UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

SCOPE OF WORK

TYPICAL DETAILS FOR THE SEISMIC BRACING OF EQUIPMENT COMMONLY FOUND ON UCSF CAMPUS
DESIGNED TO MEET THE 2016 CALIFORNIA BUILDING CODE.

APPLICABLE LOCATIONS

NON-OSHPD BUILDINGS IN EAST AND WEST FACILITY SERVICES ZONES OF UNIVERSITY OF CALIFORNIA,
SAN FRANCISCO.

COMPONENTS REQUIRING SEISMIC BRACING (PER 2016 CBC AND UCSF POLICY)

• FLOOR OR COUNTER MOUNTED ITEMS WEIGHING MORE THAN 100 LB
• WALL MOUNTED OR SUSPENDED ITEMS WEIGHING MORE THAN 20 LB
• ITEMS CONTAINING HAZARDOUS MATERIAL
• ITEMS WITH THE POTENTIAL TO BLOCK EXIT ROUTES IF THEY WERE TO TOPPLE OR SLIDE
• ITEMS CRITICAL TO THE UNIVERSITY’S OPERATIONS OR OF HIGH VALUE (AS DETERMINED BY THE USERS)
• ITEMS CONTAINING MATERIALS CRITICAL TO THE UNIVERSITY’S OPERATIONS OR OF HIGH VALUE
  (AS DETERMINED BY THE USERS)
EXCEPTION: MOBILE ITEMS (DEFINED AS MOVING AT LEAST ONCE EVERY 8 HOURS) DO NOT REQUIRE SEISMIC BRACING.
• FURNITURE FOR WHICH HEIGHT:DEPTH EXCEEDS 3:1
• FURNITURE FOR WHICH HEIGHT IS 5’ OR GREATER

PROJECT DIRECTORY

CLIENT:
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
CLS — FACILITIES SERVICES
654 MINNESOTA ST
SAN FRANCISCO, CA 94107

UNIVERSITY’S REPRESENTATIVE:
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GENERAL INFORMATION
G0.00 COVER SHEET
G0.01 TABLE OF CONTENTS
G0.02 TABLE OF CONTENTS
G0.03 TABLE OF CONTENTS
G1.01 GENERAL NOTES (GENERAL)
G1.02 GENERAL NOTES (DRILLED-IN MECHANICAL ANCHORS)
G1.03 GENERAL NOTES (STRUCT. STEEL & MISC METAL, SEISMIC RESTRAINT PRODUCTS, STRUT FRAMING)
G1.04 GENERAL NOTES (STRUCTURAL TESTS)
G1.05 GENERAL NOTES (SPECIAL INSPECTIONS, DESIGN CRITERIA)
G2.01 DESIGN CATEGORY CLASSIFICATION FOR SLAB MOUNTED EQUIPMENT
G2.11 UCSF BUILDINGS - PROPERTIES (FOR REFERENCE ONLY)
G2.12 UCSF BUILDINGS - PROPERTIES (FOR REFERENCE ONLY)
G2.13 UCSF BUILDINGS - PROPERTIES (FOR REFERENCE ONLY)

S1 - FURNITURE
S1.00A SMALL CABINETS AND SHELVING UNITS - PHOTO GUIDE
S1.00B LARGE CABINETS AND SHELVING UNITS - PHOTO GUIDE
S1.11 SMALL CABINET OR SHELVING - 400# MAX - ANCHORAGE TO SLAB
S1.12 SMALL CABINET OR SHELVING - 400# MAX - ADHESIVE STRAP TO SLAB
S1.13 SMALL CABINET OR SHELVING - 400# MAX - ADHESIVE STRAP TO WALL
S1.14 SMALL CABINET OR SHELVING - 400# MAX - SCREWED TO STUDS
S1.15 SMALL CABINET OR SHELVING - 400# MAX - ANGLES TO WALL
S1.21 LARGE CABINET OR SHELVING - ANCHORAGE TO SLAB
S1.22 LARGE CABINET OR SHELVING - ADHESIVE STRAP TO SLAB
S1.23 LARGE CABINET OR SHELVING - ADHESIVE STRAP TO WALL
S1.24 LARGE CABINET OR SHELVING - SCREWED TO STUDS
S1.25 LARGE CABINET OR SHELVING - ANGLES TO WALL
S1.26 LARGE CABINET OR SHELVING - CABLE BRACED TO SLAB ABOVE
S1.27 WIRE SHELVING - ANCHORAGE TO SLAB
S1.28 WIRE SHELVING - ANCHORAGE TO WALL
S1.29A STORAGE RACK - ATTACHMENT TO STRUT
S1.29B STORAGE RACK - ATTACHMENT THRU SHELF
S1.30 STORAGE RACK - ANGLES TO SLAB AND WALL
S1.31 RETAIL SHELVING

S2 - REFRIGERATORS, FREEZERS, AND SIMILAR
S2.00A SMALL REFRIGERATORS, FREEZERS & SIM - PHOTO GUIDE
S2.00B LARGE REFRIGERATORS, FREEZERS & SIM - PHOTO GUIDE
S2.11 SMALL REFRIGERATOR (& SIM) - 400# MAX - ANCHORAGE TO SLAB
S2.12 SMALL REFRIGERATOR (& SIM) - 400# MAX - ADHESIVE STRAPS TO SLAB
S2.13 SMALL REFRIGERATOR (& SIM) - 400# MAX - ADHESIVE STRAPS TO WALL
S2.21A LARGE REFRIGERATORS (& SIM) - ANGLES TO SLAB - 26' MIN
S2.21B LARGE REFRIGERATORS (& SIM) - ANGLES TO SLAB - 32' MIN
S2.21C LARGE REFRIGERATORS (& SIM) - ANGLES TO SLAB - 38' MIN
S2.22A LARGE REFRIGERATORS (& SIM) - 4 ADHESIVE STRAPS TO SLAB
S2.22B LARGE REFRIGERATORS (& SIM) - 8 ADHESIVE STRAPS TO SLAB
S2.22C LARGE REFRIGERATORS (& SIM) - 8 ADHESIVE STRAPS TO SLAB

TABLE OF CONTENTS

REV DESCRIPTION REV DESCRIPTION DATE

PREPARED BY

UCSF
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2016)
S2.23A LARGE REFRIGERATORS (& SIM) – ADHESIVE STRAPS TO WALL
S2.23B LARGE REFRIGERATORS (& SIM) – ADHESIVE STRAPS TO WALL
S2.24 LARGE REFRIGERATORS (& SIM) – ANGLES TO SLAB AND WALL
S2.25 LARGE REFRIGERATORS (& SIM) – SNUBBERS TO SLAB

S3 FUME HOODS AND BIOSAFETY CABINETS
S3.00 FUME HOODS AND BIOSAFETY CABINETS – PHOTO GUIDE
S3.11 COUNTER MOUNTED HOOD – ANCHORAGE TO WALL
S3.12 HOOD STAND – ANCHORAGE TO SLAB
S3.21 BIOSAFETY CABINET – ANCHORED TO SLAB AT LEGS
S3.22 BIOSAFETY CABINET – ANCHORED TO SLAB AT CROSS BEAMS
S3.23 BIOSAFETY CABINET – ADHESIVE STRAPS TO WALL
S3.24 BIOSAFETY CABINET – ANCHORED TO FLOOR

S4 GAS CYLINDERS AND DEWARS
S4.00 GAS CYLINDERS AND DEWARS – PHOTO GUIDE
S4.11 NITROGEN TANKS – PREMANUFACTURED STAND
S4.12 NITROGEN TANKS – MOBILE UNIT RESTRAINED AT WALL
S4.13 NITROGEN TANKS – STAND AND WALL ANCHORAGE
S4.21 GAS CYLINDERS – STRAPS TO WALL
S4.22 GAS CYLINDERS – PREMANUFACTURED STAND

S5 COUNTER-MOUNTED EQUIPMENT
S5.00 COUNTER-MOUNTED EQUIPMENT – PHOTO GUIDE
S5.11 COUNTER-MOUNTED EQUIPMENT – 400# MAX – SNUBBERS
S5.12 COUNTER-MOUNTED EQUIPMENT – 400# MAX – ADHESIVE STRAPS TO COUNTER
S5.13 COUNTER-MOUNTED EQUIPMENT – 400# MAX – "L" BRACKETS
S5.14 COUNTER-MOUNTED EQUIPMENT – 400# MAX – RATCHET STRAP
S5.21 COUNTER-MOUNTED EQUIPMENT – 500# MAX – ADHESIVE STRAPS TO COUNTER
S5.22 COUNTER-MOUNTED EQUIPMENT – 525# MAX – ADHESIVE STRAPS TO WALL
S5.31 TABLE SUPPORTING EQUIPMENT – ANCHORAGE TO SLAB

S6 MONITORS
S6.00 MONITORS – PHOTO GUIDE
S6.01 MONITORS – CRITERIA AND MODELS
S6.02 MONITORS – CRITERIA AND MODELS
S6.11 MONITOR FLAT MOUNT TO METAL STUDS – 20# MAX
S6.12 MONITOR FLAT MOUNT TO METAL STUDS – 40# MAX
S6.13 MONITOR FLAT MOUNT TO METAL STUDS – 110# MAX
S6.14 MONITOR FLAT MOUNT TO CONCRETE WALL – 110# MAX
S6.21 MONITOR ON ARM TO METAL STUDS – 15# MAX
S6.22 MONITOR ON ARM TO METAL STUDS – 40# MAX
S6.31A SUSPENDED MONITOR – 40# MAX (SHEET 1/2)
S6.31B SUSPENDED MONITOR – 40# MAX (SHEET 2/2)
S6.41 MONITORS – CISCO MX300
S6.42 MONITORS – CISCO MX800

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>REV</th>
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PREPARED BY

Estructure
www.estrucc.com

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
S7  MISCELLANEOUS COMPONENTS
S7.00 MISCELLANEOUS COMPONENTS - PHOTO GUIDE
S7.11 WALL-MOUNTED WORKSTATION
S7.12 SUSPENDED EXAM LIGHT
S7.13 OVERHEAD CABLE (≤5 PLF)
S7.14 MILLPORE SYSTEM
S7.15 STACKED INCUBATORS
S7.16A WHITEBOARD - "FOREVERWHITE"
S7.16B WHITEBOARD - "ICEBERG"
S7.17 BACKING PLATES
S7.18A FENCE POST - INTERMEDIATE
S7.18B FENCE POST - END CONDITION AND FENCING MATERIAL ATTACHMENT
S7.19A METAL STUD LATERAL BRACING - TYPE 1
S7.19B METAL STUD LATERAL BRACING - TYPE 2
S7.21 NESTED STUDS - SPLICE OPTION
S7.22 NESTED STUDS - ANGLES TO SLAB

S8  ELECTRICAL PANELS
S8.00 ELECTRICAL PANELS - PHOTO GUIDE
S8.11A ELECTRICAL PANEL - STUD WALL MOUNTED - OPTION A
S8.11B ELECTRICAL PANEL - STUD WALL MOUNTED - OPTION B
S8.12 ELECTRICAL PANEL - STUD WALL RECESSED
S8.13A ELECTRICAL PANEL - CONCRETE Wall MOUNTED - OPTION A
S8.13B ELECTRICAL PANEL - CONCRETE Wall MOUNTED - OPTION B
S8.14A ELECTRICAL PANEL - MASONRY Wall MOUNTED - OPTION A
S8.14B ELECTRICAL PANEL - MASONRY Wall MOUNTED - OPTION B
S8.15A ELECTRICAL PANEL - FLOOR MOUNTED - OPTION A
S8.15B ELECTRICAL PANEL - FLOOR MOUNTED - OPTION B

S9  INTERIOR PARTITIONS
S9.11 FULL HEIGHT PARTITION
S9.12 PARTIAL HEIGHT BRACED PARTITION
S9.13 PARTITION BASE CONNECTION
S9.14 BRACED PARTITION TOP CONNECTION
S9.15A FULL HEIGHT PARTITION TOP CONNECTION - OPTION 1
S9.15B FULL HEIGHT PARTITION TOP CONNECTION - OPTION 2A
S9.15C FULL HEIGHT PARTITION TOP CONNECTION - OPTION 2B
S9.15D FULL HEIGHT PARTITION TOP CONNECTION - OPTION 3A
S9.15E FULL HEIGHT PARTITION TOP CONNECTION - OPTION 3B
S9.15F FULL HEIGHT PARTITION TOP CONNECTION - OPTION 4A
S9.15G FULL HEIGHT PARTITION TOP CONNECTION - OPTION 4B
S9.16A BRACED PARTITION BRACE CONNECTION - OPTION 1
S9.16B BRACED PARTITION BRACE CONNECTION - OPTION 2A
S9.16C BRACED PARTITION BRACE CONNECTION - OPTION 2B
S9.16D BRACED PARTITION BRACE CONNECTION - OPTION 3A
S9.16E BRACED PARTITION BRACE CONNECTION - OPTION 3B
S9.16F BRACED PARTITION BRACE CONNECTION - OPTION 4A
S9.16G BRACED PARTITION BRACE CONNECTION - OPTION 4B
I. GENERAL

1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE 2016 CALIFORNIA BUILDING CODE (PART 2, TITLE 24 CCR), ASSOCIATED REFERENCE STANDARDS AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

2. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING A SAFE PLACE TO WORK AND MEETING THE REQUIREMENTS OF ALL APPLICABLE JURISDICTIONS. EXECUTE WORK TO ENSURE THE SAFETY OF PERSONS AND ADJACENT PROPERTY AGAINST DAMAGE BY FALLING DEBRIS AND OTHER HAZARDS IN CONNECTION WITH THIS WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXISTING BUILDING CONSTRUCTION PRIOR TO THE INSTALLATION OF SEISMIC ANCHORAGE.


3.2 FLOOR ANCHORAGE – WHERE DETAIL REQUIRE ANCHORAGE TO A FLOOR, VERIFY THAT THE FLOOR SLAB IS AT LEAST 4" THICK CONCRETE OR 3.25" THICK CONCRETE FILL ON METAL DECK. FOR MOST BUILDINGS VERIFICATION WILL BE BASED ON REVIEW OF ORIGINAL CONSTRUCTION DRAWINGS OR PRIOR KNOWLEDGE OF THE BUILDING. IF NEITHER CONDITION EXISTS, CONTACT THE UNIVERSITY'S REPRESENTATIVE. VERIFY TO G2.11 FOR TYPICAL SLAB CONDITIONS FOR UCSF BUILDINGS.

3.3 BUILT IN CASEWORK – FOR COUNTER MOUNTED EQUIPMENT WEIGHING OVER 200 LB, V.I.F. THAT (E) CASEWORK IS ANCHORED TO WALL STUDS AT TOP OF CABINET WITH MINIMUM #10 SMS AT 16" O.C..

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Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by: [Signature]

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<th>PROJECT NAME</th>
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II. DRILLED-IN MECHANICAL ANCHORS

1. GENERAL

1.1 WHEN INSTALLING DRILLED-IN ANCHORS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. WHEN INSTALLING THEM INTO EXISTING PRESTRESSED CONCRETE (PRE- OR POST-TENSIONED) LOCATE THE PRESTRESSED TENDONS BY USING A NON-DESTRUCTIVE METHOD PRIOR TO INSTALLATION. EXERCISE EXTREME CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE TENDONS DURING INSTALLATION. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCMENT AND THE DRILLED-IN ANCHOR AND/OR PIN. IF REINFORCING STEEL IS CUT OR DAMAGED DURING INSTALLATION, NOTIFY THE UNIVERSITY’S REPRESENTATIVE.

