



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD PREAPPROVAL OF MANUFACTURER'S CERTIFICATION (OPM)

OFFICE USE ONLY
APPLICATION #: OPM-0063-13

OSHPD Preapproval of Manufacturer's Certification (OPM)

Type: [] New [X] Renewal [] Update to Pre-CBC 2013 OPA Number:

Manufacturer Information

Manufacturer: Eaton's B-Line Series
Manufacturer's Technical Representative: Jeff Heron
Mailing Address: 13755 Stead Blvd, Reno, NV 89506
Telephone: 775-677-0855 x1724 Email: jeffheron@eaton.com

Product Information

Product Name: High Density Network Rack System
Product Type: Four-Post Adjustable Depth Server Rack and Two-Post Cable Management Rack
Product Model Number: Examples: HD4S7CFB (Four-Post Rack); HD2T7A (Cable Management Rack)
General Description: The four-post adjustable rack is an adjustable rail system for the use of storing advanced network equipment for Data Center applications. The Cable Management Rack is part of the same series, but used for storing similar products for network closets.

Applicant Information

Applicant Company Name: Eaton's B-Line Series
Contact Person: Daniel James
Mailing Address: 509 West Monroe, Highland, IL 62249
Telephone: 618-651-3024 Email: danielsjames@eaton.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant: [Signature] Date: 6-15-2015
Title: Product Manager Company Name: Eaton's B-Line Series

Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dvnamic Needs





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FACILITIES DEVELOPMENT DIVISION

Registered Design Professional Preparing Engineering Recommendations

Company Name: Armour Unsderfer Engineering, Inc.

Name: Brian Unsderfer California License Number: S5099

Mailing Address: 555 116th Avenue NE, Suite 118. Bellevue, WA 98004

Telephone: 425-614-0949 Email: brianu@au-eng.com

OSHPD Special Seismic Certification Preapproval (OSP)

- Special Seismic Certification is preapproved under OSP- (Separate application for OSP is required)
Special Seismic Certification is not preapproved

Certification Method(s)

- Testing in accordance with: ICC-ES AC156 FM 1950-10
Other* (Please Specify):

*Use of criteria other than those adopted by the California Building Standards Code, 2013 (CBSC 2013) for component supports and attachments are not permitted. For distribution system, interior partition wall, and suspended ceiling seismic bracings, test criteria other than those adopted in the CBSC 2013 may be used when approved by OSHPD prior to testing.

- Analysis
Experience Data
Combination of Testing, Analysis, and/or Experience Data (Please Specify):

List of Attachments Supporting the Manufacturer's Certification

- Test Report Drawings Calculations Manufacturer's Catalog
Other(s) (Please Specify):

OFFICE USE ONLY - OSHPD APPROVAL VALID FOR CBC 2013 ONLY

Signature: [Signature] Date: 09/15/2015
Print Name: William Staehlin
Title: SSE
Condition of Approval (if applicable):



B-Line

by **EATON**

OSHPD PRE-APPROVAL OF
MANUFACTURERS CERTIFICATION (OPM)

OPM-0063-13

BY: William Staehlin

CALIFORNIA BUILDING CODE 2013 (CBC 2013)

DATE: 09/15/2015



Eaton's B-Line Business

1375 Sampson Ave. - Corona, CA 92879
Ph# (951) 737-5599 - Fax# (951) 737-0330

Table of Contents

Section 1 - General Notes

Preface	1-1
Introduction	1-2
Building Codes, Standards, & Guidelines	1-6
Expansion Anchors General Notes	1-7
Responsibilities of the Structural Engineer of Record (SEOR) of the Building	1-8

Section 2 - Electrical Equipment Support & Attachment Details

3" Two-Post Network Equipment Rack Details	2-1
Two Post Seismic Relay Rack Details, ($S_{Ds} \leq 1.10$)	2-7
3" Two-Post Network Equipment Rack w/ Gussett Plate Details	2-11
E ² Vertical Cabinet Frames Details	2-17
Four Post - Adjustable Depth Rack Details	2-21
CCVG Series Cabinet Details	2-25
Two Post Seismic Relay Rack Details, ($S_{Ds} \leq 1.00$)	2-29
V-Line Dual Hinge Wall Mount Cabinet Detail	2-33
Attachment of Swing Gate Wall Mounted Equipment Rack	2-35
Steel Deck Requirements and Angle Detail	2-37
Wall Mounted Cable Runway Bracket Detail	2-38
Cable Runway Wall Mounted & Floor Mounted Detail	2-40

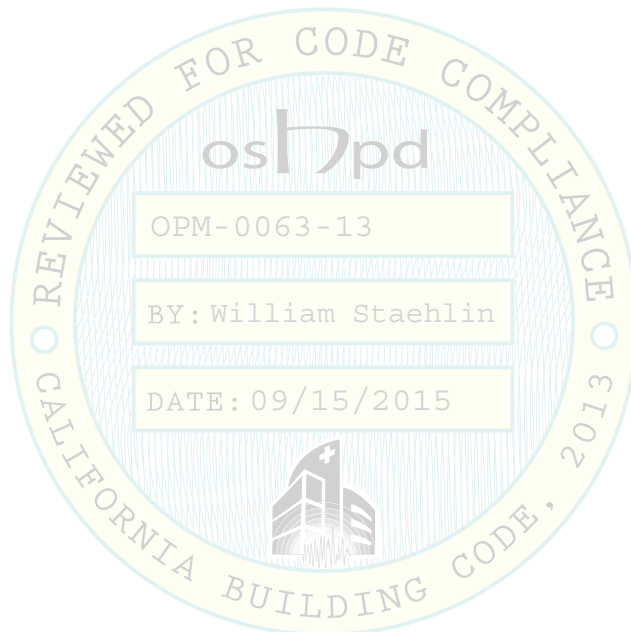


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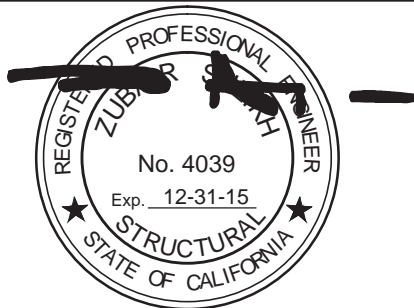
SECTION 1

GENERAL INFORMATION



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STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	October 24, 2013	PAGE: 1-0

0.0 PREFACE

I. Scope and Limitations:

This pre-approval is for the supports and attachments of the electrical equipment to the structure.

II. The Type of Electrical Equipment Included in the Pre-Approval are as Follows:

- a. 3" Two-Post Network Equipment Rack
- b. Two-Post Seismic Relay Rack
- c. E2 Vertical Cabinet Frame
- d. Four-Post Seismic Relay Rack
- e. CCVG Series Cabinet Details
- f. V-Line Dual Hinge Wall Cabinet
- g. Swing Gate Wall Mounted Equipment Rack
- h. Wall Mounted Network Equipment Rack
- i. Wall Mounted Cable Runway Bracket
- j. Cable Runway Wall Mounted & Floor Mounted

III. The Substrates included in this Pre-Approval are as Follows:

- a. Concrete
- b. Steel Stud



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DATE:	PAGE:
October 24, 2013	1-1

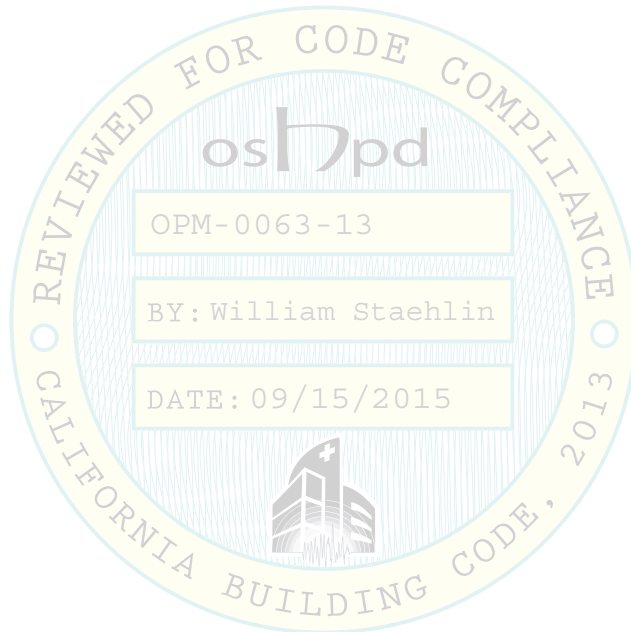
1.0 INTRODUCTION

I. This OSHPD pre-approval of Manufacturer's Certification (OPM) is based on the CBC 2013. The demand (design forces) for use with this OPM shall be based on the CBC 2013. The S_{DS} parameter varies to allow for site specific installations.

II. This manual is prepared for pre-approval of supports and attachments of electrical equipment. Following is an outline of the manual:

Section 1 - General Information. Presents general notes and requirements for supports and attachments of electrical equipment.

Section 2 - Electrical Equipment Supports and Attachment Details. Includes the manufacturer's equipment information, and the minimum anchor bolt requirements.



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ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	1-2

II. Supports and attachments design and layout drawings shall be either prepared by a Registered Structural Engineer licensed in California with experience in the design of anchors for electrical systems, or prepared by a qualified engineer with experience in the design of anchors for electrical systems and reviewed, stamped and signed by a Registered Structural Engineer licensed in California with experience in the design of anchors for electrical equipment.

III. For supports and attachments design per this manual, OSHPD to verify that the seismic force level used for bracing design for the site specific project matches.

IV. Modifications and/or changes to the designs shown in this OSHPD Pre-Approval shall be performed or reviewed by a qualified Registered Structural Engineer and approved by the design engineer of record and OSHPD.

V. When more than one criteria is presented, the more stringent criteria shall be used. The data presented in this manual is subject to change without notice. Refer to the appropriate codes and standards for additional information and requirements.

VI. The structural engineer of record shall verify the adequacy of the supporting structure and its components for the loads applied to the supporting structure and its components by the equipment supports and attachments design, and compliance with the applicable codes and standards.

VII. A copy of this manual and copies of all other details, layouts and calculations shall be at the jobsite and readily available prior to installing the equipment supports and attachments designed.

VIII. It is the responsibility of the user of this manual to be familiar with all requirements for supports and attachments design and shall be proficient in determining and applying utility loads for their application.

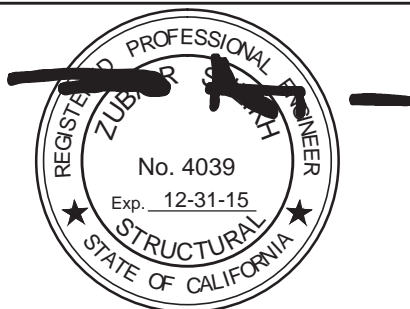
IX. The user of this manual shall determine the minimum anchor requirements (anchor spacing, edge distance, etc.) satisfies the conditions shown on the pre-approved details. The user shall determine the maximum tension and shear loads of earthquake demand loads.

X. As with all pre-approved details, systems, etc., plans are still required showing how and where this pre-approved anchorage detail will be applied on a project specific basis. This process is needed to verify that the appropriate detail has been selected and applied for each condition and for the actual substrate that it will be connected/attached to.

XI. The Structural Engineer of Record (SEOR) shall review and forward the supports and attachment plans for plan check with a notation indicating that the plans have been reviewed and they have been found to be in general conformance with the design of the project. A "shop drawing stamp" is usually acceptable for compliance with this requirement. The regional staff, on a project specific basis, must review supports and attachments details and supporting calculations that are not part of this pre-approval. Review of supports and attachments details of this nature does not constitute a pre-approval that may be used on other projects without the benefit of plan review.

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ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	1-3

XII. Layout Drawings:

a. Layout drawings of the supports and attachments in accordance with the pre-approval shall be submitted to the Registered Design Professional (RDP) in responsible charge of the project for review to verify that the details are in conformance with the code requirements. The layout drawings shall as a minimum satisfy the requirements of ASCE 7 Section 13.6 (Including supplements #1 & #2) as modified by the CBC 2013 Section 1616A.

i. The Structural Engineer Of Record (SEOR) shall verify that the supporting structure is adequate for the forces imposed on it by the supports and attachments installed in accordance with the pre-approval in addition to all other loads.

ii. The SEOR shall forward the supports, attachments, and bracing drawings (including approved amended construction documents for supplementary framing where required) to the discipline in responsible charge with a notation indicating that the drawings have been reviewed and are in general conformance with the pre-approval and the design of the project.

iii. A "shop drawing stamp" may be used to indicate compliance with this requirement.

iv. The Registered Design Professional (RDP), other than SEOR, may provide the shop drawing stamp for small projects at the discretion of the OSHPD District Structural Engineer.

b. The SEOR shall design any supplementary framing that is needed to resist the loads, maintain stability and/or is required for installation of pre-approved system.

i. The supplementary framing shall be submitted to OSHPD as an Amended Construction Documents (ACD).

c. The layout drawings (with the shop drawing stamp) shall be submitted to the OSHPD for review:

i. Structure supporting the distribution system has adequate capacity;

ii. Seismic design forces (F_p) and the seismic design criteria are in accordance with the CBC 2013

iii. Verify that submittal is within the scope of OSHPD Preapproval of Manufacturer's Certification (OPM):

- Maximum weight, range of sizes, and Center of Gravity (CG)
- Minimum edge distance and spacing for attachments
- Substrate for attachments.

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STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	1-4

d. The layout drawings (with the shop drawing stamp) shall be kept on the jobsite and can then be used for installation of the support and bracing.

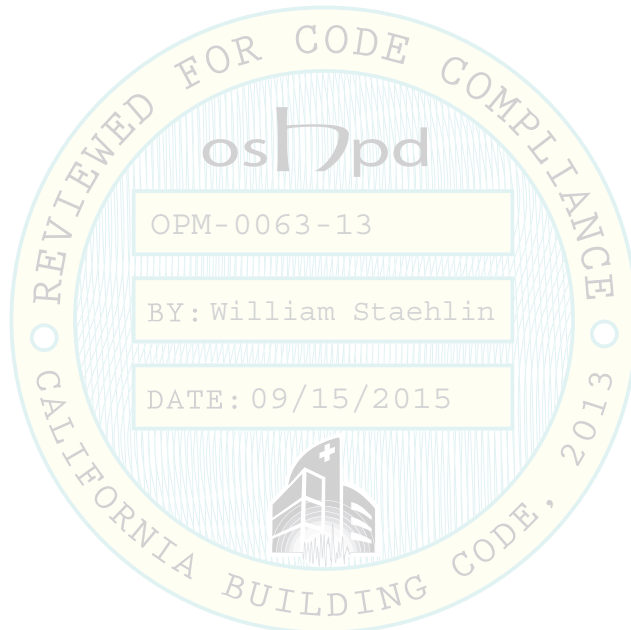
OSHPD field staff will review the installation.

e. A copy of the chosen electrical equipment supports and attachments installation guide/OPM manual shall be on the jobsite prior to starting the installation of supports and attachments.

It is the contractor's responsibility to obtain copies of OPM and furnish the IOR with one copy of each.

f. Any substitution of component of an OPM system shall require OSHPD review and approval.

Reference: 2013 CAC Sections 7-115, 7-126, 7-153, and CBC 2013 Section 107.



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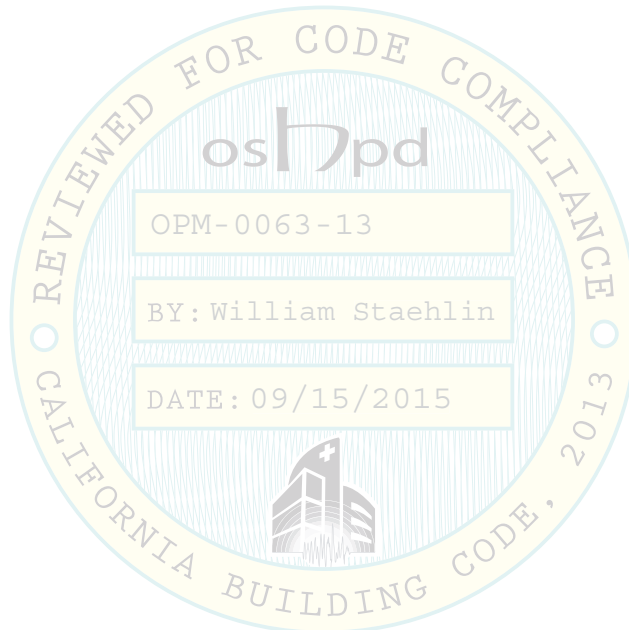
STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	1-5

2.0 BUILDING CODES, STANDARDS, & GUIDELINES

I. The Eaton's B-Line Business guidelines are designed to meet or exceed the requirements of the following:

- 2013 California Building Code (CBC 2013)
- American Concrete Institute (ACI 318-11)
- American Society of Civil Engineers (ASCE 7-10) with Supplements #1 & #2

These guidelines are intended to describe the minimum supports and attachments requirements for the electrical industry's most commonly used equipment.



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ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	1-6

3.0 EXPANSION ANCHOR GENERAL NOTES

I. Expansion anchors:

(a) Attachment is to be made with the anchors listed below and installed as described in the corresponding ICC report.

