

DOOR SYSTEMS INC

DSI 600 ELEVATOR SMOKE AND FIRE CONTAINMENT

DES. **J. ROBERSON**

JOB NO. **11-2401**

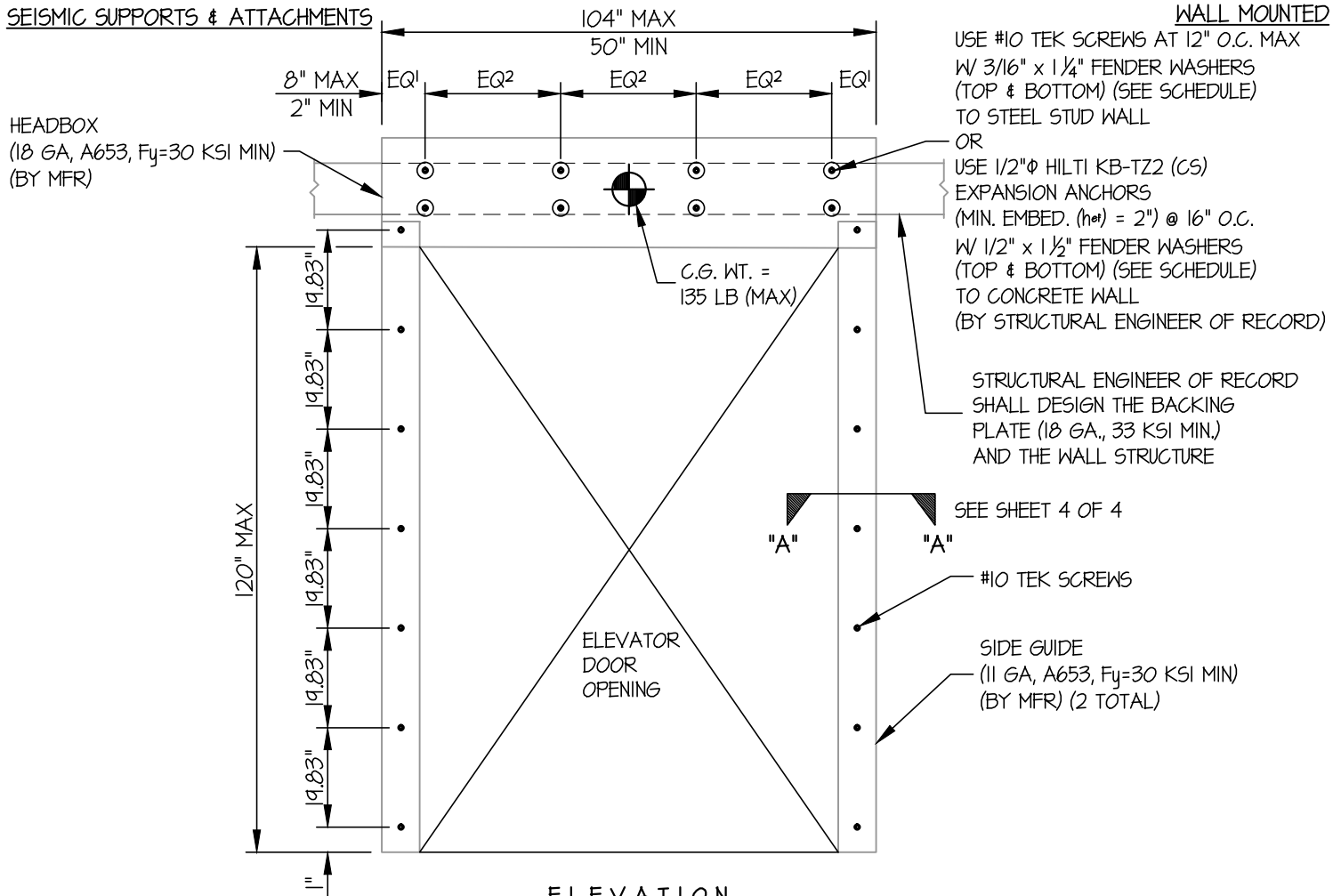
DATE **2/7/24**

SHEET

1

OF **4** SHEETS

SEISMIC SUPPORTS & ATTACHMENTS



ELEVATION

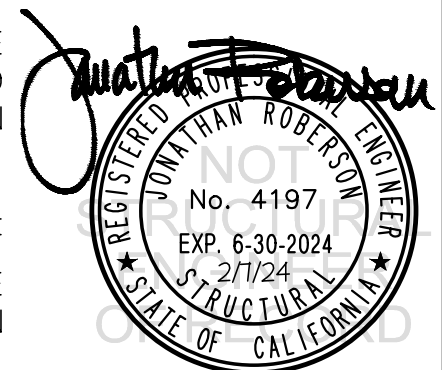
(STEEL STUD CONDITION SHOWN)

NOTES:

1. FORCES ARE DETERMINED PER 2022 CALIFORNIA BUILDING CODE AND ASCE 7-16. STRENGTH DESIGN IS USED. (EXAMPLE: $S_{ds} = 2.30$, $a_p = 1.0$, $I_p = 1.5$, $R_p = 1.5$, $\Omega_e = 2.0$, $z/h \leq 1$)

- HORIZONTAL FORCE (E_h) = $2.76 W_p$
- HORIZONTAL FORCE (E_{mh}) = $5.52 W_p$ (FOR CONCRETE ANCHORAGE)
- VERTICAL FORCE (E_v) = $0.46 W_p$

