



**EASE**  
**EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING**  
 1515 Fairview Ave. Box 12  
 Missoula, MT 59801  
 Phn: (406) 541-3273 Fax: (406) 541-3274

**Office of Statewide Health Planning and Development**  
**ANCHORAGE PRE-APPROVAL**  
**OPA-2580-10**

**THIS PRE- APPROVAL CONFORMS TO THE 2010 CALIFORNIA BUILDING CODE**

Equipment Manufacturer: Milestone Inc.

Equipment Type: E1 Series Racks

GENERAL NOTES

1. EXPANSION ANCHORS:

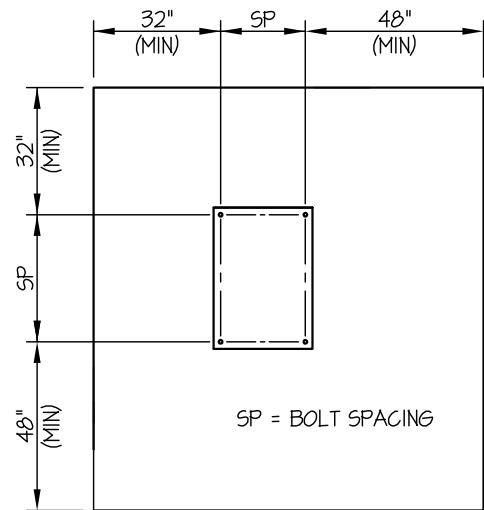
(a) ATTACHMENT IS TO BE MADE WITH THE ANCHORS LISTED BELOW AND INSTALLED AS DESCRIBED IN THE CORRESPONDING ICC REPORT.

Anchor Diameter	Concrete Type	Min. f'c (psi)	Anchor Type	ICC Report No.	Min. Embed.	Min. Spacing	Min. Edge Dist.	Min. Conc. Thickness	Installation Torque	Test Loads
5/8"	Hardrock	2500	Hilti Kwik Bolt TZ	ESR-1917	3-1/8"	12"	32"	5"	60 Ft-Lbs	Direct Pull Tension - 2861 lbs

(b) THIS PRE-APPROVAL ALLOWS FOR UP TO A MAXIMUM OF 2 ADJACENT CONCRETE SLAB EDGES, 32" AWAY MINIMUM (i.e. - CORNER). SEE ADJACENT DETAIL FOR ADDITIONAL MINIMUM ALLOWABLE CONCRETE EDGE DISTANCES.

2. TESTING OF EXPANSION ANCHORS PER 2010 CBC, 1916A.7 : TENSION TESTING SHALL BE DONE IN THE PRESENCE OF THE SPECIAL INSPECTOR AND A REPORT OF THE TEST RESULTS SHALL BE SUBMITTED TO OSHPD

- (a) AFTER AT LEAST 24 HOURS HAVE ELAPSED SINCE INSTALLATION, DIRECT PULL TENSION TEST AT LEAST 50% OF THE ANCHORS.
- (b) ACCEPTANCE CRITERIA: THE ANCHOR SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE TEST LOAD. A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER BECOMES LOOSE.
- (c) IF ANY ANCHOR FAILS, TEST ALL ANCHORS.



TYPICAL CONCRETE EDGE DETAIL



**A P P R O V E D**  
 Fixed Equipment Anchorage  
 Office of Statewide Health Planning and Development

**OPA-2580-10**

Pre-approval Program Manager:  
 Anthony R. Pike  
 (916) 440-8470



*Jeffrey Kikumoto*

Reviewed By: Jeffrey Kikumoto 4/30/12



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**GENERAL NOTES (CONTINUED)**

3. FORCES PER ASCE 7-05 SECTION 13.3.1, EQUATIONS 13.3-1, 13.3-2 & 13.3-3, WHERE  $S_{ds} = 2.0$ ,  $a_p = 2.5$ ,  $I_p = 1.5$  &  $R_p = 6.0$ ,  $z/h = 0.0$  AT CONCRETE SLAB &  $z/h \leq 1.0$  AT CONCRETE ON METAL DECK.
4. THIS PRE-APPROVAL CONFORMS TO THE 2010 CALIFORNIA BUILDING CODE WHERE  $S_{ds}$  IS NOT GREATER THAN 2.0.
5. THIS PRE-APPROVAL COVER ONLY THE ANCHORAGE OF THE EQUIPMENT TO THE HOSPITAL BUILDING'S STRUCTURE.
6. ALL ANCHOR FORCES SHOWN ON THE DRAWINGS ARE FACTORED LOADS THAT SHALL BE USED FOR STRENGTH DESIGN.