Anchor Diameter	Concrete Type	MIN. f'c (psi)	Anchor Type	ICC Report No.	h _{ef} Min. Embed.	Min. Spacing	Min. Edge Dist.	Min. Conc. Thickness	Installation Torque (i)	Test Loads
5/8	NWC	3000	Hilti Kwik Bolt TZ	ESR-1917 (2015)	4"	12"	6"	6"	60 FT-LBS	Direct Pull Tension - 4540 lbs
5/8	NWC	3000	Hilti Kwik Bolt TZ	ESR-1917 (2015)	3 1/8"	12"	6"	6"	60 FT-LBS	Direct Pull Tension - 4540 lbs
3/8	NWC, Sand LWC	3000	Hilti Kwik Bolt TZ	ESR-1917 (2015)	2"	12"	6"	3.25"	25 FT-LBS	Direct Pull Tension - 1580 lbs

i. Installation Torque requirement shall comply with the latest valid ICC report.

(b) This Pre-Approval allows for up to a maximum of 2 adjacent concrete slab edges, 8" (see schedule) away minimum (i.e. - corner). See adjacent detail for additional minimum allowable concrete edge distance.

II. Testing of expansion anchors per 2013 CBC, 1913A-7: Testing shall be done in the presence of the special inspector and a report of the test results shall be submitted to OSHPD.

(a) After at least 24 hours have elapsed since installation, direct pull tension test or torque at least 50% of the anchors.

(b) Acceptance Criteria: The anchor should have no observable movement at the test load. A practical way to determine observable movement is that the washer becomes loose. The specified torque must be attained with a calibrated torque wrench within 1/2 turn of the nut.

(c) Required test loads shall be determined by one of the following methods:

1. Twice the maximum allowable tension load or one and a quarter (1-1/4) times the maximum design strength of anchors as provided in an approved test report using criteria adopted in the 2013 CBC or determined in accordance with Appendix D of ACI 318. Tension test load need not exceed 80% of the the nominal yield strength of the anchor element.

2. The manufacturer's recommended installation torque based on approved test report using criteria adopted in the 2013 CBC.

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

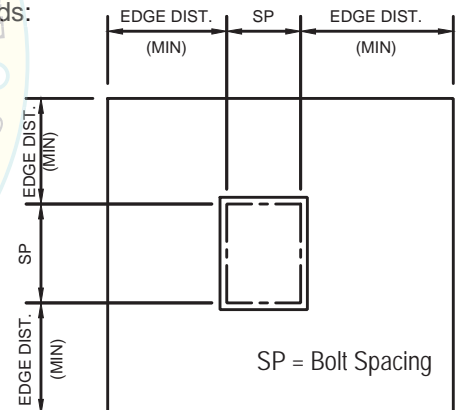


Fig. 1 - Typical Concrete Edge Detail

III. Concrete anchor design information and loads become invalid when concrete anchors have any stand-off distance from the base structure.

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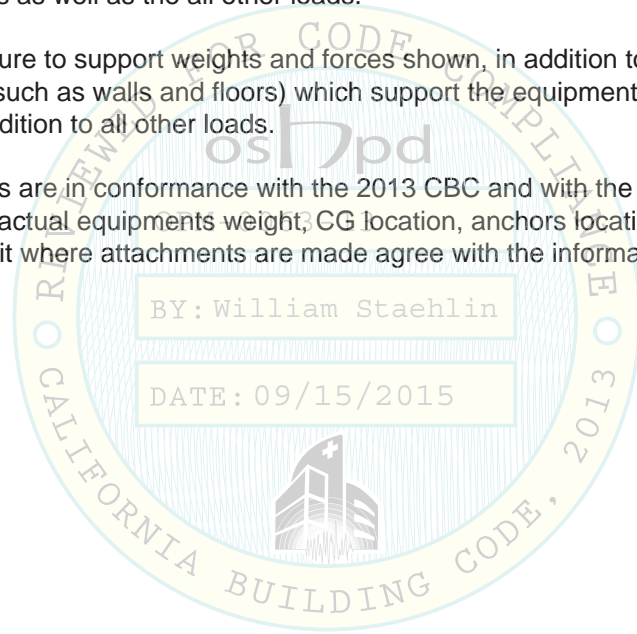
STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	1-7

4.0 RESPONSIBILITIES OF THE STRUCTURAL ENGINEER OF RECORD (SEOR) OF THE BUILDING

- I. Verify that project specific values of S_{DS} & z/h results in seismic forces (E_h , E_v) that do not exceed the values on the details.
- II. Verify that the concrete slab to which the equipment is anchored meets the requirements of the applicable ICC ESR.
- III. Verify that the anchors are an adequate distance from any slab edges or openings (see Fig. 1 - TYP. Concrete Edge Detail (1-7)).
- IV. Verify that all new or existing anchors are an adequate distance from the anchors shown on this pre-approval. In no case shall this unit's anchors be within 6" or 8" edge distance shown Fig. 1 - TYP. Concrete Edge Detail (1-7) from any new existing anchors.
- V. Design backing bars, studs, etc. which the units are attached to as noted on the drawings. The SEOR shall also verify the adequacy of the structures (such as walls and floors) which support the units for the loads imposed on them by the units as well as the all other loads.
- VI. Provide supporting structure to support weights and forces shown, in addition to all other loads. Verify the adequacy of the structures (such as walls and floors) which support the equipment for the loads imposed on them by the equipment in addition to all other loads.
- VII. Verify that all installations are in conformance with the 2013 CBC and with the details shown in this pre-approval. Verify that the actual equipments weight, CG location, anchors locations, anchor details, and the materials and gage of the unit where attachments are made agree with the information shown on the pre-approval documents.

BY: William Staehlin

DATE: 09/15/2015



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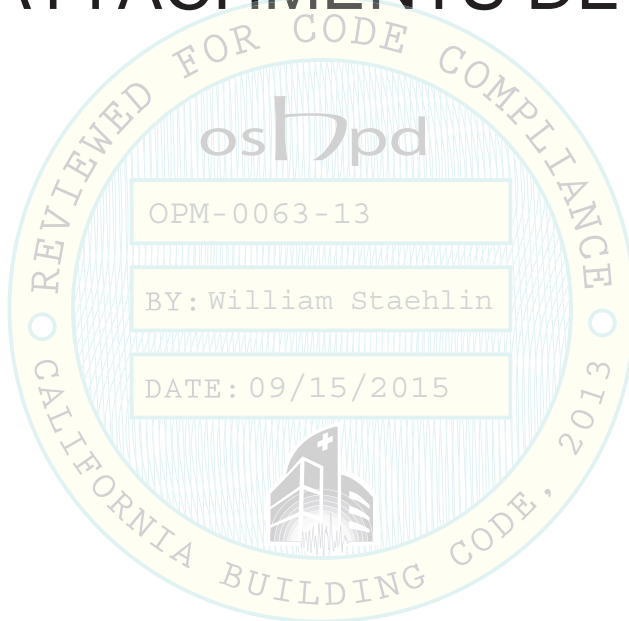
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DATE:	October 24, 2013	PAGE: 1-8

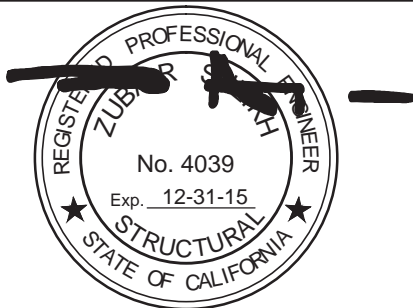
SECTION 2

ELECTRICAL EQUIPMENT SUPPORT AND ATTACHMENTS DETAILS



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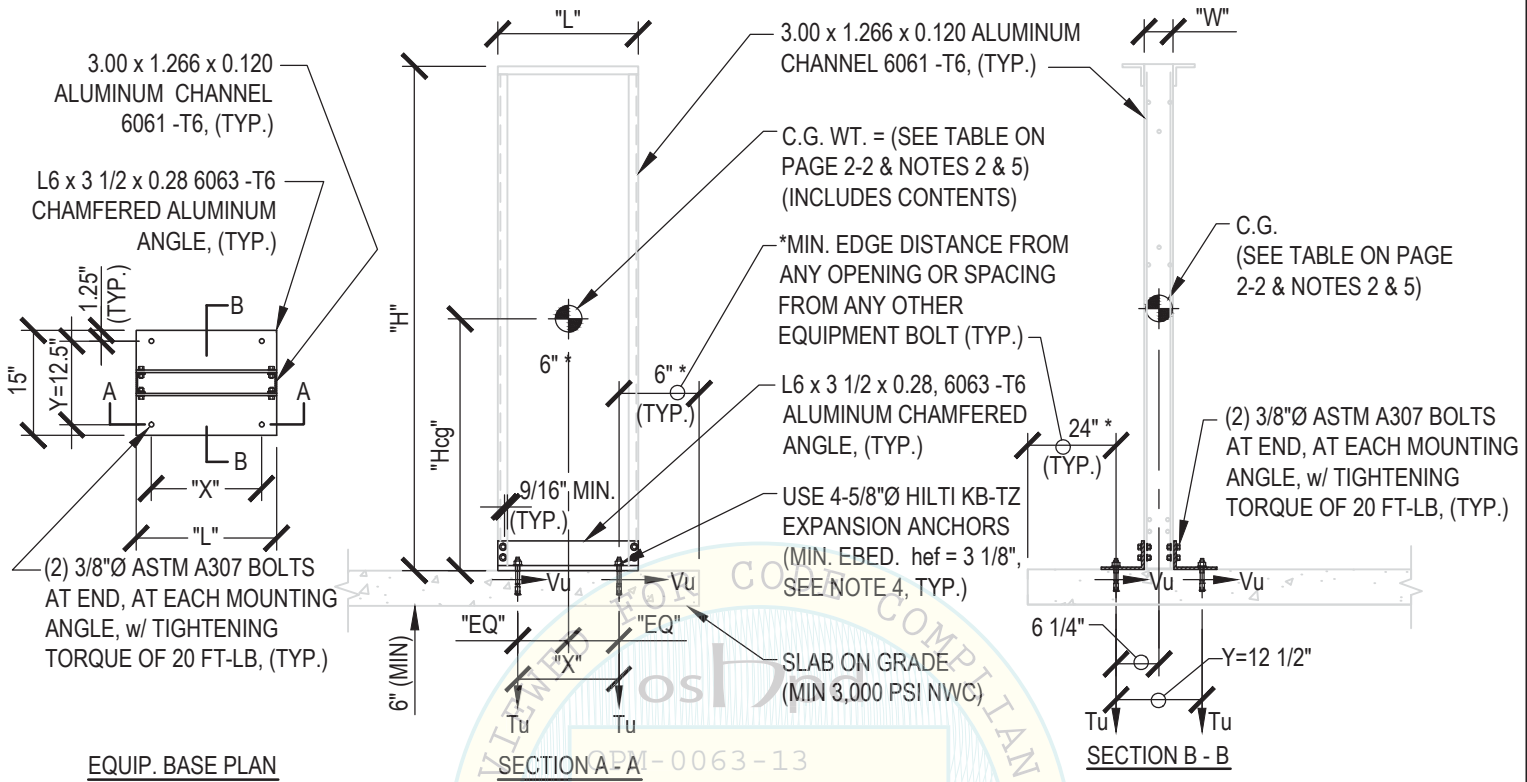
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DATE:	PAGE: 2-0
October 24, 2013	

3" TWO-POST NETWORK EQUIPMENT RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 2.00$)

DETAIL



EQUIP. BASE PLAN

SECTION A - A

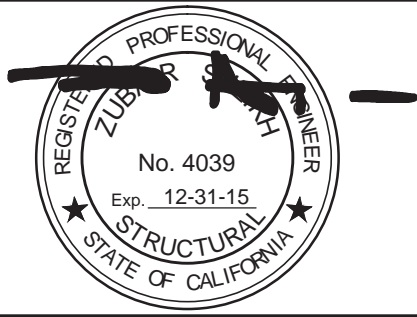
SECTION B - B

GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.90 W_p$ ($S_{DS} = 2.00$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h = 0.0$)
 VERTICAL FORCE (E_v) = $0.40 W_p$
 SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1 NOTE 4.0)
- REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
- FOR DIMENSIONS, SEE TABLE ON PAGE 2-2.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT.



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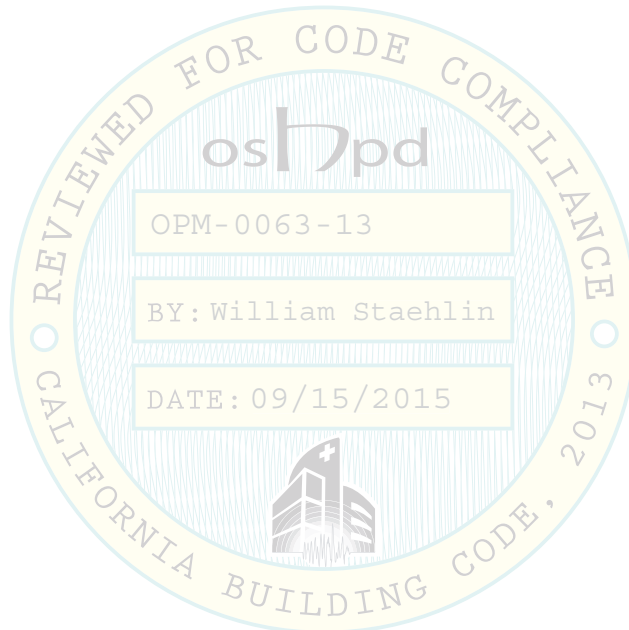
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DATE:	PAGE: 2-1
October 24, 2013	

3" TWO-POST NETWORK EQUIPMENT RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 2.00$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]	Panel Width
SB556036XU	475	20.3	3.0	36.0	18.0	16.0	12.5	1158	279	22	19" Panel Width
SB556048XU	360	20.3	3.0	48.0	24.0	16.0	12.5	1218	211	24	
SB556072XU	240	20.3	3.0	72.0	36.0	16.0	12.5	1265	141	27.5	
SB556084XU	200	20.3	3.0	84.0	42.0	16.0	12.5	1243	117	30	
SB556096XU	175	20.3	3.0	96.0	48.0	16.0	12.5	1253	103	31.5	
SB556108XU	150	20.3	3.0	108.0	54.0	16.0	12.5	1216	88	33.5	
SB558036XU	500	24.3	3.0	36.0	18.0	20.0	12.5	1403	294	24.5	23" Panel Width
SB558048XU	370	24.3	3.0	48.0	24.0	20.0	12.5	1433	217	26.5	
SB558072XU	245	24.3	3.0	72.0	36.0	20.0	12.5	1471	144	30	
SB558084XU	210	24.3	3.0	84.0	42.0	20.0	12.5	1485	123	32	
SB558096XU	180	24.3	3.0	96.0	48.0	20.0	12.5	1465	106	34	
SB558108XU	160	24.3	3.0	108.0	54.0	20.0	12.5	1473	94	36	

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



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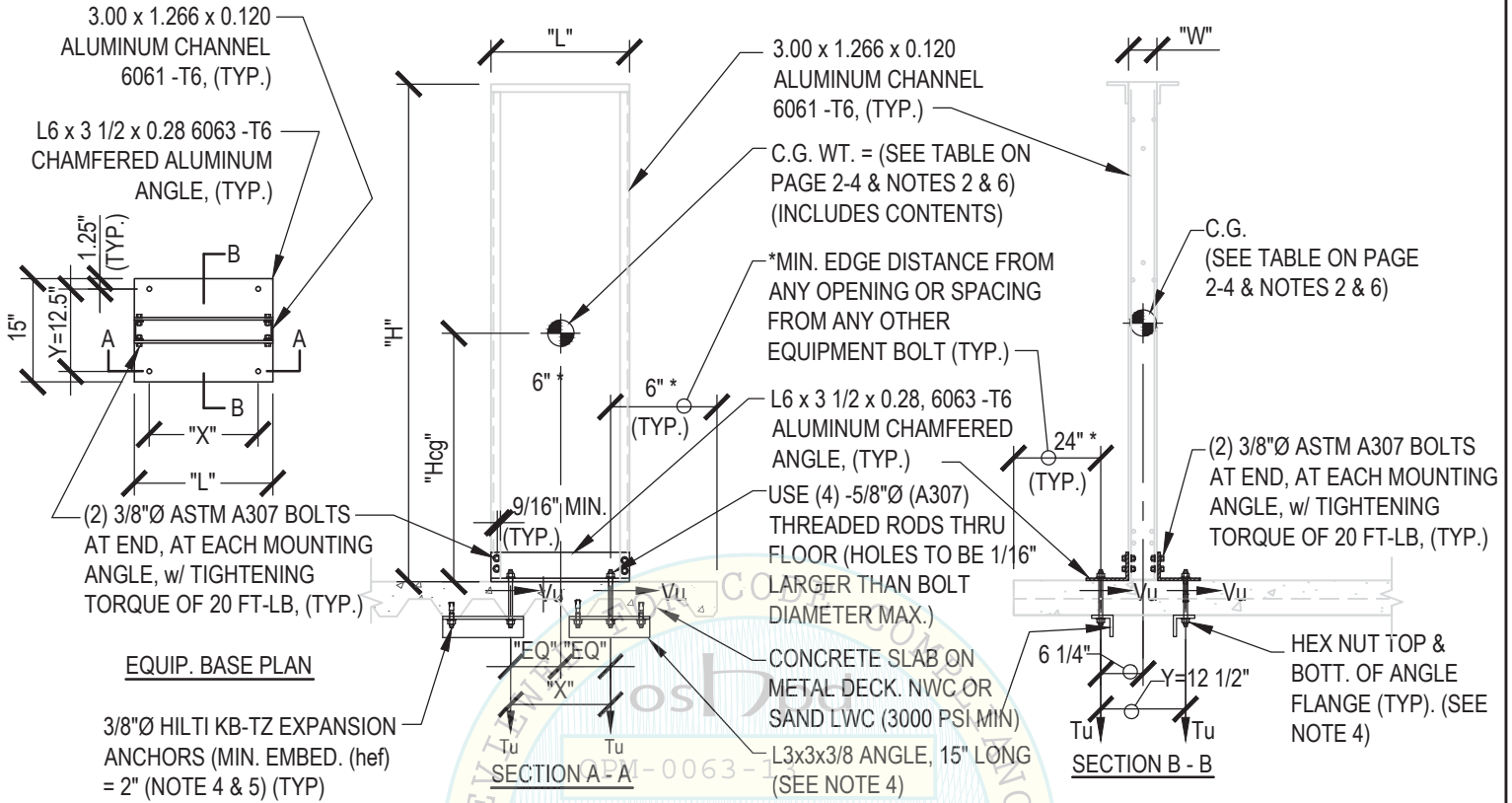
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 DATE: October 24, 2013 PAGE: 2-2

3" TWO-POST NETWORK EQUIPMENT RACK ATTACHMENT ATTACHMENT TO MIN. 3,000 PSI
 NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN),
 ($S_{DS} \leq 1.30$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.98 W_p$ ($S_{DS} = 1.30$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.26 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

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

3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.

