relay Control, 4=BAControl or 5=Modbus TCP



**REVISIONS**

NO.	REVISION	DATE	BY	APP.
1				

XX = 03  
 XXX = 010  
 4.1.72  
 107888

All Dimensions Are In Inches

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**MRH**  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

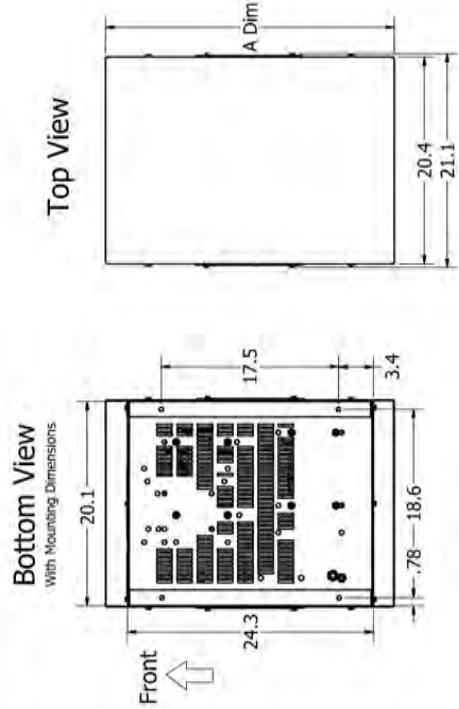
PAGE: **A-6**  
 DATE: August 17, 2022



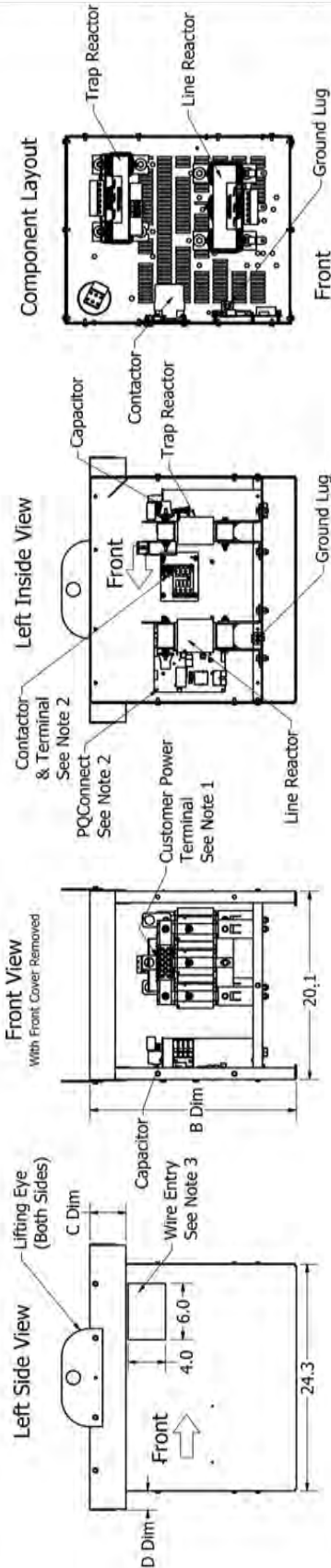
# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC

Catalog Number	HP	Volts	Phase	Hz	Contactor	Weight (lb)
*HSD0025CW <del>X</del> 023S	25	600	3	60	Without	102
*HSD0025CW <del>X</del> 123S	25	600	3	60	With	105
*HSD0030AW <del>X</del> 023S	30	480	3	60	Without	113
*HSD0030AW <del>X</del> 123S	30	480	3	60	With	116
*HSD0030CW <del>X</del> 023S	30	600	3	60	Without	113
*HSD0030CW <del>X</del> 123S	30	600	3	60	With	116
*HSD0040AW <del>X</del> 023S	40	480	3	60	Without	158
*HSD0040AW <del>X</del> 123S	40	480	3	60	With	161
*HSD0040CW <del>X</del> 023S	40	600	3	60	Without	158
*HSD0040CW <del>X</del> 123S	40	600	3	60	With	161
*HSD0050AW <del>X</del> 023S	50	480	3	60	Without	158
*HSD0050AW <del>X</del> 123S	50	480	3	60	With	161
*HSD0050CW <del>X</del> 023S	50	600	3	60	Without	158
*HSD0050CW <del>X</del> 123S	50	600	3	60	With	161
*HSD0060AW <del>X</del> 023S	60	480	3	60	Without	188
*HSD0060AW <del>X</del> 123S	60	480	3	60	With	207
*HSD0060CW <del>X</del> 023S	60	600	3	60	Without	188
*HSD0060CW <del>X</del> 123S	60	600	3	60	With	207

\*Refer to sheet 2 for nomenclature breakdown.



Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim
Type 1	26.5	23.0	2.0	1.2
Type 3R	28.5	22.1	3.9	2.1



**Notes:**

- 1.) Refer to manual for wire size and torque.
- 2.) PQConnect, contactor and terminal are optional.
- 3.) Preferred wire entry area.
- 4.) See sheet 2 for max height center of gravity (CG) dimensions.
- 5.) Enclosure is shown with a Type 3R top.
- 6.) Use only hubs or fittings that comply with UL514B for Type 3R applications
- 7.) Installation must meet all national and local codes.
- 8.) Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
- 9.) Enclosure corrosion protection in accordance with UL, R/C (DTW2).

REV	DATE	BY	APP
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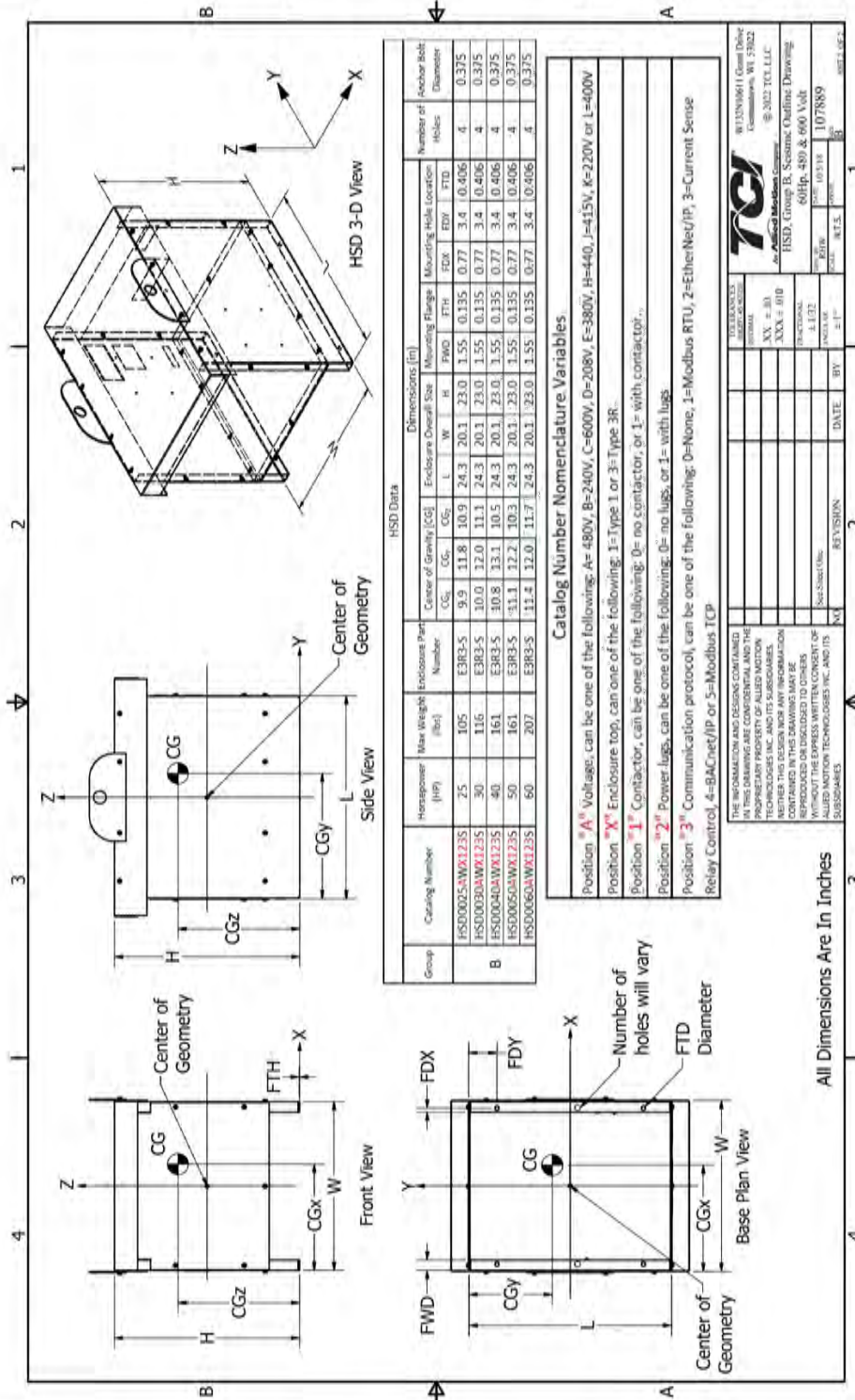
**M.R.H. STRUCTURAL ENGINEERS, INC.**  
 3400 IRVINE AVE., STE. 101  
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**MRH**  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