1.2 PROVIDE GALVANIZED CARBON STEEL, UNLESS OTHERWISE NOTED.

2. EXPANSION ANCHORS

2.1 EXPANSION ANCHORS SHALL BE HILTI KBITZ (ICC ESR-1917), DEWALT POWER-STUD+ SD2 (ICC ESR-2502), SIMPSON STRONG-BOLT 2 (ICC ESR-3037) OR EQUAL. INSTALL ANCHORS IN STRICT ACCORDANCE WITH ESR AND MANUFACTURER’S REQUIREMENTS.

2.2 ANCHOR EMBEDMENT SPECIFIED ON THE DRAWINGS REFERS TO "EFFECTIVE MINIMUM EMBEDMENT" IN ACCORDANCE WITH ESR-1917. REFER TO ESR FOR REQUIRED HOLE DEPTH.

3. INTERNALLY ThreadED SCREW ANCHORS

3.1 INTERNALLY THREADED SCREW ANCHORS SHALL BE 1/2" DEWALT SNAKE+ ANCHORS (ICC ESR-2272), NO KNOWN EQUAL. AT CONTRACTOR’S OPTION, SNAKE+ ANCHORS MAY BE REPLACED WITH EXPANSION ANCHORS. INSTALL ANCHORS IN STRICT ACCORDANCE WITH ESR AND MANUFACTURER’S REQUIREMENTS. NOMINAL EMBEDMENT DEPTH SHALL BE 2 3/16" AND MINIMUM EDGE DISTANCE SHALL BE 4".

4. ADHESIVE ANCHORS

4.1 USE HILTI HIT-HY 200 OR EQUAL. INSTALL IN ACCORDANCE WITH ICC ESR-3187.

4.2 STEEL DOWELS: ASTM A36, ASTM A615 GRADE 60, A193 GRADE B7, OR AISI 304-SS GROUP 1 CW.

5. REQUIRED ANCHOR EMBEDMENT MUST BE IN THE CONCRETE SLAB, EXCLUSIVE OF THE THICKNESS OF ANY MORTAR BED, FLOOR FINISH OR OTHER TOPPING THAT MAY BE PRESENT.
III. STRUCTURAL STEEL AND MISCELLANEOUS METAL

1. FABRICATE AND ERECT STRUCTURAL STEEL AND MISCELLANEOUS METAL IN ACCORDANCE WITH ASC SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" LATEST EDITION AND THE "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" LATEST EDITION.

2. MATERIALS:
   - MEMBER: STANDARD
   - ANGLES: ASTM A36
   - PLATES: ASTM A36
   - PIPE: AS53, TYPE E OR S, GRADE B
   - BOLTS: ASTM A307
   - WELDING: E70XX ELECTRODES
   - ANCHOR RODS: ASTM F1554, GRADE 36

3. WELDING SHALL CONFORM TO AWS D1.1 AND D1.3. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS.

4. BOLT HOLES SHALL BE 1/16" LARGER IN DIAMETER THAN NOMINAL SIZE OF BOLT USED, UNLESS OTHERWISE NOTED.

5. ALL STEEL, NOT GALVANIZED OR STAINLESS, SHALL BE PRIMED AND PAINTED.

6. SUBMIT DETAILED AND DIMENSIONED SHOP DRAWINGS SHOWING LAYOUT OF STEEL FRAMING, CONNECTIONS, ACCESSORIES AND ATTACHMENTS TO OTHER WORK. DO NOT PROCEED WITH FABRICATION OR INSTALLATION UNTIL SHOP DRAWING REVIEW IS COMPLETE.

7. SHEET METAL SCREWS SHALL BE TEK SCREWS BY ITW BUILDEX (ICC ESR-3223), HILTI SELF DRILLING SCREWS (ICC ESR-2196), OR EQUAL SCREWS MUST PENETRATE THROUGH THE SUPPORTING STEEL WITH A MINIMUM OF THREE THREADS PROTRUDING PAST THE BACK SIDE OF THE SUPPORTING STEEL.

IV. SEISMIC RESTRAINT PRODUCTS

1. SEISMIC STRAPS AND OTHER CONNECTORS SHALL BE MANUFACTURED BY ETC BUILDING AND DESIGN, WORKSAFE TECHNOLOGIES OR APPROVED EQUAL. DETAILS REFERENCING SPECIFIC COMPONENTS MAY BE SUBSTITUTED WITH EQUAL COMPONENTS BY AN ALTERNATE VENDOR WITH DEMONSTRATED EQUIVALENT PROPERTIES.

2. ADHESIVE TAPES SHALL BE INSTALLED PER THE VENDOR’S INSTRUCTIONS, INCLUDING REQUIREMENTS FOR PREPARATION OF THE SUBSTRATE, ADHESIVE SETTING, AND CURING.

3. SEISMIC STRAPS MAY NOT BE USED ON WOOD FURNITURE.

V. STRUT FRAMING

1. ALL STRUT SYSTEM COMPONENTS SHALL BE UNISTRUT, B–LINE, OR EQUAL. PART NUMBERS CALLED OUT ON DRAWINGS REFERENCE UNISTRUT COMPONENTS.

2. ALL STRUTS AND FITTINGS TO BE HOT–DIPPED GALVANIZED OR ELECTRO–GALVANIZED IN CONFORMANCE WITH ASTM A623 OR B633 AS APPLICABLE, UNLESS OTHERWISE NOTED.
3. BOLTS IN STRUT CONNECTIONS SHALL BE INSTALLED WITH THE METHODS RECOMMENDED BY THE MANUFACTURER. INSTALL STRUT NUTS TO THE FOLLOWING TORQUE VALUES:

<table>
<thead>
<tr>
<th>DIAMETER (IN)</th>
<th>TORQUE (FT-LBS)</th>
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<tbody>
<tr>
<td>3/8</td>
<td>19</td>
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<tr>
<td>1/2</td>
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4. PROVIDE END CAPS WHEREVER CUT EDGES OF STRUT ARE EXPOSED.

VI. STRUCTURAL TESTS

1. AN INDEPENDENT TESTING AGENCY AND SPECIAL INSPECTORS WILL BE RETAINED BY THE OWNER TO PERFORM THE FOLLOWING TESTS AND INSPECTION. PROVIDE ACCESS AND FURNISH SAMPLES TO THE AGENCY AS REQUIRED BY THE CONTRACT DOCUMENTS.

2. IF INITIAL TESTS OR INSPECTIONS MADE BY THE OWNER'S TESTING AGENCY REVEAL THAT ANY PORTION OF THE WORK DOES NOT COMPLY WITH THE CONTRACT DOCUMENTS, ADDITIONAL TESTS, INSPECTIONS, AND NECESSARY REPAIRS WILL BE MADE AT THE CONTRACTOR'S EXPENSE.


4. TEST EQUIPMENT SHALL BE CALIBRATED BY AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH STANDARD RECOGNIZED PROCEDURES.

5. DRILLED--IN MECHANICAL ANCHORS

5.1 GENERAL

5.1.1 HOLES DRILLED FOR ANCHORS THAT DO NOT SET PROPERLY OR FAIL PROOF TESTING MAY NOT BE REUSED, AND SHALL BE FILLED WITH NON-SHRINK GROUT.

5.1.2 TEST ALL ANCHORS IN THE PRESENCE OF THE INSPECTOR OF RECORD.

5.1.3 IF ANY ANCHOR FAILS TESTING, TEST ALL ANCHORS OF THE SAME TYPE, INSTALLED BY THE SAME TRADE, NOT PREVIOUSLY TESTED UNTIL TWENTY (20) CONSECUTIVE ANCHORS PASS, THEN RESUME THE INITIAL TEST FREQUENCY.

5.2 EXPANSION ANCHORS

5.2.1 EXPANSION ANCHORS WILL BE PROOF--TESTED BY THE UNIVERSITY'S TESTING AND INSPECTION AGENCY. ACCEPTANCE REQUIRES REACHING THE TEST TORQUE WITHIN ONE--HALF TURN OF THE NUT. EXCEPTION: ONE--QUARTER TURN OF THE NUT FOR 3/8 ANCHORS. TORQUE TEST 50% OF THE ANCHORS AS FOLLOWS:

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5.2.1 EXPANSION ANCHOR TESTING SHALL BE CONDUCTED 24 HOURS MINIMUM AFTER INSTALLATION OF THE ANCHORS.

5.3 INTERNALLY THREADED ANCHORS

5.3.1 INTERNALLY THREADED ANCHORS WILL BE PROOF--TESTED BY UNIVERSITY'S TESTING AND INSPECTION AGENCY. TENSION TEST 50% OF 1/2 DIAMETER INTERNALLY THREADED SCREW ANCHORS TO 1800 POUNDS.
VII. SPECIAL INSPECTIONS

1. Conduct tests and inspections as required by CBC Chapter 17 including but not limited to the following:
   1.1 Inspect and test installation of post-installed anchors
   1.2 Verify steel materials including weld filler
   1.3 Inspect welding

VIII. DESIGN CRITERIA

1. Applicable code: 2016 California Building Code and ASCE 7-10 Chapter 13

2. Parameters
   Risk Category: IV Maximum
   Site Class: D

3. Seismic Design Parameters

   3.1 Details are applicable to all campuses listed in the table below. At locations where demands exceed the governing values or where performance requirements in excess of code requirements are required, provide project-specific design.

   | Seismic Parameter Summary Table for Main UCSF Campus-Seismic Design Category |
   |---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
   | Campus                         | S₁              | S₀              | Risk Category I/II/III | Risk Category IV |
   | Parnassus                      | 0.778           | 1.125           | E               | F               |
   | Mt Zion                        | 0.666           | 1.000           | D               | D               |
   | Mission Bay                    | 0.601           | 1.000           | D               | D               |
   | Laurel Heights                 | 0.867           | 1.009           | D               | D               |
   | San Francisco General Hospital | 0.641           | 1.000           | D               | D               |
   | Oyster Point                   | 0.833           | 1.197           | E               | F               |
   | Mission Center Building        | 0.843           | 1.000           | D               | D               |
   | Hunters Point Facility         | 0.635           | 1.000           | D               | D               |

3.3 Seismic Force Equations

\[ F_p = \frac{0.4 \alpha_s S_0 W_p (1 + 2z/h)}{(\alpha_p / \alpha_p)} \]

\[ F_p, \text{MIN} = 0.3 S_0 S_5 \%
\]

\[ E_0 = 0.2 S_0 W_p \]

WHERE:

\[ S_0 = 1.197 \quad \text{MAXIMUM, SEE TABLE} \]

\[ W_p = \text{SEE DETAIL EQUIPMENT WEIGHT} \]

\[ \alpha_s = 1.0 \quad \text{U.O.N. ON DETAIL} \]

\[ \alpha_p = 2.5 \quad \text{U.O.N. ON DETAIL} \]

\[ b = 1.5 \quad \text{ALL COMPONENTS EXCEPT CABINETS/SHELVING WITHOUT HAZARDOUS MATERIALS} \]

\[ = 1.0 \quad \text{CABINETS/SHELVING WITHOUT HAZARDOUS MATERIALS} \]

\[ z/h = 0.5 \quad \text{UP TO MID HEIGHT IN BUILDING} \]

\[ = 1.0 \quad \text{BETWEEN BUILDING MID-HEIGHT & ROOF LEVEL} \]

\[ \alpha_0 = 2.5 \]

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**AGENCY STAMP**

CDF - Office of State Fire Marshal

**SEOR STAMP**

**DETAIL TITLE**

**DETAIL NO.**

G1.05

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**GENERAL NOTES**

**REV**

**DESCRIPTION**

**REV**

**DESCRIPTION**

**DATE**

12-1-2016

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**PREPARED BY**

Estructure

www.esruc.com

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**PROJECT NAME**

Campus Wide Seismic Bracing of Equipment

(Valid Through 2019)
INSTRUCTIONS FOR DETERMINING DESIGN CATEGORY FOR SLAB-MOUNTED EQUIPMENT

BACKGROUND:
1. Anchor demands are affected by how high a component is placed in a building.
2. Anchor capacities are affected by whether concrete is lightweight or normalweight.

NOTES:
1. On slab-mounted details, design categories A, B, & C options are given so that anchorage designs more closely reflect the individual component’s demands and anchor capacities at the component’s location.
2. Category C must be assumed whenever information about slab properties and height location is unknown.
3. Use the chart below to match the component conditions with its slab-mounting design category.
4. Determining the design category using G2.11, "UCSF Buildings - Typical Properties":
   A. To determine if the component is placed at or above midheight in the building (Z/H ≥ 0.5), compare the story number the component is placed on with the one listed in the "midheight floor" of the building in the table. If the component is being placed on a floor equal or above the level in this field, the factor applies to the component.
   B. To determine if the slab is lightweight or normalweight concrete, check the field for the building under "Typical slab properties -- normalweight (NW) or lightweight (LW).

SLAB TYPE

- NORMALWEIGHT
- LIGHTWEIGHT

AT OR ABOVE MIDHEIGHT IN BUILDING?

NO
- CATEGORY A

YES
- AT OR ABOVE MIDHEIGHT IN BUILDING?

NO
- CATEGORY B

YES
- CATEGORY C

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

DETAIL TITLE
DESIGN CATEGORY CLASSIFICATION FOR SLAB-MOUNTED EQUIPMENT
G2.01

DETAIL NO.

REV DESCRIPTION REV DESCRIPTION

PREPARED BY
Estructure
www.estruc.com

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
<table>
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<tr>
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NOTE: CONCRETE SLAB INFORMATION IS FOR REFERENCE ONLY AND REPRESENTATIVE OF TYPICAL CONSTRUCTION ONLY. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXISTING BUILDING CONSTRUCTION PRIOR TO THE INSTALLATION OF SEISMIC ANCHORAGE.
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CONTENTS OF TABLE TO BE ADDED AT A FUTURE DATE

DURING INTERIM REFER TO UCSF DRAWING ARCHIVES FOR BUILDING PROPERTIES

(https://www.cpfm.ucsf.edu/space/archives/DocArchLogin.cfm)

AGENCY STAMP: CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED: 4/21/17

PREPARED BY: Estructure
www.estruc.com

UCSF BUILDINGS - PROPERTIES FOR REFERENCE ONLY

G2.12

REV DESCRIPTION               REV DESCRIPTION               DATE

12-1-2016

PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
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<th>THICKNESS (IN)</th>
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**CONTENTS OF TABLE TO BE ADDED AT A FUTURE DATE**

**DURING INTERIM REFER TO UCSF DRAWING ARCHIVES FOR BUILDING PROPERTIES**

(https://www.cpfm.ucsf.edu/space/archives/DocArchLogin.cfm)
SMALL CABINETS AND SHELVING UNITS
USE S1.11 - S1.15 FOR THESE ITEMS AND SIMILAR FURNITURE
NOTE: CABINETS AND SHELVES INCLUDE FILING CABINETS, LATERAL FILE CABINETS, BOOKCASES, HUTCHES, WARDROBES, AND SHELVING UNITS.

1. LATERAL FILE CABINET
2. FLAMMABLE/ACID CABINET
3. LONGITUDINAL FILE CABINET
4. BOOKCASE

PREPARED BY: Estructure
PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2018)

www.estruc.com
1. LARGE CABINETS AND SHELVING UNITS

Use S1.21 - S1.26 for these items and similar furniture.

Note: Cabinets and shelves include filing cabinets, lateral file cabinets, bookcases, hutches, wardrobes, and shelving units.

---

**Agency Stamp**

CDF - Office of State Fire Marshal

Approved 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection.

One set of approved plans shall be available on the project site at all times.

Reviewed by:

---

**Prepared By:**

Estructure

www.estruc.com

**Project Name:**

Campus Wide Seismic Bracing of Equipment (Valid Through 2019)

---

**Detail Title:**

Cabinets and Shelving Units - Photo Guide

**Detail No.:**

S1.00B

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</table>

**Date:**

12-1-2016

---

**Seor Stamp:**

[Seor Stamp Image]

---

**Images:**

- **C** Lateral File Cabinet
- **A** Wood Bookcase
- **D** Metal Bookcase
- **B** Flammable/Acid Cabinet
UNDERCOUNTER

AGENCY STAMP

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

PREPARED BY

Estructure
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DETAIL NO.