4. REFER TO PAGE 2-37 FOR MIN. STEEL DECK REQUIREMENTS.

5. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.

6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.

7. FOR DIMENSIONS, SEE TABLE ON PAGE 2-4

8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT.

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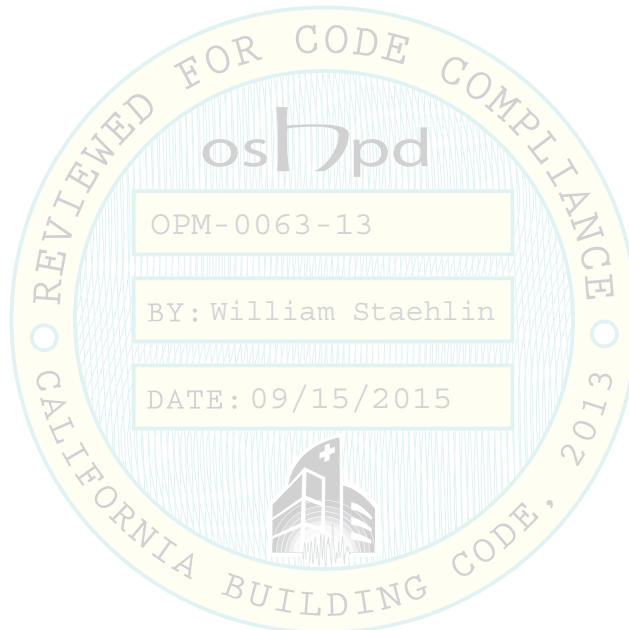
STRUCTURAL ENGINEER:
 ZUBAIR SHEIKH
 DATE: October 24, 2013
 PAGE: 2-3

3" TWO-POST NETWORK EQUIPMENT RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 1.30$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lb]	Panel Width
SB556036XU	475	20.3	3	36	18	16	12.5	1218	302	22	19" Panel Width
SB556048XU	360	20.3	3	48	24	16	12.5	1291	229	24	
SB556072XU	240	20.3	3	72	36	16	12.5	1352	153	27.5	
SB556084XU	200	20.3	3	84	42	16	12.5	1331	127	30	
SB556096XU	175	20.3	3	96	48	16	12.5	1344	111	31.5	
SB556108XU	150	20.3	3	108	54	16	12.5	1305	95	33.5	
SB558036XU	500	24.3	3	36	18	20	12.5	1481	318	24.5	23" Panel Width
SB558048XU	370	24.3	3	48	24	20	12.5	1523	235	26.5	
SB558072XU	245	24.3	3	72	36	20	12.5	1575	156	30	
SB558084XU	210	24.3	3	84	42	20	12.5	1593	134	32	
SB558096XU	180	24.3	3	96	48	20	12.5	1573	115	34	
SB558108XU	160	24.3	3	108	54	20	12.5	1583	102	36	

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



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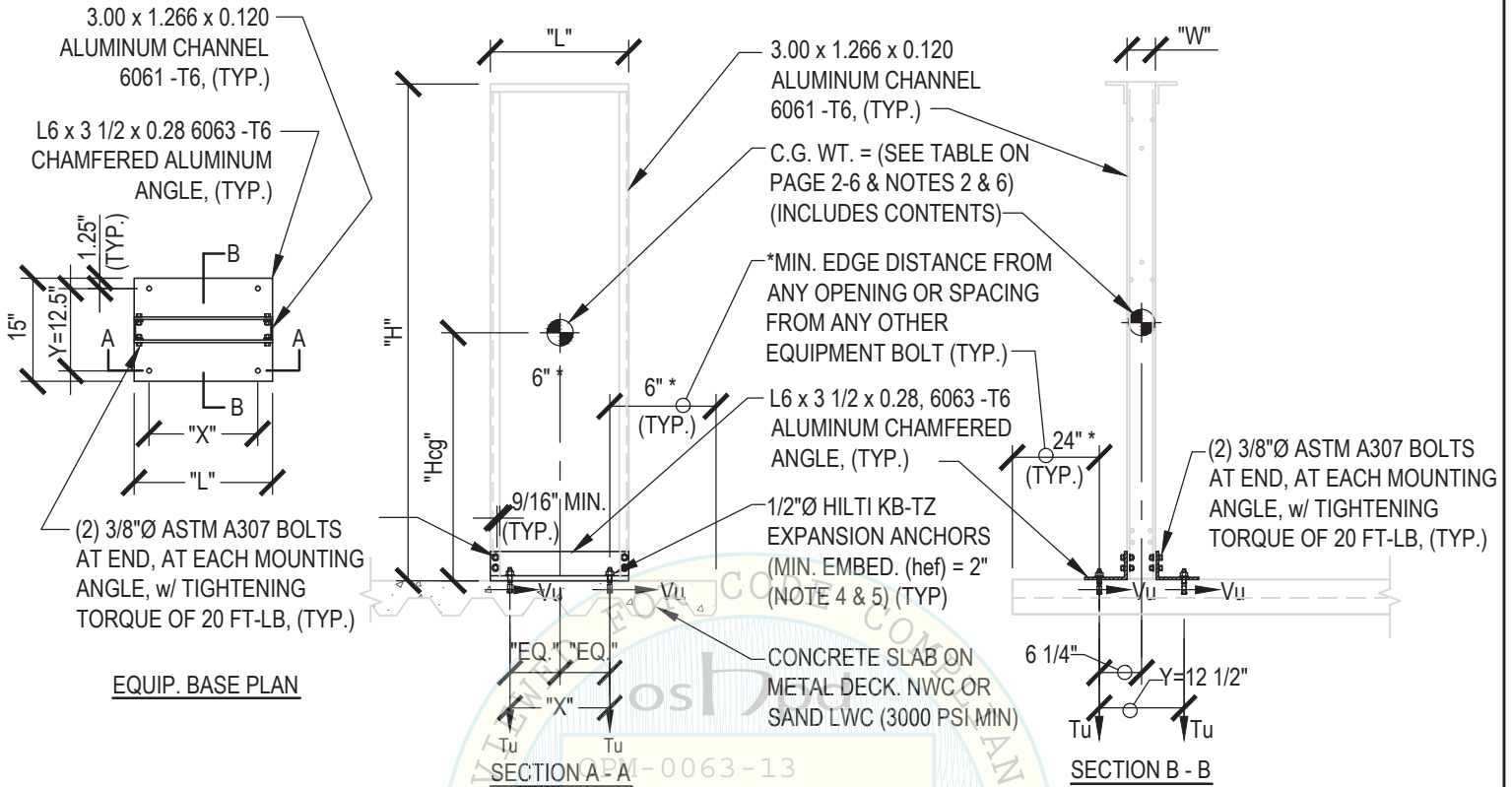
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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-4

3" TWO-POST NETWORK EQUIPMENT RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) , ($S_{DS} \leq 0.64$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.48 W_p$ ($S_{DS}=0.64$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 1.0$)

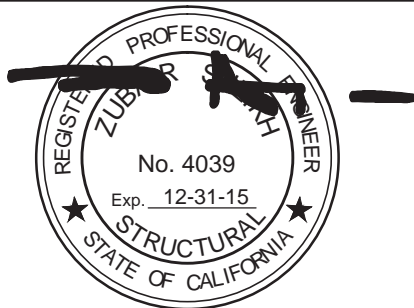
VERTICAL FORCE (E_v) = $0.13 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORD'S RESPONSIBILITIES.
- REFER TO PAGE 2-37 FOR MIN. STEEL DECK REQUIREMENTS.
- REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
- FOR DIMENSIONS, SEE TABLE ON PAGE 2-6
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).



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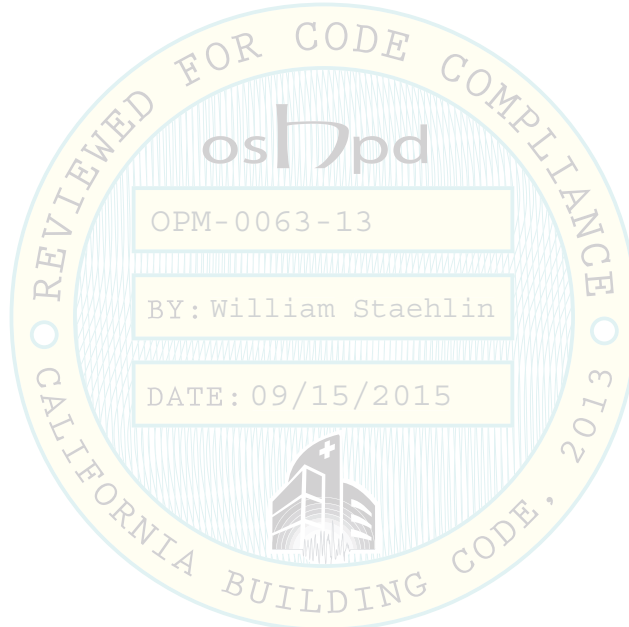
STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE: 2-5
October 24, 2013	

3" TWO-POST NETWORK EQUIPMENT RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) , ($S_{DS} \leq 0.64$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]	Panel Width
SB556036XU	475	20.3	3	36	18	16	12.5	428	149	22	19" Panel Width
SB556048XU	360	20.3	3	48	24	16	12.5	506	113	24	
SB556072XU	240	20.3	3	72	36	16	12.5	579	75	27.5	
SB556084XU	200	20.3	3	84	42	16	12.5	583	63	30	
SB556096XU	175	20.3	3	96	48	16	12.5	598	55	31.5	
SB556108XU	150	20.3	3	108	54	16	12.5	588	47	33.5	
SB558036XU	500	24.3	3	36	18	20	12.5	549	157	24.5	23" Panel Width
SB558048XU	370	24.3	3	48	24	20	12.5	616	116	26.5	
SB558072XU	245	24.3	3	72	36	20	12.5	687	77	30	
SB558084XU	210	24.3	3	84	42	20	12.5	708	66	32	
SB558096XU	180	24.3	3	96	48	20	12.5	710	56	34	
SB558108XU	160	24.3	3	108	54	20	12.5	722	50	36	

a. Tu max and Vu max loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



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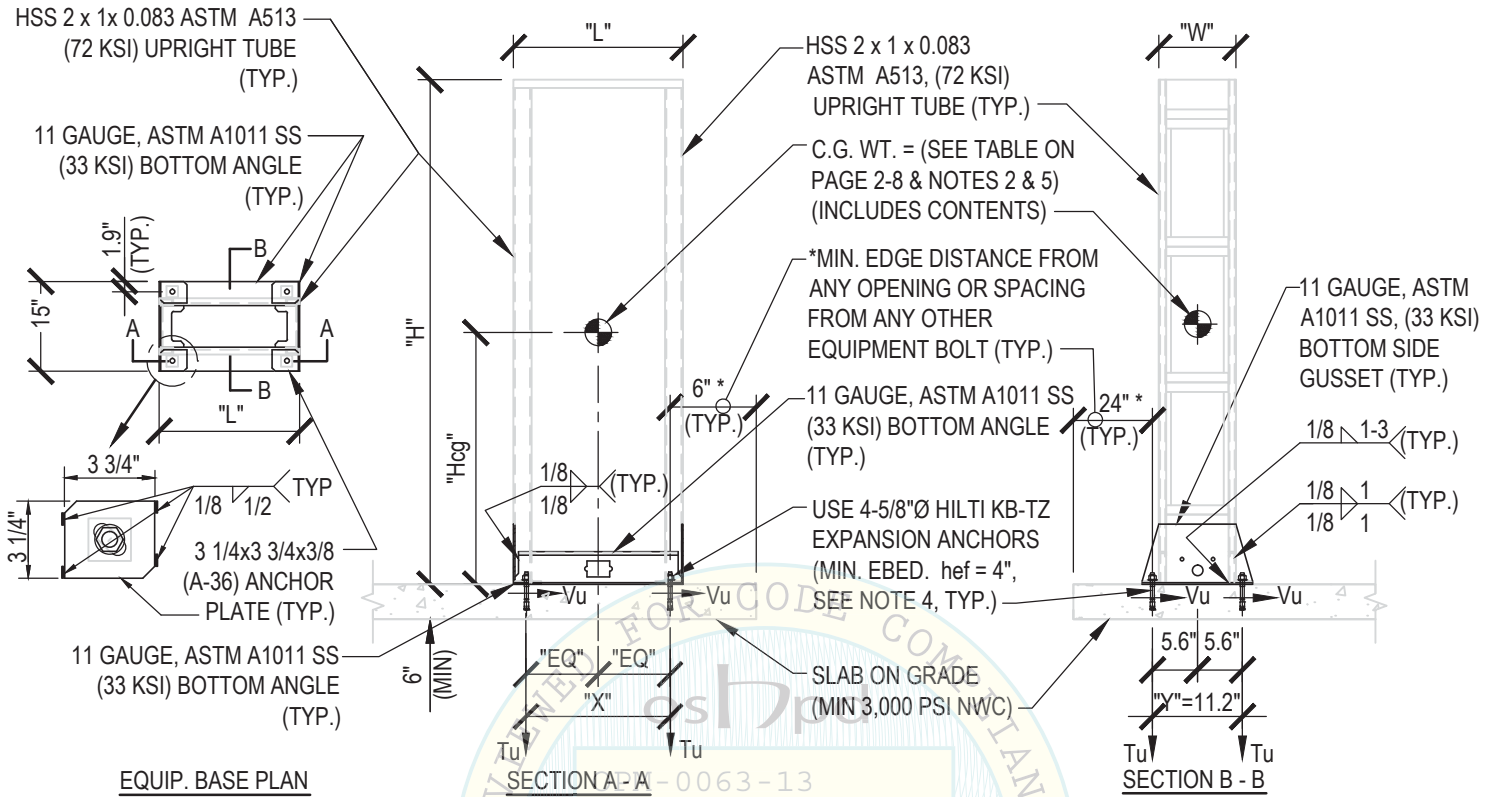
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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-6

TWO POST SEISMIC RELAY RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.10$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.50 W_p$ ($S_{DS} = 1.10$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h = 0.0$)
 VERTICAL FORCE (E_v) = $0.22 W_p$
2. SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)
3. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
4. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
5. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
7. FOR DIMENSIONS, SEE TABLE ON PAGE 2-8.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-7

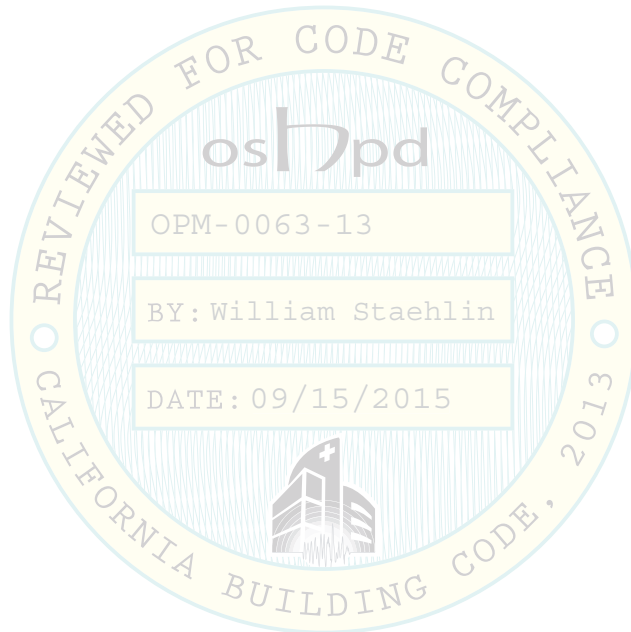
TWO POST SEISMIC RELAY RACK
ANCHORED TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.10$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu* max LRFD [lb]	Unit Wt. [lbs]
SB85219084	714	24.75	8	84	42	21.62	11.2	2741	461	130
SB85223084	718	28.75	8	84	42	25.62	11.2	3314	464	137

a. Tumax and Vumax loads in table includes over strength factor $\Omega_0 = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11

* The shear forece "Vu" shown on table above distributed over 2-bolts only.