PAGE: **A-7**  
 DATE: August 17, 2022



# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC



HSD Data

Group	Catalog Number	Horsepower (HP)	Max Weight (lbs)	Enclosure Part Number	Dimensions (in)										Number of Anchor Holes		
					CGx	CGy	CGz	L	W	H	FWD	FTH	FDX	FDY		FTD	
B	HSD0005AWX1235	25	105	E3R3-S	9.9	11.8	10.9	24.3	20.1	23.0	1.55	0.135	0.77	3.4	0.406	4	0.375
	HSD0030AWX1235	30	116	E3R3-S	10.0	12.0	11.1	24.3	20.1	23.0	1.55	0.135	0.77	3.4	0.406	4	0.375
	HSD0040AWX1235	40	161	E3R3-S	10.8	13.1	10.5	24.3	20.1	23.0	1.55	0.135	0.77	3.4	0.406	4	0.375
	HSD0050AWX1235	50	161	E3R3-S	11.1	12.2	10.3	24.3	20.1	23.0	1.55	0.135	0.77	3.4	0.406	4	0.375
	HSD0060AWX1235	60	207	E3R3-S	11.4	12.0	11.7	24.3	20.1	23.0	1.55	0.135	0.77	3.4	0.406	4	0.375

**Catalog Number Nomenclature Variables**

Position "A" Voltages, can be one of the following: A= 480V, B=240V, C=600V, D=208V, E=380V, H=440, J=415V, K=220V or L=400V

Position "X" Enclosure top, can one of the following: 1=Type 1 or 3=Type 3R

Position "1" Contactor, can be one of the following: 0= no contactor, pr 1= with contactor...

Position "2" Power lugs, can be one of the following: 0= no lugs, or 1= with lugs

Position "3" Communication protocol, can be one of the following: D=None, I=Modbus RTU, Z=EtherNet/IP, 3=Current Sense Relay Control, 4=BACnet/IP or 5=Modbus TCP

**TCI**

An Applied Motion Technologies Company

HSD, Group B, Seismic, Outline Drawing  
60HP, 480 & 600 Volt

REV: 08/21/22

DWG NO: 107889

All Dimensions Are In Inches

**M.R.H. STRUCTURAL ENGINEERS, INC.**  
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 NEWPORT BEACH, CA 92660  
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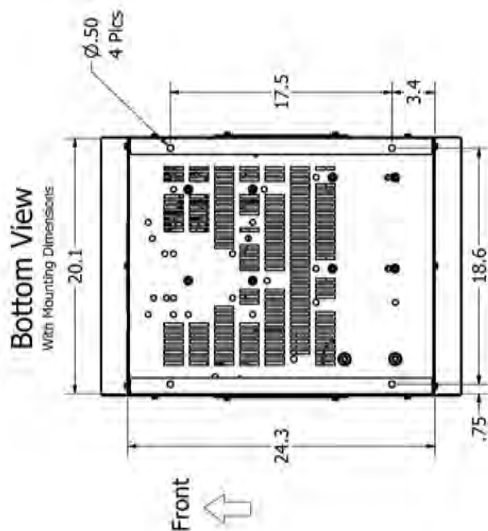
Structural Engineer: Mohammad Hari  
 California SE No. S3545

PAGE: **A-8**  
 DATE: August 17, 2022

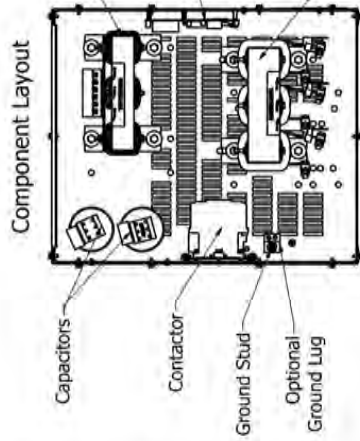
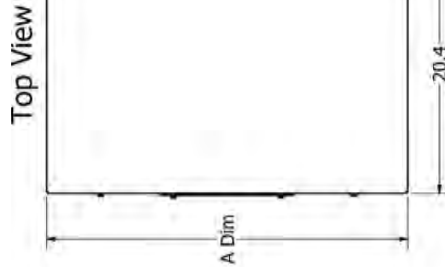
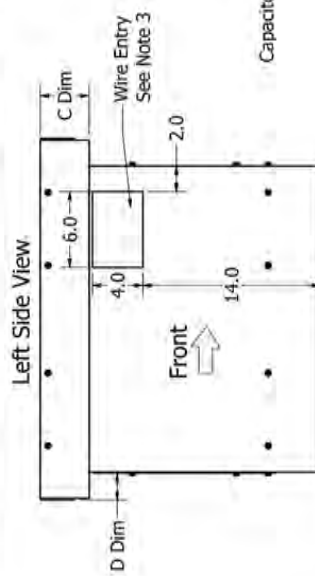
# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC

Catalog Number	HP	Volts	Phase	Hz	Contactor Weight (lb)	Terminal Hole Size
*HSD0075AWX023S	75	480	3	60	Without	205
*HSD0075AWX123S	75	480	3	60	With	208
*HSD0075CW023S	75	600	3	60	Without	205
*HSD0075CW123S	75	600	3	60	With	208

\*Refer to sheet 2 for nomenclature breakdown.

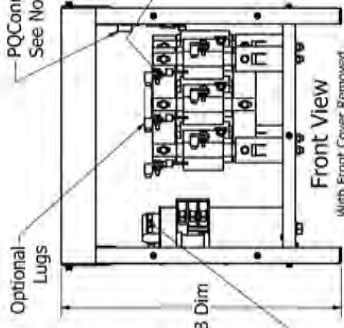
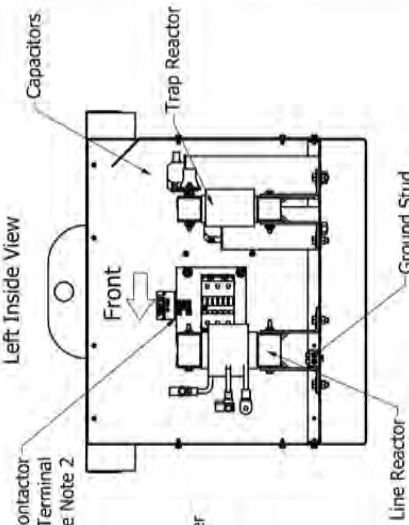


Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim
Type 1	26.5	23.0	2.0	1.2
Type 3R	28.5	22.1	3.9	2.1



Front

Left Inside View



- Notes:
- Refer to manual for wire size and torque.
  - PQConnect, contactor and terminal are optional.
  - Preferred wire entry area.
  - See sheet 2 for max height center of gravity (CG) dimensions.
  - Enclosure is shown with a Type 3R top.
  - Use only hubs or fittings that comply with UL514B for Type 3R applications.
  - Installation must meet all national and local codes.
  - Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
  - Enclosure corrosion protection in accordance with UL, R/C (DTW2).

