EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING
www.equipmentanchorage.com

ICW USA INC.

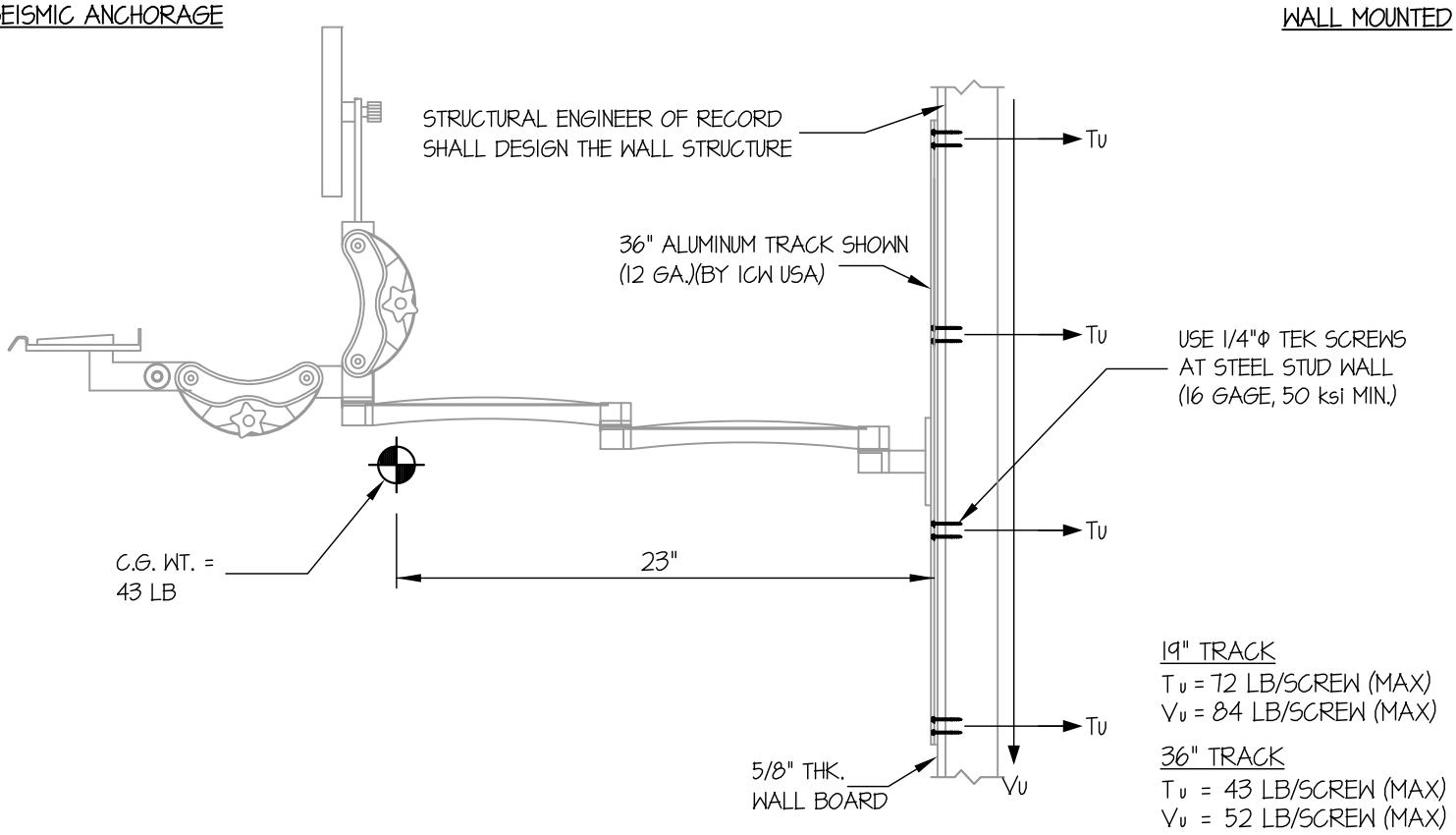
DOUBLE ARM ULTRA II

DES. J. ROBERSON
JOB NO. 11-1058
DATE 11/1/12

SHEET 1 OF 3 SHEETS

SEISMIC ANCHORAGE

WALL MOUNTED



19" TRACK
T_u = 72 LB/SCREW (MAX)
V_u = 84 LB/SCREW (MAX)

36" TRACK
T_u = 43 LB/SCREW (MAX)
V_u = 52 LB/SCREW (MAX)

STEEL STUD WALL SECTION

NOTES:

1. ANCHORAGE DESIGN PER 2010 CALIFORNIA BUILDING CODE AND ASCE 7-05. STRENGTH DESIGN IS USED.

   HORIZONTAL FORCE (E_h) = 3.60 W_p (S_{DS} = 2.00, a_p = 2.5, I_p = 1.5, R_p = 2.5, z/h ≤ 1.0)
   VERTICAL FORCE (E_v) = 0.40 W_p

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.