S1.11

DETAIL TITLE

SMALL CABINET OR SHELVING - 400# MAX ANCHORAGE TO SLAB

REV DESCRIPTION REV DESCRIPTION DATE

12-1-2016

PROJECT NAME

CAMPUS WIDE SEISMIC EHCING OF EQUIPMENT (VALID THROUGH 2019)
5"x6" MP-203 FASTENERS BY SAFE-T-PROOF OR EQUAL W/ 3M VHB ADHESIVE PADS (4 TOTAL)

12" STRAPS BY SAFE-T-PROOF OR EQUAL

4"Wx2"Dx7½"H 3¼" THICK STEEL POWER COATED STEEL "L BRACKETS" BY SAFE-T-PROOF OR EQUAL (4 TOTAL)

D=18" MIN

W=18" MIN

H=60" MAX.

CG, WEIGHT 400# MAX (INCLUDING CONTENTS, WHERE WCONTENT = VOLUME x 20 LB/FT³)

(8) #10-32 x1/2" PHILLIPS PAN HEAD MACHINE SCREWS
18-8 (16) #10x0.688 SS STEEL FENDER WASHERS
(8) #10-32 ZINC FINISHED NM GRADE 2 NYLON INSERT LOCK NUTS

(E) SLAB (MIN 4" CONCRETE SLAB OR 3¼" CONCRETE FILL ON METAL DECK)

3/8"Øx2" EMBED HILTI KB-TZ (4 TOTAL)

NOTE: DETAIL MAY NOT BE USED ON UNSEALED WOOD FURNITURE.

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEQR STAMP
CHERNOV PROFESSIONAL ENGINEERS
No. 2859
EP. 6/28/16

DETAIL TITLE
SMALL CABINET OR SHELVING- 400# MAX ADHESIVE STRAPS TO SLAB

DETAIL NO.
S1.12

PREPARED BY
Estructure
www.estruc.com

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

REV DESCRIPTION REV DESCRIPTION DATE

12-1-2016

Reviewed by: [Signature]
CG. WEIGHT 400# MAX
(INCLUDING CONTENTS,
WHERE \( W_{\text{CONTENTS}} = \text{VOLUME} \times 20 \text{ LB/FT}^3 \))

18" STRAPS BY
SAFE-T-PROOF
OR EQUAL (2 TOTAL)

2\(\frac{5}{16}\)" W x 2"D x 7"H 3\(\frac{1}{16}\)"
THICK STEEL POWDER
COATED (W/ KEEPER)
"L BRACKETS" BY
SAFE-T-PROOF
OR EQUAL (2 TOTAL)

2-#12 SMS EACH STUD
(E) OR (N) 5/8" MAX.
GYPSUM WALLBOARD

(E) 3\(\frac{3}{8}\)"x20 GA MIN.
METAL STUDS (FULL
HEIGHT OR FULLY
BRACED TO
STRUCTURE, V.I.F.)

\( \frac{3}{8}\)" CHANNEL
STRUT BOLT,
WASHER &
NUT (TYP. EA
STRAP)

\( \frac{3}{8}\)" CHANNEL
STRUT BOLT,
WASHER &
NUT (TYP. EA
STRAP)

5"x6" MP-203
FASTENERS BY
SAFE-T-PROOF OR
EQUAL W/ 3M VHB
ADHESIVE PADS
(2 TOTAL)

(E) SLAB (MIN 4"
CONCRETE SLAB OR
3/4" CONCRETE FILL
ON METAL DECK)

1\(\frac{5}{8}\)"x1\(\frac{5}{8}\)x12GA CHANNEL STRUT
(1 TOTAL, UNPUNCHED, 3'-0" MIN.)
ACROSS 3 STUDS MIN. PROVIDE
STRUT CAP EA. END, TYP. (OK TO
USE (E))

NOTE: DETAIL MAY NOT BE USED ON UNSEALED WOOD FURNITURE.

---

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

DETAIL TITLE
SMALL CABINET OR SHELVING - 400# MAX
ANCHORAGE TO WALL

DETAIL NO.
S1.13

REV DESCRIPTION REV DESCRIPTION

DATE 12-1-2016

PREPARED BY
Estructure
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PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
ELEVATION

NOTE: PRIOR TO INSTALLING SCREWS THROUGH BACK, VERIFY THAT CABINET BACK IS A MINIMUM OF 3/4" PLYWOOD/PARTICLEBOARD/FIBERBOARD OR 20 GA SHEET METAL, AND, AS A MINIMUM, IS CONNECTED TO THE SIDES AND THE TOP OF THE CABINET. IF THIS MINIMUM REQUIREMENT IS NOT SATISFIED OR CANNOT BE VERIFIED, USE ALTERNATE DETAIL.
Note: Prior to installing screws through top, verify that cabinet top is a minimum of 3/8" plywood/particleboard/fiberboard or 20 ga sheet metal. If this minimum requirement is not satisfied or cannot be verified, use alternate detail.
### Design Category of Component* (See G2.01)

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<tr>
<th>Component Details</th>
<th>Maximum Weight, Including Contents**</th>
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<tr>
<td><strong>A</strong> (NW Concrete and Below Midheight in Building)</td>
<td><strong>600#</strong>&lt;br&gt;6 TOTAL (3 per angle)</td>
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<tr>
<td><strong>B</strong> (LWC &amp; Below Midheight or NWC &amp; Above Midheight)</td>
<td><strong>6 TOTAL</strong> (3 per angle)</td>
</tr>
<tr>
<td><strong>C</strong> (LW Concrete and Above Midheight in Building)</td>
<td><strong>8 TOTAL</strong> (4 per angle)</td>
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</tbody>
</table>

### Table Notes
1. Assume lightweight concrete when slab type is unknown.
2. Assume above midheight in building if location relative to building midheight is unknown.

**Weight of Contents** = Volume (interior) x 20 lb/ft³

---

**TABLE: # of Anchors Required**

<table>
<thead>
<tr>
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<th>CDF - Office of State Fire Marshal&lt;br&gt;APPROVED 4/21/17</th>
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<td>SEOR Stamp</td>
<td>[Stamp Image]</td>
</tr>
<tr>
<td>Detail Title</td>
<td>LARGE CABINET OR SHELVING - ANCHORAGE TO SLAB</td>
</tr>
<tr>
<td>Detail No.</td>
<td>S1.21</td>
</tr>
<tr>
<td>REV</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>DATE</td>
<td>12-1-2016</td>
</tr>
<tr>
<td>PREPARED BY</td>
<td>Estructure</td>
</tr>
<tr>
<td><a href="http://www.estruc.com">www.estruc.com</a></td>
<td>CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2/18)</td>
</tr>
</tbody>
</table>
5"x6" MP-203 FASTENERS BY SAFE-T-PROOF OR EQUAL W/ 3M VHB ADHESIVE PADS (4 TOTAL)

4"Wx2" Dx7/32" H 3/8" THICK STEEL POWER COATED STEEL "L BRACKETS" BY SAFE-T-PROOF OR EQUAL (4 TOTAL)

D=18" MIN
W=24" MIN

CG, MAX WEIGHT SEE TABLE

(8) #10-32 x1/2" PHILLIPS PAN HEAD MACHINE SCREWS 18-8
(16) #10x0.688 SS STEEL FENDER WASHERS
(8) #10-32 ZINC FINISHED NM GRADE 2 NYLON INSERT LOCK NUTS

3/8"Øx2" EMBED HILTI KB-TZ (4 TOTAL)

H/2

12" STRAPS BY SAFE-T-PROOF OR EQUAL

(E) SLAB (MIN 4" CONCRETE SLAB OR 3¾" CONCRETE FILL ON METAL DECK)

### Design Category of Component (See G2.01)*

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>900 LB</td>
</tr>
<tr>
<td>B (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>600 LB</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>400 LB</td>
</tr>
</tbody>
</table>

### Table Notes

1. Assume lightweight concrete when slab type is unknown.
2. Assume above midheight in building if location relative to building midheight is unknown.

** \[ \text{weight}_{\text{contents}} = \text{volume}_{\text{interior}} \cdot 20 \text{ lb/ft}^3 \]**

### Table: Max Weight by Design Category

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>SEOR STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>LARGE CABINET OR SHELVING - ADHESIVE STRAPS TO SLAB</td>
<td>S1.22</td>
</tr>
</tbody>
</table>

Prepared by: Estructure  www.estruc.com

UCSF CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by:
5"x6" MP-203 FASTENERS BY SAFE-T-PROOF OR EQUAL W/ 3M VHB ADHESIVE PADS (4 TOTAL)
(E) 3¾"x20 GA MIN. METAL STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)
(E) ¾" MAX. GYPSUM WALLBOARD
3/8" CHANNEL STRUT BOLT, WASHER & NUT (TYP. EA. STRAP)
18" STRAPS BY SAFE-T-PROOF OR EQUAL (4 TOTAL)
CG, MAX WEIGHT SEE TABLE
2-#12 SMS EACH STUD

2½"W x 2"D x 7"H 3/16" THICK STEEL POWDER COATED "L BRACKETS" BY SAFE-T-PROOF OR EQUAL (4 TOTAL)
(E) SLAB (MIN 4" CONCRETE SLAB OR 3¼" CONCRETE FILL ON METAL DECK)

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>950 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>625 LB</td>
</tr>
</tbody>
</table>

TABLE NOTES
* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = VOLUME \text{IN\text{\textsc{terior}}} \cdot 20 \text{ LB/FT}^3

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP
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Estructure
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DETAIL TITLE
LARGE CABINET OR SHELVING - ADHESIVE STRAPS TO WALL
PREPARED BY
Estructure
www.estructure.com

DETAIL NO.
S1.23

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

REV DESCRIPTION REV DESCRIPTION DATE
12-1-2016

PROJECT TITLE
PREPARED BY
Estructure
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UCSF

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Reviewed by:
[Signature]
(E) 3⅛"x20GA MIN. METAL STUD TYP. (FULL HEIGHT OR FULLY BRACED TO STRUCTURE)

(E) ½" MAX. GYPSUM WALLBOARD

CG MAX WEIGHT, SEE TABLE

W=30" MIN.

D=20" MAX.


(3)#10 SMS @ TOP, MID HEIGHT & BOTT. @ EA STUD TYP. INSTALL AT MIDDLE OF FLANGE SEE TABLE FOR MIN # OF STUDS

(E) SLAB (MIN 4" CONCRETE SLAB OR 3¼" CONCRETE FILL ON METAL DECK)

NOTE: PRIOR TO INSTALLING SCREWS THROUGH BACK, VERIFY THAT CABINET BACK IS A MINIMUM OF ¼" PLYWOOD/PARTICLEBOARD/FIBERBOARD OR 20 GA SHEET METAL, AND, AS A MINIMUM, IS CONNECTED TO THE SIDES AND THE TOP. IF THIS MINIMUM REQUIREMENT IS NOT SATISFIED OR CANNOT BE VERIFIED, USE ALTERNATE DETAIL.

<table>
<thead>
<tr>
<th>MIN # OF STUDS</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>500</td>
</tr>
<tr>
<td>3</td>
<td>775</td>
</tr>
<tr>
<td>4</td>
<td>1025</td>
</tr>
</tbody>
</table>

TABLE NOTES
** WEIGHT_{CONTENTS}= VOLUME_{INTERIOR} x 20 LB/FT^3

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PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

University of California, San Francisco
NOTES:
1. DO NOT USE DETAIL WHEN CABINET OR SHELVING CONTAINS HAZARDOUS MATERIAL

CG MAX WEIGHT
SEE TABLE

D = 20" MAX.
W = 30" MIN.

(4) #10 SMS TO COMPONENT
    @ EA STUD

(2) L3x3x12GA MIN x
0' - 2" BENT PLATE
(ALT: 1 CONTINUOUS
L3x3x12GA MIN
SHOWN DASHED)

(4) #10 SMS TO
    STUD, TYP.

(E) 3 3/4"x20 GA MIN.
    METAL STUD W/ 1 3/4"
    MIN. FLANGE. VERIFY
    FLANGE LOCATION
    AND INSTALL SCREWS
    @ CENTER OF FLANGE

(E) SLAB (MIN 4"
    CONCRETE SLAB OR
    3 3/4" CONCRETE FILL
    ON METAL DECK)

NOTE: PRIOR TO INSTALLING SCREWS THROUGH TOP, VERIFY
THAT CABINET TOP IS A MINIMUM OF 3/4"
PLYWOOD/PARTICLEBOARD/FIBERBOARD OR 20 GA SHEET METAL. IF THIS MINIMUM REQUIREMENT IS NOT SATISFIED
OR CANNOT BE VERIFIED, USE ALTERNATE DETAIL.

** WEIGHT CONTENTS = VOLUMEINTERIOR x 20 LB/FT³

<table>
<thead>
<tr>
<th>MIN # OF STUDS</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>450</td>
</tr>
<tr>
<td>3</td>
<td>775</td>
</tr>
<tr>
<td>4</td>
<td>1025</td>
</tr>
</tbody>
</table>

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

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Reviewed by: [Signature]

SECR STAMP

DETAIL TITLE
LARGE CABINET OR SHELVING - ANGLES TO WALL

DETAIL NO.
S1.25

REV DESCRIPTION

DATE
12-1-2016

PREPARED BY
Estructure
www.estruc.com

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
### Table: Max Weight by Design Category

<table>
<thead>
<tr>
<th>Design Category of Component (See G2.01)*</th>
<th>Maximum Weight, Including Contents**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW Concrete and Below Midheight in Building)</td>
<td>2000 LB</td>
</tr>
<tr>
<td>B (LWC &amp; Below Midheight or NWC &amp; Above Midheight)</td>
<td>1200 LB</td>
</tr>
<tr>
<td>C (LW Concrete and Above Midheight in Building)</td>
<td>750 LB</td>
</tr>
</tbody>
</table>

** Notes: 
1. Assume lightweight concrete when slab type is unknown.
2. Assume above midheight in building if location relative to building midheight is unknown.

**Weight contents = \( \text{Area}_{\text{shelf}} \times \text{Number}_{\text{shelves}} \times 20 \text{ LB/FT}^2 \)
WIRE SHELVING BY METRO SHELVING OR EQUAL

CG, MAX WEIGHT SEE TABLE

2-#10 SMS EACH STUD (VERIFY STUD FLANGE LOCATION & INSTALL SMS @ CENTER OF FLANGE)

P2860 STRUT END CAP, TYP.

(E) SLAB (MIN 4" CONCRETE SLAB OR 3¾" CONCRETE FILL ON METAL DECK)

ELEVATION

P1000 ACROSS 6 STUDS MINIMUM (2 TOTAL)

P1113 OR P2558 PIPE CLAMP TO P1000 (4 TOTAL)

D = 24" MAX.

W = 72" MAX.

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>1500 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>1000 LB</td>
</tr>
</tbody>
</table>

TABLE NOTES
* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = AREA_SHELF * NUMBER_SHELVES * 20 LB/FT²

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SEOR STAMP
PREPARED BY
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

DETAIL TITLE
WIRE SHELVING - ANCHORAGE TO WALL

DETAIL NO.
S1.28

12-1-2016

PROJECT NAME
University of California San Francisco
www.astruc.com
P2860 STRUT END CAP, TYP.

W = 96" MAX.

H = 84" MAX.