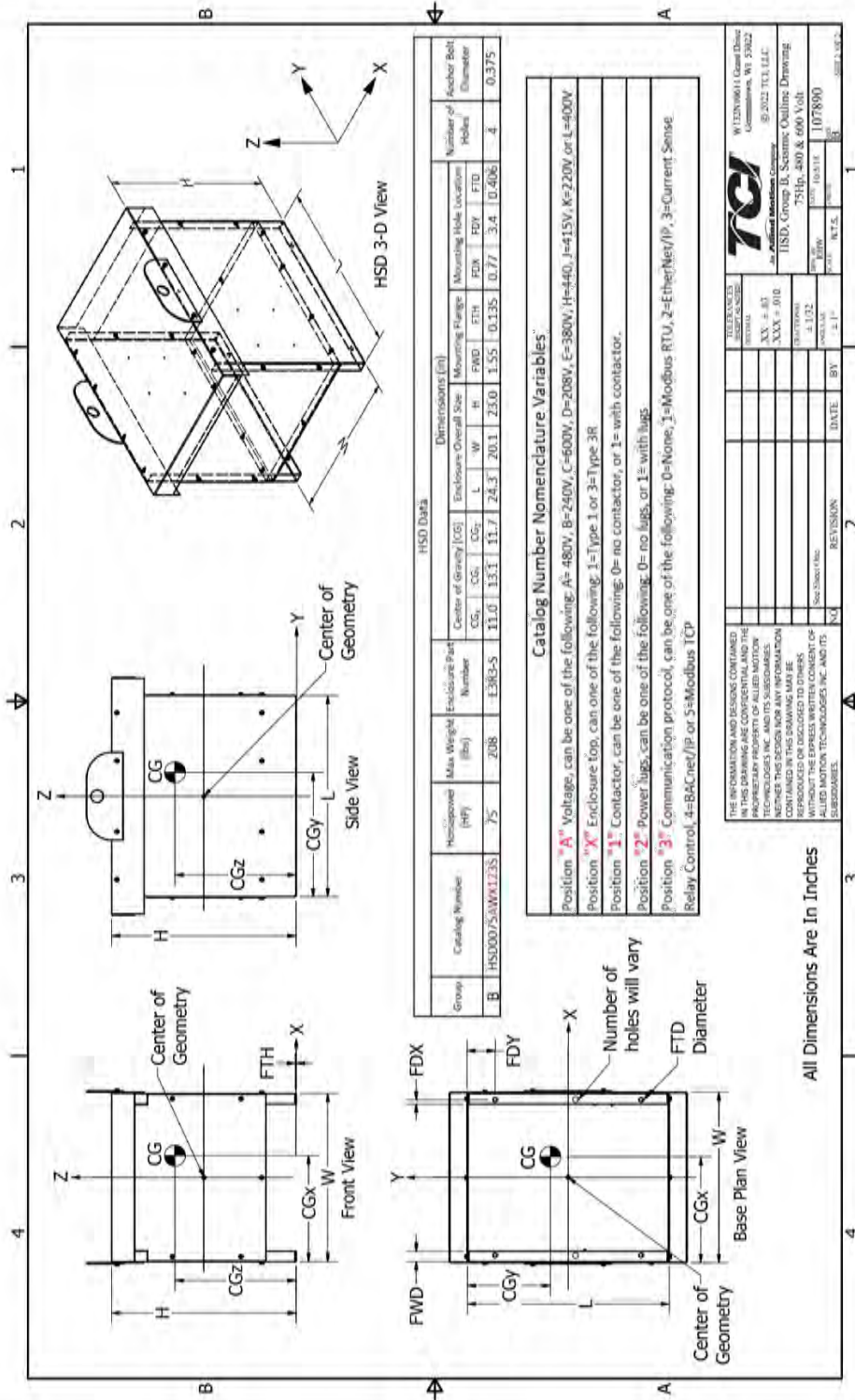
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08	02/27/19	BDW	Revised
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17	02/27/19	BDW	Revised
18	02/27/19	BDW	Revised
19	02/27/19	BDW	Revised
20	02/27/19	BDW	Revised

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**MRH**  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

PAGE: **A-9**  
 DATE: August 17, 2022

**FOR REFERENCE ONLY**



REVISIONS	DATE	BY	NO.
1	10-23-11	J.T.S.	1
2	10-23-11	J.T.S.	2
3	10-23-11	J.T.S.	3
4	10-23-11	J.T.S.	4
5	10-23-11	J.T.S.	5

WITNESSED (Under Seal)  
 TCI  
 8032 TCI LLC  
 TCI Group B, Seismic Outline Drawing  
 75Hp, 480 & 600 Volt  
 107890

All Dimensions Are In Inches

**M.R.H. STRUCTURAL ENGINEERS, INC.**  
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 TEL: (949) 690-2751 EMAIL: MRH@MRHSE.COM

Structural Engineer: Mohammad Hari  
 California SE No. S3545

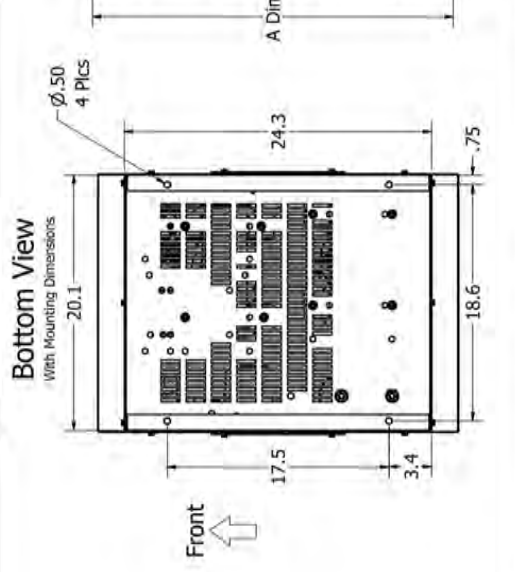
PAGE: **A-10**  
 DATE: August 17, 2022



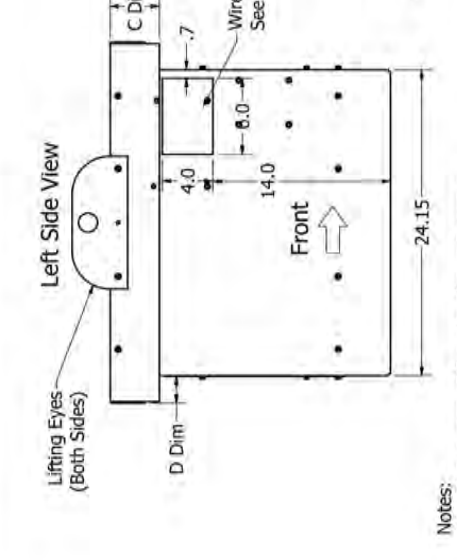
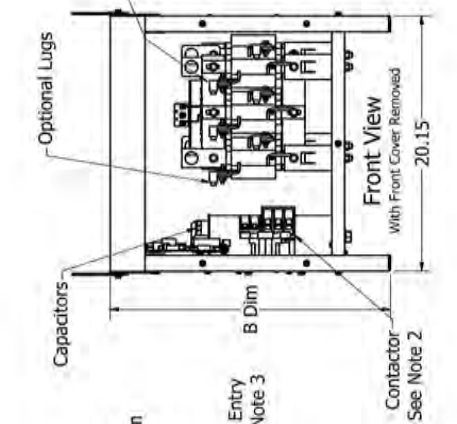
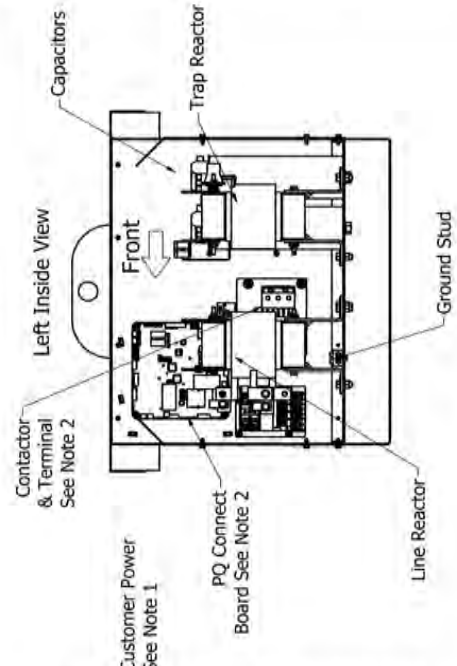
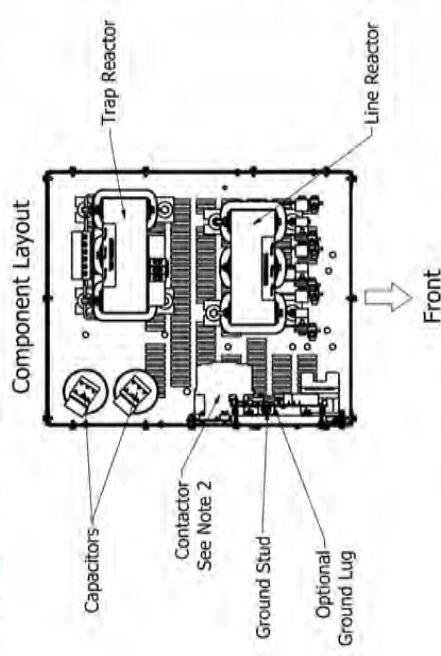
# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC

Catalog Number	HP	Volts	Phase	Hz	Contactors	Weight (lb)	Terminal Hole Size (in)
*HSD0100AWX023S	100	480	3	60	Without	259	0.38
*HSD0100AWX123S	100	480	3	60	With	262	0.38
*HSD0100CWX023S	100	600	3	60	Without	259	0.38
*HSD0100CWX123S	100	600	3	60	With	262	0.38

\*Refer to sheet 2 for nomenclature breakdown.



Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim
Type 1	26.5	23.0	2.0	1.2
Type 3R	28.5	22.1	3.9	2.1



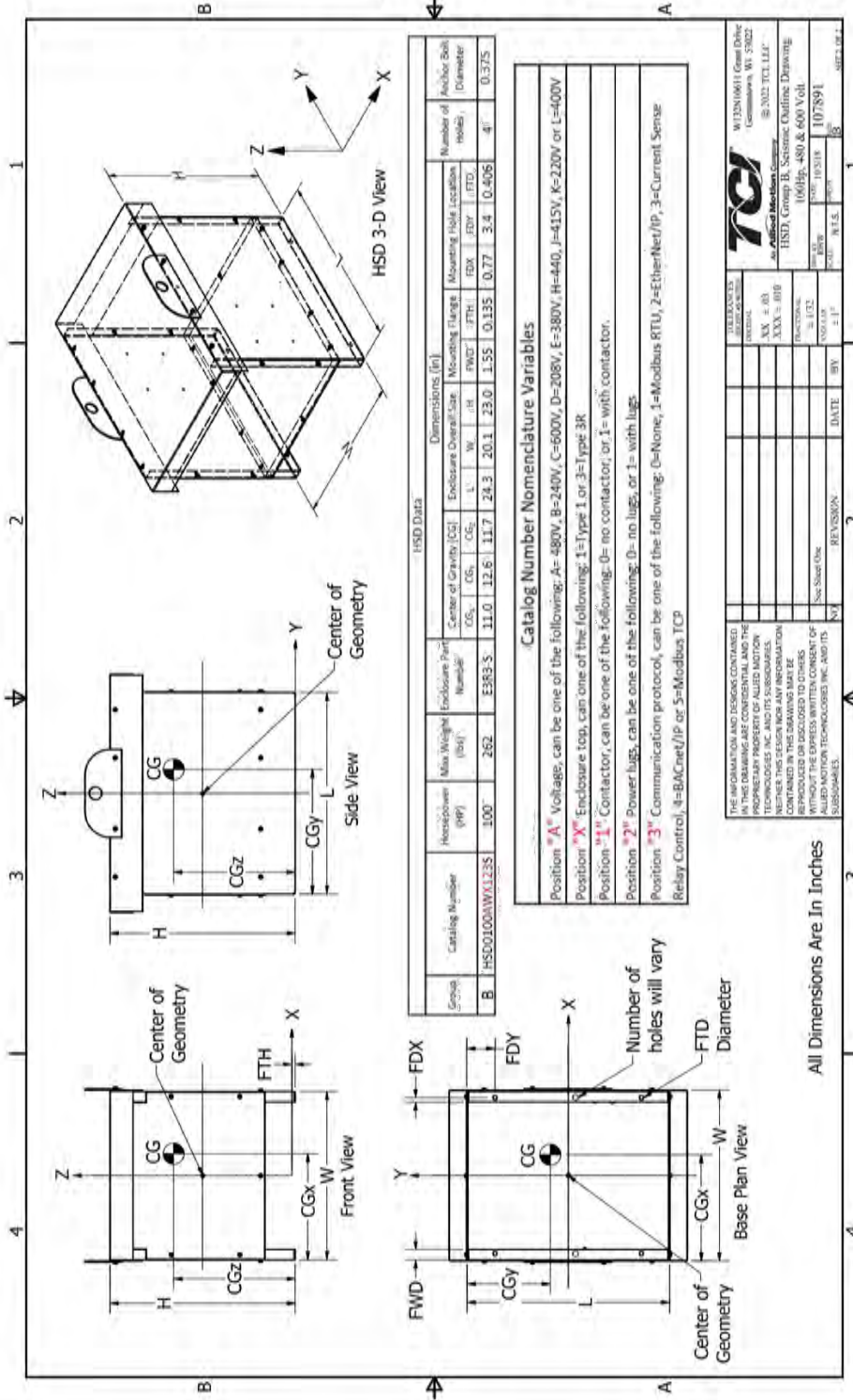
- Notes:
- 1.) Refer to manual for wire size and torque.
  - 2.) PQConnect, contactor and terminal are optional.
  - 3.) Preferred wire entry area.
  - 4.) See sheet 2 for max height center of gravity (CG) dimensions.
  - 5.) Enclosure is shown with a Type 3R top.
  - 6.) Use only hubs or fittings that comply with UL514B for Type 3R applications.
  - 7.) Installation must meet all national and local codes.
  - 8.) Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
  - 9.) Enclosure corrosion protection in accordance with UL, R/C (DTW2).

REV	DATE	BY	CHK	DESCRIPTION
01	10/28/11	TCI		Initial Release
02	03/22/12	MES		020312
03	12/17/14	WAB	XX	020312
04	02/17/15	REB		020312
05	12/18/18	REB		020312
06	03/22/19	REB		020312

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**MRH**  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

PAGE: **A-11**  
 DATE: August 17, 2022



HSD Data

Enclosure Overall Size	Center of Gravity (CG)	Mounting Flange	Number of Anchor Bolt Holes
L' W' H'	CGx' CGy' CGz'	FWD' FTH' FDX' FDY'	
20.1 24.3 20.1	11.0 12.6 11.7	1.55 1.35 0.77 3.4	4"
262	E383 S		0.375

**Catalog Number Nomenclature Variables**

Position "A" voltage, can be one of the following: A= 480V, B=240V, C=600V, D=208V, E=380V, H=440, J=415V, K=220V or L=400V  
 Position "X" Enclosure top, can one of the following: 1=Type 1 or 3=Type 3R  
 Position "1" Contactor, can be one of the following: 0= no contactor; or 1= with contactor.  
 Position "2" Power lugs, can be one of the following: 0= no lugs; or 1= with lugs  
 Position "3" Communication protocol, can be one of the following: 0=None, 1=Modbus RTU, 2=Ethernet/IP, 3=Current Sense Relay Control, 4=BAControl/IP or 5=Modbus TCP

DESIGNER	DATE	REV	BY
TCI	10/31/18	1	W.S.
XX, 4, 01			
XXX, 1, 01B			
FUNCTIONAL			
See Sheet One			
10/31/18			
10/7/19			

All Dimensions Are In Inches

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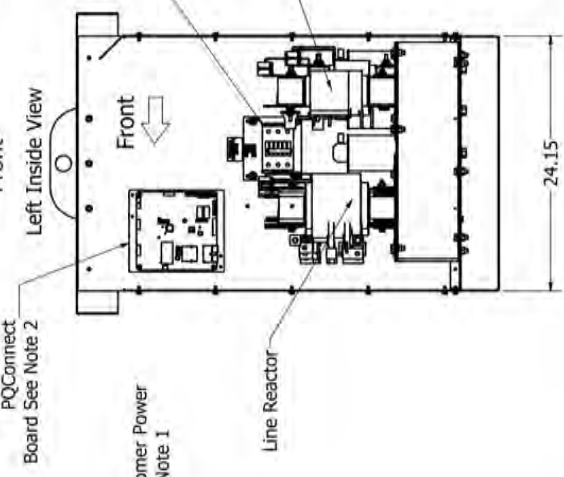
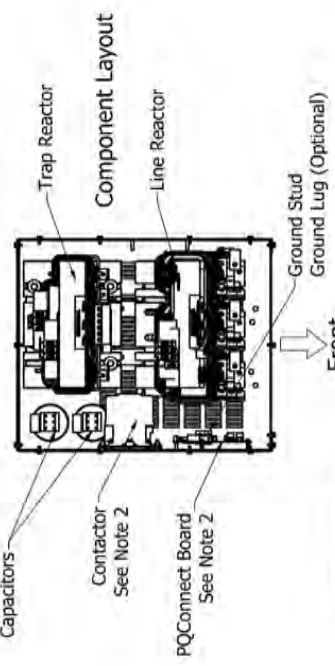
  
