Robinson
Meier
Juilly & Associates

Schneider Electric
NetShelter SX

Structural Drawings
For Seismic Anchorage

Prepared for:
Schneider Electric
March 2, 2018
RMJ Job No. 14109
Valid Thru December 31, 2019

241 Joaquin Avenue
San Leandro, CA 94577
(510) 991-0977
**GENERAL NOTES**

This Design and design forces are based on 2015 IBC. This Document may only be used with the express written consent of the manufacturer listed below for the specific project site and installation location. This document is invalid without such consent.

**Design Criteria:**
Importance Factor ..............1.5
Maximum Value of $S_p=2.0$, $q_p=1.0$, $R_p=2.5$, $Q_p=2.5$ (As req'd for anchorage to concrete), $z/h=0.0$ (Concrete slab on grade), $z/h=0.5$ (For Upper Levels)
*Note: For Site Specific $S_p$, SEOR shall determine appropriate value to be utilized.*

**Dimensions:** Refer to rough concrete surfaces, or top of slab, unless otherwise indicated.

**Fasteners Expansion Anchors:**

<table>
<thead>
<tr>
<th>Anchor Diameter</th>
<th>Concrete Type</th>
<th>Min. f’c (psi)</th>
<th>Anchor Type</th>
<th>ICC Report No.</th>
<th>Min. Embed.</th>
<th>Min. Spacing</th>
<th>Min. Edge Dist.</th>
<th>Min. Conc. Thickness</th>
<th>Torque Test</th>
<th>Direction Tension</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2”</td>
<td>Normal Weight</td>
<td>3,000</td>
<td>Kwik Bolt CS</td>
<td>ESR–1917</td>
<td>2 7/8”</td>
<td>6 1/2”</td>
<td>24”</td>
<td>4”</td>
<td>40 FT-LB</td>
<td>2,600 lb</td>
</tr>
</tbody>
</table>

Tension testing shall be done in the presence of the special inspector and a report of the test results shall be submitted to SEOR (After at least 24 hours have elapsed since installation, direct pull tension test or torque test at least 50% of the anchors.) Testing shall be done in the presence of Special Inspector, and a report shall be submitted to the enforcement agency.

**Acceptance Criteria:**
Direction Tension Test:
Anchor shall have maintain test load of (15) seconds & shall exhibit no discernable movement during the tension test, e.g., as evidenced by loosening of the washer under the nut.
Torque Test:
The applicable torque must be achieved within the following limits: wedge type: 1/2 turn of the nut.

*If any anchor fails testing, all anchors of the same type shall be tested, which are install by the same trade, not previously tested until twenty (20) consecutive anchors pass, then resume initial test frequency.

**TYPICAL CONCRETE EDGE DETAIL**

**RMJ Structural Engineers**
241 Joaquin Avenue
San Leandro CA 94577
510.991.0977

**SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE**
LOW, MODERATE, AND HIGH SEISMIC REGIONS

Signed by MAS Date 11.2016

**Job No. 14109.01**

**Sheet No. SK1**
Test Loads:
Calculations are in accordance with the 2015 International Building Code.

The details are applicable to locations in the United States of California where $S_{DS}$ is not greater than 2.0. For site specific $S_{DS}$, SEOR shall determine appropriate value to be utilized. Locations determined to be risk category IV not covered under this package.

Anchor forces shown on the drawings are factored loads that shall be used for strength design.

Package only covers only the supports & attachments of the unit to the structure.

RESPONSIBILITY OF STRUCTURAL ENGINEER OF RECORD

1. Verify that the concrete meets the requirements of the applicable ICC ESR.
2. Verify that the anchors are at an adequate distance from any slab opening or edges.
3. Verify that all new or existing anchors are at an adequate distance from the anchors shown in this pre-approval. The SEOR shall verify that there is no adverse interaction where other anchors are within 18” or 6 $h_{ef}$ from the unit’s anchors.
4. Verify the adequacy of the structure to support the weight and forces shown here in addition to all other weights and forces that are imposed on it.
5. Provide any supplementary structure required for strength and stability.
6. Verify that the installation is in conformance with the 2015 IBC and with the notes and details shown in this pre-approval. Verify that the equipment’s actual weight, center of gravity location, anchor locations, anchor details and the material and gage of the unit where attachments are made conform with the information shown in this pre-approval.
7. If content weight is less than 33 pcf, maximum live loads permitted shall be posted.
SEISMIC SUPPORT & ANCHORAGE