H/2

H/4

METAL STORAGE RACK, TENNSCO Z-LINE OR SIMILAR

ELEVATION

2-#10 SMS EACH STUD (VERIFY STUD FLANGE LOCATION & INSTALL SMS @ CENTER OF FLANGE)

CG

P1000 ACROSS 8 STUDS MINIMUM (2 TOTAL)

3/8" BOLT, NUT SPRING, AND WASHER (4 TOTAL)

W = 96" MAX.

D = 24" MAX.

CG, MAX WEIGHT SEE TABLE

PLAN

(E) OR (N) 3¾"x20 GA MIN STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)

(E) SLAB (MIN 4" CONCRETE SLAB OR 3¾" CONCRETE FILL ON METAL DECK)

DESIGN CATEGORY OF COMPONENT (SEE G2.01)*

MAXIMUM WEIGHT, INCLUDING CONTENTS**

BELOW MIDHEIGHT OF BUILDING 1800 LB

ABOVE MIDHEIGHT OF BUILDING 1200 LB

TABLE: MAX WEIGHT BY DESIGN CATEGORY

TABLE NOTES

* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.

** WEIGHT CONTENTS = AREA SHELF * NUMBER SHELVES * 20 LB/FT²

AGENCY STAMP

CDF: OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

PREPARED BY

PREPARED BY

STORAGE RACK - ATTACHMENT TO STRUT

DETAIL TITLE

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

DETAIL NO.

S1.29A

REV DESCRIPTION REV DESCRIPTION

12-1-2016

PROJECT NAME

University of California San Francisco

www.esstruc.com

Reviewed by:
METAL STORAGE RACK, TENNSCO Z-LINE OR SIMILAR

W = 96" MAX.

L3 x L3 x L3 CONT.

2-#10 SMS EACH STUD (VERIFY STUD FLANGE LOCATION & INSTALL SMS CENTER OF FLANGE).

BOTTOM SHELF MUST BE INSTALLED AT FLOOR LEVEL.

L3 x 3 x 3/4" EA. END

#10 SMS @ 3" O.C.

(E) SLAB (MIN 4" CONCRETE SLAB OR 3 3/4" CONCRETE FILL ON METAL DECK)

(E) OR (N) 3/8" x 20 GA MIN STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)

#10 SMS @ 8" O.C.

3/8" HILTI KB-TZ W/2" EMBED @ 6" O.C. (4 PER ANGLE)

PLAN

CG, MAX WEIGHT SEE TABLE

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>3500 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>2300 LB</td>
</tr>
</tbody>
</table>

** WEIGHT CONTENTS = \( \text{AREA}_{\text{SHELF}} \times \text{NUMBER}_{\text{SHELVES}} \times 20 \text{ LB/FT}^2 \)

TABLE NOTES
- ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.

PREPARED BY

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

Reviewed by:
TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS PER SHELVING UPRIGHT**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>225 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>185 LB</td>
</tr>
</tbody>
</table>

TABLE NOTES
* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = AREA SHELVING * NUMBER SHELVES * 20 LB/FT²

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

PREPARED BY
Estructura
www.estruc.com

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
1. SMALL REFRIGERATORS, FREEZERS, AND SIM

USE S2.11–S2.13 FOR THESE ITEMS AND SIMILAR EQUIPMENT

NOTE: REFRIGERATORS, FREEZERS, AND SIMILAR GROUP INCLUDES REFRIGERATORS, FREEZERS, CENTRIFUGES, INCUBATORS, AUTOCLAVES, ICE MACHINES, AND SIMILAR ITEMS THAT MEET MINIMUM DIMENSIONAL AND WEIGHT REQUIREMENTS OF THE DETAIL.

<table>
<thead>
<tr>
<th>A</th>
<th>REFRIGERATOR/FREEZER</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>INCUBATOR</td>
</tr>
<tr>
<td>C</td>
<td>CENTRIFUGE</td>
</tr>
<tr>
<td>D</td>
<td>ICE MACHINE</td>
</tr>
</tbody>
</table>

PREPARED BY: Estructure
www.estruce.com

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
1. LARGE REFRIGERATORS, FREEZERS, AND SIM

USE S2.21 - S2.25 FOR THESE ITEMS AND SIMILAR EQUIPMENT

NOTE: REFRIGERATORS, FREEZERS, AND SIMILAR GROUP INCLUDES REFRIGERATORS, FREEZERS, CENTRIFUGES, INCUBATORS, AUTOCLAVES, ICE MACHINES, AND SIMILAR ITEMS THAT MEET MINIMUM DIMENSIONAL AND WEIGHT REQUIREMENTS OF THE DETAIL.

| A. SCIENTIFIC ULTRA-LOW FREEZER |
| B. AUTOCLAVE |
| C. REFRIGERATOR/FREEZER |
| D. DELI CASE |

REFRIGERATORS, FREEZERS, & SIM - PHOTO GUIDE

<table>
<thead>
<tr>
<th>REV</th>
<th>DESCRIPTION</th>
<th>REV</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>

PREPARED BY: Estructure

Reviewed by:

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Date: 12-1-2016

University of California San Francisco

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
**Counter Casework**

CG, weight 400#/MAX (including contents, where
\[ W_{\text{contents}} = \text{volume} \times 20 \text{ lb/ft}^3 \])

\[ 2.5'' \times 2'' \times 4'' \times 0'-3'' \]
(Use alt angle size to suit base condition)

\[ 2-\frac{3}{4}'' \text{ SMS} \]

\[ \frac{3}{8}'' \times 2'' \text{ embed. Hilti KB-TZ} \]

Alternative location shown dashed

**Note:** Where gap ≤1" on all sides between item and counter, angle restraints are not required.

**Undercounter**

CG, weight 400#/MAX (including contents, where
\[ W_{\text{contents}} = \text{volume} \times 20 \text{ lb/ft}^3 \])

\[ 1/4'' \text{ SMS} @ 5'' \text{ o.c.} \]
(3 per angle)

\[ \frac{3}{8}'' \times 2'' \text{ embed. Hilti KB-TZ} \]
(2 per angle)

**Free Standing**

\[ \frac{3}{4}'' \text{ slab} \quad \text{(min 4'' concrete slab or 3\(\frac{3}{4}'' \text{ concrete fill on metal deck}) \]

\[ \frac{3}{4}'' \times 2'' \times 3\frac{3}{4}'' \times 1'-0'' \]
(Use alt angle size to suit base condition)

**Small Refrigerator - 400#/Max Anchorage to Slab**

<table>
<thead>
<tr>
<th>REVISION</th>
<th>DESCRIPTION</th>
<th>REVISION</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Prepared By:**

[Signature]

**Project Name:**

**Small Refrigerator - 400#/Max Anchorage to Slab**

**Detail No.:** S2.11

**Date:** 12-1-2016

**Agency Stamp:** CDF - Office of State Fire Marshal

**Seor Stamp:**

**Approval:** 4/21/17

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Reviewed by: [Signature]
5"x6" MP-203 FASTENERS BY SAFE-T-PROOF OR EQUAL W/ 3M VH3 ADHESIVE PADS (4 TOTAL)

12" STRAPS BY SAFE-T-PROOF OR EQUAL

4"Wx2"DxD7\(\frac{1}{2}\)H \(\frac{3}{16}\) THICK STEEL POWER COATED STEEL "L BRACKETS" BY SAFE-T-PROOF OR EQUAL (4 TOTAL)

(E) SLAB (MIN 4" CONCRETE SLAB OR 3\(\frac{1}{4}\)" CONCRETE FILL ON METAL DECK)

3/8"Øx2" EMBED HILTI KB-TZ (4 TOTAL)

CG, WEIGHT 400# MAX (INCLUDING CONTENTS, WHERE \(W_{\text{contents}} = \text{VOLUME} \times 20 \text{ LB/FT}^3\))

(B) #10-32 x1/2" PHILLIPS PAN HEAD MACHINE SCREWS
18-8 (16) #10x0.688 SS STEEL FENDER WASHERS
(B) #10-32 ZINC FINISHED NM GRADE 2 NYLON INSERT LOCK NUTS
**NOTE:** SPACER CUSHION TO BE ORANGE SKIDMATE OR EQUAL AND POSITIVELY ATTACHED TO EQUIPMENT OR STRUT.

### SMALL REFRIGERATOR - 400# MAX ADHESIVE STRAPS TO WALL

**DETAIL NO.:** S2.13

<table>
<thead>
<tr>
<th>REV</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PREPARED BY:** Estructure

**PROJECT NAME:** CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT

**VALID THROUGH:** 2019

---

**AGENCY STAMP:** CDF - OFFICE OF STATE FIRE MARSHAL

**SEOR STAMP:**

**DETAIL TITLE:** SMALL REFRIGERATOR - 400# MAX ADHESIVE STRAPS TO WALL

**APPROVED:** 4/21/17

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Reviewed by: [Signature]

---

**EQUIPMENT STRAP SPECIFICATIONS:**

- **3½" x 20 GA MIN. METAL STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)**
- **CG, WEIGHT 400# MAX (INCLUDING CONTENTS, WHERE W CONTENTS = VOLUME x 20 LB/FT³)**
- **18" STRAPS BY SAFE-T-PROOF OR EQUAL (2 TOTAL)**
- **2½" W x 2" D x 7" H 3/16" THICK STEEL POWDER COATED (W/ KEEPER) "L BRACKETS" BY SAFE-T-PROOF OR EQUAL (2 TOTAL)**
- **2-#12 SMS EACH STUD**
- **(E) OR (N) ½" MAX. GYPSUM WALLBOARD**
- **5" x 6" MP-203 FASTENERS BY SAFE-T-PROOF OR EQUAL W/ 3M VHB ADHESIVE PADS (2 TOTAL)**
- **(E) SLAB (MIN 4" CONCRETE SLAB OR 3¼" CONCRETE FILL ON METAL DECK)**
- **1½" x 1½" x 12GA CHANNEL STRUT (1 TOTAL, UNPUNCHED) ACROSS 3 STUDS MIN. PROVIDE STRUT CAP EA. END, TYP. (OK TO USE (E))**
### DESIGN CATEGORY OF COMPONENT*  
*(SEE G2.01)*

<table>
<thead>
<tr>
<th></th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>750#</td>
</tr>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>6 TOTAL (3 PER ANGLE)</td>
</tr>
<tr>
<td>B (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>8 TOTAL (4 PER ANGLE)</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>10 TOTAL (5 PER ANGLE)</td>
</tr>
</tbody>
</table>

### TABLE: # OF ANCHORS REQUIRED

- **TABLE NOTES**  
  1. ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.  
  2. ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.  
  **WEIGHT CONTENTS = VOLUME_{INTERIOR} \times 20 \text{ LB/FT}^3**

---

-icons: CDF-OF-SF-MARSHAL

**Details:**

- **REFRIGERATORS (S & SIMILAR) - 26" MIN DEPTH - ANGLES TO SLAB**
- **PREPARED BY**
- **PROJECT NAME**
- **U.C.S.F.**
  - SAN FRANCISCO
  - CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

---

 uyarı: **Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.**

reviewed by: [Signature]

---

**DRAWING INFORMATION:**

- **DETAIL NO.** S2.21A
- **DATE** 12-1-2016
### Notes:
1. Use alternate angle size as required to suit base condition.

### Design Category of Component (See G2.01)

<table>
<thead>
<tr>
<th>Component</th>
<th>Maximum Weight, Including Contents**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW Concrete and Below Midheight in Building)</td>
<td>1050#</td>
</tr>
<tr>
<td>B (LWC &amp; Below Midheight or NWC &amp; Above Midheight)</td>
<td>1650#</td>
</tr>
<tr>
<td>C (LW Concrete and Above Midheight in Building)</td>
<td>6 Total (3 Per Angle)</td>
</tr>
<tr>
<td></td>
<td>8 Total (4 Per Angle)</td>
</tr>
<tr>
<td></td>
<td>10 Total (5 Per Angle)</td>
</tr>
<tr>
<td></td>
<td>12 Total (6 Per Angle)</td>
</tr>
<tr>
<td></td>
<td>Project-Specific Design Required</td>
</tr>
</tbody>
</table>

**Weight of Contents = Volume of Interior × 20 lb/ft³

### Table Notes
1. Assume lightweight concrete when slab type is unknown.
2. Assume above midheight in building if location relative to building midheight is unknown.

### Table: # of Anchors Required

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF - Office of State Fire Marshal</td>
<td>Refrigerators (Similar) - 32&quot; Min Depth - Angles to Slab</td>
<td>S2.21B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BEOR STAMP</th>
<th>PREPARED BY</th>
<th>PROJECT NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCSF</td>
<td>Pstructure</td>
<td>Campus Wide Seismic Bracing of Equipment (Valid through 2019)</td>
</tr>
</tbody>
</table>

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by:

University of California
San Francisco
**NOTES:**
1. Use alternate angle size as required to suit base condition.

---

**Diagram:**
- D = 38" MIN
- W = 38" MIN
- #12 SMS @ 3" O.C.
- 1/2"Ø x 2" Embed Hilti KB-TZ @ 6" O.C.
- (see table for quantity required)
- L = 3x3xL
- Length = 2" + 6" x (N-1)
- where N = # of anchors ea angle
- (E) Slab (min 4" concrete slab or 3¾" concrete fill on metal deck)

---

**Design Category of Component**
(see G2.01)

<table>
<thead>
<tr>
<th>Component Description</th>
<th>Maximum Weight, Including Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW Concrete and below midheight in building)</td>
<td>1450#</td>
</tr>
<tr>
<td></td>
<td>2000#</td>
</tr>
<tr>
<td>B (LWC &amp; below midheight or NWC &amp; above midheight)</td>
<td>6 total (3 per angle)</td>
</tr>
<tr>
<td></td>
<td>8 total (4 per angle)</td>
</tr>
<tr>
<td>C (LW Concrete and above midheight in building)</td>
<td>10 total (5 per angle)</td>
</tr>
<tr>
<td></td>
<td>12 total (6 per angle)</td>
</tr>
<tr>
<td></td>
<td>14 total (7 per angle)</td>
</tr>
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<td>PROJECT-SPECIFIC DESIGN REQUIRED</td>
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</table>

**Table Notes**
* (1) Assume lightweight concrete when slab type is unknown.
(2) Assume above midheight in building if location relative to building midheight is unknown.

**Weight of Contents = Volume x 20 LB/FT³**

---

**Table: # of Anchors Required**

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>SEOR STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
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<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>REFRIGERATORS (&amp; SIMILAR) - 38&quot; MIN DEPTH - ANGLES TO SLAB</td>
<td>S2.21C</td>
</tr>
<tr>
<td>APPROVED 4/21/17</td>
<td></td>
<td></td>
<td></td>
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</table>

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by:

[Signature]

---

**Prepared By:**
Estructure
www.estruc.com

**Project Name:**
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

**Date of Approval:**
12-1-2016

[Seal]
CG, MAX WEIGHT SEE TABLE

5"x6" MP-203 FASTENERS BY
SAFE-T-PROOF W/ 3M VHB
ADHESIVE PADS (4 TOTAL)
OR EQUAL

(8) #10-32 x 1/2" PHILLIPS PAN
HEAD MACHINE SCREWS 18-8 (16)
#10x0.688 SS STEEL FENDER
WASHERS (8) #10-32 ZINC
FINISHED NM GRADE 2 NYLON
INSERT LOCK NUTS

3/8"Øx2" EMBED HILTI KB-TZ
(4 TOTAL)

(E) SLAB (MIN 4" CONCRETE SLAB OR
3 3/4" CONCRETE FILL ON METAL DECK)

12" STRAPS BY SAFE-T-PROOF
OR EQUAL

4"Wx2"Dx7"H 3/8" THICK STEEL POWER
COATED STEEL "L" BRACKETS BY
SAFE-T-PROOF OR
EQUAL (4 TOTAL)

<table>
<thead>
<tr>
<th>DESIGN CATEGORY</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>900 LB</td>
</tr>
<tr>
<td>B (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>600 LB</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>400 LB</td>
</tr>
</tbody>
</table>

TABLE NOTES
* (1) ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
(2) ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = VOLUME * 20 LB/FT^3

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>BEGOR STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>REFRIGERATORS (&amp; SIMILAR) - 4 ADHESIVE STRAPS TO SLAB</td>
<td>S2.22A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

REVIEWED BY:

PREPARED BY:

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

www.esruct.com

University of California San Francisco
5"x6" MP-203 FASTENERS BY SAFE-T-PROOF W/ 3M VHB ADHESIVE PADS (8 TOTAL) OR EQUAL
(8) #10–32 x1/2" PHILLIPS PAN HEAD MACHINE SCREWS 18–8 (16)
#10x0.688 SS STEEL FENDER WASHERS (8) #10–32 ZINC FINISHED NM GRADE 2 NYLON INSERT LOCK NUTS

3/8"Øx2" EMBED HILTI KB–TZ (8 TOTAL)

(E) SLAB (MIN 4" CONCRETE SLAB OR 3 3/4" CONCRETE FILL ON METAL DECK)

12" STRAPS BY SAFE-T-PROOF OR EQUAL

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>1800 LB</td>
</tr>
<tr>
<td>B (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>1200 LB</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>720 LB</td>
</tr>
</tbody>
</table>

**TABLE NOTES**
* (1) ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
(2) ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.