2. THIS PREAPPROVAL ENCOMPASSES WEIGHTS AND VERTICAL CG POSITIONS UP TO THE VALUES SHOWN.
3. THIS PREAPPROVAL WAS PREPARED WITHOUT KNOWLEDGE OF ANY SITE CONDITION. COMPATIBILITY FOR USE WITH A SITE SHALL BE EVALUATED BY THE STRUCTURAL ENGINEER OF RECORD OF THE INSTALLATION (SEOR). USE REQUIRES APPROVAL BY THE SEOR.
4. STRUCTURAL ENGINEER OF RECORD FOR THE INSTALLATION SHALL VERIFY ALL CONDITIONS, EVALUATE INTERACTION WITH ADJACENT EQUIPMENT AND ANCHORS, AND PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN IN COMBINATION WITH ALL OTHER LOADS THAT MAY BE PRESENT.



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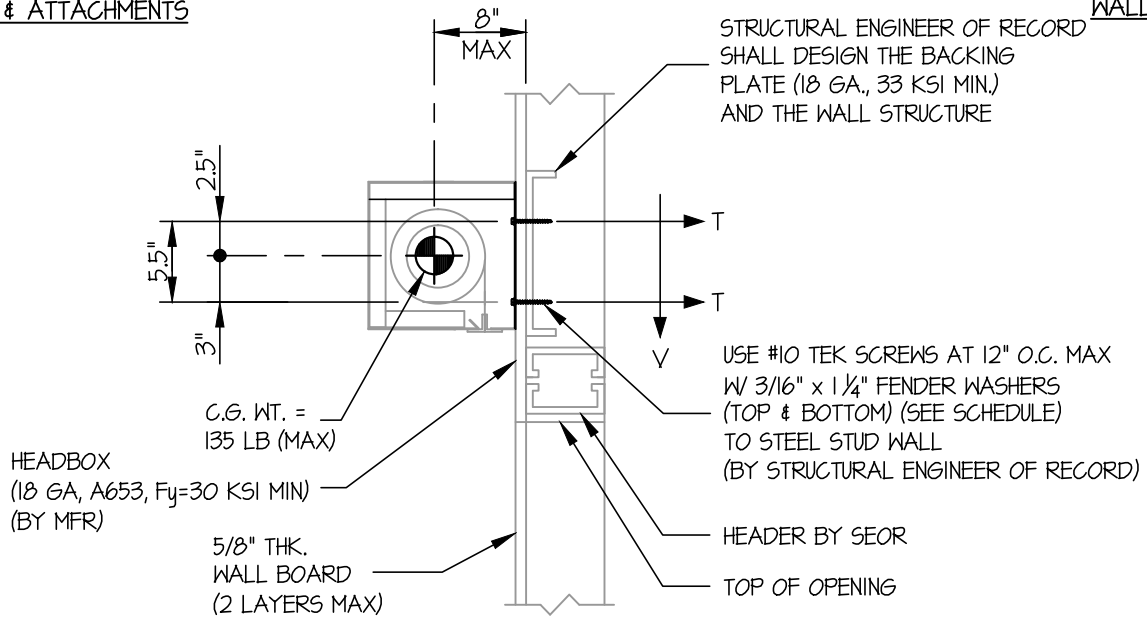
SHEET