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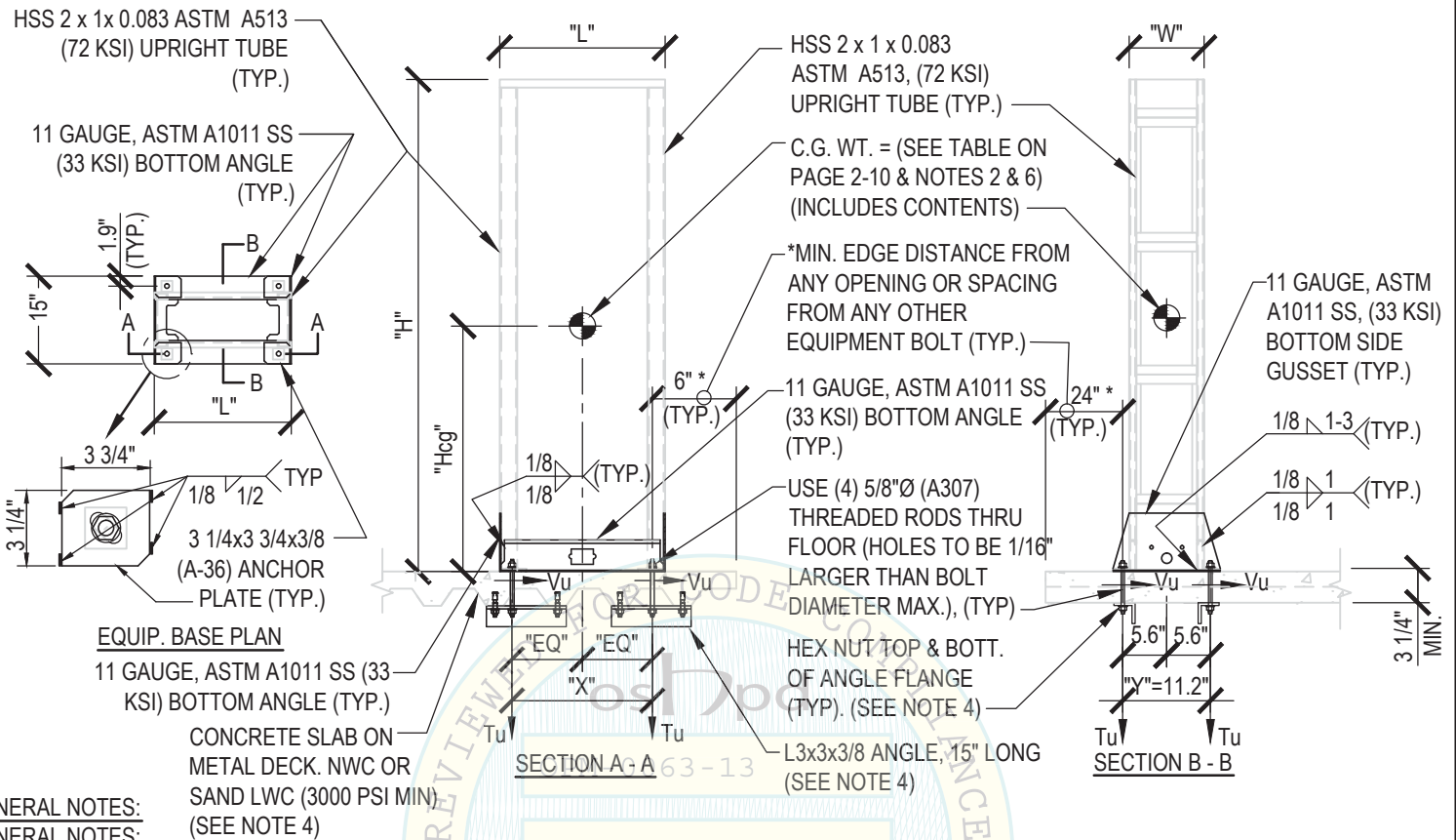
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STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	October 24, 2013	PAGE: 2-8

TWO POST SEISMIC RELAY RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) , ($S_{DS} \leq 1.10$)

DETAIL



GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.83 W_p$ ($S_{DS} = 1.10$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 1.0$)
 VERTICAL FORCE (E_v) = $0.22 W_p$
 SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER TO PAGE 2-37 FOR MIN. STEEL DECK REQUIREMENTS.
- REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT.

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PAGE: 2-9

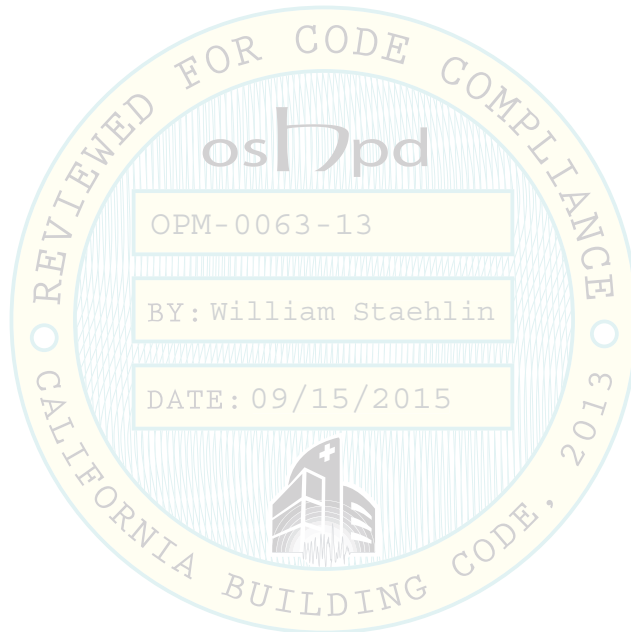
TWO POST SEISMIC RELAY RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) , ($S_{DS} \leq 1.10$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu* max LRFD [lb]	Unit Wt. [lbs]
SB85219084	714	24.75	8	84	42	21.62	11.2	4770	769	130
SB85223084	637	28.75	8	84	42	25.62	11.2	5081	686	137

a. Tumax and Vumax loads in table includes over strength factor $\Omega_0 = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11

* The shear force "Vu" shown on table above distributed over 2-bolts only.



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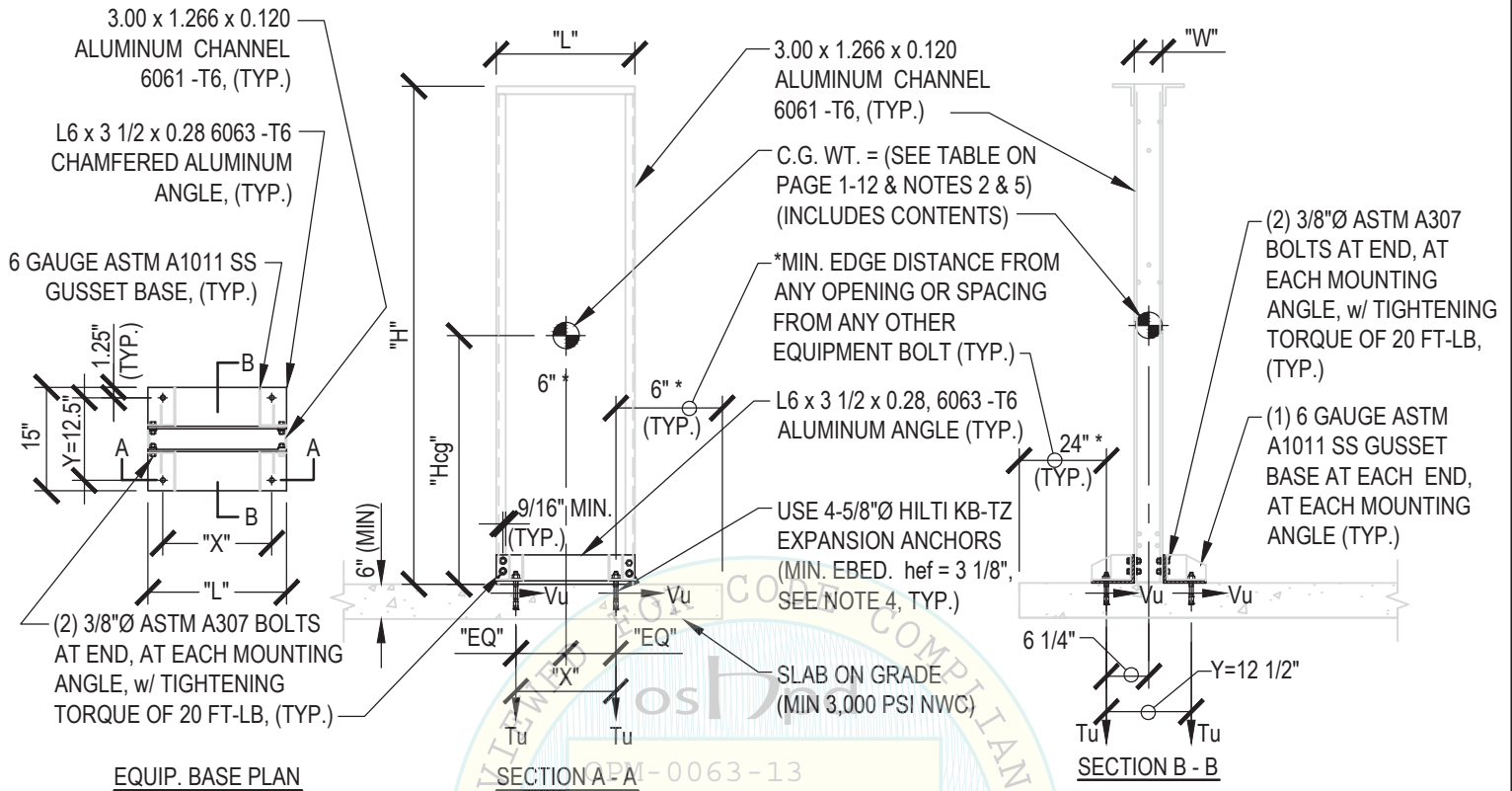
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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-10

3" TWO-POST NETWORK EQUIPMENT RACK W/ GUSSET PLATE
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 2.0$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.90 W_p$ ($S_{DS} = 2.00$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h = 0.0$)

VERTICAL FORCE (E_v) = $0.40 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1 NOTE 4.0
4. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
5. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
6. FOR DIMENSIONS, SEE TABLE ON PAGE 2-12.
7. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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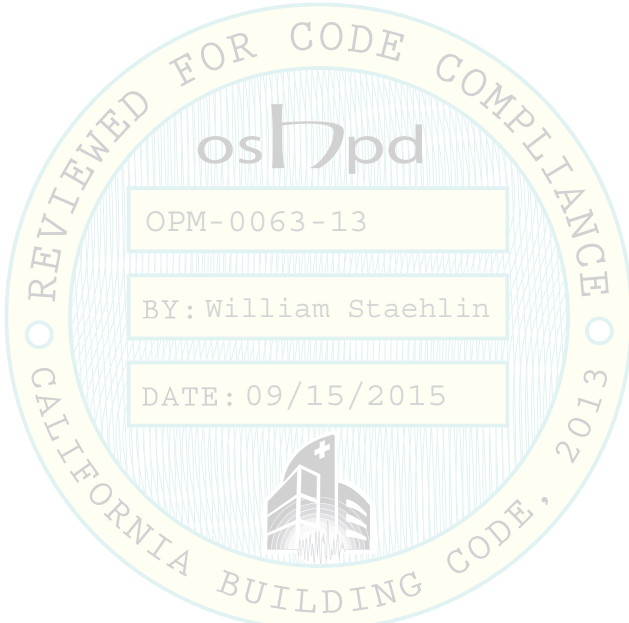
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DATE:	PAGE: 2-11
October 24, 2013	

**3" TWO-POST NETWORK EQUIPMENT RACK W/ GUSSET PLATE
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 2.0$)**

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]	Panel Width
SB556036XU	475	20.3	3	36	18	16	12.5	1158	279	22	19" Panel Width
SB556048XU	360	20.3	3	48	24	16	12.5	1218	211	24	
SB556072XU	240	20.3	3	72	36	16	12.5	1265	141	27.5	
SB556084XU	200	20.3	3	84	42	16	12.5	1243	117	30	
SB556096XU	175	20.3	3	96	48	16	12.5	1253	103	31.5	
SB556108XU	150	20.3	3	108	54	16	12.5	1216	88	33.5	
SB558036XU	500	24.3	3	36	18	20	12.5	1403	294	24.5	23" Panel Width
SB558048XU	370	24.3	3	48	24	20	12.5	1433	217	26.5	
SB558072XU	245	24.3	3	72	36	20	12.5	1471	144	30	
SB558084XU	210	24.3	3	84	42	20	12.5	1485	123	32	
SB558096XU	180	24.3	3	96	48	20	12.5	1465	106	34	
SB558108XU	160	24.3	3	108	54	20	12.5	1473	94	36	

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



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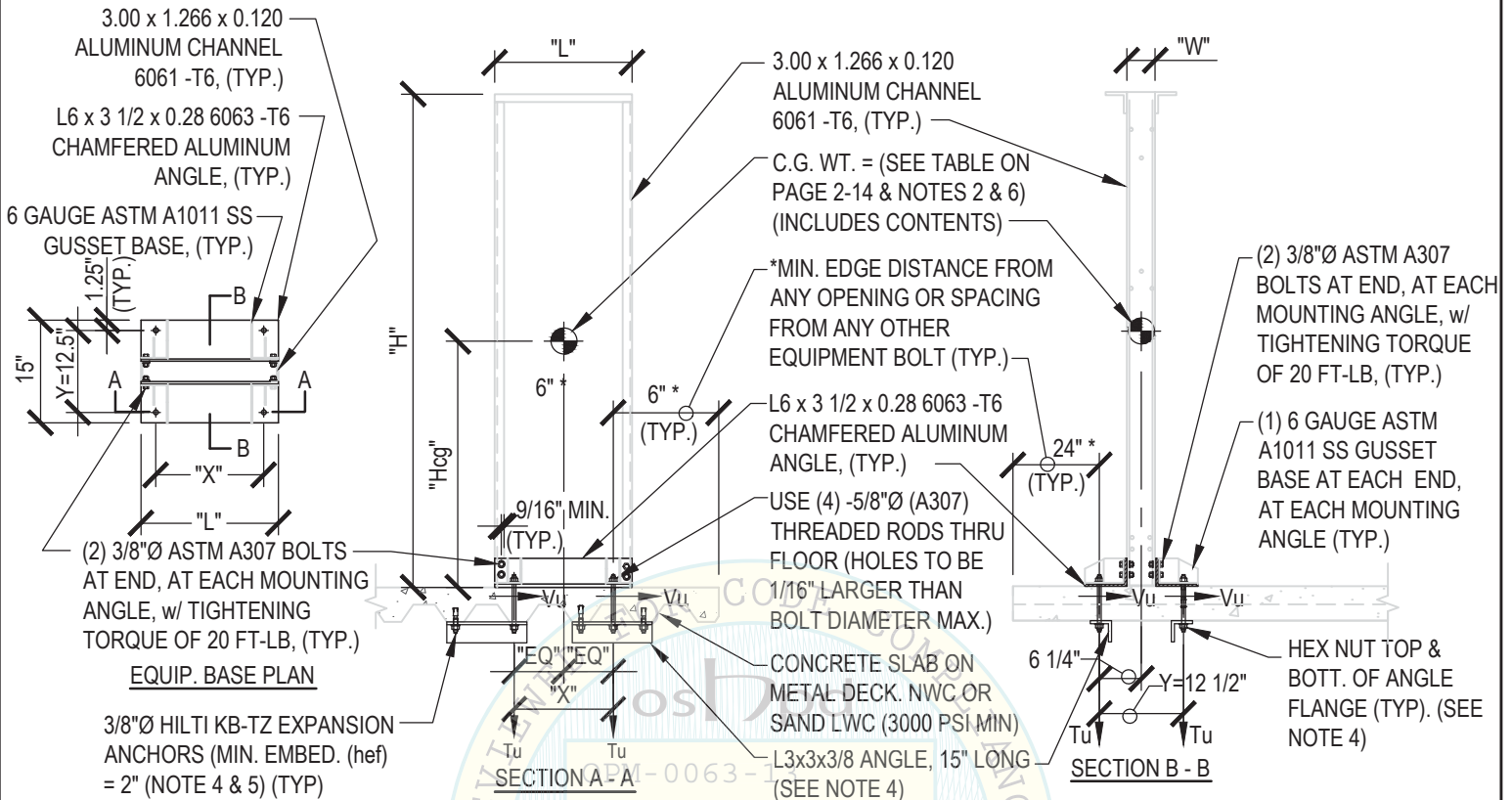
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STRUCTURAL ENGINEER: **ZUBAIR SHEIKH**
DATE: **October 24, 2013** PAGE: **2-12**