 Structural Engineer: Mohammad Hariri  
 California SE No. S3545

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 DATE: August 17, 2022

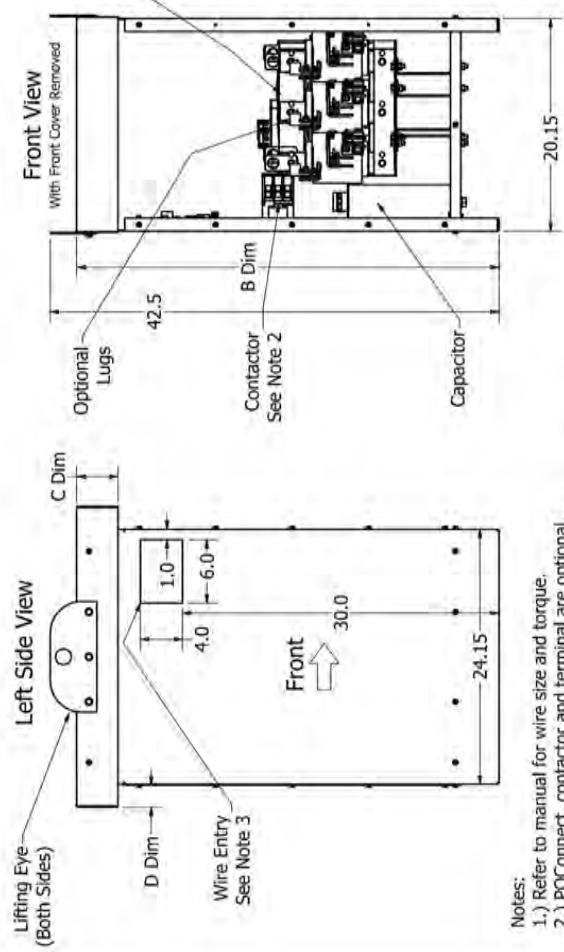
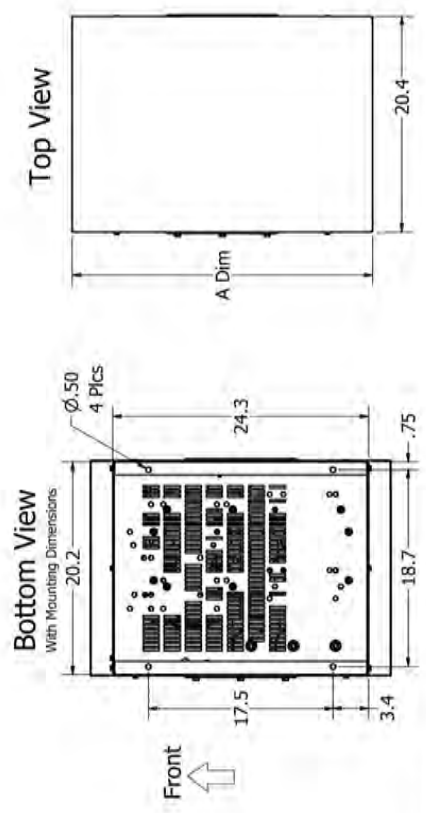
# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC

Catalog Number	HP	Volts	Phase	Hz	Contactor Weight (lb)	Terminal Hole Size
*HSD0125AWX0235	125	480	3	60	Without	331 0.38 in
*HSD0125AWX1135	125	480	3	60	With	336 0.38 in
*HSD0125CWX0235	125	600	3	60	Without	331 0.38 in
*HSD0125CWX1135	125	600	3	60	With	336 0.38 in
*HSD0150AWX0235	150	480	3	60	Without	380 0.44 in
*HSD0150AWX1135	150	480	3	60	With	385 0.44 in
*HSD0150CWX0235	150	600	3	60	Without	380 0.44 in
*HSD0150CWX1135	150	600	3	60	With	385 0.44 in

\*Refer to sheet 2 for nomenclature breakdown.



Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim
Type 1	26.5	40.4	2.0	1.1
Type 3R	28.5	40.0	3.9	2.1



- Notes:
- 1.) Refer to manual for wire size and torque.
  - 2.) PQConnect, contactor and terminal are optional.
  - 3.) Preferred wire entry area.
  - 4.) See sheet 2 for max height center of gravity (CG) dimensions.
  - 5.) Enclosure is shown with a Type 3R top.
  - 6.) Use only hubs or fittings that comply with UL514B for Type 3R applications.
  - 7.) Installation must meet all national and local codes.
  - 8.) Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
  - 9.) Enclosure corrosion protection in accordance with UL, R/C (DTW2).

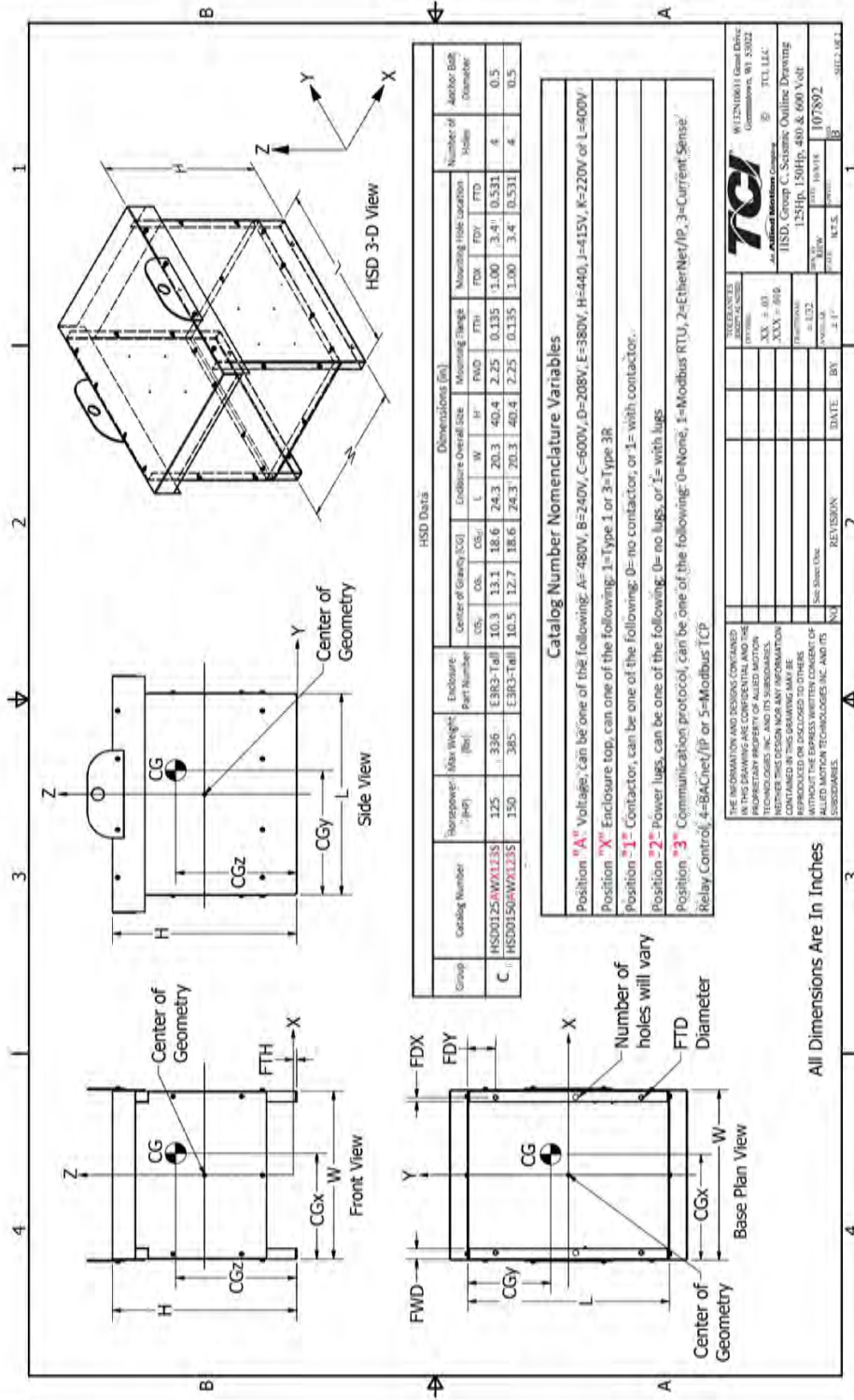
REV	DATE	BY	CHK	APP	DESCRIPTION
1	10/23/18	RDW			ASB (A-13)
2	12/27/18	RDW			REVISED TO ADD 3R TOP
3	02/27/19	RDW			REVISED TO ADD 3R TOP
4	03/20/19	RDW			REVISED TO ADD 3R TOP
5	03/27/19	RDW			REVISED TO ADD 3R TOP
6	03/27/19	RDW			REVISED TO ADD 3R TOP
7	03/27/19	RDW			REVISED TO ADD 3R TOP
8	03/27/19	RDW			REVISED TO ADD 3R TOP
9	03/27/19	RDW			REVISED TO ADD 3R TOP
10	03/27/19	RDW			REVISED TO ADD 3R TOP
11	03/27/19	RDW			REVISED TO ADD 3R TOP
12	03/27/19	RDW			REVISED TO ADD 3R TOP
13	03/27/19	RDW			REVISED TO ADD 3R TOP
14	03/27/19	RDW			REVISED TO ADD 3R TOP
15	03/27/19	RDW			REVISED TO ADD 3R TOP
16	03/27/19	RDW			REVISED TO ADD 3R TOP
17	03/27/19	RDW			REVISED TO ADD 3R TOP
18	03/27/19	RDW			REVISED TO ADD 3R TOP
19	03/27/19	RDW			REVISED TO ADD 3R TOP
20	03/27/19	RDW			REVISED TO ADD 3R TOP