2

OF **4** SHEETS

SEISMIC SUPPORTS & ATTACHMENTS

WALL MOUNTED



SECTION AT STEEL STUD WALL

WIDTH (in)	MAX WEIGHT (lb.)	** # SCREWS (MIN) (TOP & BOTTOM)	+ Tu (lb.)	+ Vu (lb.)	UNITY
50	75	8	82	32	0.70
56	80	10	70	28	0.60
96	125	16	67	27	0.58
* 104	135	18	64	26	0.55

** NUMBER OF SCREWS EX: 8 = 4 TOP & 4 BOTTOM

* THIS UNIT IS USED IN CALCULATION
+ (VALUES DO NOT INCLUDE Ω)

LOADS:

WEIGHT (W_p) = 135 LB MAX
HORIZONTAL FORCE (E_h) = 2.76 W_p = 373 LB
VERTICAL FORCE (E_v) = 0.46 W_p = 62 LB

SCREW FORCES:

TENSION (T)

$$T_U \text{ VERTICAL} = \frac{(1.2(135\#) + 62\#)(8'')}{9 \text{ SCREWS}(5.5'')} = 36 \text{ LB/SCREW}$$

$$T_U \text{ PARALLEL} = \frac{373\#(8'')(3'')}{1 \text{ SCREW}(88'')(5.5'')} = 19 \text{ LB/SCREW}$$

$$T_U \text{ PERP} = \frac{373\#(3'')}{9 \text{ SCREWS}(5.5'')} = 23 \text{ LB/SCREW}$$

$$T_U \text{ MAX} = 36\# + 19\#(0.3) + 23\# = 64 \text{ LB/SCREW (MAX)}$$

SHEAR (V)

$$V_U \text{ WALL} = \sqrt{\left(\frac{(1.2(135\#) + 62\#)}{18 \text{ SCREWS}}\right)^2 + \left(\frac{373\#(3'')}{9 \text{ SCREWS}(5.5'')} \right)^2} = 26 \text{ LB/SCREW (MAX)}$$

#10 TEK SCREWS (18 GA, 33 KSI STEEL STUDS)
W/ 2 LAYERS GYP BOARD MAX
φT = 160 LB/SCREW
φV = 174 LB/SCREW

UNITY CHECK:

$$\left(\frac{T_u}{\phi T}\right) + \left(\frac{V_u}{\phi V}\right) \leq 1.0$$

$$\left(\frac{64}{160}\right) + \left(\frac{26}{174}\right) = 0.55 \leq 1.0 \therefore \text{O.K.}$$