Page dimensions: 792.0x612.0

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by: [Signature]

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
TABLE NOTES
* (1) ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
   (2) ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = VOLUME * 20 LB/FT^3

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
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<tr>
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<td>1800 LB</td>
</tr>
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<td>1200 LB</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>720 LB</td>
</tr>
</tbody>
</table>

TABLE: MAX WEIGHT BY DESIGN CATEGORY

AGENCY STAMP: CDF - OFFICE OF STATE FIRE MARSHAL
SEOR STAMP: APPROVED 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by:

PREPARED BY: Estructure
PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
18" STRAPS BY SAFE-T-PROOF (4 TOTAL) OR EQUAL
(E) 5/8" MAX. GYPSUM WALLBOARD
(E) OR (N) 3 3/8" x 20 GA MIN STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)
SPACER CUSHION REQ'D WHERE FREEZER IS NOT TIGHT AGAINST STRUT, SEE NOTE
2-#12 SMS EACH STUD
2 5/8"W x 2'D x 7"H 3 3/16" THICK STEEL POWDER COATED (W/ KEEPER) "L BRACKETS" BY SAFE-T-PROOF (4 TOTAL) OR EQUAL
(E) SLAB (MIN 4" CONCRETE SLAB OR 3 3/8" CONCRETE FILL ON METAL DECK)
NOTE: SPACER CUSHION TO BE ORANGE SKIDMATE OR EQUAL AND POSITIVELY ATTACHED TO FREEZER OR STRUT.

5"x6" MP-203 FASTENERS BY SAFE-T-PROOF OR EQUAL W/ 3M VHB ADHESIVE PADS (4 TOTAL)
5"x6" FASTENERS BY SAFE-T-PROOF OR EQUAL AND 3M ADHESIVE PADS (2 EA. SIDE, 4 TOTAL)
9/16" CHANNEL STRUT BOLT, WASHER & NUT (TYP. EA. STRAP)
1 3/4"x1 3/4"x12GA CHANNEL STRUT (2 TOTAL, UNPUNCHED, 3'-0" MIN.) ACROSS 3 STUDS MIN. PROVIDE STRUT CAP EA. END, TYP. (OK TO USE (E))
2-#12 SMS EACH STUD (VERIFY STUD FLANGE LOCATION & INSTALL SMS @ CENTER OF FLANGE)

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>950 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>625 LB</td>
</tr>
</tbody>
</table>

TABLE: MAX WEIGHT BY DESIGN CATEGORY

TABLE NOTES
* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = VOLUME INTERIOR x 20 LB/FT^3

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4-21-17

SECT STAMP

DETAIL TITLE
REFRIGERATORS (& SIMILAR) - ADHESIVE STRAPS TO WALL

DETAIL NO. S2.23A

REV DESCRIPTION REV DESCRIPTION

DATE 12-1-2016

PREPARED BY University of California
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
www.estruc.com

PROJECT NAME

Reviewed by:
5"x6" FASTENERS BY SAFE-T-PROOF OR EQUAL AND 3M ADHESIVE PADS (2 EA. SIDE, 4 TOTAL)

\( \frac{3}{8} \)" CHANNEL STRUT BOLT, WASHER & NUT (TYP. EA. STRAP)

1\( \frac{1}{2} \)x1\( \frac{1}{2} \)x12GA CHANNEL STRUT (2 TOTAL, UNPUNCHED, 3'-0" MIN.) ACROSS 4 STUDS MIN. PROVIDE STRUT CAP EA. END, TYP. (OK TO USE (E))

2-\#12 SMS EACH STUD (VERIFY STUD FLANGE LOCATION & INSTALL SMS @ CENTER OF FLANGE)

\( \frac{3}{8} \)" GYPSUM WALLBOARD

(E) 4"x20 GA FULL HEIGHT STUDS @ 16" O.C.

18" STRAPS BY SAFE-T-PROOF OR EQUAL (4 TOTAL)

SPACER CUSHION Req'D WHERE FREEZER IS NOT TIGHT AGAINST STRUT, SEE NOTE

2-\#12 SMS EACH STUD

2\( \frac{1}{2} \)W X 2D X 7"H \( \frac{3}{8} \)" THICK STEEL POWDER COATED (W/ KEEPER) "L BRACKETS" BY SAFE-T-PROOF (4 TOTAL) OR EQUAL

(E) 2" 18GA METAL DECK W/ 4\( \frac{1}{2} \)" NWC FILL (4000 PSI)

NOTE: SPACER CUSHION TO BE ORANGE SKIDMATE OR EQUAL AND POSITIVELY ATTACHED TO FREEZER OR STRUT.

5"x6" MP-203 FASTENERS BY SAFE-T-PROOF OR EQUAL W/ 3M VHB ADHESIVE PADS (4 TOTAL)

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>950 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>625 LB</td>
</tr>
</tbody>
</table>

**WEIGHT CONTENTS = VOLUME x 20 LB/FT³**

D/2

| D=29"-33" |

H/3 H/3

H=41"-42"
PL 7/8" W/ (2) 1/2" Øx2" EMBED. HILTI K9-TZ. FABRICATE PLATE TO FIT SNUG AROUND LEVELER

SECTION A-A @ FRONT

PL 7/8" TO FIT AROUND WHEEL STEM OR LEVELER ADJUST HEIGHT AS REQUIRED. SEE A-A FOR ANCHORAGE.

SIDE ELEVATION

2 CLIPS AT FRONT LEVELERS (2 TOTAL)
(E) SLAB (MIN 4" CONCRETE SLAB OR 3¾" CONCRETE FILL ON METAL DECK)

2 CLIPS AT REAR (2 TOTAL)

<table>
<thead>
<tr>
<th>DESIGN CATEGORY</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>1000 LB</td>
</tr>
<tr>
<td>B (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>650 LB</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>400 LB</td>
</tr>
</tbody>
</table>

TABLE: MAX WEIGHT BY DESIGN CATEGORY

** WEIGHT\textsubscript{CONTENT} = VOLUME\textsubscript{INTERIOR} × 20 LB/FT\textsuperscript{3}

SECTION B-B @ REAR

TABLE NOTES
(1) ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
(2) ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by: 

www.estruc.com
**Fume Hoods and Biosafety Cabinets**

Use detail S3.11 - S3.22 for these items.

### Table

<table>
<thead>
<tr>
<th>A</th>
<th>Fume Hood</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Biosafety Cabinet</td>
</tr>
<tr>
<td>B</td>
<td>Support Stand without cross beams</td>
</tr>
<tr>
<td>D</td>
<td>Support stand with cross beams</td>
</tr>
</tbody>
</table>

---

**Agency Stamp**

CDF - Office of State Fire Marshal

**SEOR Stamp**

No. 2935

**Detail Title**

Fume Hoods & Biosafety Cabinets - Photo Guide

**Detail No.**

S3.00

**Prepared By**

Estructure

www.eastruc.com

**Project Name**

Campus Wide Seismic Bracing of Equipment (Valid Through 2019)

**Date**

12-1-2016

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by:
NOTES:
1. MAY BE USED AT HOODS MOUNTED ON SECURED COUNTER TOPS.
GALVANIZED 12 GA BENT PLATE ALT: USE BIO SAFETY CABINET FASTENING SYSTEM STP–SS–134–32

(2)–#10 SMS, TYP.

AT CONC. FLOOR, USE 3/8"Ø W/ 2" EMBED., TYP. 3/8" Ø X 2" EMBED HILTI KB–TZ (1 PER BRACKET)

PLAN

ELEVATION A–A

MATCH WIDTH TO LEG WIDTH 2 1/4" MIN.

GALVANIZED 12 GA. PLATE OR ALT. NOTED IN SECTION A–A

REPAIR GALVANIZING AS REQ'D

3/16 GALVANIZED BENT P. MATCH CURVE OF LEG. 2 1/2" MAX. TALL

DETAIL B

DETAIL C

EQUIPMENT LEG 12 GA MIN STEEL

2ND BRACKET (IF REQUIRED) SHOWN DASHED

(E) SLAB (MIN 4" CONCRETE SLAB OR 3 1/4" CONCRETE FILL ON METAL DECK)

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM EQUIPMENT WEIGHT*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 BRACKET PER LEG</td>
</tr>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>900 LB</td>
</tr>
<tr>
<td>B (LOW &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>550 LB</td>
</tr>
<tr>
<td>C (LOW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>350 LB</td>
</tr>
</tbody>
</table>

*CONTENTS WEIGHT NOT REQUIRED FOR FUME HOODS AND BIOSAFETY CABINETS

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

DETAIL TITLE HOOD STAND - ANCHORAGE TO SLAB
DETAIL NO. S3.12

PREPARED BY
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

DATE 12-1-2016

UCSF
(E) EQUIPMENT LEG, 12 GA MIN STEEL

(E) 1/4" BENT PLATE 8"x8"x0'-2" w/ 1/4" PLATE STIFFENER

(E) (4)-1/4" MIN BOLTS BETWEEN HOOD AND SUPPORTING TABLE (V.I.F.)

(E) SLAB (MIN 4" CONCRETE SLAB OR 3X" CONCRETE FILL ON METAL DECK)

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT *</th>
</tr>
</thead>
<tbody>
<tr>
<td>A  (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>1200 LB</td>
</tr>
<tr>
<td>B  (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>750 LB</td>
</tr>
<tr>
<td>C  (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>500 LB</td>
</tr>
</tbody>
</table>

TABLE NOTES:
- (1) ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
- (2) ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
- CONTENTS WEIGHT NOT REQUIRED FOR FUME HOODS AND BIOSAFETY CABINETS

AGENCY STAMP: CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED: 4/21/17

PREPARED BY: Estructure
www.estruc.com

PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
### Table: Max Weight by Design Category

<table>
<thead>
<tr>
<th>Design Category of Component (See G2.01)*</th>
<th>Maximum Weight *</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW Concrete and Below Midheight in Building)</td>
<td>750 LB</td>
</tr>
<tr>
<td>B (LWC &amp; Below Midheight or NWC &amp; Above Midheight)</td>
<td>450 LB</td>
</tr>
<tr>
<td>C (LW Concrete and Above Midheight in Building)</td>
<td>300 LB</td>
</tr>
</tbody>
</table>

**Table Notes**

* (1) Assume lightweight concrete when slab type is unknown.
* (2) Assume above midheight in building if location relative to building midheight is unknown.

* Contents weight not required for fume hoods and biosafety cabinets.

---

**Design Category**

- **A** (NW Concrete and Below Midheight in Building)
  - Maximum Weight: 750 LB

- **B** (LWC & Below Midheight or NWC & Above Midheight)
  - Maximum Weight: 450 LB

- **C** (LW Concrete and Above Midheight in Building)
  - Maximum Weight: 300 LB

---

**Agency Stamp**

CDF - Office of State Fire Marshal

**Approved** 4/21/17

*Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.*

*Reviewed by:* [Signature]

[Diagram of biosafety cabinet anchored to floor at cross beams]

**Biological Safety Cabinet - Anchored to Floor at Cross Beams**

**Detail No:** S3.22

**Date:** 12-1-2016

**Prepared By:** [Signature]

**Project Name:** Campus Wide Seismic Bracing of Equipment (Valid through 2019)
Note: Spacers cushion to be orange skidmate or equal and positively attached to cabinet or strut.

**TABLE:** MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>950 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>625 LB</td>
</tr>
</tbody>
</table>

**TABLE NOTES**

* Assume above midheight in building if location relative to building midheight is unknown.

** Contents weight not required for fume hoods and biosafety cabinets

**AGENCY STAMP**

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

**DETAIL TITLE**

BIOSAFETY CABINET - ADHESIVE STRAPS TO WALL

**DETAIL NO.**

S3.23

**DATE**

12-1-2016

**PREPARED BY**

Estructure
www.estruc.com

**PROJECT NAME**

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
FRONT VIEW

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT *</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>800 LB</td>
</tr>
<tr>
<td>B (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>500 LB</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>300 LB</td>
</tr>
</tbody>
</table>

TABLE NOTES:
1. ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
2. ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
3. CONTENTS WEIGHT NOT REQUIRED FOR FUME HOODS AND BIOSAFETY CABINETS.

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>SEOR STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>BIOSAFETY CABINET - ANCHORED TO FLOOR</td>
<td>S3.24</td>
</tr>
<tr>
<td>APPROVED 4/21/17</td>
<td></td>
<td>REV</td>
<td>DESCRIPTION</td>
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<tr>
<td></td>
<td></td>
<td>REV</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12-1-2016</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PREPARED BY</td>
<td>CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>UCSF</td>
</tr>
</tbody>
</table>
### 1. GAS CYLINDERS AND DEWARS

**USE S4.11 - S4.22 FOR THESE ITEMS**

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>SEOR STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>GAS CYLINDERS AND DEWARS</td>
<td>S4.00</td>
</tr>
</tbody>
</table>

**Date:** 12-1-2016

---

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by: [Signature]

Prepared by: Estructure
www.estruc.com

Project Name: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
**TABLE: MAX WEIGHT BY DESIGN CATEGORY**

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>1000 LB</td>
</tr>
<tr>
<td>B (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>575 LB</td>
</tr>
<tr>
<td>C (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>400 LB</td>
</tr>
</tbody>
</table>

**TABLE NOTES**

- (1) ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
- (2) ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.

**Weight CONTENTS : VOLUME_{INTERIOR} x DENSITY_{GAS}**

---

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Reviewed by: [Signature]

---

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

NITROGEN TANKS - PREMANUFACTURED STAND

PREPARED BY: Estructure
www.estruc.com

PROJECT NAME: UC SF
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

 UC SF
(E) or (N) 3½"x20 GA MIN STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)

32° MAX

½" EYE BOLT, WASHER & NUT (4 TOTAL)

RESTRAINT CABLE OR CHAIN RATED FOR MIN. 500 LB. (2 TOTAL)

2-#12 SMS EACH STUD (VERIFY STUD FLANGE LOCATION & INSTALL SMS @ CENTER OF FLANGE)

1½"x1½"x12GA CHANNEL STRUT (2 TOTAL, UNPUNCHED, 3'-0" MIN.) ACROSS 4 STUDS MIN. PROVIDE STRUT CAP EA. END, TYP. (OK TO USE (E))

CG, MAX WEIGHT SEE TABLE

(E) SLAB (MIN 4" CONCRETE SLAB OR 3½" CONCRETE FILL ON METAL DECK)

### TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE 62.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>1000 LB</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>650 LB</td>
</tr>
</tbody>
</table>

### TABLE NOTES

* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.