NOTES:
1. DESIGN CENTER OF GRAVITY AT 1/2 THE HEIGHT OF THE UNIT. (NOTE: ACTUAL CENTER OF GRAVITY DOES NOT EXCEED DESIGN HEIGHT.)
2. FORCES ARE DETERMINED PER 2012 INTERNATIONAL BUILDING CODE AND ASCE 7-10 STRENGTH DESIGN. (SBS=2.0(HIGH SEISMIC) 1.0(LOW SEISMIC), Vp=1.0, I=1.5, Rp=2.5, Ωp=2.5, z/I=5(GROUND LEVEL) & z/I=5(50% OF BLDG. HT.).
3. SEE GENERAL NOTES FOR ALL OTHER CONDITIONS AND LIMITATIONS.
4. NETSHELTER SX EXTERIOR CABINET UNIT COVER COMPOSED OF 14 GA COLD ROLLED STEEL 29.4 ksi.
5. SIGN MUST BE POSTED INDICATING CABINET TOTAL WT LIMITS LISTED IN THE TABLE 1.
6. WEIGHTS LISTED IN "TABLE 1" APPLY TO ALL UNITS IRRESPECTIVE OF SIZE. MAXIMUM CABINET CONTENT WEIGHT LB (TABLE 1)

MAX. CABINET ADDED WEIGHT (ALL WEIGHTS GIVEN IN LB) TABLE 1

<table>
<thead>
<tr>
<th>MAX. CABINET WT. (500)</th>
<th>LOW &amp; MODERATE SEISMIC</th>
<th>HIGH SEISMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ON FLOOR</td>
<td>RAISED</td>
</tr>
<tr>
<td>SINGLE UNIT</td>
<td>1,500</td>
<td>850</td>
</tr>
<tr>
<td>GANGED UNIT</td>
<td>2,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

INCLUDES Ωp FOR ANCHORAGE TO CONCRETE

DIMENSIONS, AND DEMAND LOADING (TABLE 2)

COVERS ALL SCHNEIDER ELECTRIC NETSHELTER SX UNITS WITH-IN THE FOLLOWING DIMENSIONS

<table>
<thead>
<tr>
<th>SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE</th>
</tr>
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<tbody>
<tr>
<td>LOW, MODERATE, AND HIGH SEISMIC REGIONS</td>
</tr>
</tbody>
</table>

Signed by MAS Date 4/2017

Job No. 4109.01 Sheet No. SK3
**NOTES:**
POSITION BOLTS IN OUTER OR UPPER HALF OF SLOTTED BOLT HOLES WHERE APPLICABLE.
SEE MANUFACTURE DRAWINGS FOR EXACT DIMENSIONS OF NETSHELTER SX CABINETS. AR3100 SHOWN FOR REFERENCE.
HIGH SEISMIC BRACKET INSTALLATION SHOWN HERE. CLIENT HAS OPTION TO USE INTERNAL OR EXTERNAL BRACKET INSTALLATION FOR LOW AND MODERATE SEISMIC REGIONS.

**CONDITION SCHEDULE**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>SEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCRETE SLAB</td>
<td>SK6</td>
</tr>
<tr>
<td>CONCRETE FILL</td>
<td>SK7</td>
</tr>
<tr>
<td>OVER METAL DECK</td>
<td>SK8</td>
</tr>
<tr>
<td>RAISED COMP. FLOOR</td>
<td>SK9</td>
</tr>
<tr>
<td>CONC. FILL METAL DECK</td>
<td></td>
</tr>
<tr>
<td>RAISED COMP. FLOOR CONC. SLAB</td>
<td></td>
</tr>
</tbody>
</table>

**BOLT REQUIREMENTS**
1. USE 8 BOLTS PER CABINET FOR HIGH SEISMIC
2. USE 4 BOLTS PER CABINET FOR LOW AND MODERATE SEISMIC

**INTERNAL BRACKET INSTALLATION SHOWN**
**EXTERNAL BRACKET INSTALLATION (HIGH SEISMIC)**

**VERTICAL SUPPORT ELEMENT 16 GA ASTM A1008-13 SHS GRADE 41**

**BRACKET MATERIAL (0.135" THK, ASTM A1008-13 SHS GRADE 41) W/ M6 (ISO 898-1 CLASS 10.9) BOLTS PROVIDED BY NETSHELTER**

**SINGLE UNIT BOTTOM PLAN VIEW**

**PLAN 1**

**ANCHOR BOLT DIMENSIONS TABLE 3**

<table>
<thead>
<tr>
<th>H</th>
<th>A'</th>
<th>B'</th>
<th>C'</th>
<th>D'</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX (in.)</td>
<td>MAX (in.)</td>
<td>MAX (in.)</td>
<td>MAX (in.)</td>
<td></td>
</tr>
<tr>
<td>59.3</td>
<td>3.41</td>
<td>5.9</td>
<td>15.03</td>
<td>15.75</td>
</tr>
</tbody>
</table>

**WORST CASE VALUES**

**SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE**
LOW, MODERATE, AND HIGH SEISMIC REGIONS

**Signed by MAS Date 11.2016**
### NOTES:
- Position bolts in outer or upper half of slotted bolt holes where applicable.
- See manufacture drawings for exact dimensions of NETSHELTER SX cabinets. AR3100 shown for reference.
- High seismic bracket installation shown here. Client has option to use internal or external bracket installation for low and moderate seismic regions.