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 Structural Engineer: Mohammad Hari  
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PAGE:  
**A-13**  
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Structural Engineer: Mohammad Hari  
 California SE No. S3545

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**A-14**

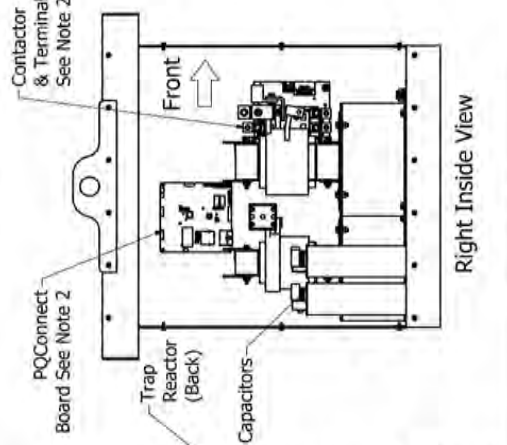
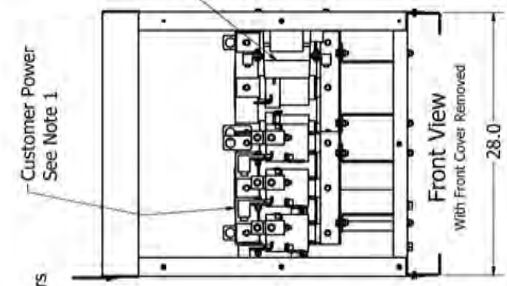
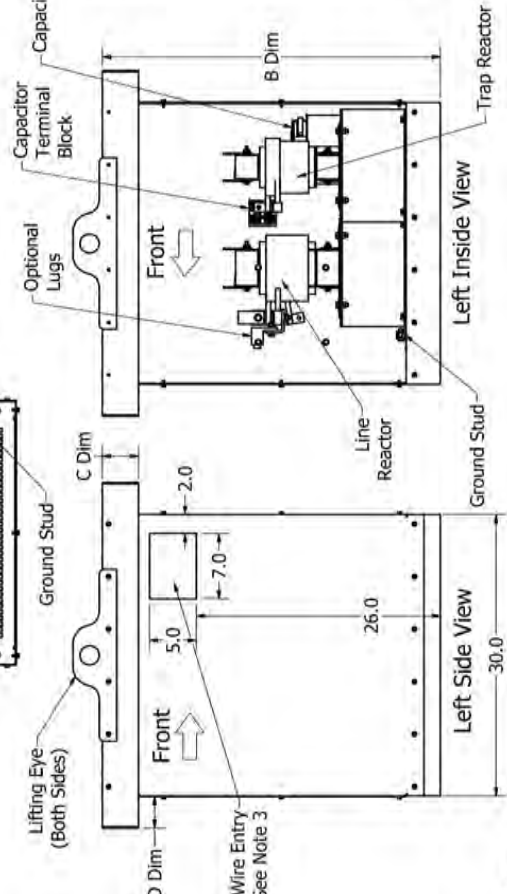
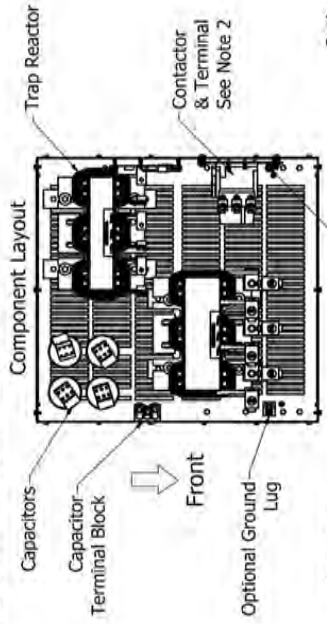
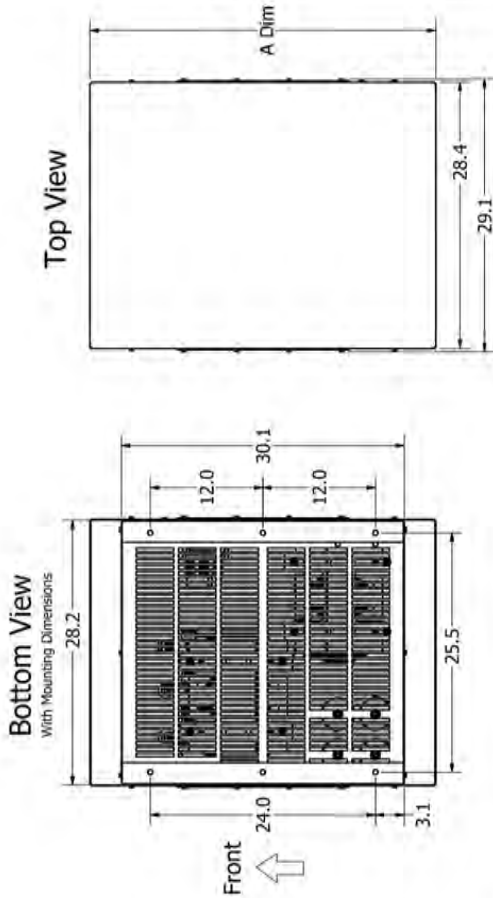
DATE:

August 17, 2022

# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI, LLC

Catalog Number	HP	Volts	Phase	Hz	Contactor Weight (lb)	Terminal Hole Size
*HSD0200AWX023S	200	480	3	60	Without	552 0.44 In
*HSD0200AWX123S	200	480	3	60	With	561 0.44 In
*HSD0200CW023S	200	600	3	60	Without	552 0.44 In
*HSD0200CW123S	200	600	3	60	With	561 0.44 In
*HSD0250AWX023S	250	480	3	60	Without	554 0.44 In
*HSD0250AWX123S	250	480	3	60	With	563 0.44 In
*HSD0250CW023S	250	600	3	60	Without	554 0.44 In
*HSD0250CW123S	250	600	3	60	With	563 0.44 In

\*Refer to sheet 2 for nomenclature breakdown.



- Notes:
- 1.) Refer to manual for wire size and torque.
  - 2.) PQConnect, contactor and terminal are optional.
  - 3.) Preferred wire entry area.
  - 4.) See sheet 2 for max height center of gravity (CG) dimensions.
  - 5.) Enclosure is shown with a Type 3R top.
  - 6.) Use only hubs or fittings that comply with UL514B for Type 3R applications.
  - 7.) Installation must meet all national and local codes.
  - 8.) Enclosure material shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
  - 9.) Enclosure corrosion protection in accordance with UL, R/C (DTW2).

Dimension Table

Enclosure	"A" Dim	"B" Dim	"C" Dim	"D" Dim
Type 1	33.2	37.0	2.3	1.5
Type 3R	36.9	36.0	3.8	3.4