** WEIGHT CONTENTS = VOLUME * 20 LB/FT³

---

AGENCY STAMP: CDF - OFFICE OF STATE FIRE MARSHAL

APPROVED: 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by: [Signature]

PREPARED BY: Pstructure
www.estruc.com

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

SEGR STAMP: [Stamp] No. 2005

DETAIL TITLE: NITROGEN TANKS - MOBILE UNIT RESTRAINED AT WALL

DETAIL NO.: S4.12

DATE: 12-1-2016
PLAN A-A

ELEVATION

DESIGN CATEGORY OF COMPONENT (SEE G2.01)* | MAXIMUM WEIGHT, INCLUDING CONTENTS**
--- | ---
BELOW MIDHEIGHT OF BUILDING | 1500 LB
ABOVE MIDHEIGHT OF BUILDING | 1000 LB

TABLE NOTES
* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = VOLUME INTERIOR • 20 LB/FT³

TABLE: MAX WEIGHT BY DESIGN CATEGORY

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/1/17

SEOR STAMP

DETAIL TITLE
NITROGEN TANKS - STAND AND WALL ANCHORAGE

DETAIL NO. S4.13

PREPARED BY

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
Wp=350#/ MAX
INCLUDING CONTENTS**

ELEVATION

VESTIL WALL MOUNTED CYLINDER BRACKET CB-W-S OR EQUAL (ALT. USE CB-W-3S AT LOCATIONS WITH 3 CYLINDERS)

BACKING PLATE (SEE ARCH DWGS)

2-#12 SMS MIN PER BRACKET (AT 3 CYLINDER BRACKET USE 2-#12 SMS AT EACH CYLINDER ANCHORAGE LOCATION).

** Wt= CONTENTS\text{=}VOLUME_{INTERIOR}\times DENSITY_{GAS}

---

AGENCY STAMP

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

REVIEWED: 4/21/17

PREPARED BY: Estructure

WWW.ESTRUC.COM

PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

GAS CYLINDERS - STRAPS TO WALL

REV DESCRIPTION REV DESCRIPTION DATE

S4.21

12-1-2016
**TABLE: MAX WEIGHT BY DESIGN CATEGORY**

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS** DUAL RACK CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>550 LB</td>
</tr>
<tr>
<td><strong>B</strong> (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>350 LB</td>
</tr>
<tr>
<td><strong>C</strong> (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>225 LB</td>
</tr>
</tbody>
</table>

**TABLE NOTES**

* (1) ASSUME LIGHTWEIGHT CONCRETE WHEN SLAB TYPE IS UNKNOWN.
* (2) ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.
** WEIGHT CONTENTS = VOLUME INTERIOR * DENSITY GAS
COUNTER MOUNTED EQUIPMENT

USE S5.11- S5.22 FOR THESE ITEMS
SNUBBER DETAIL

1. L2.5x2.5x1/8" angle shall be tall enough such that at least 1/2" will bear on equipment. Weld angle to base plate.

2. 4"x4"x1/8" base plate

3. CG WT
400# MAX W/ CG
HEIGHT < 4'-0"

4. COUNTER
1/2" MIN SUBSTRATE

5. EQUIPMENT

1/4"Ø BOLT THROUGH COUNTER 3 PER SNUBBER, TYP.

NOTES:
1. DETAIL MAY NOT BE USED IF HEIGHT DIMENSION OF EQUIPMENT EXCEEDS WIDTH DIMENSION OR DEPTH DIMENSION.

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by:

PREPARED BY
Estructure
www.estruc.com

PROJECT NAME
CAMPUS WIDE SEISMIC BRAICNG OF EQUIPMENT (VALID THROUGH 2019)

DETAIL NO.
S5.11

DETAIL TITLE
COUNTER-MOUNTED EQUIPMENT - 400# MAX - SNUBBERS

REV DESCRIPTION REV DESCRIPTION

DATE
12-1-2016
2"x3" MP-201 FASTENER W/ 3M ADHESIVES (8 TOTAL) ADHERE TO SIDE OR UNDERSIDE OF EQUIPMENT

AS FAR AS PRACTICAL (8" MIN)

8" STRAPS BY SAFE-T-PROOF

(C) BUILT IN CASEWORK MEETING MIN REQUIREMENTS OUTLINED IN GENERAL NOTES OR TABLE WITH POSITIVE ATTACHMENT TO SLAB (SEE DETAIL S5.31 FOR TABLE ANCHORAGE DETAIL)
"L" BRACKET SYSTEM BY WORKSAFE TECHNOLOGIES, SAFE-T-PROOF, OR EQUIVALENT (4 TOTAL, 2 PER SIDE)

AS FAR AS PRACTICAL (8" MIN)

(E) BUILT IN CASEWORK MEETING MIN REQUIREMENTS OUTLINED IN GENERAL NOTES OR TABLE WITH POSITIVE ATTACHMENT TO SLAB (SEE DETAIL S5.31 FOR TABLE ANCHORAGE DETAIL)

---

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

DETAIL TITLE
COUNTER-MOUNTED EQUIPMENT - 400# MAX - L BRACKETS

DETAIL NO.
S5.13

REV DESCRIPTION REV DESCRIPTION

DATE
12-1-2016

PREPARED BY

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

www.estructure.com
(E) BUILT IN CASEWORK MEETING MIN REQUIREMENTS OUTLINED IN GENERAL NOTES OR TABLE WITH POSITIVE ATTACHMENT TO SLAB (SEE DETAIL S5.31 FOR TABLE ANCHORAGE DETAIL)

NOTE: USE ONLY IF S5.11, S5.12 & S5.13 ARE NOT FEASIBLE DUE TO GRILLS OR ACCESS REQUIREMENTS.
(E) BUILT IN CASEWORK MEETING MIN REQUIREMENTS OUTLINED IN GENERAL NOTES OR TABLE WITH POSITIVE ATTACHMENT TO SLAB (SEE DETAIL SS.31 FOR TABLE ANCHORAGE DETAIL)
1 5/8" x 1 5/8" x 12GA CHANNEL STRUT
(1 TOTAL, UNPUNCHED, 3'-0" MIN.) ACROSS 3
STUDS MIN. PROVIDE STRUT CAP EA. END,
TYP. (OK TO USE (E))

2 STRUTS REQUIRED IF OVER 400#
3/8" CHANNEL STRUT BOLT, WASHER
& NUT (TYP. EA. STRAP)

8" STRAPS BY
SAFE-T-PROOF

2 3/8" x 2 3/8" x 7" H 3/8" THICK STEEL POWDER COATED
(W/ KEEPER) "L BRACKETS" BY SAFE-T-PROOF
OR EQUAL (2 TOTAL)

(E) BUILT IN CASework MEETING MIN REQUIREMENTS
OUTLINED IN GENERAL NOTES OR TABLE WITH POSITIVE
ATTACHMENT TO SLAB (SEE DETAIL S5.31 FOR TABLE
ANCHORAGE DETAIL)

18" STRAPS BY
SAFE-T-PROOF
OR EQUAL (2 TOTAL)

5" x 6" MP-203
FASTENERS BY
SAFE-T-PROOF OR
EQUAL W/ 3M VHB
ADHESIVE PADS
(2 TOTAL)

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

DETAIL TITLE
COUNTER-MOUNTED EQUIPMENT - 525# MAX - ADHESIVE STRAPS TO WALL

DETAIL NO.
S5.22

PREPARED BY
Estructure
www.estru.com

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

DATE
12-1-2016

Reviewed by:
GALVANIZED 12 GA BENT PLATE ALT: USE BIO SAFETY CABINET FASTENING SYSTEM STP-SS-134-32

(2)-#10 SMS, TYP.

AT CONC. FLOOR, USE 3/8"Ø W/ 2" EMBED., TYP. 3/8" Ø X 2" EMBED HILTI KB-TZ (1 PER BRACKET)

ELEVATION A-A

MATCH WIDTH TO LEG WIDTH 2 1/4" MIN.

GALVANIZED 12 GA. PLATE OR ALT. NOTED IN SECTION A-A

REPAIR GALVANIZING AS REQ'D

3/8" GALVANIZED BENT P. MATCH CURVE OF LEG. 2 1/2" MAX. TALL

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM EQUIPMENT WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 BRACKET PER LEG</td>
</tr>
<tr>
<td>A  (NW CONCRETE AND BELOW MIDHEIGHT IN BUILDING)</td>
<td>900 LB</td>
</tr>
<tr>
<td>B  (LWC &amp; BELOW MIDHEIGHT OR NWC &amp; ABOVE MIDHEIGHT)</td>
<td>550 LB</td>
</tr>
<tr>
<td>C  (LW CONCRETE AND ABOVE MIDHEIGHT IN BUILDING)</td>
<td>350 LB</td>
</tr>
</tbody>
</table>

TABLE SUPPORTING EQUIPMENT - ANCHORAGE TO SLAB

REV DESCRIPTION REV DESCRIPTION

PREPARED BY:

PROJECT NAME:

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
# Monitors

Use S6.11–S6.31 for these items and similar equipment. 

**Note:** Monitors include televisions screens, touch screens, and other similar components.

<table>
<thead>
<tr>
<th>A</th>
<th>Wall Mounted Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Monitor on Articulating Arm</td>
</tr>
<tr>
<td>C</td>
<td>Suspended Monitor</td>
</tr>
</tbody>
</table>

## Monitors - Photo Guide

<table>
<thead>
<tr>
<th>REV</th>
<th>Description</th>
<th>REV</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12-1-2016</td>
</tr>
</tbody>
</table>

Prepared by: Estructure

Project Name: Campus Wide Seismic Bracing of Equipment (valid through 2019)
MONITOR DESIGN CRITERIA
MONITOR DETAILS S6.11, S6.12, S6.13, S6.14, S6.21, S6.22 DENOTE VARIOUS MONITOR BRACKETS AND THEIR ATTACHMENTS TO EXISTING METAL STUDS. THE DESIGN CRITERIA FOR EACH DETAIL IS BASED ON THE FOLLOWING CRITERIA:

- MONITOR WEIGHT
- CENTER OF GRAVITY DISTANCE FROM FACE OF WALL
- NUMBER OF SCREWS FROM BRACKET TO WALL
- SPACING OF BRACKET SCREWS IN BOTH DIRECTIONS

THE FOLLOWING BRACKETS MEET THE DESIGN CRITERIA LISTED ABOVE. HOWEVER, OTHER BRACKETS NOT LISTED MAY BE USED IF ALL CRITERIA LISTED ABOVE ARE MET AS DEFINED ON THE DETAILS.

S6.11 AND S6.14 SIM.
PEERLESS PF630
CHIEF/MILESTONE KOW100
S6.12 AND S6.14 SIM.
PEERLESS PF640
CHIEF/MILESTONE MSA1U
CHIEF/MILESTONE MTA1U (TILT)
CHIEF/MILESTONE MSM1U
CHIEF/MILESTONE MTM1U (TILT)
S6.13 AND S6.14
PEERLESS PF660
PEERLESS SF660
CHIEF/MILESTONE LSA1U
CHIEF/MILESTONE LTA1U (TILT)
CHIEF/MILESTONE LSM1U
CHIEF/MILESTONE LTM1U (TILT)
CHIEF/MILESTONE MTMP1U (PORTRAIT, TILT)
S6.21
PEERLESS PA740
CHIEF/MILESTONE TS218S
LUCASEY LC200WDA
S6.22
PEERLESS DS-VW765 (PORTRAIT, LANDSCAPE, TILT OPTIONS)
PEERLESS PA762
PEERLESS SA761PU (TILT)
PEERLESS SA771PU (TILT)
PEERLESS SAX762PU
CHIEF/MILESTONE TS318TU
LUCASEY LC200DS1
LUCASEY FSWADS2 (TILT OPTION)

ALTERNATE MONITOR BRACKET ATTACHMENTS

IF THE MONITOR BRACKET SCREWS CANNOT BE INSTALLED DIRECTLY INTO THE METAL STUDS AS SHOWN IN THE DETAILS, INSTALL TWO ROWS OF BACKING PLATES ACROSS THREE STUDS MINIMUM PER DETAIL S7.17B AND ATTACH MONITOR BRACKET TO THE BACKING PLATES.

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>SEOR STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>MONITORS - CRITERIA AND MODELS</td>
<td>S6.02</td>
</tr>
<tr>
<td>APPROVED 4/21/17</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Reviewed by: [Signature]

<table>
<thead>
<tr>
<th>PREPARED BY</th>
<th>PROJECT NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estructure</td>
<td>CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)</td>
</tr>
<tr>
<td><a href="http://www.estruc.com">www.estruc.com</a></td>
<td></td>
</tr>
</tbody>
</table>
NOTE: IF MONITOR BRACKET SCREWS CANNOT BE INSTALL DIRECTLY INTO METAL STUDS, INSTALL ONE BACKING PLATE ACROSS TWO STUDS MINIMUM PER DETAIL S7.17B AND ATTACH MONITOR BRACKET TO THE BACKING PLATE.
NOTE: IF MONITOR BRACKET SCREWS CANNOT BE INSTALL DIRECTLY INTO METAL STUDS, INSTALL TWO BACKING PLATES ACROSS THREE STUDS MINIMUM PER DETAIL S7.17B AND ATTACH MONITOR BRACKET TO THE BACKING PLATES.

1/4"Ø SMS AND FLAT WASHER TO (E) METAL STUDS (4 TOTAL)

(E) 3 5/8" x 20 GA MINIMUM STUD WITH 1 1/4" MINIMUM FLANGE. VERIFY FLANGE LOCATION AND INSTALL SCREWS AT CENTER OF FLANGE.

BRACKET ARMS TO BE INSTALLED TO BACK OF TELEVISION

S6.12

PREPARED BY: Estructure
www.estruc.com

PREPARED BY: Project Name: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUHG 2019)

EXPERIMENTAL L. PRATT No. 295 PROF. P. A. D. 5/23/18

CDF - OFFICE OF STATE FIRE MARSHAL APPROVED 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed by: [Signature]
NOTE: IF MONITOR BRACKET SCREWS CANNOT BE INSTALL DIRECTLY INTO METAL STUDS, INSTALL TWO BACKING PLATES ACROSS THREE STUDS MINIMUM PER DETAIL S7.17B AND ATTACH MONITOR BRACKET TO THE BACKING PLATES.

1/4"Ø SMS AND FLAT WASHER TO (E) METAL STUDS (4 TOTAL)

11" MIN.

16" MIN.

(E) 3 5/8"x20 GA MINIMUM STUD WITH 1 1/4" MINIMUM FLANGE. VERIFY FLANGE LOCATION AND INSTALL SCREWS AT CENTER OF FLANGE.

BRACKET ARMS TO BE INSTALLED TO BACK OF TELEVISION

SECTION

MONITOR BRACKET
SEE 6.01

MONITOR FLAT MOUNT TO METAL STUDS - 110# MAX

REV DESCRIPTION REV DESCRIPTION

S6.13

DATE

12-1-2016

PREPARED BY

Estructure
www.estruc.com

PROJECT NAME

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.
CC BRACKET
WT=25# MAX.

CC MONITOR
WT=110# MAX.

\[ \frac{3}{8}'' \text{ HILTI KB-TZ W/ 2'' MIN. EMBED W/ 1'' MIN. ALUMINUM SLEEVE AT EACH EXP. ANCHOR (4 TOTAL)} \]

(E) MET. FURRING CHANNEL

(E) 5/8'' GYP. BOARD, PATCH TO MATCH (E) FINISH

(E) CONCRETE WALL (NWC, 2500 PSI MIN.)