### CONDITION SCHEDULE

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<td>RAISED COMP. FLOOR CONC. FILL METAL DECK</td>
<td>SK8</td>
</tr>
<tr>
<td>RAISED COMP. FLOOR CONC. SLAB</td>
<td>SK9</td>
</tr>
</tbody>
</table>

### INSTALLATION FOR THE FOLLOWING CONDITIONS:

1. See bolt requirements on SK4 for anchorage requirements.

### PLAN

1. SK5

### SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE

Low, moderate, and high seismic regions

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NOTE:
OPTIONAL EXTERNAL INSTALLATION SHOWN DASHED.

SCHNEIDER ELECTRIC NETSHELTER SX CABINET FRAME

M8 BOLTS PROVIDED BY SCHNEIDER ELECTRIC WITH STANDARD CABINET PACKAGING AND AS OPTIONAL KIT AR7701 or AR7701A-S, POSITION BOLTS IN UPPER HALF OF SLOTTED HOLES.

1/2" HILTI Kwik Bolt KB-TZ

CONCRETE SLAB INSTALLATION

DETAIL 1
3" = 1'-0"

SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH SEISMIC REGIONS

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Job No. 14109.01 Sheet No. SK6
INTERNAL BRACKET INSTALLATION

EXTERNAL BRACKET INSTALLATION

SCHNEIDER ELECTRIC NETSHELTER SX CABINET FRAME

M8 BOLTS PROVIDED BY SCHNEIDER ELECTRIC WITH STANDARD CABINET PACKAGING AND AS OPTIONAL KIT AR7701 or AR7701A—S, POSITION BOLTS IN UPPER HALF OF SLOTTED HOLES.

2½” MIN. CONC. COVER

(E) CONC. SLAB

MINIMUM 3/8” HILTI KWIK BOLT KB–TZ BY SEOR, TYP.

1½” MIN. 6” MAX

BY SEOR

ADD NUT AND FASTEN TIGHT (SEE NOTE 4)

CONCRETE FILL OVER METAL DECK INSTALLATION

DETAIL

3”=1’–0”

SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE

LOW, MODERATE, AND HIGH SEISMIC REGIONS

Job No. 14109.01

Sheet No. SK7

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RMJ Structural Engineers
Robinson Meier Jolly & Associates
241 Joaquin Avenue San Leandro CA 94577 510.991.0977

NOTE:
OPTIONAL EXTERNAL INSTALLATION SHOWN DASHED.
RAISED COMPUTER OVER CONC. FILLED METAL DECK INSTALLATION

DETAIL 1

3" = 1' - 0"

NOTE:
OPTIONAL EXTERNAL INSTALLATION SHOWN DASHED.

SCHNEIDER ELECTRIC NETSHELTER SX CABINET FRAME
1/2" ø A36 THREADED ROD

USE A563 COUPLER NUT MIN 58 KSI TENSILE STRESS

COMPRESSION STRUT BY SEOR DESIGN FOR 2,000 LB MIN. LOAD TO PREVENT THREADED ROD FROM BUCKLING

M8 BOLTS PROVIDED BY SCHNEIDER ELECTRIC WITH STANDARD CABINET PACKAGING AND AS OPTIONAL KIT AR7701 or AR7701A-5, POSITION BOLTS IN UPPER HALF OF SLOTTED HOLES.

Vu strut

Vu

21/2" MIN. CONC. COVER

MINIMUM 3/8" ø HILTI KWIK BOLT KB-TZ BY SEOR, TYP. BY SEOR

24" MAX.

FOR USES OVER 24" SITE SPECIFIC ENGINEERING REQ'D

(R) CONC. SLAB

11/2" MIN. 6" MAX

1/4" MIN.
NOTE:
OPTIONAL EXTERNAL INSTALLATION SHOWN DASHED.

INTERNAL BRACKET INSTALLATION

EXTERNAL BRACKET INSTALLATION

SCHNEIDER ELECTRIC NETSHELTER SX CABINET FRAME

1/2" Ø A36 THREADED ROD

USE A563 COUPLER NUT MIN 58 KSI TENSILE STRESS

COMPRESSION STRUT BY SEOR DESIGN FOR 2,000 LB MIN. LOAD TO PREVENT THREADED ROD FROM BUCKLING

1/2" Ø HILTI KWIK BOLT KB-TZ

M8 BOLTS PROVIDED BY SCHNEIDER ELECTRIC WITH STANDARD CABINET PACKAGING AND AS OPTIONAL KIT AR7701 or AR7701A-S, POSITION BOLTS IN UPPER HALF OF SLOTTED HOLES.