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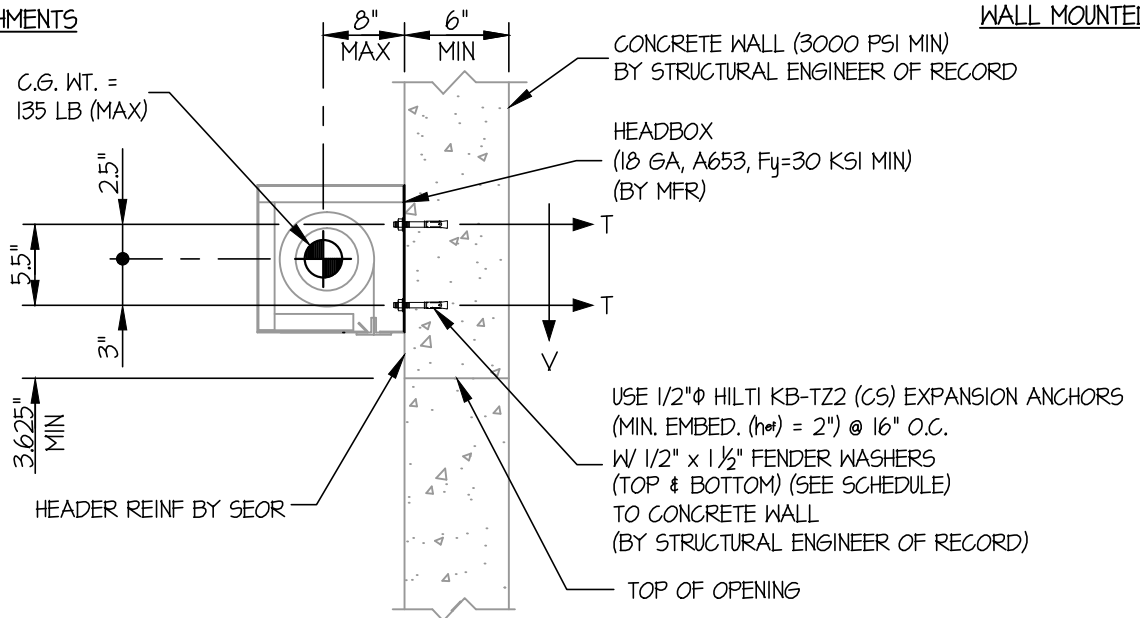
SHEET

3

OF **4** SHEETS

SEISMIC SUPPORTS & ATTACHMENTS

WALL MOUNTED



CONCRETE WALL SECTION

WIDTH (in)	MAX WEIGHT (lb.)	** # ANCHOR (MIN) (TOP & BOTTOM)	+ T _u (lb.)	+ V _u (lb.)	UNITY
50"	75	8	118	59	0.16
56"	80	8	123	63	0.17
96"	125	10	147	78	0.21
* 104"	135	12	133	70	0.19

** NUMBER OF ANCHOR EX: 8 = 4 TOP & 4 BOTTOM

* THIS UNIT IS USED IN CALCULATION

+ (VALUES INCLUDE Ω₀)

LOADS:

WEIGHT (W_p) = 135 LB
 HORIZONTAL FORCE (E_h) = 5.52 W_p = 745 LB
 VERTICAL FORCE (E_v) = 0.46 W_p = 62 LB

ANCHOR SPEC: 1/2"φ HILTI KB-TZ2 (CS): (h_{ef} = 2")

SPACING = 5.5" MIN

EDGE DISTANCE = 2.75" MIN:

φT = 0.75φN_n = 1389 LB/ANCHOR (TENSION)

φV = φV_n = 771 LB/ANCHOR (SHEAR)

SCREW FORCES:

TENSION (T)

$$T_{U \text{ VERTICAL}} = \frac{(1.2(135\#) + 62\#)(8'')}{6 \text{ BOLTS}(5.5'')} = 54 \text{ LB/BOLT}$$

$$T_{U \text{ PARALLEL}} = \frac{745\#(8'')(3'')}{1 \text{ BOLT } (88'')(5.5'')} = 37 \text{ LB/BOLT}$$

$$T_{U \text{ PERP}} = \frac{745\#(3'')}{6 \text{ BOLTS } (5.5'')} = 68 \text{ LB/BOLT}$$

$$T_{U \text{ MAX}} = 54\# + 37\#(0.3) + 68\# = 133 \text{ LB/BOLT (MAX)}$$

SHEAR (V)

$$V_{U \text{ WALL}} = \sqrt{\left(\frac{(1.2(135\#) + 62\#)}{12 \text{ BOLTS}}\right)^2 + \left(\frac{745\#(3'')}{6 \text{ BOLTS } (5.5'')} \right)^2} = 70 \text{ LB/BOLT (MAX)}$$

UNITY CHECK:

$$\left(\frac{T_u}{\phi T}\right) + \left(\frac{V_u}{\phi V}\right) \leq 1.2$$

$$\left(\frac{133}{1389}\right) + \left(\frac{70}{771}\right) = 0.19 \leq 1.2 \therefore \text{O.K.}$$