SECTION

MONITOR BRACKET
SEE 6.01

\[ \frac{3}{8}'' \text{ HILTI KB-TZ W/ 2'' MIN. EMBED W/ 1'' MIN. ALUMINUM SLEEVE AT EACH EXP. ANCHOR (4 TOTAL)} \]

11'' MIN.

FRONT VIEW

16'' MIN.

BRACKET ARMS TO BE INSTALLED TO BACK OF TELEVISION

AGENCY STAMP

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

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Reviewed by:

PREPARED BY

Pstructure
www.estru.com

DVISITY OF CALIFORNIA
S F

DETAIL TITLE

DETAIL NO.

SER OR STAMP

MONITOR FLAT MOUNT TO CONCRETE WALL - 110# MAX
S6.14

REV DESCRIPTION REV DESCRIPTION

DATE 12-1-2016

PROJECT NAME

UCSF

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
NOTE: IF MONITOR BRACKET SCREWS CANNOT BE INSTALL DIRECTLY INTO METAL STUDS, INSTALL TWO BACKING PLATES ACROSS TWO STUDS MINIMUM PER DETAIL S7.17B AND ATTACH MONITOR BRACKET TO THE BACKING PLATES.
ARTICULATING ARM MONITOR BRACKET, SEE S6.02
1/4" DIA. SMS AND FLAT WASHER TO (E) STUD

(E) 5/8" MAX. GYPSUM WALLBOARD

(E) 3 5/8 X 18 GA MIN. METAL STUD (FULL HEIGHT OR FULLY BRACED, V.I.F.)

NOTE: IF MONITOR BRACKET SCREWS CANNOT BE INSTALL DIRECTLY INTO METAL STUDS, INSTALL TWO BACKING PLATES ACROSS THREE STUDS MINIMUM PER DETAIL S7.17B AND ATTACH MONITOR BRACKET TO THE BACKING PLATES.

FRONT VIEW - WALL PLATE

MONITOR BRACKET SEE S6.02

1/4" DIA. SMS AND FLAT WASHER TO (E) STUD

10" MIN.

16" MIN.

26.6" MAX.

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CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
SEE S6.31A FOR OVERHEAD SUSPENSION SYSTEM

(E) CEILING, PATCH AND REPAIR WITH SAME MATERIALS AFTER INSTALLATION

MONITOR 40# MAXIMUM

ESCUTCHEON COLLAR, LUCASEY CMAEF150 OR EQUIVALENT THREAD INSIDE BOTTOM END OF PIPE
ATTACH (N) 1"Ø POLE TO 1½"Ø PIPE

LUCASEY LC200C9F 1"Ø CEILING MOUNT FLAT PANEL POLE OR EQUIVALENT

AGENCY STAMP

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PROJECT NAME

SUSPENDED MONITOR - 40# MAX

NO. 2905
SUSPENDED MONITOR - 40# MAX

REV DESCRIPTION REV DESCRIPTION DATE

12-1-2016

UNIVERSITY OF CALIFORNIA
San Francisco

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
6" x 16GA NOTCHED TRACK BACKING PLATES PER S7.17B ACROSS THREE STUDS MINIMUM (2 TOTAL)

(E) 9/16" MAX. GYPSUM WALLBOARD

(E) 3 5/8" X 20GA MIN. METAL STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE V.I.F.)

SECTION

MX300 G2 WALL MOUNT BRACKET BY CISCO

1/4" SMS TO BACKING PLATE (4 TOTAL)

FRONT VIEW

MONITOR - CISCO MX300

S6.41

REV DESCRIPTION REV DESCRIPTION DATE

12-1-2016

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PROJECT NAME

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
1. MISCELLANEOUS COMPONENTS

- **C** MILLIPORE SYSTEM
- **A** WALL MOUNTED WORKSTATION
- **D** STACKED EQUIPMENT
- **B** SUSPENDED EXAM LIGHT

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
<th>SEOR STAMP</th>
<th>DETAIL TITLE</th>
<th>DETAIL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>MISCELLANEOUS - PHOTO GUIDE</td>
<td>S7.00</td>
</tr>
<tr>
<td></td>
<td></td>
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PREPARED BY: [Signature]

PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

[University of California logo]

[UCSF logo]
OPTION 2 - J-HOOK CABLE SUPPORT

0.157"Ø HILTI XU OR EQUAL EMBED 1¼"
MIN. (ESR-2269)

TOTAL MAXIMUM WEIGHT PER SUPPORTED ITEMS = 5 PLF

½" OR ¾" THREADED STIFFY BY CEAS OR EQUAL MAXIMUM SPACING = 5'-0"

MAXIMUM WEIGHT PER HANGER = 25# USE ONLY FOR ELECTRICAL CABLES

OPTION 1 - THREADED HANGER CABLE SUPPORT

20GA MIN. METAL STUDS @ 16" O.C.
#12 SMS TO METAL STUD

ACCESS OPENING

CABLE OR INTERDUC (PLENUM RATED)

"STIFFY COMFORT CRADLE" OR EQUAL 2" MAX.

MAXIMUM WEIGHT = 5 LB/FT (25 LBS TOTAL PER ROD)

OPTION 3 - WALL-MOUNTED CABLE SUPPORT

MAXIMUM TRIBUTARY WEIGHT = 25#
1/4" BOLTS IN SLEEVES TO EQUIP (TOTAL) MIN

#14 SMS (4 TOTAL) MIN

MOUNTING BRACKET BY MANUFACTURER

CG WT=40#
(E) 3¾"x20 GA MIN. METAL STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)

(E) ½" MAX. GYPSUM WALLBOARD

18" STRAPS BY SAFE-T-PROOF OR EQUAL (4 TOTAL)

2-#12 SMS EACH STUD

1½"x1½"x12GA CHANNEL STRUT (2 TOTAL, UNPUNCHED) ACROSS 3 STUDS MIN. PROVIDE STRUT CAP EA. END, TYP.

2½"W 2"D 7"H x ¾" THICK STEEL POWDER COATED "L BRACKETS" BY SAFE-T-PROOF OR EQUAL (4 TOTAL)

(E) SLAB (MIN 4" CONCRETE SLAB OR 3¾" CONCRETE FILL ON METAL DECK)

**WEIGHTCONTENT = VOLUMEINTERIOR x 20 LB/FT³

TABLE NOTES
* ASSUME ABOVE MIDHEIGHT IN BUILDING IF LOCATION RELATIVE TO BUILDING MIDHEIGHT IS UNKNOWN.

TABLE: MAX WEIGHT BY DESIGN CATEGORY

<table>
<thead>
<tr>
<th>DESIGN CATEGORY OF COMPONENT (SEE G2.01)*</th>
<th>MAXIMUM WEIGHT, INCLUDING CONTENTS**</th>
</tr>
</thead>
<tbody>
<tr>
<td>BELOW MIDHEIGHT OF BUILDING</td>
<td>475 (EA INCUBATOR)</td>
</tr>
<tr>
<td>ABOVE MIDHEIGHT OF BUILDING</td>
<td>310 (EA INCUBATOR)</td>
</tr>
</tbody>
</table>

AGENCY STAMP
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PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
P4100 (ALT: P4000, P3300)
P3006-1024 CHANNEL NUT
(OR SIM W/SPRING AT EA SMS)
#10 SMS AT EA EDGE GRIP
TO CHANNEL NUT

3" MAX.
TYP

W = 42" MIN TO 96" MAX

6" MIN, 12" MAX TYP
(PER MANUFACTURER'S
INSTRUCTIONS)

CG WT =
108 LB MAX
2" FROM
WALL

30" MIN TO 42" MAX

1/4" Ø HILTI KWIK HUS-EZ W/
1 5/8" EMBED (ESR-3027)
2 EA STRUT
PULL TEST 50% TO 225 LB
(ALT: 3/8" Ø X 2" EMBED HILTI KBTZ)

#10 SMS AT EA EDGE GRIP TO
BACKING PLATE OR METAL STUD
FOR CONCRETE WALL INSTALLATION
SEE DETAIL 1

EDGE GRIP STANDOFF BY
MANUFACTURER (6 TOTAL)

FLAT BACKING PLATE PER DETAIL A ON
S7.17, AS REQUIRED (CONTINUOUS OK,
MAY BE INSTALLED ON OUTSIDE
OF GYP BOARD)

(E) 3 5/8" x 20 GA MIN METAL STUDS
@ 16" O.C.
FOR CONCRETE WALL INSTALLATION
SEE DETAIL 1

---

AGENCY STAMP
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SEOR STAMP
No. 2095
DP. 6/28/18

DETAIL TITLE
WHITEBOARD - "FOREVERWHITE"
S7.16A

DETAIL NO.

REV DESCRIPTION REV DESCRIPTION

DATE 12-1-2016

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PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

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University of California
San Francisco
4\(\frac{3}{4}\)" TYP
(PER MANUFACTURER'S
INSTRUCTIONS)

18" MIN TO 72" MAX

CG WT =
50 LB MAX
3" FROM WALL

#8 MIN SMS TO BACKING PLATE
(3 PER BRACKET) AT METAL
STUDS, FOR CONCRETE WALL
INSTALLATION, SEE NOTE 1
MOUNTING BRACKET BY
MANUFACTURER (4 TOTAL)

(E) 2.5"x20 GA MIN METAL STUDS @
16" O.C, FOR CONCRETE WALL
INSTALLATION, SEE NOTE 1
FLAT BACKING PLATE PER DETAIL A ON S7.17A,
AS REQUIRED (CONTINUOUS OK, MAY BE INSTALLED
ON OUTSIDE OF GYP BOARD)

NOTE 1: FOR INSTALLATION ONTO CONCRETE WALL, USE \(\frac{3}{4}\)"Ø HILTI KWIK HUS-EZ W/ 1\(\frac{3}{4}\)" EMBED
(ESR-3027) – 2 MIN EA MOUNTING BRACKET, PULL TEST 50% TO 225 LB.

<table>
<thead>
<tr>
<th>AGENCY STAMP</th>
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<th>DETAIL TITLE</th>
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<tbody>
<tr>
<td>CDF - OFFICE OF STATE FIRE MARSHAL</td>
<td></td>
<td>WHITEBOARD - ICEBERG</td>
<td>S7.16B</td>
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<tr>
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CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
(E) 20 GA MIN STUDS @16" O.C.

16 GA 6" TRACK W/ 1¼" MIN FLANGE, NOTCHED AROUND STUDS

(3) #10 SMS LOW PROFILE HEAD @ EA STUD, TYP

B NOTCHED TRACK BACKING PLATE

A FLAT BACKING PLATE

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DETAIL TITLE

BACKING PLATES

DETAIL NO.

S7.17

REV DESCRIPTION REV DESCRIPTION DATE

12-1-2016

PROJECT NAME

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

Reviewed by:
FENCE POST - INTERMEDIATE

ELEVATION

SECTION A-A

SECTION B-B

NOTE: FOR INTERIOR INSTALLATION CONDITIONS ONLY.

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Seor stamp

Prepared by:

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Detail title

FENCE POST - INTERMEDIATE

Detail no.

S7.18A

Rev description rev description date

12-1-2016

Project name

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

University of California San Francisco

UCSF
ELEVATION

END CONDITION

SECTION A-A

FENCING MATERIAL ATTACHMENT

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DETAIL TITLE

FENCE POST - END CONDITION AND FENCING MATERIAL ATTACHMENT

DETAIL NO.

S7.18B

REV DESCRIPTION REV DESCRIPTION

DATE 12-1-2016

PROJECT NAME

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
NOTES:
1. LATERAL BRACING IS NOT REQUIRED WHERE GYP. BOARD IS INSTALLED ON BOTH SIDES OF PARTITION WALL.
2. NOTCHING OR CUTTING OF COLD-ROLLED CHANNEL IS NOT PERMITTED FOR ANY CONDITION.
NOTES:
1. LATERAL BRACING IS NOT REQUIRED WHERE GYP. BOARD IS INSTALLED ON BOTH SIDES OF PARTITION WALL.
2. NOTCHING OR CUTTING OF BLOCKING OR STRAP IS NOT PERMITTED FOR ANY CONDITION.
(E) STUDS @ 16" O.C.

2½"x16GA NESTED TRACK AND STUD BETWEEN (E) WALL STUDS (2 TOTAL)
SEE C FOR SPLICE DETAIL

(2)—3/8"Øx2" EMBED. EXPANSION ANCHOR
#10 SMS EA. SIDE

16GA DEEP LEG DEFLECTION TRACK POSITION SCREWS AT CENTER OF SLOTTED HOLE

SECTION A-A

2½"x1½" FLANGE 16 GA STUD

SECTION B-B

#10 SMS @ 8" O.C. MAX. AND 3" FROM EA. END. TYP. EA. SIDE

2½"x1½" FLANGE 16 GA TRACK

C NESTED STUD SPLICE DETAIL

---

NESTED STUDS - SPLICE OPTION

DETAIL TITLE

S7.21

DETAIL NO.

REV DESCRIPTION REV DESCRIPTION DATE

12-1-2016

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PROJECT NAME

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
1/4" DIA SMS EA SIDE

3\(\frac{3}{4}\)"x2"x16GAx1\(\frac{3}{4}\)" ANGLE WITH 2#10 SMS TO NESTED TRACK, TOP AND BOTTOM

3\(\frac{5}{8}\)"x16GAx1\(\frac{3}{4}\)" FLANGE

#10 SMS @ 8" O.C. AND 3" FROM EA END

0.157" DIA x 3/4"
HILTI XU EA SIDE

(E) BOTTOM TRACK

(E) SLAB (MIN 4" CONCRETE SLAB OR 3\(\frac{3}{4}\)" CONCRETE FILL ON METAL DECK)

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CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

DETAIL TITLE
NESTED - ANGLES TO SLAB
S7.22

DETAIL NO.

REV DESCRIPTION REV DESCRIPTION

DATE 12-1-2016
# Electrical Panels

<table>
<thead>
<tr>
<th>A</th>
<th>STUD WALL MOUNTED</th>
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<tbody>
<tr>
<td>B</td>
<td>STUD WALL RECESSED</td>
</tr>
<tr>
<td>C</td>
<td>CMU WALL MOUNTED</td>
</tr>
<tr>
<td>D</td>
<td>FLOOR MOUNTED</td>
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</tbody>
</table>

## Table: Electrical Panels - Photo Guide

<table>
<thead>
<tr>
<th>REV</th>
<th>DESCRIPTION</th>
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<th>DESCRIPTION</th>
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**Prepared By:**
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**Project Name:**
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

**Details:**

- S8.00
- Date: 12-1-2016

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[Stamp: State of California - Professional Engineering]
(E) 3\(\frac{5}{8}\)" x 20 GA MIN. METAL STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)

#10 SMS AND FENDER WASHER (4 MIN, EA CORNER)

CG WT=225# MAX.

ADDITIONAL #10 SMS EA SIDE WHERE H > 30"

ELEVATION

SECTION A--A
(E) 3 5/8" x 20 GA MIN. METAL STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)

(2) - #10 SMS EA STUD

CG WT=150# MAX.

UNISTRUT P1000 ACROSS 3 STUDS MIN. (3 TOTAL)

3/8" ø BOLT, NUT SPRING, AND WASHER (6 TOTAL)

ELEVATION  

SECTION A-A

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DETAIL TITLE  

ELECTRICAL PANEL - STUD WALL MOUNTED - OPTION B

DETAIL NO.  