3" TWO-POST NETWORK EQUIPMENT RACK W/ GUSSET PLATE ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 1.30$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.98 W_p$ ($S_{DS} = 1.30$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.26 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
4. REFER TO PAGE 2-37 FOR MIN. STEEL DECK REQUIREMENTS.
5. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
7. FOR DIMENSIONS, SEE TABLE ON PAGE 2-14
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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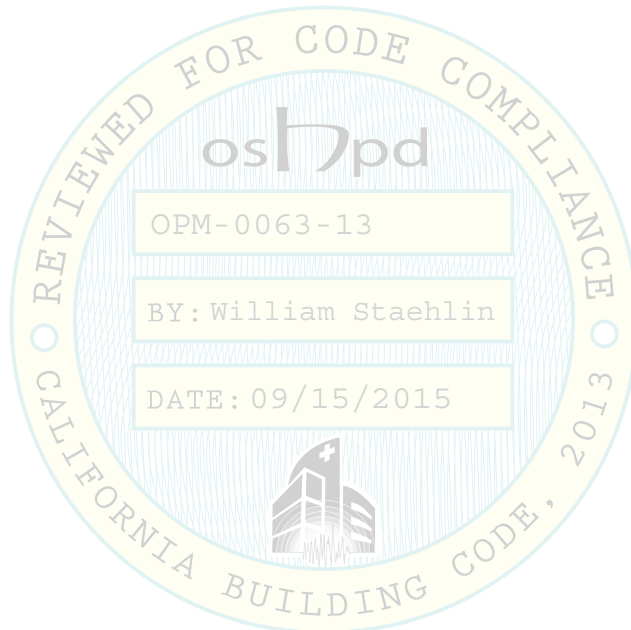
STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE: 2-13
October 24, 2013	

3" TWO-POST NETWORK EQUIPMENT RACK W/ GUSSET PLATE ATTACHMENT TO MIN. 3,000 PSI
 NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 1.30$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]	Panel Width
SB556036XU	475	20.3	3	36	18	16	12.5	1218	302	22	19" Panel Width
SB556048XU	360	20.3	3	48	24	16	12.5	1291	229	24	
SB556072XU	240	20.3	3	72	36	16	12.5	1352	153	27.5	
SB556084XU	200	20.3	3	84	42	16	12.5	1331	127	30	
SB556096XU	175	20.3	3	96	48	16	12.5	1344	111	31.5	
SB556108XU	150	20.3	3	108	54	16	12.5	1305	95	33.5	
SB558036XU	500	24.3	3	36	18	20	12.5	1481	318	24.5	23" Panel Width
SB558048XU	370	24.3	3	48	24	20	12.5	1523	235	26.5	
SB558072XU	245	24.3	3	72	36	20	12.5	1575	156	30	
SB558084XU	210	24.3	3	84	42	20	12.5	1593	134	32	
SB558096XU	180	24.3	3	96	48	20	12.5	1573	115	34	
SB558108XU	160	24.3	3	108	54	20	12.5	1583	102	36	

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



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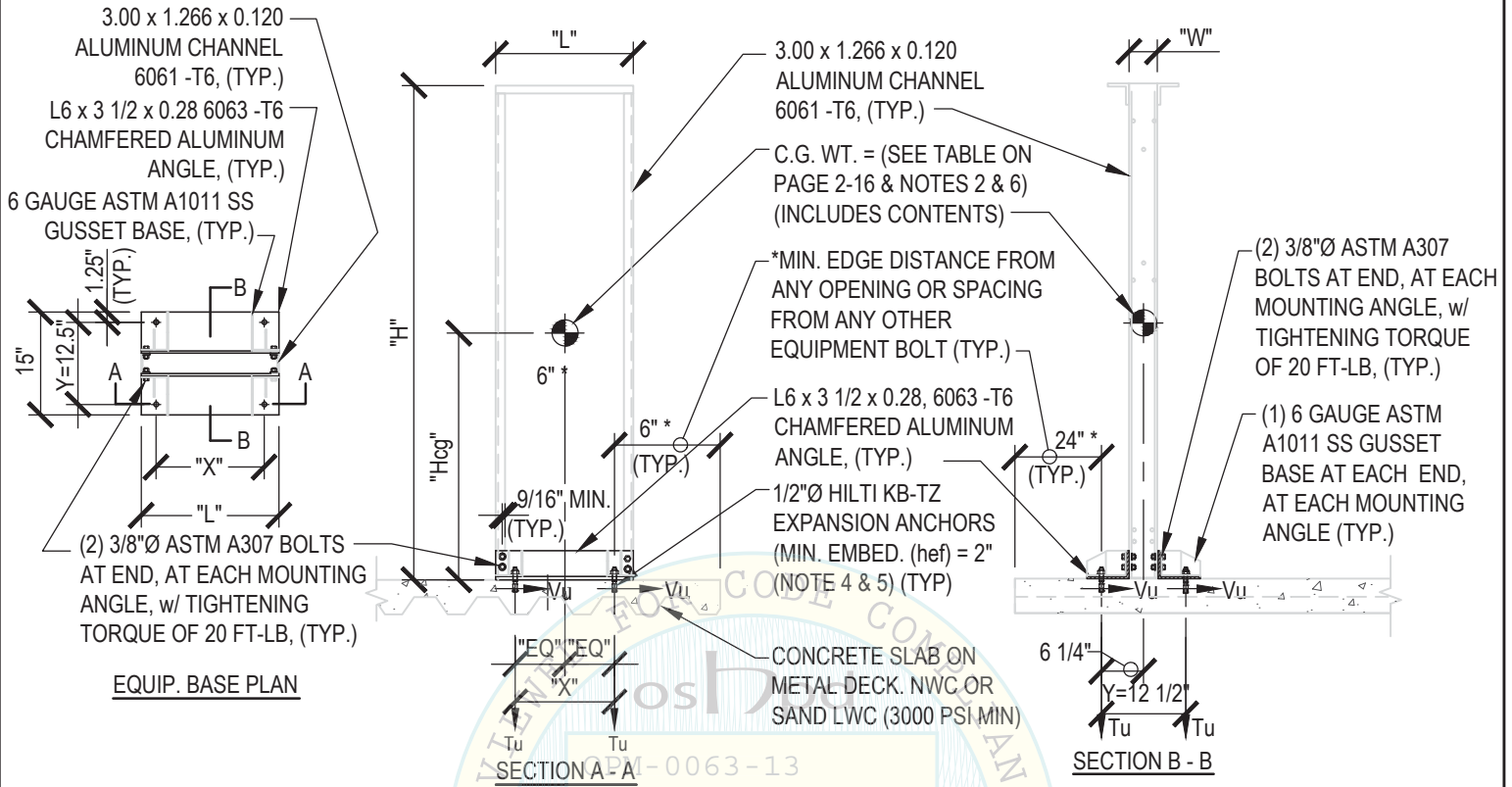
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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
 DATE: October 24, 2013 PAGE: 2-14

3" TWO-POST NETWORK EQUIPMENT RACK W/ GUSSET PLATE ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 0.67$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.50 W_p$ ($S_{DS} = 0.67$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.13 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
4. REFER TO PAGE 2-37 FOR MIN. STEEL DECK REQUIREMENTS.
5. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
7. FOR DIMENSIONS, SEE TABLE ON PAGE 2-16.
8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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STRUCTURAL ENGINEER:

ZUBAIR SHEIKH

DATE:

October 24, 2013

PAGE:

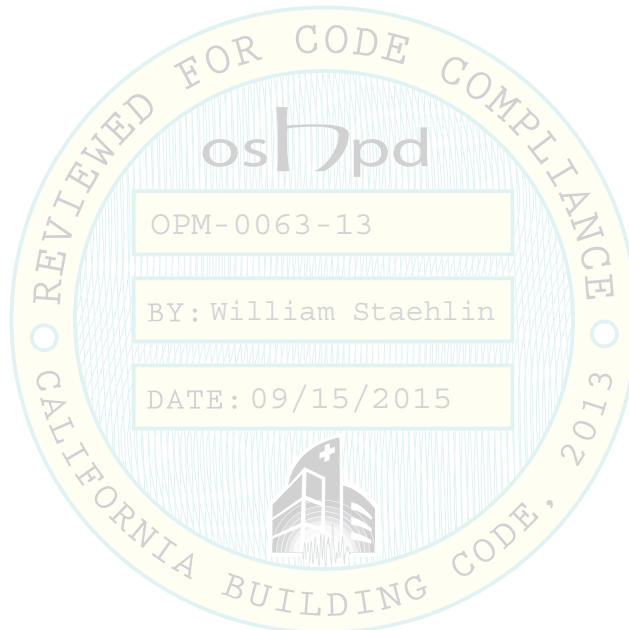
2-15

3" TWO-POST NETWORK EQUIPMENT RACK W/ GUSSET PLATE ATTACHMENT TO MIN. 3,000 PSI
 NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 0.67$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]	Panel Width
SB556036XU	475	20.3	3	36	18	16	12.5	464	156	22	19" panel Width
SB556048XU	360	20.3	3	48	24	16	12.5	542	118	24	
SB556072XU	240	20.3	3	72	36	16	12.5	614	79	27.5	
SB556084XU	200	20.3	3	84	42	16	12.5	617	66	30	
SB556096XU	175	20.3	3	96	48	16	12.5	632	57	31.5	
SB556108XU	150	20.3	3	108	54	16	12.5	621	49	33.5	
SB558036XU	500	24.3	3	36	18	20	12.5	591	164	24.5	23" Panel Width
SB558048XU	370	24.3	3	48	24	20	12.5	658	121	26.5	
SB558072XU	245	24.3	3	72	36	20	12.5	727	80	30	
SB558084XU	210	24.3	3	84	42	20	12.5	748	69	32	
SB558096XU	180	24.3	3	96	48	20	12.5	749	59	34	
SB558108XU	160	24.3	3	108	54	20	12.5	761	52	36	

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



B-Line
by **EATON**

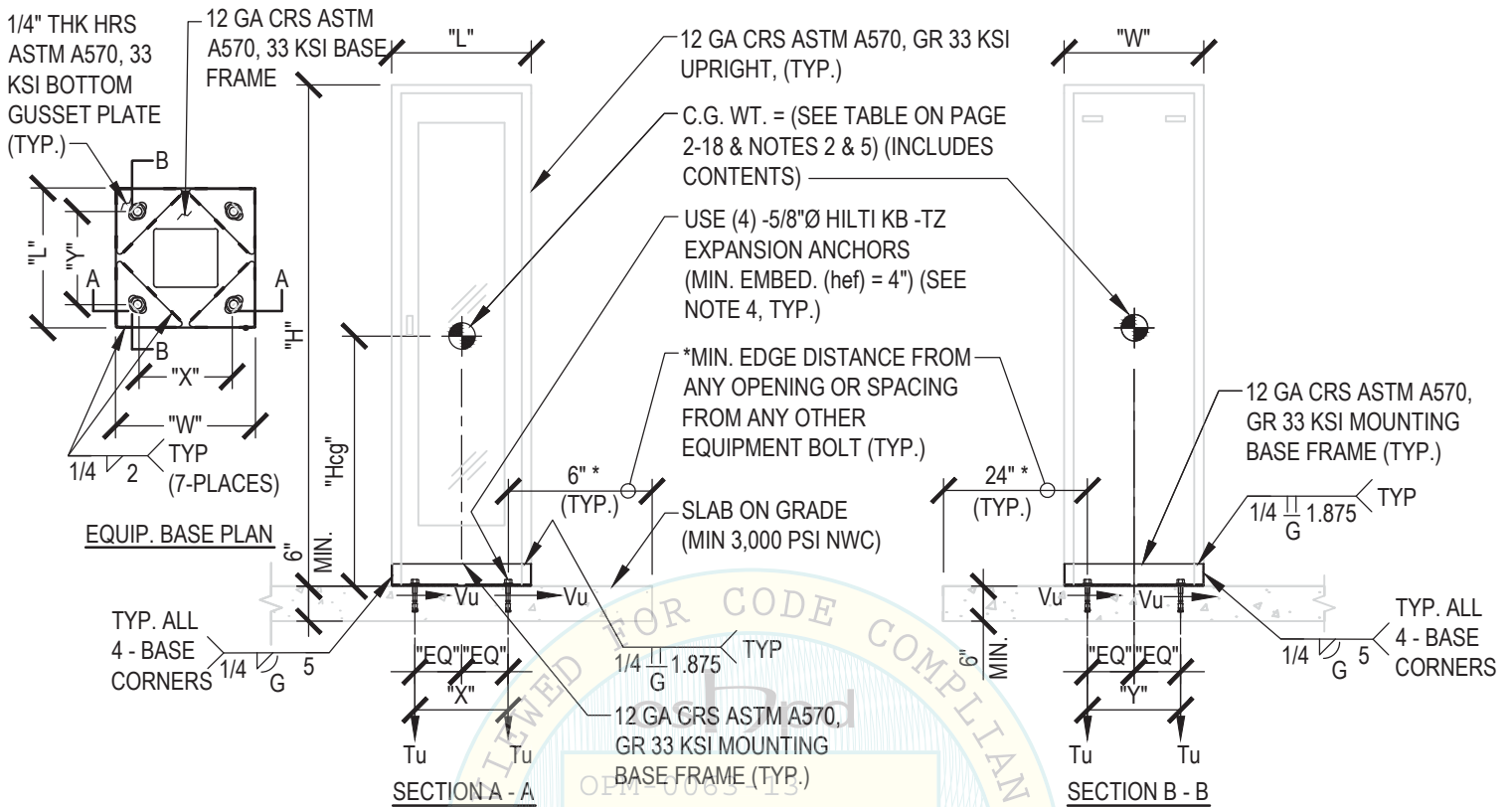
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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
 DATE: October 24, 2013 PAGE: 2-16

E² VERTICAL CABINET FRAMES
 ANCHORED TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB , (S_{DS} ≤ 1.65)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = 0.74 Wp (S_{DS} = 1.65, ap = 2.5, lp = 1.5, Rp = 6.0, Ωo = 2.5, z/h = 0.0)

VERTICAL FORCE (E_v) = 0.33 Wp

SEISMIC COEFFICIENTS ap, lp, AND Rp USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

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

3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1 NOTE 4.0.

4. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.

5. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.

6. FOR DIMENSIONS, SEE TABLE ON PAGE 2-18.

7. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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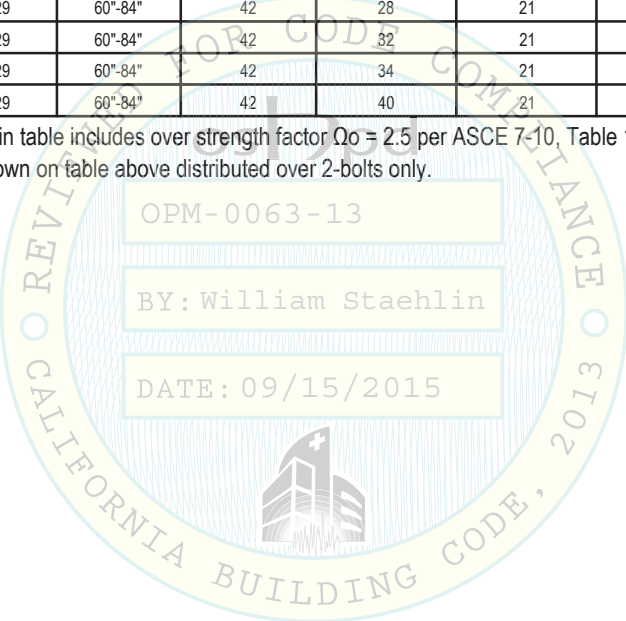
STRUCTURAL ENGINEER:
 ZUBAIR SHEIKH
 DATE: October 24, 2013
 PAGE: 2-17

E² VERTICAL CABINET FRAMES
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB , ($S_{DS} \leq 1.65$)

TABLE

UNIT NUMBER	WEIGHT "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tumax, LRFD [lb]	Vumax, LRFD [lb]	Unit Weight [lb]	Panel Width
E2Z4F0842424	800	24	24	60"-84"	42	16	16	2471	775	255	19" Panel Width
E2Z4F0842426	850	26	24	60"-84"	42	18	16	2526	824	258	
E2Z4F0842428	825	28	24	60"-84"	42	20	16	2472	799	261	
E2Z4F0842430	800	30	24	60"-84"	42	22	16	2489	775	264	
E2Z4F0842432	750	32	24	60"-84"	42	24	16	2464	727	267	19" Panel Width
E2Z4F0842436	675	36	24	60"-84"	42	28	16	2525	654	270	
E2Z4F0842440	575	40	24	60"-84"	42	32	16	2458	557	279	
E2Z4F0842442	550	42	24	60"-84"	42	34	16	2507	533	288	
E2Z4F0842448	450	48	24	60"-84"	42	40	16	2450	436	297	19" or 23" Panel Width
E2Z4F0842924	800	24	29	60"-84"	42	16	21	2436	775	262	
E2Z4F0842926	950	26	29	60"-84"	42	18	21	2468	921	266	
E2Z4F0842928	1050	28	29	60"-84"	42	20	21	2462	1017	270	
E2Z4F0842930	1150	30	29	60"-84"	42	22	21	2551	1114	274	19" or 23" Panel Width
E2Z4F0842932	1150	32	29	60"-84"	42	24	21	2503	1114	278	
E2Z4F0842936	1100	36	29	60"-84"	42	28	21	2475	1066	282	
E2Z4F0842940	1000	40	29	60"-84"	42	32	21	2447	969	294	
E2Z4F0842942	950	42	29	60"-84"	42	34	21	2444	921	306	19" or 23" Panel Width
E2Z4F0842948	800	48	29	60"-84"	42	40	21	2410	775	318	

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11
 * The shear force "Vu" shown on table above distributed over 2-bolts only.