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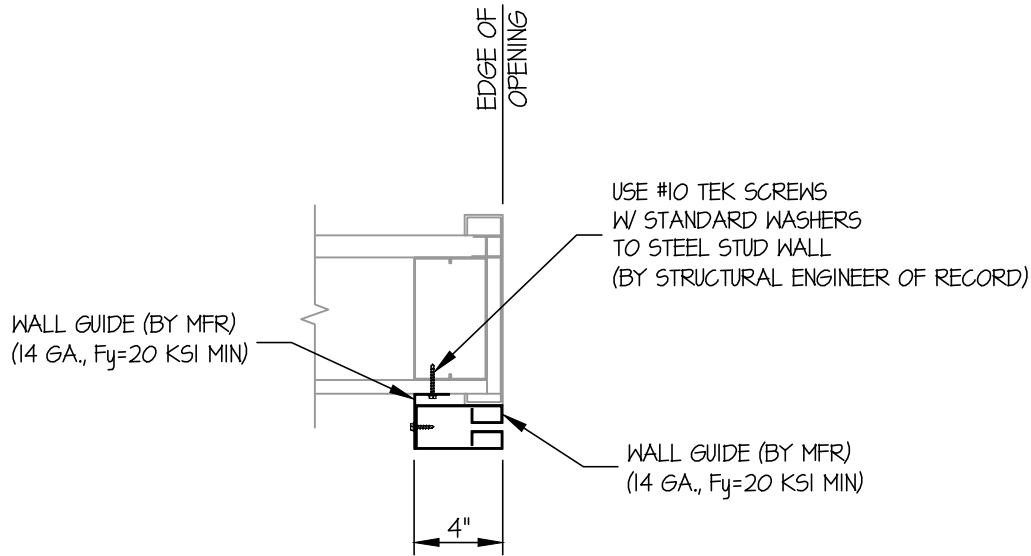
SHEET

4

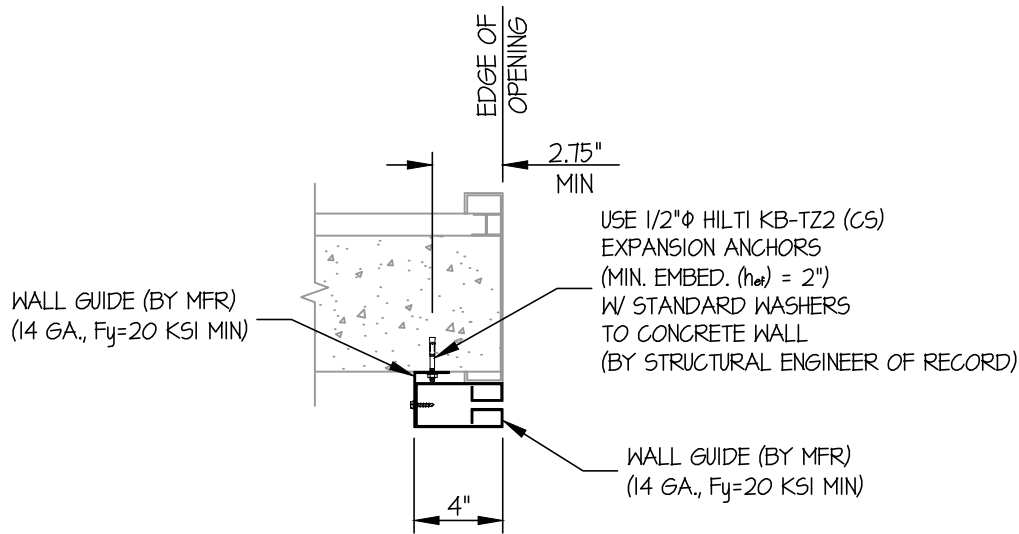
OF 4 SHEETS

SEISMIC SUPPORTS & ATTACHMENTS

WALL MOUNTED



SECTION AT STEEL STUD WALL



SECTION AT CONCRETE WALL

SECTION A-A