S8.11B

REV  DESCRIPTION  REV  DESCRIPTION  DATE

12-1-2016

PROJECT NAME  

CAMPUSS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
(N) METAL STUD TRACK TOP & BOTTOM W/DEPTH AND GAGE TO MATCH (E)
BEND WEB AND FASTEN TO HEADER/SILL WITH 2-#10 SMS (ALTERNATE: USE L1½x1½x18GAxSTUD DEPTH W/2-#10 EA FLANGE)

(N) METAL STUD W/ DEPTH AND GAGE TO MATCH (E) EA SIDE

(E) 3½"x20 GA MIN. METAL STUDS (FULL HEIGHT OR FULLY BRACED TO STRUCTURE, V.I.F.)
#10 SMS (3 MIN. PER SIDE)

ELEVATION  SECTION A–A
3/8" HILTI KB-TZ w/2" EMBED. (4 TOTAL)

CG
WT=225# MAX.

(E) 6" MIN. CONC WALL
(NWC, 2500 PSI MIN.)

ELEVATION

SECTION A--A
3/8" HILTI KB-TZ W/2" EMBED. (4 TOTAL)

CG
WT=225# MAX.

UNISTRUT P1000
(2 TOTAL)

3/8" BOLT, NUT
SPRING, AND
WASHER (4 TOTAL)

(E) 6" MIN. CONC WALL
(NWC, 2500 PSI MIN.)

ELEVATION

SECTION A–A
20" MAX.

3/8" HILTI KB-TZ W/2" EMBED. (4 TOTAL)

CG WT=225# MAX.

48" MAX.

(E) 8" MIN. CMU BLOCK WALL (1500 PSI MIN.)

ELEVATION    SECTION A--A
3/8" HILTI KB-TZ W/2" EMBED. (4 TOTAL)

CG
WT=225# MAX.

UNISTRUT P1000
(2 TOTAL)

3/8" BOLT, NUT
SPRING, AND
WASHER (4 TOTAL)

(E) 8" MIN. CMU BLOCK WALL
(1500 PSI MIN.)

ELEVATION

SECTION A–A
P3300 T&B FASTEN TO P1000 W/\(\frac{3}{8}\)" ø BOLT, SPRING NUT AND WASHER

CG
WT=225# MAX.
P1000 (2 TOTAL)

\(\frac{3}{8}\)" ø BOLT, SPRING NUT AND WASHER (4 TOTAL)

P3300 W/(2)−\(\frac{3}{8}\)" ø BOLT, SPRING NUT AND WASHER AS REQ'D FOR CONDUIT SUPPORT

\(\frac{3}{4}\)" ø BOLT, SPRING NUT AND WASHER (4 TOTAL)

P2072A SQ (2 TOTAL)

\(\frac{1}{2}\)" HILTI KB-TZ W/2" EMBED. (8 TOTAL)

(E) SLAB (MIN 4" CONCRETE SLAB OR 3\(\frac{3}{4}\)" CONCRETE FILL ON METAL DECK)

FRONT ELEVATION  SIDE ELEVATION
P3300 T&B FASTEN TO P1000 W/3/8" φ BOLT, SPRING NUT AND WASHER

P1000 (2 TOTAL)

P1000 BRACE FASTEN TO P1000 W/3/8" φ BOLT, SPRING NUT AND WASHER

60" MAX

P2942 (2 TOTAL)

P1000 BRACE W/P1354 EA END W/(2) – 1/2" φ BOLTS, SPRING NUTS AND WASHERS (2 TOTAL)

3/8" φ BOLT, SPRING NUT AND WASHER (4 TOTAL)

1/2" φ BOLT, SPRING NUT AND WASHER (4 TOTAL)

60" MAX

1/2" φ HILTI KB-TZ W/2" EMBED. (2 TOTAL)

1/2" φ HILTI KB-TZ W/2" EMBED. (2 TOTAL)

(E) SLAB (MIN 4" CONCRETE SLAB OR 3/4" CONCRETE FILL ON METAL DECK)

FRONT ELEVATION

SIDE ELEVATION

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SEOR STAMP

PREPARED BY

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DETAIL TITLE

ELECTRICAL PANEL - FLOOR MOUNTED - OPTION B

DETAIL NO.

S8.15B

REV DESCRIPTION REV DESCRIPTION

DATE

12-1-2016

PROJECT NAME

CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
(N) GYPSUM WALLBOARD, 5/8" MAX. THICKNESS. IF ONE SIDE OF WALL DOES NOT HAVE GYPSUM WALLBOARD SCREWED TO STUDS, ADD IMMEDIATE STIFFENERS PER S7.19

(E) SLAB (MIN 4" CONCRETE SLAB OR 3/4" CONCRETE FILL ON METAL DECK)

<table>
<thead>
<tr>
<th>FLOOR-TO-FLOOR HEIGHT</th>
<th>MINIMUM STUD SIZE</th>
<th>POWER DRIVEN FASTENER SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP TO 11'-0&quot;</td>
<td>362S137-33</td>
<td>8&quot;</td>
</tr>
<tr>
<td>11'-0&quot; TO 16'-0&quot;</td>
<td>362S137-43</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>

NOTE: NO FIRE RATING IS ASSUMED FOR THIS PARTITION TYPE. IF A FIRE RATED PARTITION IS REQUIRED, DO NOT USE THIS DETAIL.
NOTE: NO FIRE RATING IS ASSUMED FOR THIS PARTITION TYPE. IF A FIRE RATED PARTITION IS REQUIRED, DO NOT USE THIS DETAIL.

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PARTIAL HEIGHT BRACED PARTITION

12-1-2016

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CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
METAL STUD @ 16" O.C. MAX., SEE S9.11 OR S9.12

(N) GYPSUM WALLBOARD

362T125-XX MIN. TRACK TO MATCH METAL STUD GAGE

#10 SMS EA SIDE, TYP

(E) SLAB (MIN 4" CONCRETE SLAB OR 3 3/4" CONCRETE FILL ON METAL DECK)

0.157" HILTI X-U W/ 1" MIN EMBED (ESR-2269) SEE S9.11 OR S9.12 FOR SPACING 3" MAX FROM ENDS
3-#10 SMS

4-#10 SMS

362S137-43 @
4'-0" O.C. MAX.
L_max=10'-0"

50" MAX

L4x4x18GAx0'-3½"
@ 4'-0" O.C. MAX

362T125-XX MIN. TRACK
TO MATCH METAL STUD GAGE

#10 SMS EA SIDE, TYP

(N) GYPSUM WALLBOARD

METAL STUD @ 16" O.C.
SEE S9.11 OR S9.12

AGENCY STAMP

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DETAIL TITLE
BRACED PARTITION TOP CONNECTION

DETAIL NO.
S9.14

REV DESCRIPTION REV DESCRIPTION DATE

12-1-2016

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

Reviewed by:
OPTION 1 - CONCRETE SLAB

ACOUSTICAL SEALANT - TYP. BOTH SIDES

0.157" @ HILTI X-U
W/ 1" EMBED @ 16" O.C.
6" MAX FROM ENDS
(E SR-2269)

SLOTTED CEILING RUNNER 'SLIPTRAK' 186A MIN W/ 2½" TRACK FLANGES

#10 SMS EA SIDE OF STUD POSITION SCREW AT CENTER OF SLOT

(N) GYPSUM WALLBOARD

METAL STUD @ 16" O.C.
SEE S9.11 OR S9.12

AGENCY STAMP: CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED: 4/21/17

PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
OPTION 2A - METAL DECK W/ CONCRETE FILL
PARALLEL TO WALL

- 3" METAL DECK W/ 3¾" CONC FILL
- MINERAL WOOL

0.157" Ø HILTI X-U
W/ 1" EMBS @
16" O.C. EA FLUTE
6" MAX FROM
ENDS (ESR-2269)

3" X 12GA PLATE @ 16" O.C.
AT RATED WALLS, USE
CONTINUOUS PLATE

#12 SMS @ 16" O.C.
6" MAX FROM END

ACOUSTICAL SEALANT
TYP. BOTH SIDES

#10 SMS EA SIDE OF STUD
POSITION SCREW AT CENTER
OF SLOT

SLOTTED CEILING RUNNER
'SLIPTRAK' 18GA MIN W/
2½" TRACK FLANGES

(N) GYPSUM WALLBOARD

METAL STUD @ 16" O.C.
SEE S9.11 OR S9.12

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PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
OPTION 2B - METAL DECK W/ CONCRETE FILL
PERPENDICULAR TO WALL

ACOUSTICAL SEALANT
TYP. BOTH SIDES

0.157" Ø HILTI X-U
W/ 1" EMBED Ø EA
LOWER FLUTE
(ESR-2269)

(E) 3" METAL DECK
W/ 3\(\frac{3}{4}\)" CONC FILL

SLOTTED CEILING RUNNER
'SLIPTRAK' 18GA MIN W/
2\(\frac{3}{4}\)" TRACK FLANGES

#10 SMS EA SIDE OF STUD
POSITION SCREW AT CENTER
OF SLOT

(N) GYPSUM WALLBOARD

METAL STUD Ø 16" O.C.
SEE S9.11 OR S9.12
(E) STEEL BEAM REMOVE AND REPLACE FIREPROOFING AS REQUIRED TO RESTORE FIRE RATING

0.157" HILTIX-U 2 PER CLIP (ESR-2269)

12" MAX

2-#10 SMS

18GA MIN Z-CLIP @ 4'-0" O.C.

SLOTTED CEILING RUNNER 'SLIPTRAK' 18GA MIN W/ 2½" TRACK FLANGES

#10 SMS EA SIDE OF STUD POSITION SCREW AT CENTER OF SLOT

(N) GYPSUM WALLBOARD

METAL STUD @ 16" O.C. SEE S9.11 OR S9.12

OPTION 3A - STEEL BEAM PARALLEL TO WALL AND OFFSET

AGENCY STAMP
CDF · OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SEOR STAMP

DETAIL TITLE
FULL HEIGHT PARTITION TOP CONNECTION OPTION 3A

DETAIL NO.
S9.15D

REV DESCRIPTION REV DESCRIPTION DATE

PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)

PREPARED BY
www.estructure.com

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OPTION 3B - STEEL BEAM PERPENDICULAR TO WALL

18GA MIN Z-CLIP @ 4'-0" O.C.

2-#10 SMS

0.157" HILTI X-U
2 PER CLIP
(ESR-2269)

SLOTTED CEILING RUNNER
'SLIPTRAK' 18GA MIN W/
2½" TRACK FLANGES

#10 SMS EA SIDE OF STUD
POSITION SCREW AT CENTER
OF SLOT

(N) GYPSUM WALLBOARD

METAL STUD @ 16" O.C.
SEE S9.11 OR S9.12
OPTION 4A - BARE METAL DECK PARALLEL TO WALL

1/4" SMS @ 16" O.C. 2 PER FLUTE
6" FROM ENDS

3" X 12GA PLATE @ 16" O.C.
AT RATED WALLS, USE
CONTINUOUS PLATE

(E) 20 GA MIN. 1 1/2"
BARE METAL DECK

ACOUSTICAL SEALANT
TYP. BOTH SIDES

SLOTTED CEILING RUNNER
'SLIPTRAK' 18GA MIN W/
2 1/2" TRACK FLANGES

#10 SMS EA SIDE OF STUD
POSITION SCREW AT CENTER
OF SLOT

(N) GYPSUM WALLBOARD

METAL STUD @ 16" O.C.
SEE S9.11 OR S9.12

#12 SMS @ 16" O.C.
6" FROM ENDS

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APPROVED 4/21/17

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PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)
OPTION 4B - BARE METAL DECK PERPENDICULAR TO WALL

- (E) 20 GA MIN. 1/2" BARE METAL DECK
- SLOTTED CEILING RUNNER 'SLIPTRAK' 18GA MIN W/ 2 1/2" TRACK FLANGES
- #10 SMS EA SIDE OF STUD POSITION SCREW AT CENTER OF SLOT
- (N) GYPSUM WALLBOARD
- METAL STUD @ 16" O.C. SEE S9.11 OR S9.12

ACOUSTICAL SEALANT TYP. BOTH SIDES

(2) 1/4" Ø SMS Ø EA LOWER FLUTE

[Diagram of the construction detail with labeled components]
OPTION 1 - CONCRETE SLAB

3/8" HILTI KB-TZ
W/ 2" EMBED @ 6" O.C. (2 TOTAL)

L3x3x16GAx0'-10" MIN.

3-#10 SMS

363S137-43 @ 4'-0" O.C. MAX.
L_{MAX}=10'-0"

AGENCY STAMP
CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

SECR STAMP

DETAIL TITLE
BRACED PARTITION BRACE CONNECTION
OPTION 1

DETAIL NO.
S9.16A

REV DESCRIPTION REV DESCRIPTION DATE
12-1-2016

PREPARED BY

PROJECT NAME
CAMPUS WIDE SEISMIC BRAQNG OF EQUIPMENT
(VALID THROUGH 2019)

Reviewed by:
OPTION 2A - METAL DECK W/ CONCRETE FILL PARALLEL TO WALL

(E) 3" METAL DECK W/ 3/4" CONC FILL

3/8" HILTI KB-TZ W/ 2" EMBED @ 12" O.C. (2 TOTAL)

3-#10 SMS

L3x3x16GAx1'-2" MIN. ACROSS TWO FLUTES MIN

363S137-43 @ 4'-0" O.C. MAX. L_{MAX}=10'-0"

AGENCY STAMP

CDF - OFFICE OF STATE FIRE MARSHAL
APPROVED 4/21/17

Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

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CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
OPTION 2B - METAL DECK W/ CONCRETE FILL PERPENDICULAR TO WALL
OPTION 3A - STEEL BEAM PARALLEL TO WALL

(E) STEEL BEAM REMOVE AND REPLACE FIREPROOFING AS REQUIRED TO RESTORE FIRE RATING

0.157" HILTI X-U (2 TOTAL) (ESR-2269)

L3x3x16GAx0'-10" MIN.

3-#10 SMS

363S137-43 @ 4'-0" O.C. MAX.
L_MAX=10'-0"

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Reviewed by: [Signature]

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www.estru.com

PROJECT NAME: CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT (VALID THROUGH 2019)
OPTION 3B - STEEL BEAM PERPENDICULAR TO WALL

0.157" Ø HILTI X-U
6" O.C. (2 TOTAL)

L3x3x16GAx0'-10" MIN.

3-#10 SMS

363S137-43 @ 4'-0" O.C.
L_{max}=10'

(E) STEEL BEAM
REMOVE AND REPLACE FIREPROOFING
AS REQUIRED TO RESTORE FIRE RATING

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<th>SECOR STAMP</th>
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<td>BRACED PARTITION BRACE CONNECTION</td>
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Reviewed by: [Signature]

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PROJECT NAME
UNIVERSITY OF CALIFORNIA SF
(CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT)
(VALID THROUGH 2019)

DATE
12-1-2016
OPTION 4A - BARE METAL DECK PARALLEL TO WALL

(E) 20GA MIN. 1\(\frac{1}{2}\)" BARE METAL DECK

L3\times3\times16GA\times0'-10" MIN.
ACROSS TWO FLUTES MIN.

#10 SMS
2 PER FLUTE
(4 MIN TOTAL)

3-#10 SMS

363S137-43 @ 4'-0" O.C. MAX.
L_{MAX}=10'-0"

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PROJECT NAME
CAMPUS WIDE SEISMIC BRACING OF EQUIPMENT
(VALID THROUGH 2019)

DETAIL TITLE
BRACED PARTITION BRACE CONNECTION
OPTION 4A

DETAIL NO.
S9.16F

REVIEWED

12-1-2016
OPTION 4B - BARE METAL DECK PERPENDICULAR TO WALL

(E) 20GA MIN. 1\(\frac{1}{2}\)" BARE METAL DECK

#10 SMS
@ 2" O.C.
(4 TOTAL)

L3x3x16GAx0'--10" MIN.
ATTACH TO LOWER FLUTE

\(L_{\text{MAX}}=10'-0"\)

363SI37-43 @ 4'-0" O.C. MAX.