



EASE
EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING

2801 Connery Way Suite B

Missoula, MT 59808

Phn: (406) 541-3273 Fax: (406) 541-3274

Sheet 1 of 3

Office of Statewide Health Planning and Development
ANCHORAGE PRE-APPROVAL

OPA-1365-07

Equipment Manufacturer: Milestone AV Technologies

Equipment Type: Chief - CMA - 115 Projector Mount

GENERAL NOTES

1. FORCES ARE DETERMINED PER ASCE 7-05 SECTION 13.3.1, EQUATIONS 13.3.1, 13.3-2 & 13.3-3, WHERE $S_{DS} = 1.93$, $a_p = 2.5$, $I_p = 1.5$ & $R_p = 2.5$
2. THIS PRE-APPROVAL CONFORMS TO THE 2007 CALIFORNIA BUILDING CODE.
3. THE DETAILS IN THIS PRE-APPROVAL MAY BE USED AT ANY LOCATION AND AT ANY HEIGHT IN THE STATE OF CALIFORNIA.
4. THE ENGINEER OF RECORD SHALL DESIGN BACKING BARS, STUDS, ETC.
WHICH THE UNITS ARE ATTACHED TO AS NOTED ON THE DRAWINGS. THE ENGINEER OF RECORD
SHALL ALSO VERIFY THE ADEQUACY OF THE STRUCTURES (SUCH AS WALLS AND FLOORS)
WHICH SUPPORT THE UNITS FOR THE LOADS IMPOSED ON THEM BY THE UNITS AS WELL AS ALL OTHER LOADS.
5. ALL ANCHOR FORCES SHOWN ON THE DRAWINGS ARE WORKING LOADS (AS OPPOSED TO STRENGTH LEVEL LOADS)
AND MAY BE USED FOR ALLOWABLE STRENGTH DESIGN.



MILESTONE AV TECHNOLOGIES

CHIEF - CMA - 115 PROJECTOR MOUNT

DES. **R. LA BRIE**

EASE JOB NO. **11-0781**

DATE **6/10/08**

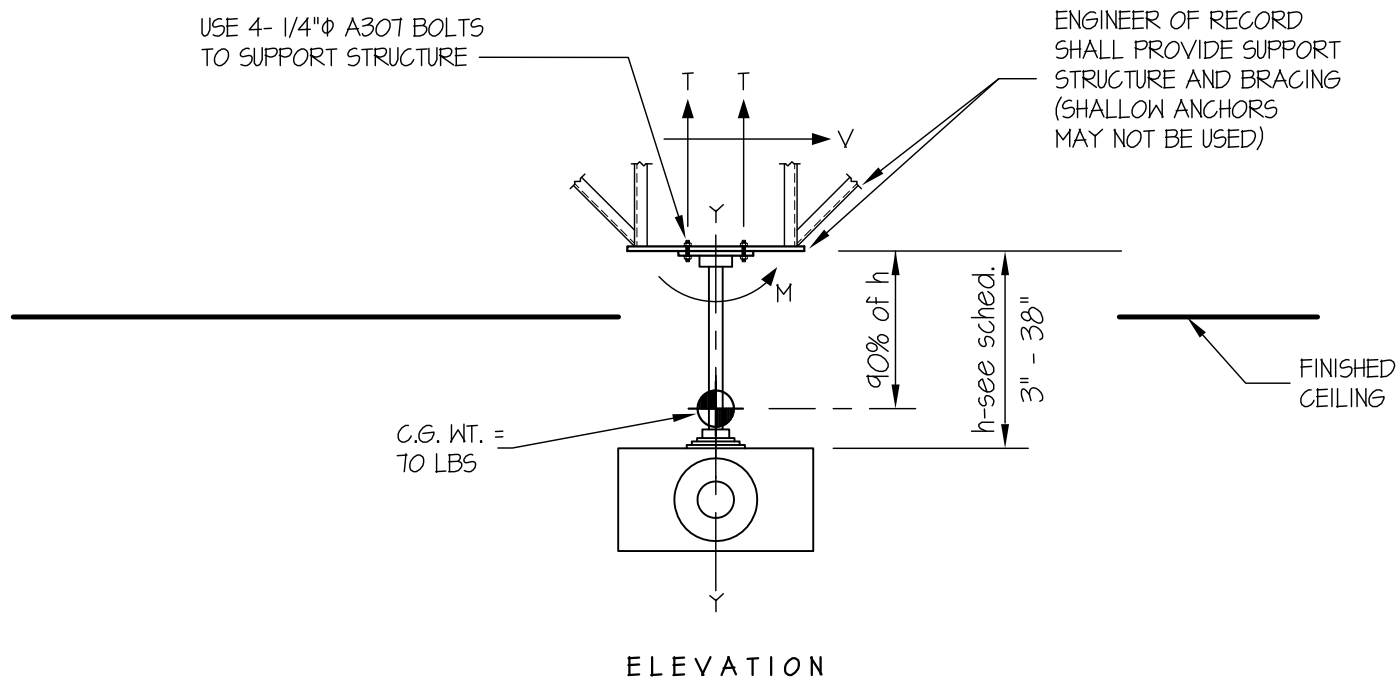
SHEET

2

OF **3** SHEETS

SEISMIC ANCHORAGE

CEILING MOUNTED



NOTES:

1. ANCHORAGE DESIGN PER 2007 CALIFORNIA BUILDING CODE - SECTION 1613A AND ASCE 7-05 SECTIONS 12 AND 13. ALLOWABLE STRESS DESIGN IS USED.
HORIZONTAL FORCE (E_h) = $2.43 W_p (S_{DS} = 1.93, I_p = 1.5, a_p = 2.5, R_p = 2.5)$
VERTICAL FORCE (E_v) = $0.27 W_p$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.
4. SEE GENERAL NOTES: SHEET 1



MILESTONE AV TECHNOLOGIES

CHIEF - CMA - 115 PROJECTOR MOUNT

DES. **R. LA BRIE**

EASE
JOB NO. **11-0781**

DATE **6/10/08**

SHEET

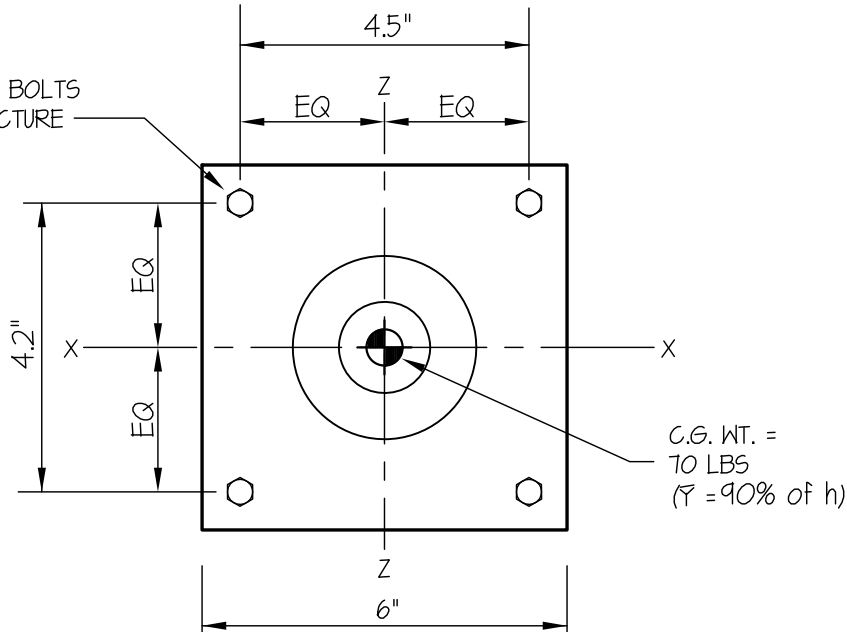
3

OF **3** SHEETS

SEISMIC ANCHORAGE

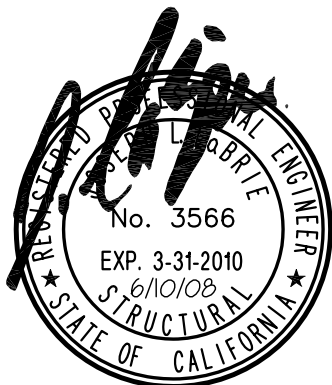
CEILING MOUNTED

USE 4- 1/4" Φ A307 BOLTS
TO SUPPORT STRUCTURE



PLAN AT CEILING PLATE

Drop Tube (h)	Moment inch-lbs	Tension lbs/bolt	Shear lbs/bolt
12"	1836	320	43
24"	3672	618	43
36"	5508	915	43
38" (MAX)	5814	965	43



MILESTONE AV TECHNOLOGIES

CHIEF - CMA - 115 PROJECTOR MOUNT

DES. **R. LA BRIE**

EASE
JOB NO. **11-0781**

DATE **6/10/08**

SHEET

1

OF **2** SHEETS

SEISMIC ANCHORAGE

CEILING MOUNTED

USE 4- 1/4" Φ A307 BOLTS
TO SUPPORT STRUCTURE

ENGINEER OF RECORD
SHALL PROVIDE SUPPORT
STRUCTURE AND BRACING
(SHALLOW ANCHORS
MAY NOT BE USED)

C.G. WT. =
70 LBS

FINISHED
CEILING

ELEVATION

NOTES:

1. FORCES ARE DETERMINED PER 2007 CALIFORNIA BUILDING CODE SECTION 1613A AND ASCE 7-05 SECTIONS 12 AND 13. ALLOWABLE STRESS DESIGN IS USED.

$$\text{HORIZONTAL FORCE } (E_h) = 2.43 W_p \quad (S_{DS} = 1.93, a_p = 2.5, I_p = 1.5, R_p = 2.5)$$

$$\text{VERTICAL FORCE } (E_v) = 0.27 W_p$$

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



MILESTONE AV TECHNOLOGIES

CHIEF - CMA - 115 PROJECTOR MOUNT

DES. R. LA BRIE

EASE JOB NO. 11-0781

DATE 6/10/08

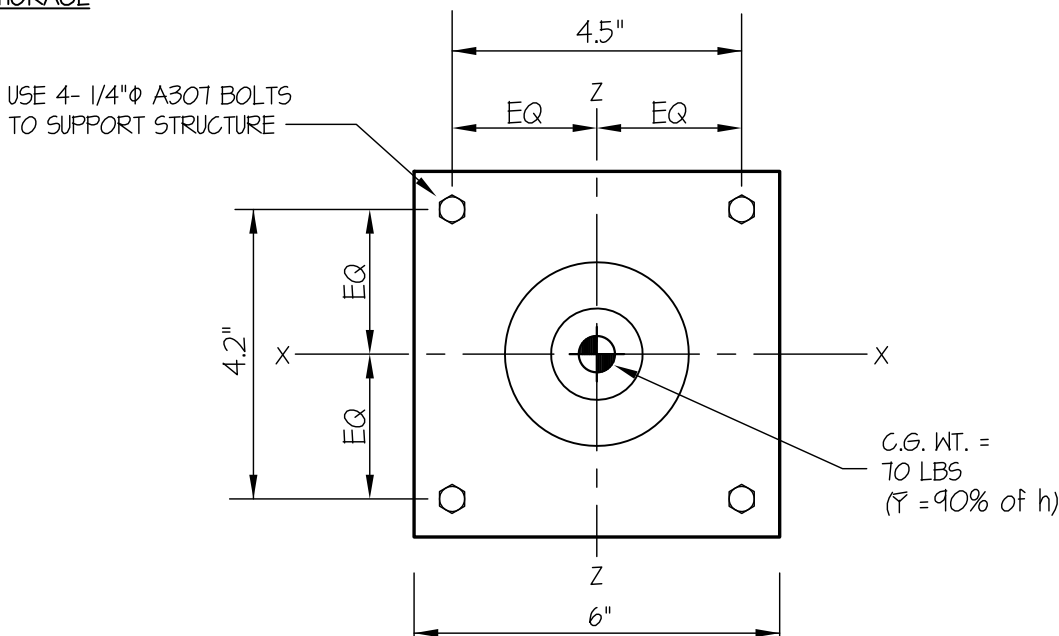
SHEET

2

OF 2 SHEETS

SEISMIC ANCHORAGE

CEILING MOUNTED



PLAN AT CEILING PLATE

LOADS:

WEIGHT = 70 LBS (INCLUDES PROJECTOR)

HORIZONTAL FORCE (E_h) = 170 LBS

VERTICAL FORCE (E_v) = 19 LBS

Drop Tube (h)	Moment inch-lbs	Tension lbs/bolt	Shear lbs/bolt
12"	1836	320	43
24"	3672	618	43
36"	5508	915	43
38" (MAX)	5814	965	43

BOLT GROUP PROPERTIES:

$$I_{X-X} = 19 \text{ in.}^4$$

$$I_{Z-Z} = 19 \text{ in.}^4$$

$$I_{Y-Y} = 38 \text{ in.}^4$$

MOMENTS:

$$M_{XX} = 170\#(37") = 5814\text{"}\#$$

$$M_{ZZ} = 170\#(37") = 5814\text{"}\#$$

$$M_{YY} = 170\#(0") = 0\text{"}\#$$

BOLT FORCES:

TENSION (T)

$$T = \frac{5814\text{"}\#(3.08")}{19} + \frac{70\# + 19\#}{4 \text{ BOLTS}} = 965 \text{ LBS/BOLT (MAX)}$$

SHEAR (V)

$$V = \frac{170\#}{4 \text{ BOLTS}} = 43 \text{ LBS/BOLT (MAX)}$$

STRESS CHECK: 1/4" A307 BOLT

$$f_v = 43\#/0.5" = .9 \text{ ksi} \quad F_v = 10 \text{ ksi}$$

$$f_T = 965\#/0.5" = 19.3 \text{ ksi} \leq 20 \text{ ksi}$$

$$\begin{aligned} F_T &= 26 - 18F_v \leq 20 \text{ ksi} \\ &= 26 - 18(.9) = 24.4 > 20 \\ &= 20 \text{ ksi} \end{aligned}$$