TCI, LLC

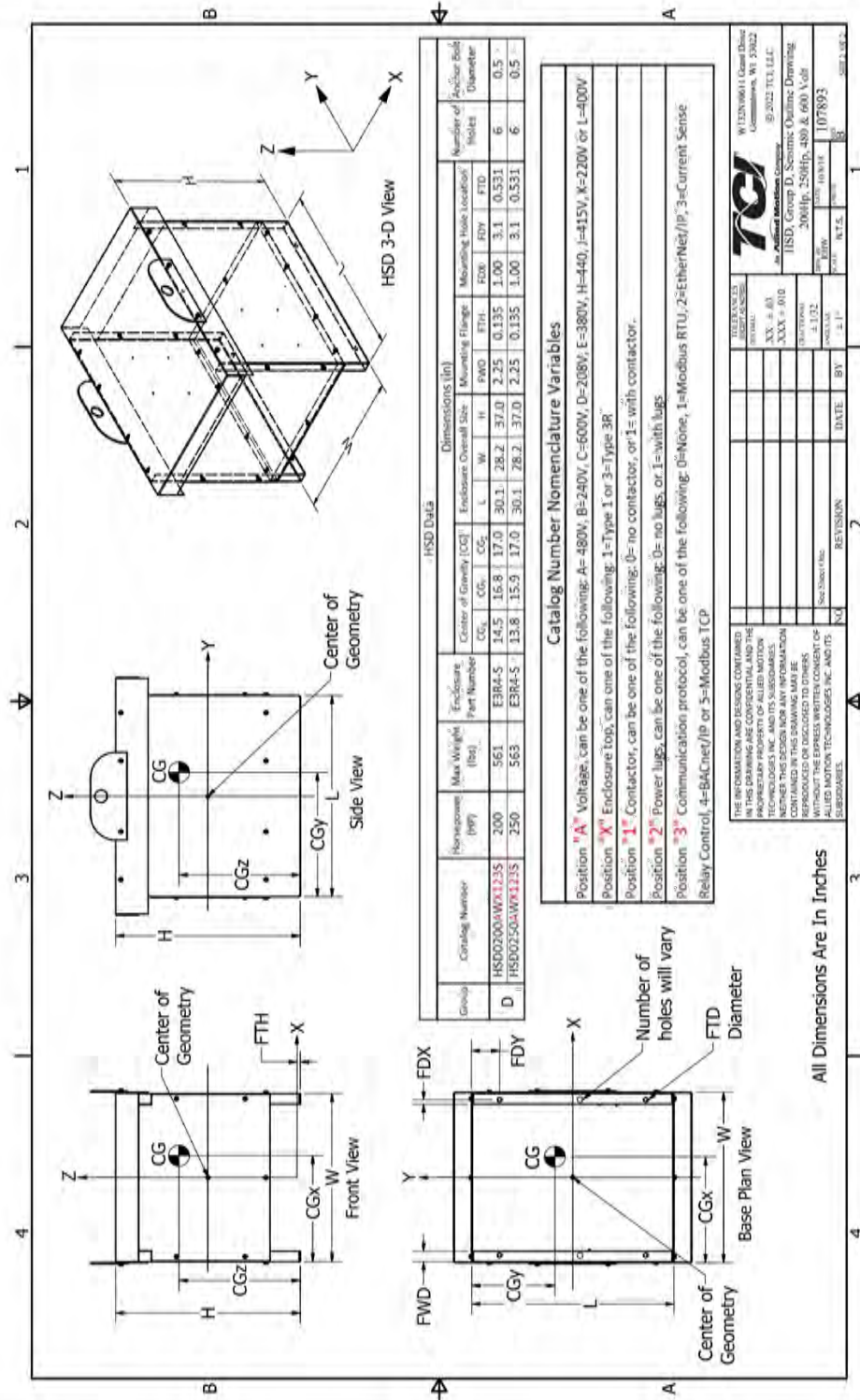
W13750 (Rev 1) General Drawing  
©2022 TCI, LLC  
An American Manufacturer  
HSD - Group D, Schematic Outline Drawing  
2000Hp, 250Hp, 480 & 600 VOLT

REV	DATE	BY	CHKD	APP'D
01	08/17/2022	MRH		

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**MRH**  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

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 August 17, 2022



HSD Data

Grain	Catalog Number	Nominsize (HP)	Max Weight (lbs)	Enclosure Part Number	Center of Gravity (CG)				Mounting Flange				Mounting Hole Location				Number of Filter Bolt Diameter
					CGx	CGy	CGz	CGz	L	W	H	FWD	FTH	FDZ	FDY	FTD	
D	HSD0200AW41235	200	561	E3R4-S	14.5	16.8	17.0	30.1	38.2	37.0	0.135	1.00	3.1	0.531	6	0.5	
D	HSD0250AW41235	250	563	E3R4-S	13.8	15.9	17.0	30.1	38.2	37.0	0.135	1.00	3.1	0.531	6	0.5	

**Catalog Number Nomenclature Variables**

Position "A" Voltage, can be one of the following: A=480V, B=240V, C=600V, D=208V, E=380V, H=440, J=415V, K=220V or L=400V

Position "X" Enclosure top, can be one of the following: 1=Type 1 or 3=Type 3R

Position "1" Contactor, can be one of the following: 0= no contactor, or 1= with contactor.

Position "2" Power lugs, can be one of the following: 0= no lugs, or 1= with lugs

Position "3" Communication protocol, can be one of the following: 0=Noine, 1=EtherNet/IP, 3=Current Sense Relay Control, 4=BACnet/IP or 5=Modbus TCP

DATE	BY	REVISION	NO
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07/11/11			2
07/11/11			3
07/11/11			4
07/11/11			5
07/11/11			6
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07/11/11			95
07/11/11			96
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07/11/11			98
07/11/11			99
07/11/11			100

All Dimensions Are In Inches

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 Structural Engineer: Mohammad Hari  
 California SE No. S3545

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**A-16**  
 DATE:  
 August 17, 2022



# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC

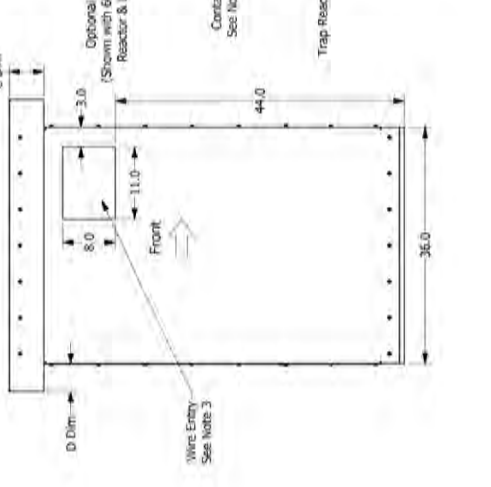
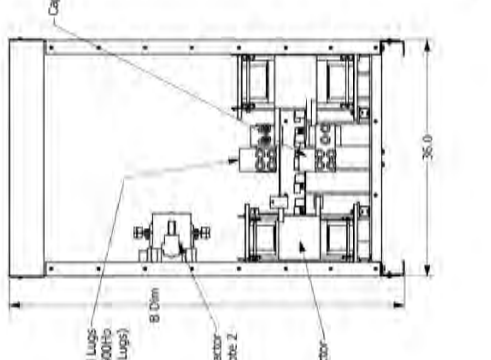
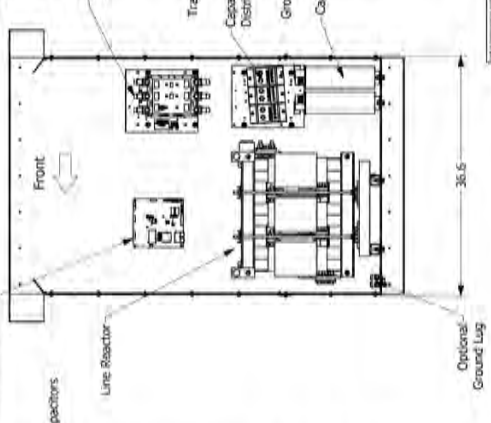
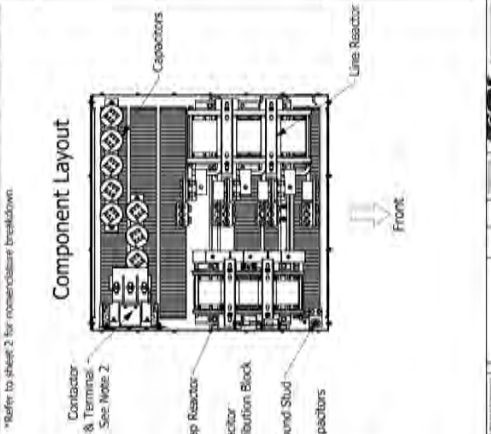
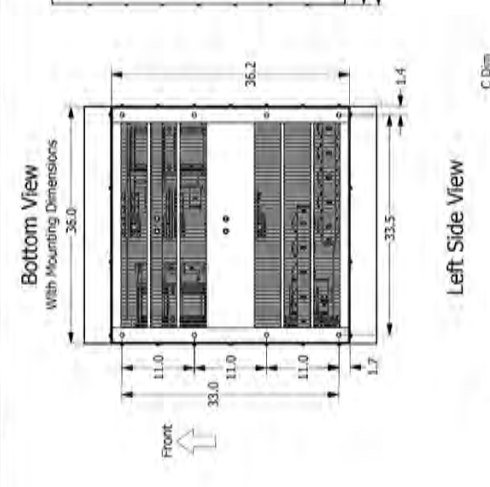
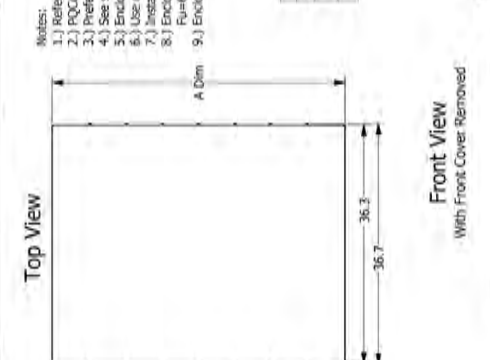
Catalog Number	HP	With Phase	Wt.	Contr.	Weight (lb)	Terminal Hole Size (in)
*HSD0600AW/023S	300	480	3	60	Without	843
*HSD0600AW/023S	300	480	3	60	With	858
*HSD0600CW/023S	300	600	3	60	Without	843
*HSD0600CW/023S	300	600	3	60	With	858
*HSD0600AW/023S	350	480	3	60	Without	887
*HSD0600AW/023S	350	480	3	60	With	901
*HSD0600CW/023S	350	600	3	60	Without	887
*HSD0600CW/023S	350	600	3	60	With	901
*HSD0600AW/023S	400	480	3	60	Without	1058
*HSD0600AW/023S	400	480	3	60	With	1073
*HSD0600CW/023S	400	600	3	60	Without	1058
*HSD0600CW/023S	400	600	3	60	With	1073
*HSD0600AW/023S	450	480	3	60	Without	1228
*HSD0600AW/023S	450	480	3	60	With	1243
*HSD0600CW/023S	450	600	3	60	Without	1228
*HSD0600CW/023S	450	600	3	60	With	1243
*HSD0600AW/023S	500	480	3	60	Without	1239
*HSD0600AW/023S	500	480	3	60	With	1254
*HSD0600CW/023S	500	600	3	60	Without	1239
*HSD0600CW/023S	500	600	3	60	With	1254
*HSD0600AW/023S	600	480	3	80	Without	1317
*HSD0600AW/023S	600	480	3	80	With	1342
*HSD0600CW/023S	600	600	3	60	Without	1317
*HSD0600CW/023S	600	600	3	60	With	1342