ADD NUT AND FASTEN TIGHT

4" MIN

(E) CONC. SLAB

2 3/4" MIN EMBEDMENT FOR USES OVER 24" SITE SPECIFIC ENGINEERING REQ'D

RAISED COMPUTER OVER CONC. SLAB INSTALLATION

DETAIL

3" = 1'-0"

SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH SEISMIC REGIONS

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Robinson Meier Jolly & Associates
241 Joaquin Avenue
San Leandro CA 94577
510.991.0977

Job No. 14109.01
Sheet No. SK9

REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

JATSON E. HAINES
ENG. 12/31/2019
NOTE:
CUSTOMER MAY CHOOSE EITHER INTERNAL
OR EXTERNAL INSTALLATION FOR LOW
AND MODERATE SEISMIC REGIONS.

M6x12 HEX HEAD
CAP SCREW GRADE
10.9 STEEL ZINC
PLATED ISO
898-1, TYP.

EXTERIOR BRACKET
INSTALLATION
WHERE APPLICABLE.

DETAL
N.T.S.
B
SK10

SCHNEIDER ELECTRIC
NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH
SEISMIC REGIONS

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AR7701 BRACKET SUPPLIED BY SCHNEIDER ELECTRIC (4 TOTAL)
(0.118" THK PL ASTM A1008 SHS
GRADE 41)

PLAN

ELEVATION

DETAIL A

N.T.S.

NOTE:
FOR EXACT BRACKET DIMENSION SEE
SCHNEIDER ELECTRIC NETSHELTER SX
MANUFACTURER DRAWINGS.

SECTION

DETAIL B

N.T.S.

ASTM A1008–13 SHS
GRADE 41, TYP.
BRACKET SUPPLIED BY SCHNEIDER ELECTRIC (4 TOTAL) (0.118" THK PL ASTM A11011 SS GRADE 55)

NOTE:
FOR EXACT BRACKET DIMENSION SEE SCHNEIDER ELECTRIC NETSHELTER SX MANUFACTURER DRAWINGS.

SECTION DETAIL N.T.S. B SK12

ASTM A1008-13 SHS GRADE 41, TYP.

RMJ Structural Engineers
Robinson Meier Jolly & Associates
241 Joaquin Avenue
San Leandro CA 94577
510.991.0977

SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE LOW, MODERATE, AND HIGH SEISMIC REGIONS

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Job No. 14109.01 Sheet No. (SK12)
FACTORY INSTALLED
SELF CLINCHING PEM NUTS

NETSHELTER FRAME
HORIZ BASE
1
SK11

INTERIOR
BRACKET
LOC’N

NOTE:
BOTH INTERIOR
AND EXTERIOR
BRACKETS SHALL
BE INSTALLED

M6x12 HEX HEAD
CAP SCREW GRADE
10.9 STEEL ZINC
PLATED ISO
898-1,TYP.

EXTERIOR BRACKET
LOCATION WHERE
APPLICABLE

AR7701A-S BRACKET
FOR HIGH SEISMIC REGIONS

SCHNEIDER ELECTRIC
NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH
SEISMIC REGIONS

Signed by MAS Date 03.2018
SEISMIC BRACKET PLAN

0.38" max width hole for M8 bolt

0.5625" min diameter
0.625" max diameter

BRACKET SUPPLIED BY SCHNEIDER ELECTRIC (4 TOTAL) (0.1181" thk pl ASTM 1008-13, SHS grade 41 steel)

NOTE:
BRACKET SHALL BE FABRICATED BY SCHNEIDER ELECTRIC WITH METRIC DIMENSIONS, PER SCHNEIDER STANDARDS

SEISMIC BRACKET ELEVATION

DETAIL

N.T.S.

A

SK14

B

SK14

C

SK14

D

SK14

0.25"

2.76" 1.1875" 0.9685"

2.76"

1/8" bend radius

0.1182"

0.25"

1.9685"

1.9685"

1/8" bend radius

1/8"

0.25"

0.25"

PL 0.1181" ASTM 1008-13, SHS grade 41 steel

SEC.

N.T.S.

B

SK14

C

SK14

D

SK14

SCHNEIDER ELECTRIC NETSHELTER SX ANCHORAGE
LOW, MODERATE, AND HIGH SEISMIC REGIONS

ROBINSON

MAYER

JULLY & ASSOCIATES

241 Joaquin Avenue
San Leandro CA 94577
510.991.0977

SIGNED BY MAS DATE 03.2018

Job No.

14109.01

Sheet No.

SK13