3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL OTHER LOADS.

REGISTERED PROFESSIONAL ENGINEER
JONATHAN ROBERSON
No. 4197
EXP. 6-30-2014
11/1/12
STRUCTURAL
STATE OF CALIFORNIA

NOT STRUCTURAL ENGINEER OF RECORD

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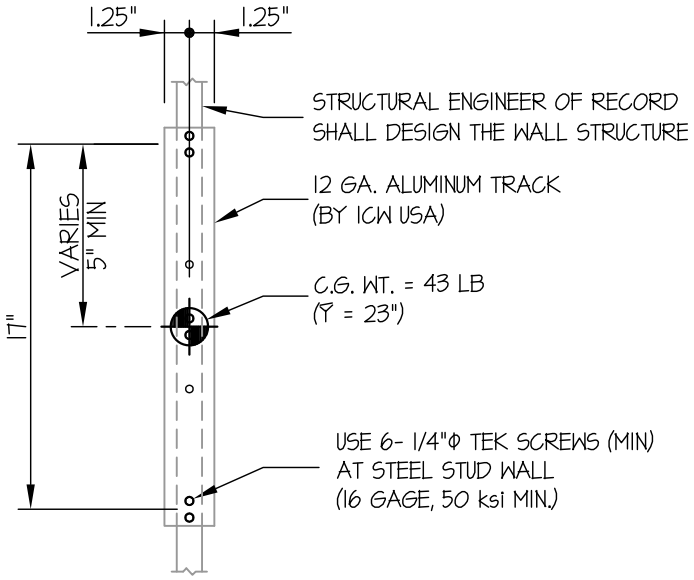
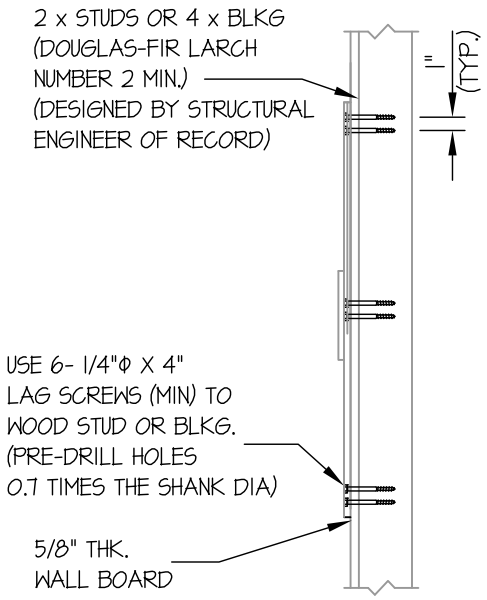
SEISMIC ANCHORAGE

19" TRACK

WALL MOUNTED



ELEVATION AT WALL



WOOD STUD WALL SECTION

LOADS:

WEIGHT = 43 LBS (MAX OPERATING WEIGHT)
HORIZONTAL FORCE (E_h) = 155 LB
VERTICAL FORCE (E_v) = 17 LB

TENSION (T)

$$T_{u\ VERTICAL} = \frac{(43\#(1.2) + 17\#)(23")}{2 SCREWS\ (17")} = 46\ LB$$

$T_{u\ PARALLEL}$ = 0 LBS (UNIT IS FREE TO ROTATE 180° HORIZONTALLY)

$$T_{u\ PERP.} = \frac{155\#}{6\ SCREWS} = 26\ LB/SCREW$$

$T_{u\ MAX}$ = 46# + 26# = 72 LB/SCREW (MAX)

SHEAR (V) (WHEN UNIT IS ROTATED FLAT AGAINST THE WALL)

$$V_{u\ MAX} = \frac{43\#(1.2) + 17\#}{6\ SCREWS} + \frac{(43\#(1.2) + 17\#)(23")}{17"(2\ SCREWS)} + \frac{155\#}{6\ SCREWS} = 84\ LB/SCREW\ (MAX)$$

BOLT SPEC: 1/4"ø LAG BOLT
ϕT = 717 LB/BOLT
ϕV = 184 LB/BOLT

UNITY CHECK:

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

$$\left(\frac{72}{717}\right) + \left(\frac{84}{184}\right) = 0.56 \leq 1.0 \quad \therefore \text{ O.K.}$$

SCREW SPEC: 1/4"ø TEK SCREWS
ϕT = 418 LB/SCREW
ϕV = 362 LB/SCREW

UNITY CHECK:

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

$$\left(\frac{72}{418}\right) + \left(\frac{84}{362}\right) = 0.40 \leq 1.0 \quad \therefore \text{ O.K.}$$