**RESPONSIBILITIES OF THE STRUCTURAL ENGINEER OF RECORD OF THE BUILDING**

7. VERIFY THAT PROJECT SPECIFIC VALUES OF  $S_{ds}$  &  $z/h$  RESULT IN SEISMIC FORCES ( $E_h$ ,  $E_v$ ) THAT DO NOT EXCEED THE VALUES ON THE DETAILS.
8. VERIFY THAT THE CONCRETE SLAB TO WHICH THE EQUIPMENT IS ANCHORED MEETS THE REQUIREMENTS OF THE APPLICABLE ICC ESR
9. VERIFY THAT THE ANCHORS ARE AN ADEQUATE DISTANCE FROM ANY SLAB EDGES OR OPENINGS (SEE TYPICAL DETAIL ON SHEET 1).
10. VERIFY THAT ALL NEW OR EXISTING ANCHORS ARE AN ADEQUATE DISTANCE FROM THE ANCHORS SHOWN IN THIS PRE-APPROVAL. SEOR SHALL VERIFY THAT THERE IS NO ADVERSE INTERACTION WHERE OTHER ANCHORS ARE WITHIN 18" OR  $6h_{ef}$  FROM THIS UNIT'S ANCHORS
11. PROVIDE SUPPORTING STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL OTHER LOADS. VERIFY THE ADEQUACY OF THE STRUCTURES (SUCH AS WALLS AND FLOORS) WHICH SUPPORT THE EQUIPMENT FOR THE LOADS IMPOSED ON THEM BY THE EQUIPMENT IN ADDITION TO ALL OTHER LOADS.
12. VERIFY THAT THE INSTALLATION IS IN CONFORMANCE WITH THE 2010 CBC AND WITH THE DETAILS SHOWN IN THIS PRE-APPROVAL. VERIFY THAT THE ACTUAL EQUIPMENT'S WEIGHT, CG LOCATION, ANCHOR LOCATIONS, ANCHOR DETAILS, AND THE MATERIAL AND GAGE OF THE UNIT WHERE ATTACHMENTS ARE MADE AGREE WITH THE INFORMATION SHOWN ON THE PRE-APPROVAL DOCUMENTS.