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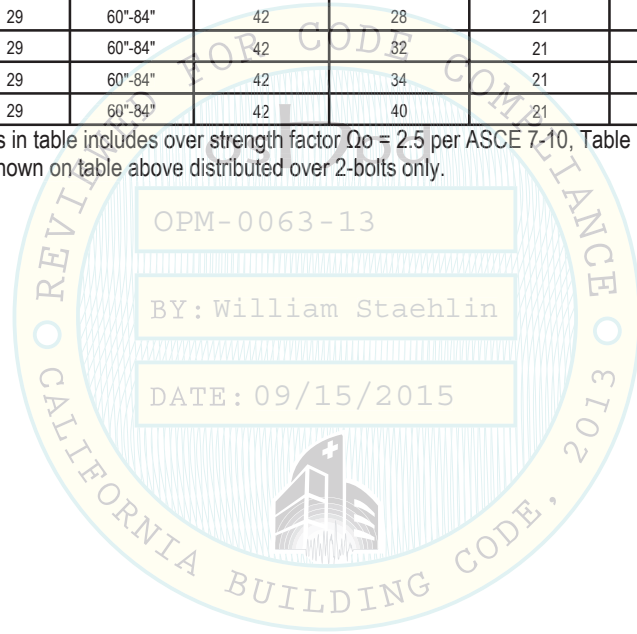
STRUCTURAL ENGINEER: ZUBAIR SHEIKH
 DATE: October 24, 2013 PAGE: 2-18

E² VERTICAL CABINET FRAMES ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) , (S_{DS} ≤ 1.00)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]	Panel Width
E2Z4F0842424	800	24	24	60"-84"	42	16	16	2434	783	255	19" Panel Width
E2Z4F0842426	850	26	24	60"-84"	42	18	16	2485	832	258	
E2Z4F0842428	825	28	24	60"-84"	42	20	16	2432	807	261	
E2Z4F0842430	800	30	24	60"-84"	42	22	16	2452	783	264	
E2Z4F0842432	750	32	24	60"-84"	42	24	16	2430	734	267	19" Panel Width
E2Z4F0842436	675	36	24	60"-84"	42	28	16	2498	661	270	
E2Z4F0842440	575	40	24	60"-84"	42	32	16	2438	563	279	
E2Z4F0842442	550	42	24	60"-84"	42	34	16	2489	538	288	
E2Z4F0842448	450	48	24	60"-84"	42	40	16	2439	440	297	19" or 23" Panel Width
E2Z4F0842924	800	24	29	60"-84"	42	16	21	2398	783	262	
E2Z4F0842926	950	26	29	60"-84"	42	18	21	2419	930	266	
E2Z4F0842928	1050	28	29	60"-84"	42	20	21	2406	1028	270	
E2Z4F0842930	1150	30	29	60"-84"	42	22	21	2487	1126	274	19" or 23" Panel Width
E2Z4F0842932	1150	32	29	60"-84"	42	24	21	2439	1126	278	
E2Z4F0842936	1100	36	29	60"-84"	42	28	21	2415	1077	282	
E2Z4F0842940	1000	40	29	60"-84"	42	32	21	2394	979	294	
E2Z4F0842942	950	42	29	60"-84"	42	34	21	2395	930	306	19" or 23" Panel Width
E2Z4F0842948	800	48	29	60"-84"	42	40	21	2372	783	318	

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11
 * The shear force "Vu" shown on table above distributed over 2-bolts only.



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by **EATON**

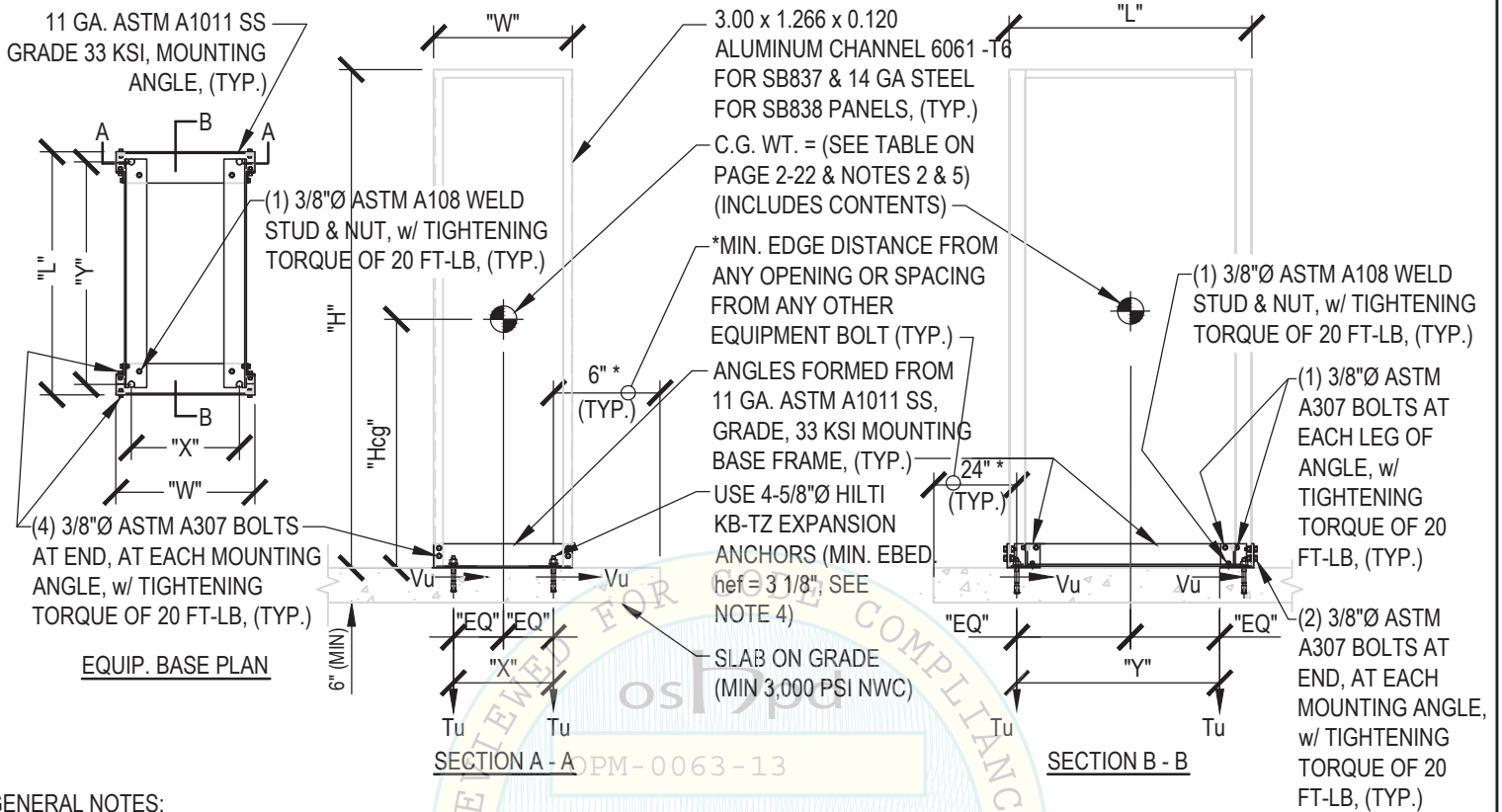
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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
 DATE: October 24, 2013
 PAGE: 2-20

FOUR POST - ADJUSTABLE DEPTH RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.00$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.45 W_p$ ($S_{DS} = 1.00$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 0.0$)

VERTICAL FORCE (E_v) = $0.20 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING). CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.

3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1 NOTE 4.0

4. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.

5. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.

6. FOR DIMENSIONS, SEE TABLE ON PAGE 2-22

7. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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by **EATON**

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STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	PAGE:	2-21
October 24, 2013		

FOUR POST - ADJUSTABLE DEPTH RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.00$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.] (b)	Tu max LRFD [lb] (a)	Vu max LRFD [lb] (a)	Unit Wt. [lbs]
SB837072A	1100	18 to 24	20.3125	72	36	16	15	1567	323	49.8
SB837084A	900	18 to 24	20.3125	84	42	16	15	1561	264	53.2
SB837096A	800	18 to 24	20.3125	96	48	16	15	1636	235	56.8
SB837072B	1200	24 to 30	20.3125	72	36	16	21	1595	352	57.9
SB837084B	1000	24 to 30	20.3125	84	42	16	21	1624	294	56.4
SB837096B	900	24 to 30	20.3125	96	48	16	21	1726	264	59.9
SB837072C	1000	30 to 36	20.3125	72	36	16	27	1626	294	56
SB837084C	800	30 to 36	20.3125	84	42	16	27	1576	235	59.5
SB837096C	700	30 to 36	20.3125	96	48	16	27	1620	206	63.1
SB837072D	800	36 to 42	20.3125	72	36	16	33	1633	235	59.2
SB837084D	700	36 to 42	20.3125	84	42	16	33	1718	206	62.6
SB837096D	600	36 to 42	20.3125	96	48	16	33	1720	176	66.2
SB838072A	1200	18 to 24	20.3125	72	36	16	15	1709	352	55.4
SB838084A	1000	18 to 24	20.3125	84	42	16	15	1735	294	59.9
SB838096A	800	18 to 24	20.3125	96	48	16	15	1636	235	64.4
SB838072B	1200	24 to 30	20.3125	72	36	16	21	1595	352	58.6
SB838084B	1000	24 to 30	20.3125	84	42	16	21	1624	294	63
SB838096B	850	24 to 30	20.3125	96	48	16	21	1630	250	67.5
SB838072C	1000	30 to 36	20.3125	72	36	16	27	1626	294	61.7
SB838084C	850	30 to 36	20.3125	84	42	16	27	1675	250	66.1
SB838096C	725	30 to 36	20.3125	96	48	16	27	1678	213	70.6
SB838072D	850	36 to 42	20.3125	72	36	16	33	1735	250	64.8
SB838084D	700	36 to 42	20.3125	84	42	16	33	1718	206	69.3
SB838096D	600	36 to 42	20.3125	96	48	16	33	1720	176	73.8

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11

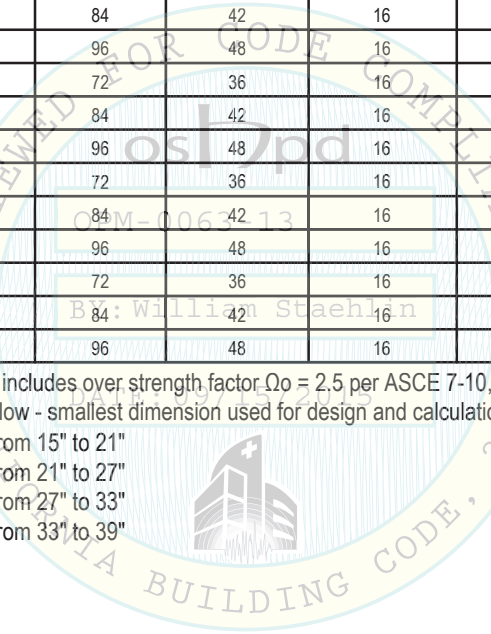
b. "Y" dimension varies as noted below - smallest dimension used for design and calculations:

Y = 15"....."Y" ranges from 15" to 21"

Y = 21"....."Y" ranges from 21" to 27"

Y = 27"....."Y" ranges from 27" to 33"

Y = 33"....."Y" ranges from 33" to 39"



B-Line
by **EATON**

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STRUCTURAL ENGINEER:

ZUBAIR SHEIKH

DATE:

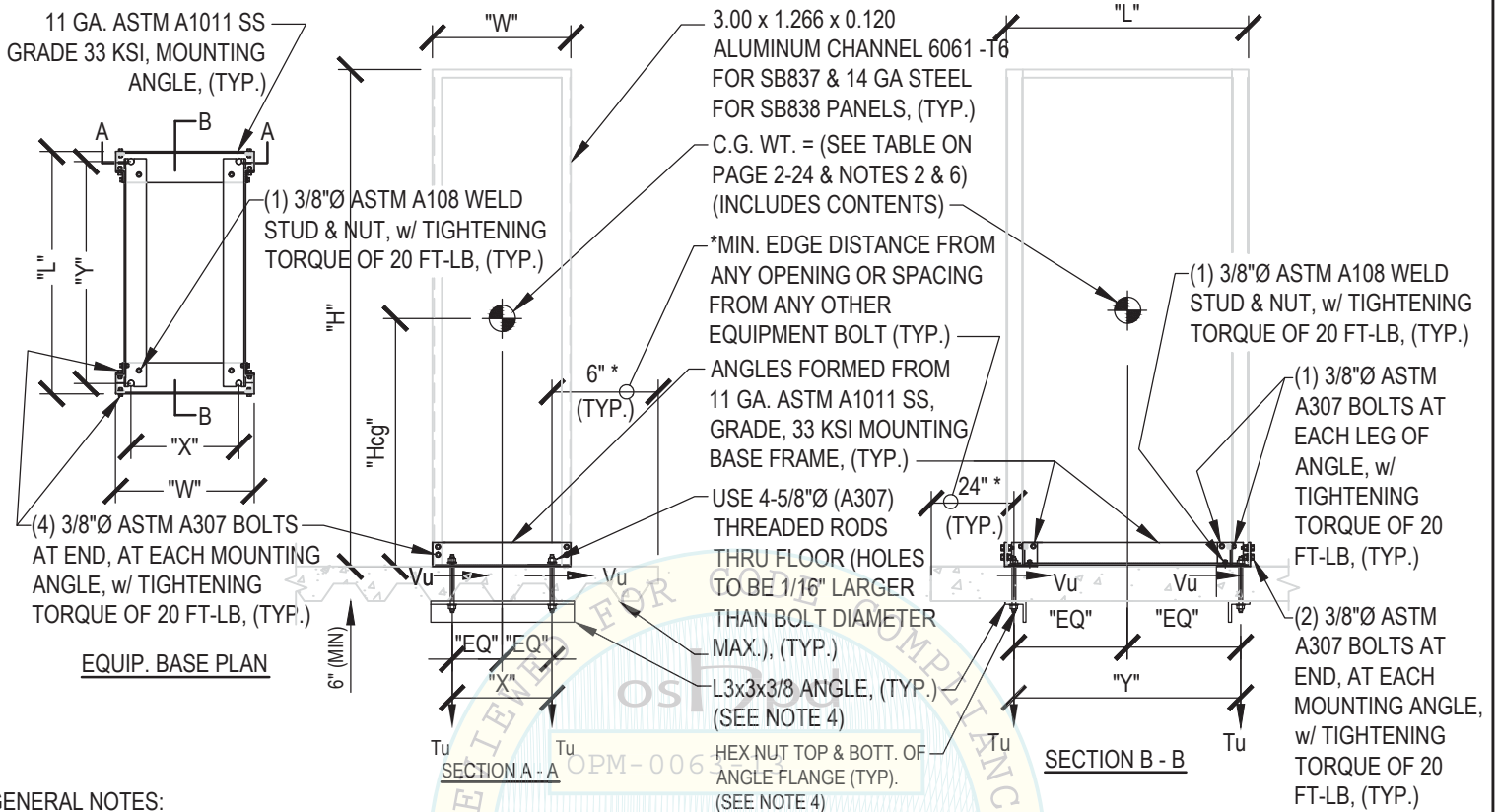
October 24, 2013

PAGE:

2-22

FOUR POST - ADJUSTABLE DEPTH RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN),
($S_{DS} \leq 1.00$)

DETAIL



GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.75 W_p (S_{DS} = 1.00, a_p = 2.5, I_p = 1.5, R_p = 6.0, \Omega_o = 2.5, z/h \leq 1.0)$
 VERTICAL FORCE (E_v) = $0.20 W_p$
 SEISMIC COEFFICIENTS I_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING).
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER 2-37 FOR MIN. STEEL DECK REQUIREMENTS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
- FOR DIMENSIONS, SEE TABLE ON PAGE 2-24.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013
PAGE: 2-23