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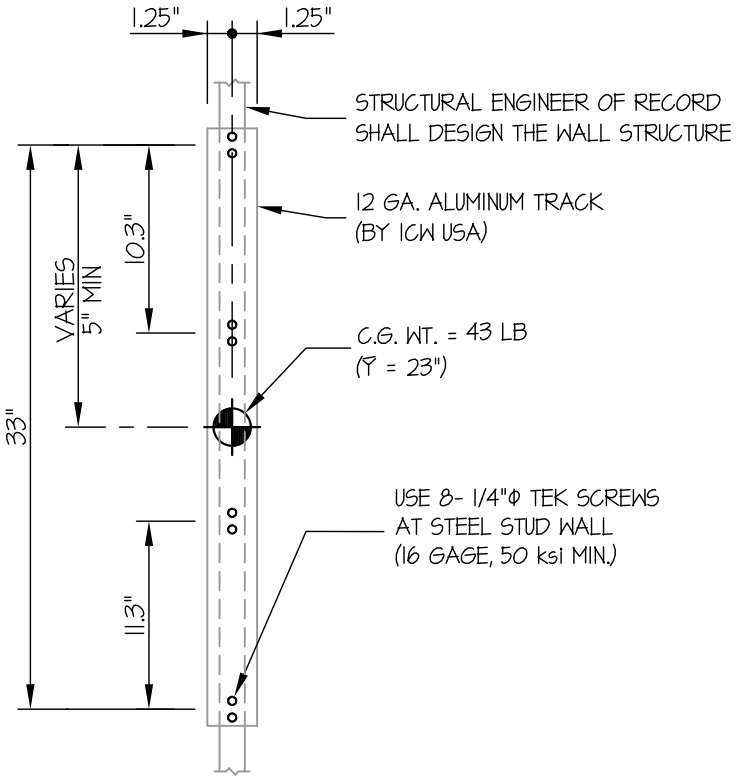
SHEET 3 OF 3 SHEETS

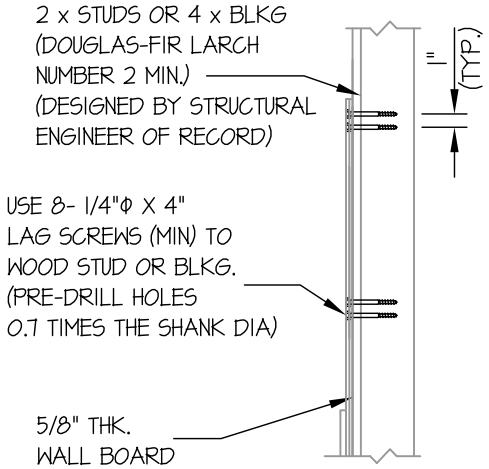
SEISMIC ANCHORAGE

36" TRACK

WALL MOUNTED



ELEVATION AT WALL



SECTION AT WOOD STUD WALL

LOADS:

WEIGHT = 43 LB (MAX OPERATING WEIGHT)
HORIZONTAL FORCE (E_h) = 155 LB
VERTICAL FORCE (E_v) = 17 LB

TENSION (T)

$$T_{u\ VERTICAL} = \frac{(43\#(1.2) + 17\#)(23")}{2\ SCREWS\ (33")} = 24\ LB/SCREW$$

$T_{u\ PARALLEL}$ = 0 LBS (UNIT IS FREE TO ROTATE 180° HORIZONTALLY)

$$T_{u\ PERP.} = \frac{155\#}{8\ SCREWS} = 19\ LB/SCREW$$

$T_{u\ MAX}$ = 24# + 19# = 43 LB/SCREW (MAX)

SHEAR (V) (WHEN UNIT IS ROTATED FLAT AGAINST THE WALL)

$$V_{u\ MAX} = \frac{43\#(1.2) + 17\#}{8\ SCREWS} + \frac{(43\#(1.2) + 17\#)(23")}{33"(2\ SCREWS)} + \frac{155\#}{8\ SCREWS} = 52\ LB/SCREW\ (MAX)$$

BOLT SPEC: 1/4"ø LAG BOLT
ΦT = 717 LB/BOLT
ΦV = 184 LB/BOLT

UNITY CHECK:

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

$$\left(\frac{43}{717}\right) + \left(\frac{52}{184}\right) = 0.34 \leq 1.0 \quad \therefore \text{ O.K.}$$

SCREW SPEC: 1/4"ø TEK SCREWS
ΦT = 418 LB/SCREW
ΦV = 362 LB/SCREW

UNITY CHECK:

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

$$\left(\frac{43}{418}\right) + \left(\frac{52}{362}\right) = 0.25 \leq 1.0 \quad \therefore \text{ O.K.}$$