**MILESTONE INC.**

**E1 SERIES RACKS**

DES. **J. ROBERSON**

JOB NO. **11-1052**

DATE **4/30/12**

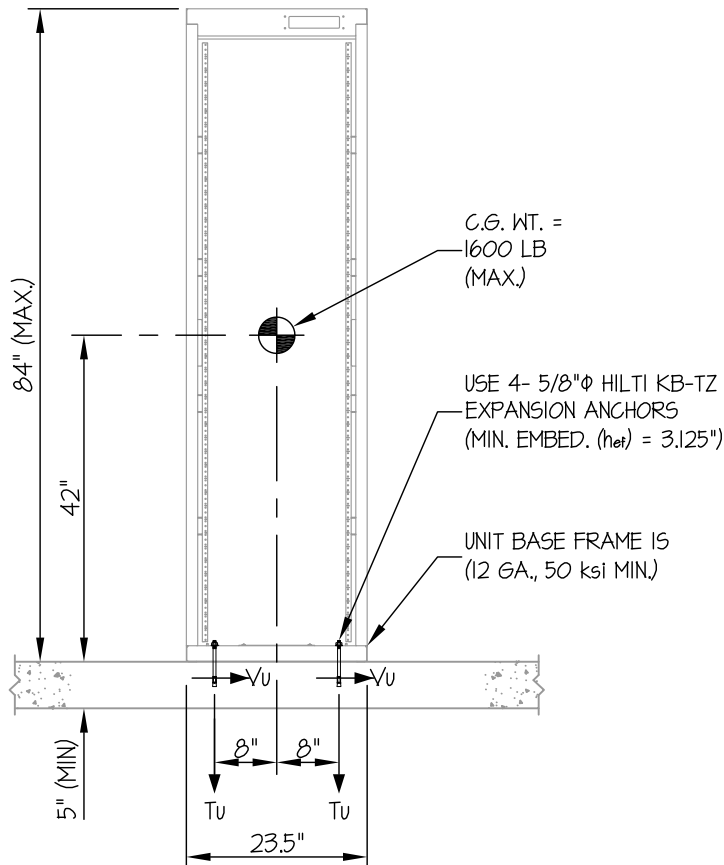
SHEET

**3**

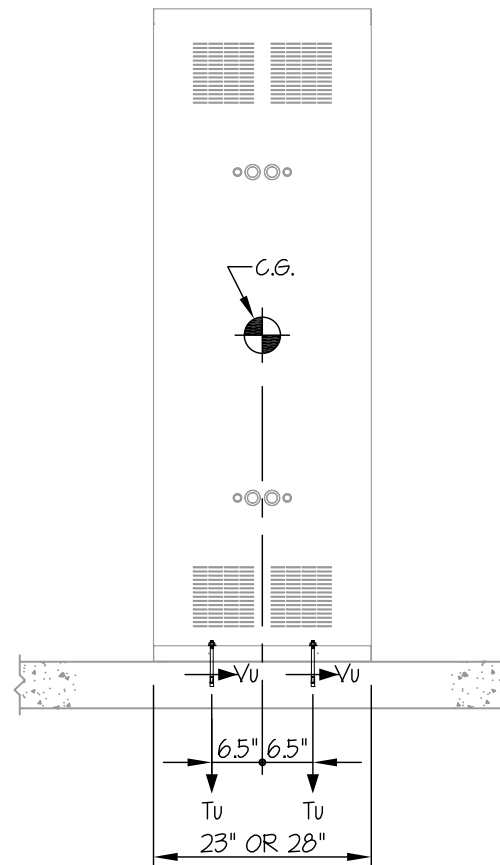
OF **4** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB



**FRONT ELEVATION**



**SIDE ELEVATION**

**NOTES:**

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

$T_u = 1939$  LB/BOLT (MAX)  
 $V_u = 720$  LB/BOLT (MAX)

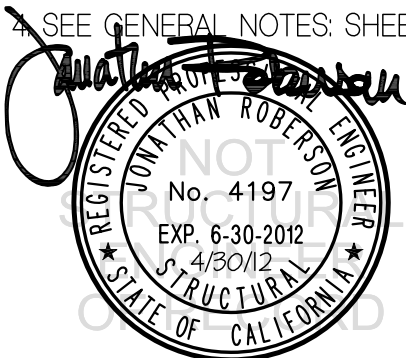
HORIZONTAL FORCE ( $E_h$ ) =  $0.90 W_p$  ( $S_{ds} = 2.00$ ,  $\alpha_p = 2.5$ ,  $I_p = 1.5$ ,  $R_p = 6.0$ ,  $z/h = 0.0$ )

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.