\*Refer to sheet 2 for commercial breakdown.

Notes:

- Refer to manual for wire size and torque.
- PQConnect, contactor and terminal are optional.
- Preferred wire entry area.
- See sheet 2 for max height, center of gravity (CG) dimensions.
- Enclosure is shown with a Type 3R top.
- Use only hubs or fittings that comply with UL514B for Type 3R applications.
- Installation must meet all national and local codes.
- Enclosure materials shall conform to ASTM A-1011, Grade 50, Fy=50 ksi & Fu=65 ksi.
- Enclosure corrosion protection in accordance with UL-RIC (DTW2).

Enclosure Type	"A" Dim	"B" Dim	"C" Dim	"D" Dim	"E" Dim
Type 1	39.6	60.2	2.5	1.7	
Type 3R	44.6	60.1	5.3	4.2	



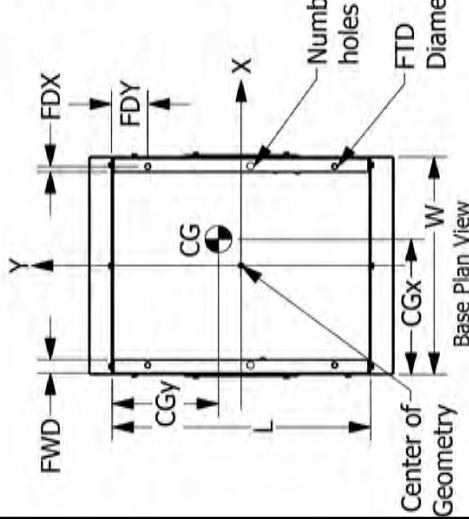
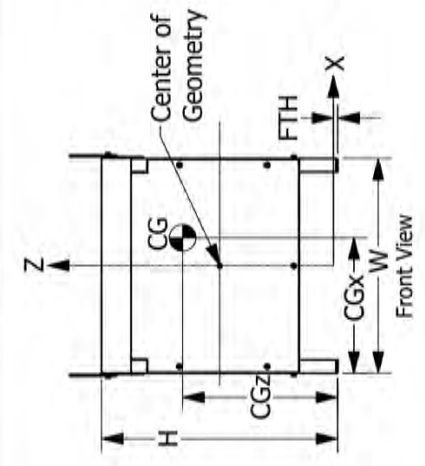
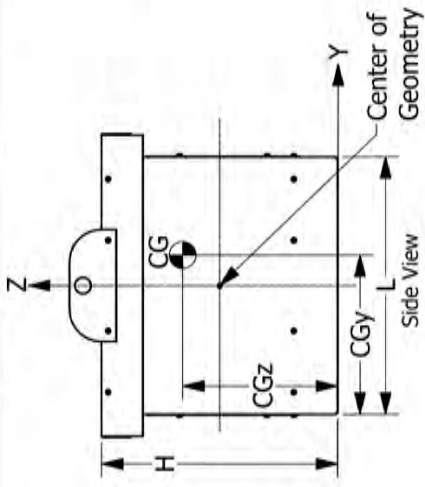
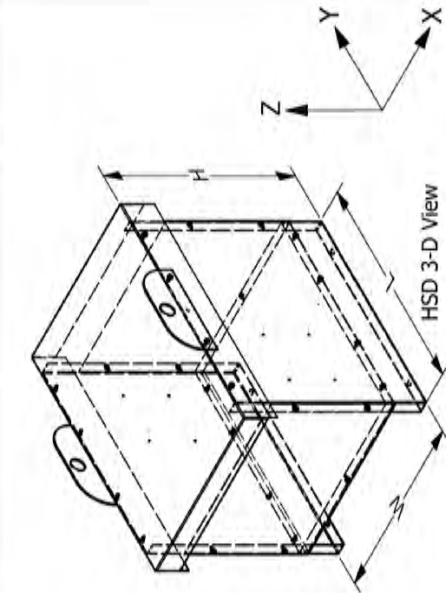
Part No.	Part Name	Qty	Notes
1	Enclosure	1	
2	Capacitors	1	
3	Line Reactor	1	
4	Capacitor Distribution Block	1	
5	Ground Stud	1	
6	Trap Reactor	1	
7	Contactor & Terminal	1	
8	Optional Ground Lug	1	

**M.R.H. STRUCTURAL ENGINEERS, INC.**  
 3400 IRVINE AVE., STE. 101  
 NEWPORT BEACH, CA 92660  
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**MRH**  
 Structural Engineer: Mohammad Hari  
 California SE No. S3545

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 DATE: August 17, 2022

# HarmonicShield Filter (HSD / 3-600HP / 3ph / 480/600 Volts) By TCI. LLC



Group	Catalog Number	Horsepower (HP)	Max Weight (lbs)	Enclosure Part Number	Center of Gravity (CG)			Dimensions (in)						Anchor Bolt Diameter	Number of Holes		
					CGx	CGy	CGz	Enclosure Overall Size	Mounting Flange	Mounting Hole Location	FWD	FDX	FDY			FTD	
E	HSD0300AWX1235	300	858	E3R5	20.3	15.9	23.7	36.2	36.0	60.2	2.25	0.179	1.125	1.7	0.656	8	0.625
	HSD0350AWX1235	350	901	E3R5	20.8	16.4	22.9	36.2	36.0	60.2	2.25	0.179	1.125	1.7	0.656	8	0.625
	HSD0400AWX1235	400	1073	E3R5	18.0	15.6	22.8	36.2	36.0	60.2	2.25	0.179	1.125	1.7	0.656	8	0.625
	HSD0450AWX1235	450	1243	E3R5	17.7	15.5	22.5	36.2	36.0	60.2	2.25	0.179	1.125	1.7	0.656	8	0.625
	HSD0500AWX1235	500	1254	E3R5	17.6	15.5	22.5	36.2	36.0	60.2	2.25	0.179	1.125	1.7	0.656	8	0.625
	HSD0600AWX1235	600	1342	E3R5	18.5	16.0	23.7	36.2	36.0	60.2	2.25	0.179	1.125	1.7	0.656	8	0.625

**Catalog Number Nomenclature Variables**

- Position "A" Voltage, can be one of the following: A= 480V, B= 240V, C= 600V, D= 208V, E= 380V, H= 440, J= 415V, K= 220V or L= 400V
- Position "X" Enclosure top, can one of the following: 1=Type 1 or 3=Type 3R
- Position "1" Contactor, can be one of the following: 0= no contactor, or 1= with contactor.
- Position "2" Power lugs, can be one of the following: 0= no lugs, or 1= with lugs
- Position "3" Communication protocol, can be one of the following: 0=None, 1=Modbus RTU, 2=EtherNet/IP, 3=Current Sense Relay Control, 4=BACnet/IP or 5=Modbus TCP

TOLERANCES UNLESS OTHERWISE SPECIFIED		W132N10611 Grant Drive Greenwich, WI 53022	
FINISH		TCI	
PROV. VOL.		As Allied Motion Company	
XXX = .05		© 2022 TCI, LLC	
XXX = .010		HSD, Group E, Seismic Outline Drawing	
XXX = .010		300HP to 600HP, 480 & 600 Volt	
DATE: 10/9/18		107894	
DRAWN BY: NJS		REVISED BY: NJS	
CHECKED BY: NJS		DATE: 10/9/18	
SCALE: 1:1		SHEET OF 2	

All Dimensions Are In Inches

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