FOUR POST - ADJUSTABLE DEPTH RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) ,
($S_{DS} \leq 1.00$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.] (b)	Tu max LRFD [lb] (a)	Vu max LRFD [lb] (a)	Unit Wt. [lbs]
SB837072A	160	18 to 24	20.3125	72	36	16	15	427	78	49.8
SB837084A	140	18 to 24	20.3125	84	42	16	15	446	69	53.2
SB837096A	120	18 to 24	20.3125	96	48	16	15	444	59	56.8
SB837072B	210	24 to 30	20.3125	72	36	16	21	526	103	57.9
SB837084B	170	24 to 30	20.3125	84	42	16	21	510	83	56.4
SB837096B	150	24 to 30	20.3125	96	48	16	21	523	73	59.9
SB837072C	250	30 to 36	20.3125	72	36	16	27	751	122	56
SB837084C	210	30 to 36	20.3125	84	42	16	27	751	103	59.5
SB837096C	180	30 to 36	20.3125	96	48	16	27	747	88	63.1
SB837072D	240	36 to 42	20.3125	72	36	16	33	886	117	59.2
SB837084D	200	36 to 42	20.3125	84	42	16	33	876	98	62.6
SB837096D	170	36 to 42	20.3125	96	48	16	33	862	83	66.2
SB838072A	170	18 to 24	20.3125	72	36	16	15	453	83	55.4
SB838084A	140	18 to 24	20.3125	84	42	16	15	446	69	59.9
SB838096A	120	18 to 24	20.3125	96	48	16	15	444	59	64.4
SB838072B	240	24 to 30	20.3125	72	36	16	21	602	117	58.6
SB838084B	200	24 to 30	20.3125	84	42	16	21	600	98	63
SB838096B	170	24 to 30	20.3125	96	48	16	21	593	83	67.5
SB838072C	250	30 to 36	20.3125	72	36	16	27	751	122	61.7
SB838084C	200	30 to 36	20.3125	84	42	16	27	715	98	66.1
SB838096C	175	30 to 36	20.3125	96	48	16	27	726	86	70.6
SB838072D	240	36 to 42	20.3125	72	36	16	33	886	117	64.8
SB838084D	200	36 to 42	20.3125	84	42	16	33	876	98	69.3
SB838096D	170	36 to 42	20.3125	96	48	16	33	862	83	73.8

a. Tumax and Vumax loads in table includes over strength factor $\Omega_0 = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11

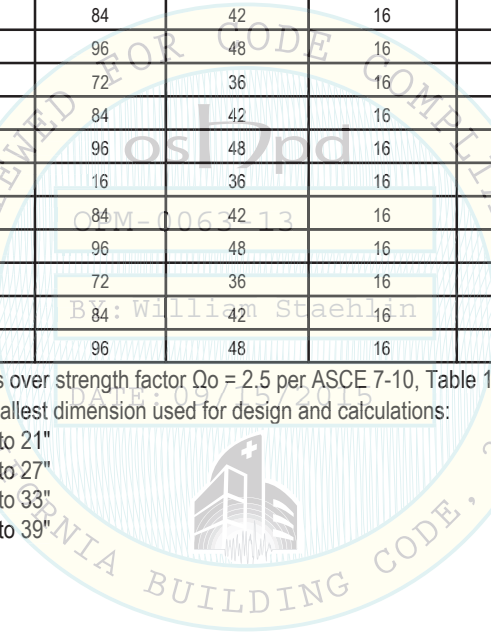
b. "Y" dimension varies as noted below - smallest dimension used for design and calculations:

Y = 15"....."Y" ranges from 15" to 21"

Y = 21"....."Y" ranges from 21" to 27"

Y = 27"....."Y" ranges from 27" to 33"

Y = 33"....."Y" ranges from 33" to 39"



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STRUCTURAL ENGINEER:

ZUBAIR SHEIKH

DATE:

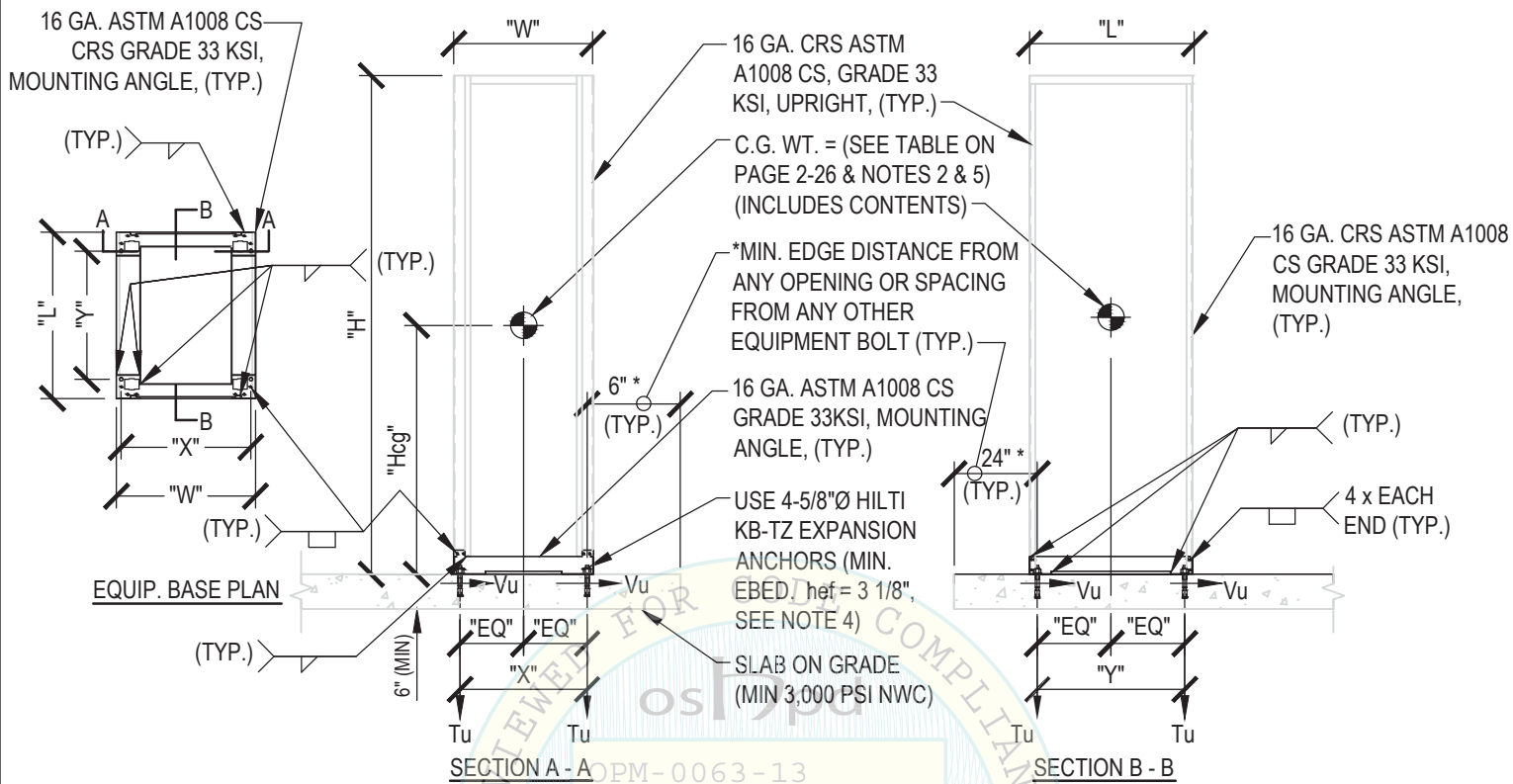
October 24, 2013

PAGE:

2-24

CCVG SERIES CABINET
 ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.12$)

DETAIL



GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.50 W_p$ ($S_{DS} = 1.12$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h = 0.0$)
 VERTICAL FORCE (E_v) = $0.22 W_p$
 SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1 NOTE 4.0)
- REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
- FOR DIMENSIONS, SEE TABLE ON PAGE 2-26.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT.

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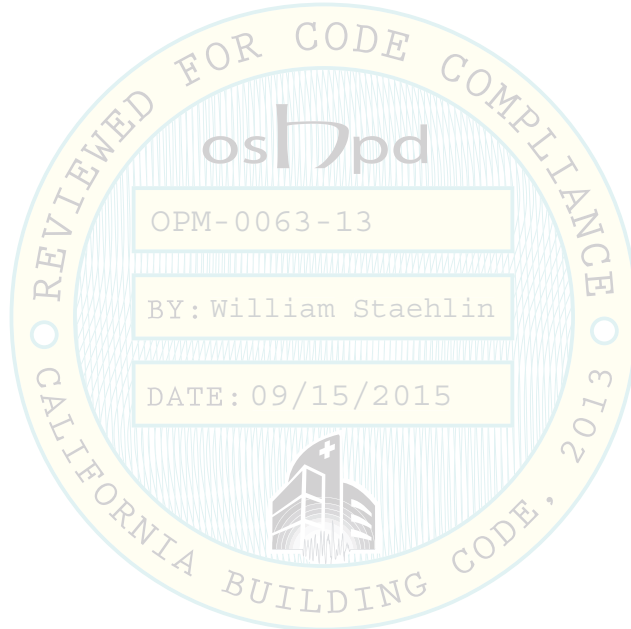
STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE: 2-25
October 24, 2013	

CCVG SERIES CABINET
 ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.12$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]
CCVG2006158	630	44	35	87.6	43.8	28.64	39.39	598	207	291
CCVG2005897	670	40	35	87.6	43.8	28.64	33.39	597	220	217
CCVG2005896	670	40	35	87.6	43.8	28.64	33.39	597	220	301
CCVG2005900	630	44	35	87.6	43.8	28.64	39.39	598	207	157

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



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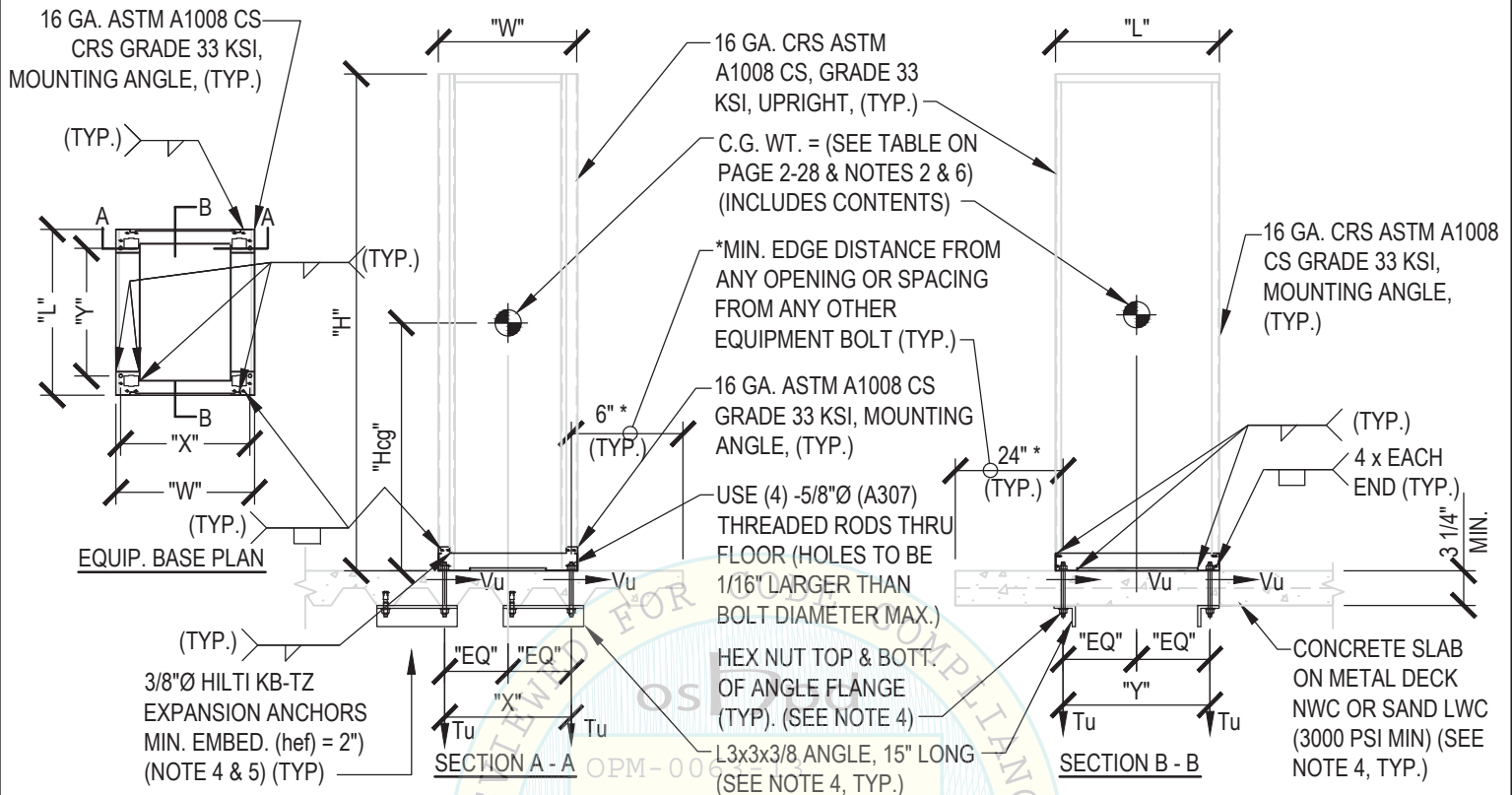
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STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	October 24, 2013	PAGE: 2-26

CCVG SERIES CABINET ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT
OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) , ($S_{DS} \leq 0.70$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $.53 W_p$ ($S_{DS} = 0.70$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.14 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

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

3. STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.

4. REFER TO PAGE 2-37 FOR MIN. STEEL DECK REQUIREMENTS.

5. REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.

6. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.

7. FOR DIMENSIONS, SEE TABLE ON PAGE 2-28.

8. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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DATE:

October 24, 2013

PAGE:

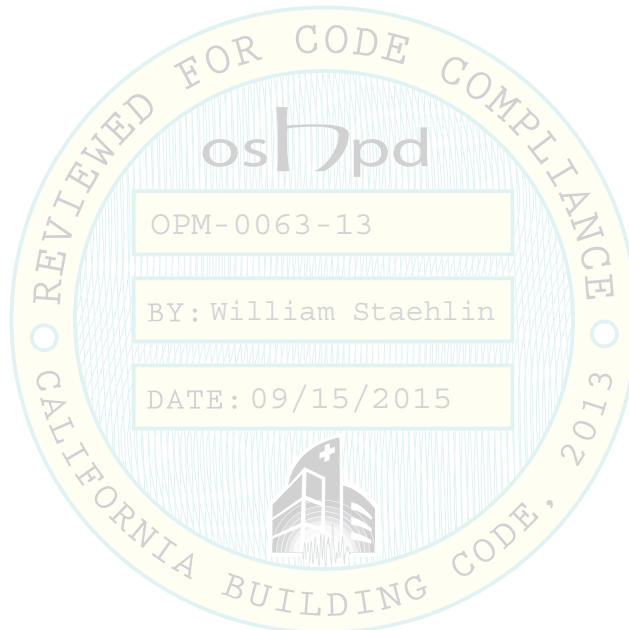
2-27

CCVG SERIES CABINET ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT
OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN) , ($S_{DS} \leq 0.70$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]
CCVG2006158	630	44	35	87.6	43.8	28.64	39.39	601	216	291
CCVG2005897	670	40	35	87.6	43.8	28.64	33.39	599	230	217
CCVG2005896	670	40	35	87.6	43.8	28.64	33.39	599	230	301
CCVG2005900	630	44	35	87.6	43.8	28.64	39.39	601	216	157

a. Tumax and Vumax loads in table includes over strength factor $\Omega = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11