4. SEE GENERAL NOTES: SHEETS 1 AND 2



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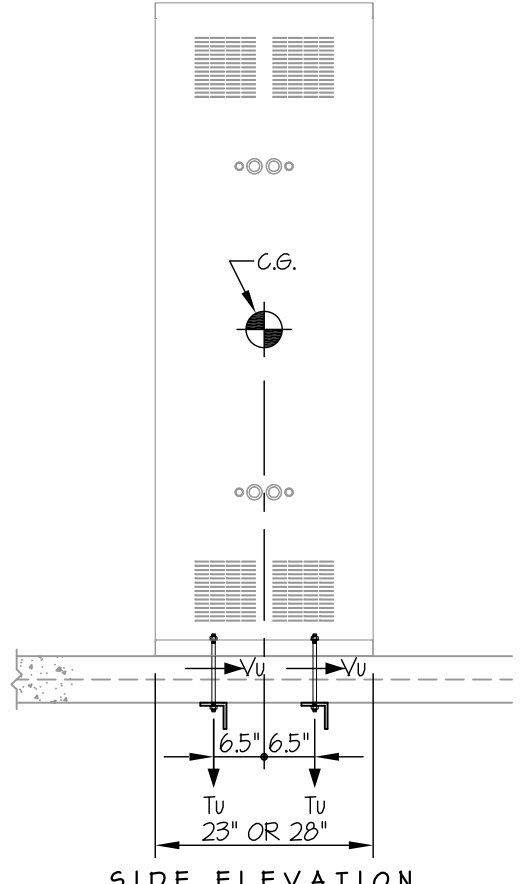
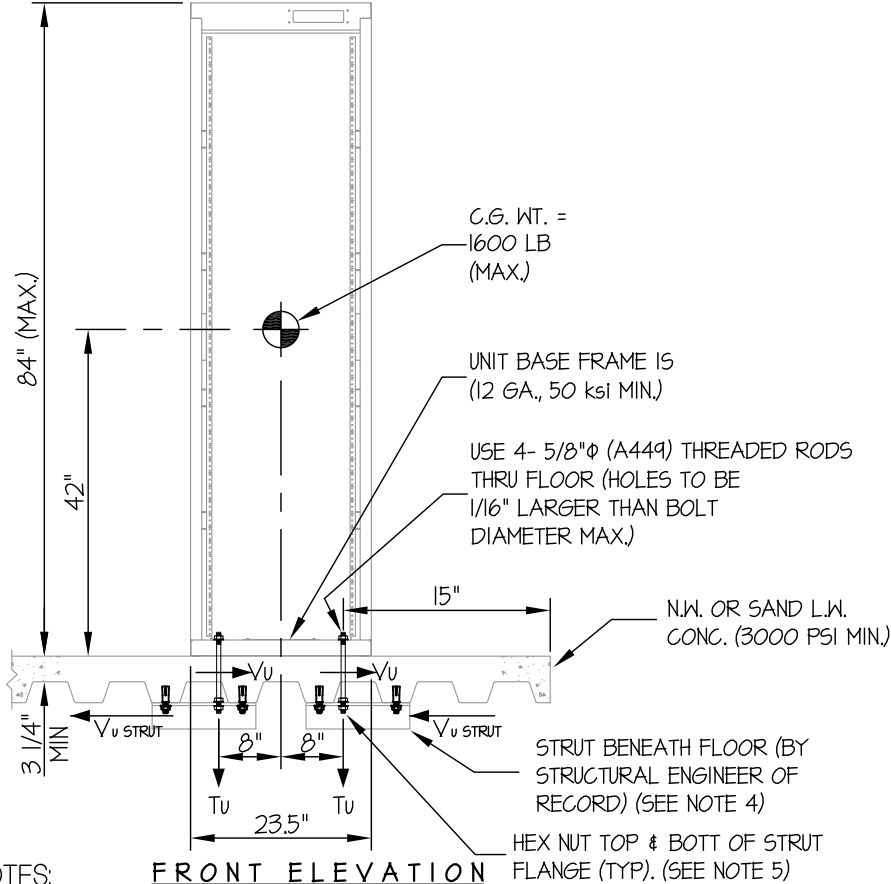
SHEET

**4**

OF **4** SHEETS

SEISMIC ANCHORAGE

CONCRETE SLAB ON METAL DECK



NOTES:

FRONT ELEVATION

FLANGE (TYP.) (SEE NOTE 5)

SIDE ELEVATION

- FORCES ARE DETERMINED PER 2010 CALIFORNIA BUILDING CODE AND ASCE 7-05 STRENGTH DESIGN IS USED.

HORIZONTAL FORCE ( $E_h$ ) =  $1.50 W_p$  ( $S_{ds} = 2.00$ ,  $a_p = 2.5$ ,  $I_p = 1.5$ ,  $R_p = 6.0$ ,  $z/h \leq 1.0$ )

VERTICAL FORCE ( $E_v$ ) =  $0.40 W_p$

$T_u = 3366$  LB/BOLT (MAX)

$V_u = 1200$  LB/BOLT (MAX)

- 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 SHALL PROVIDE STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.
- STRUCTURAL ENGINEER OF RECORD SHALL DESIGN THE STRUT(S) AND ITS ATTACHMENTS TO RESIST A LOAD NOT LESS THAN  $V_{STRUT}$  IN COMBINATION WITH ALL OTHER LOADS THAT MAY BE PRESENT, WHERE  $V_{STRUT} = 0.6V_u \times$  (NO. OF ANCHORS ENGAGED BY STRUT) (MIN)
- AT CONDITIONS WHERE NUT CANNOT BE PROVIDED AT TOP SIDE OF STRUT PROVIDE TAPPED HOLE THROUGH STRUT FLANGE.