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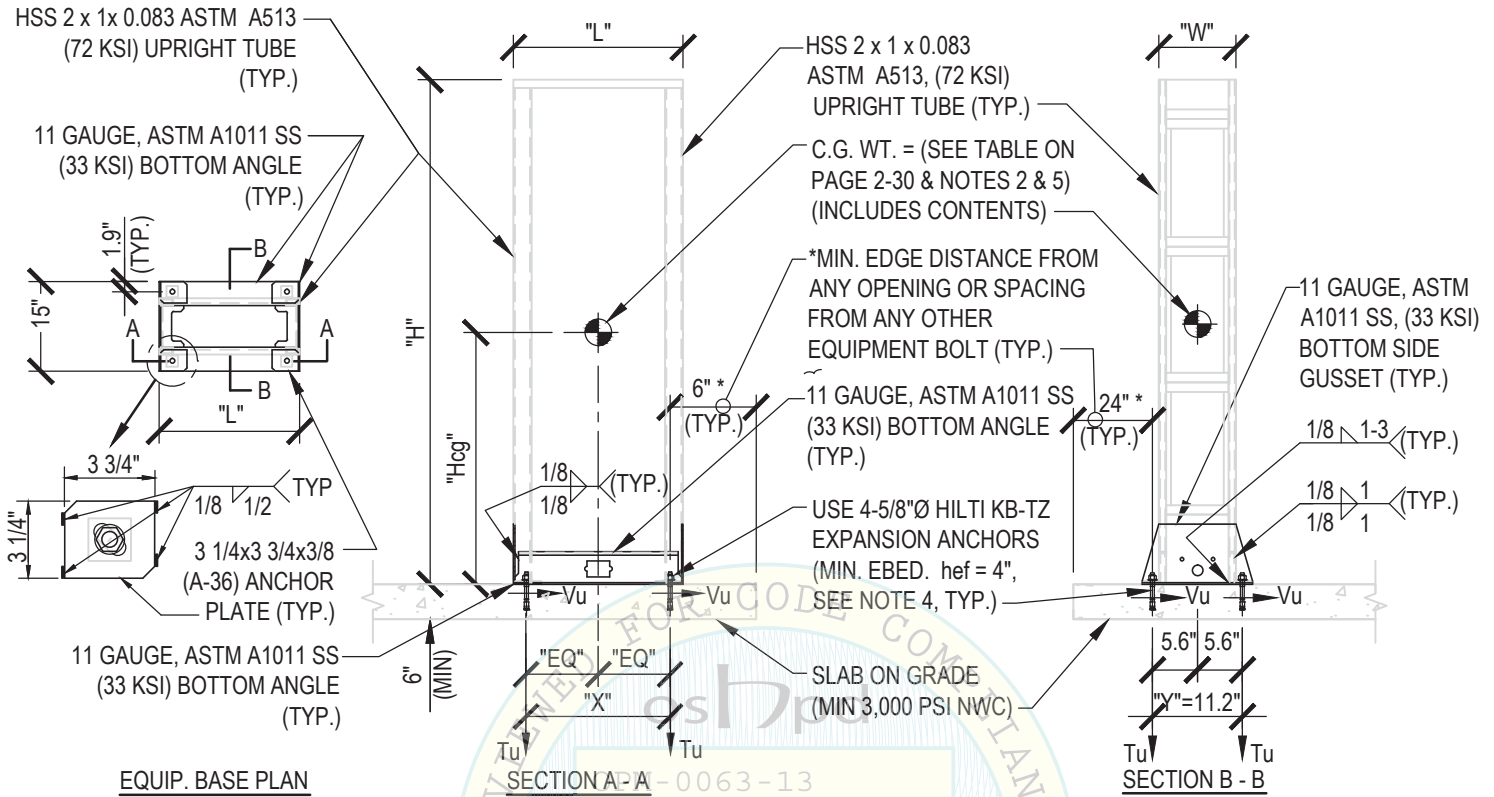
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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-28

TWO POST SEISMIC RELAY RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.00$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.45 W_p (S_{DS} = 1.00, a_p = 2.5, I_p = 1.5, R_p = 6.0, \Omega_o = 2.5, z/h = 0.0)$

VERTICAL FORCE (E_v) = $0.20 W_p$

SEISMIC COEFFICIENTS I_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
- FOR DIMENSIONS, SEE TABLE ON PAGE 2-30.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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STRUCTURAL ENGINEER:

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DATE:

October 24, 2013

PAGE:

2-29

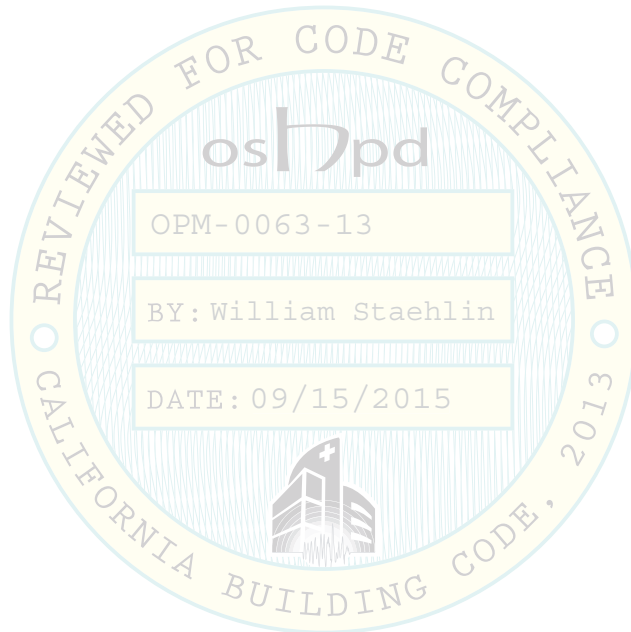
TWO POST SEISMIC RELAY RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB, ($S_{DS} \leq 1.00$)

DETAIL

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu max LRFD [lb]	Unit Wt. [lbs]	Panel Width [in.]
SB85219096	654	24.75	8	96	48	21.62	11.2	2611	384	130	19
SB85223096	669	28.75	8	96	48	25.62	11.2	3211	393	137	23

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11

* The shear force "Vu" shown on table above distributed over 2-bolts only.



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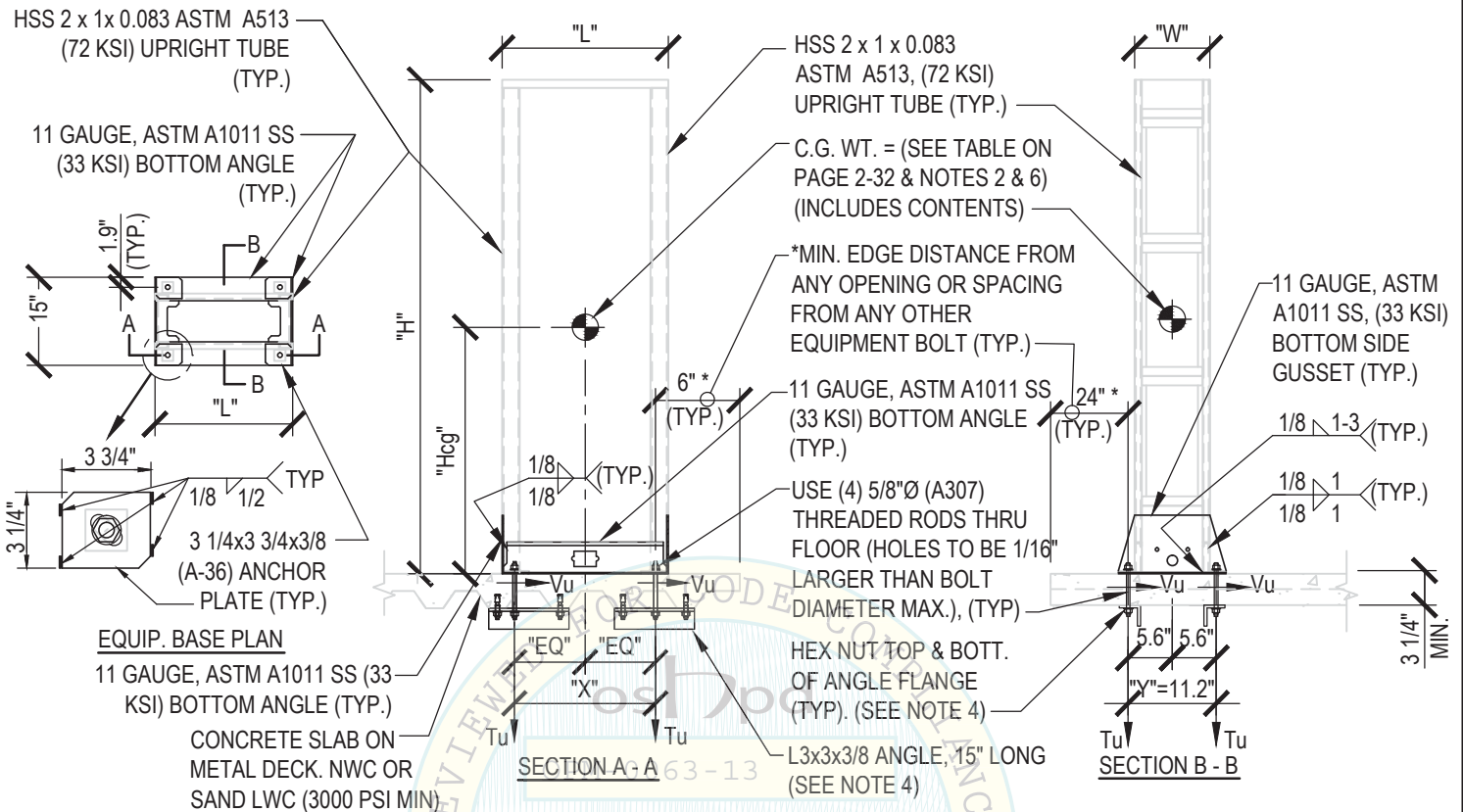
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STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	October 24, 2013	PAGE: 2-30

TWO POST SEISMIC RELAY RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 1.00$)

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = 0.75 W_p ($S_{DS} \leq 1.00$, $a_p = 2.5$, $I_p = 1.5$, $R_p = 6.0$, $\Omega_o = 2.5$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = 0.20 W_p

SEISMIC COEFFICIENTS I_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAM)

- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LIST OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER TO PAGE 2-37 FOR MIN. STEEL DECK REQUIREMENTS.
- REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
- FOR DIMENSIONS, SEE TABLE ON PAGE 2-32.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013
PAGE: 2-31

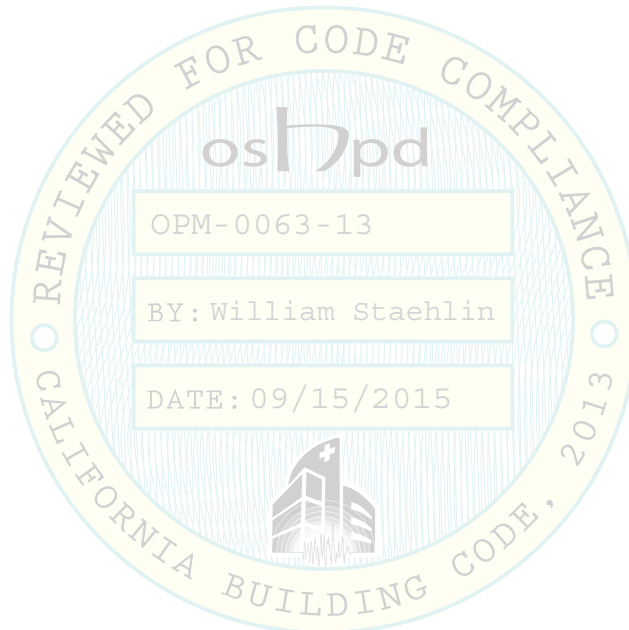
TWO POST SEISMIC RELAY RACK ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 1.00$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Length "L" [in.]	Width "W" [in.]	Height "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X" [in.]	Length along Y-axis between Anchors "Y" [in.]	Tu max LRFD [lb]	Vu* max LRFD [lb]	Unit Wt. [lbs]	Panel Width [in.]
SB85219096	654	24.75	8	96	48	21.62	11.2	4542	640	130	19
SB85223096	623	28.75	8	96	48	25.62	11.2	5166	610	137	23

a. Tumax and Vumax loads in table includes over strength factor $\Omega_o = 2.5$ per ASCE 7-10, Table 13.6-1 to satisfy ACI 318-11

* The shear force "Vu" shown on table above distributed over 2-bolts only.

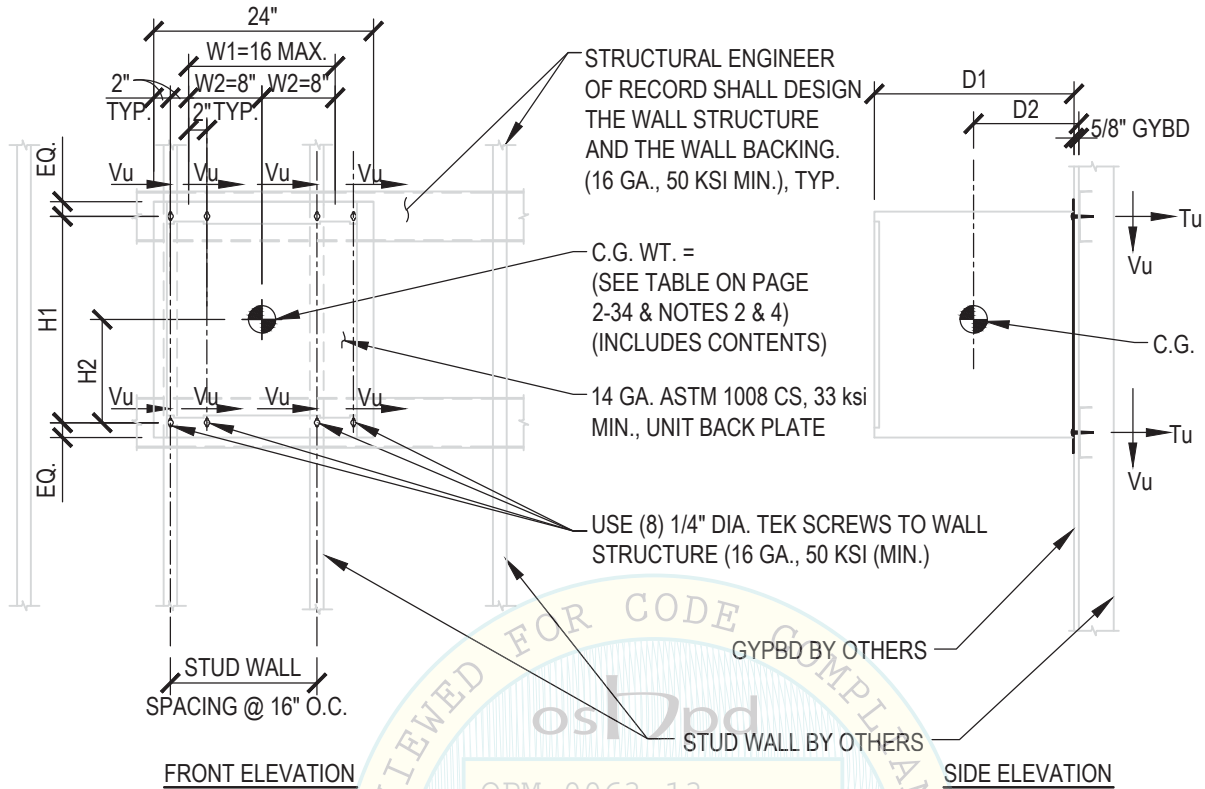


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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-32



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $1.05 W_p$ ($S_{DS} = 1.40$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.26 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

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

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

4. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.

5. REFER TO TABLE ON PAGE 2-34 FOR ALL DIMENSIONS AND UNIT ATTACHMENT TO STRUCTURE.

6. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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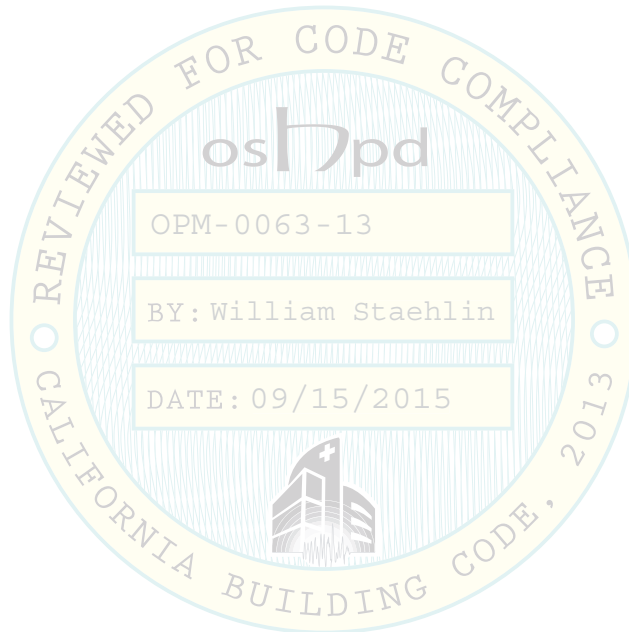
REGISTERED PROFESSIONAL ENGINEER
ZUBAIR SHEIKH
No. 4039
Exp. 12-31-15
STRUCTURAL
STATE OF CALIFORNIA

STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	2-33

V-LINE DUAL HINGE WALL MOUNT CABINET, ($S_{DS} \leq 1.40$)

TABLE

UNIT NUMBER	WEIGHT "Wp" [lb]	Depth "D1" [in.]	Width "W1" [in.]	Height "H1" [in.]	C.G. Depth "D2" [in.]	G.G. Width "W2" [in.]	C.G. Height "H2" [in.]	Sheet Metal Screw Size	Metal Stud THK.	Tmax, LRFD [lb/screw]	Vmax, LRFD [lb/screw]	Unit Weight [lb]
VLWM2420	200	20	16	19.88	10.6	8	9.9	No. 14	16 GA.	90	76	62
VLWM2425	200	25	16	19.88	13.1	8	9.9	No. 14	16 GA.	107	88	70
VLWM2430	200	30	16	19.88	15.6	8	9.9	No. 14	16 GA.	124	100	79
VLWM3620	200	20	16	32.13	10.6	8	16.1	No. 14	16 GA.	75	61	80
VLWM3625	200	25	16	32.13	13.1	8	16.1	No. 14	16 GA.	88	69	90
VLWM3630	200	30	16	32.13	15.6	8	16.1	No. 14	16 GA.	102	78	100
VLWM4820	300	20	16	44.38	10.6	8	22.2	No. 14	16 GA.	103	82	98
VLWM4825	300	25	16	44.38	13.1	8	22.2	No. 14	16 GA.	120	92	111
VLWM4830	300	30	16	44.38	15.6	8	22.2	No. 14	16 GA.	138	102	123

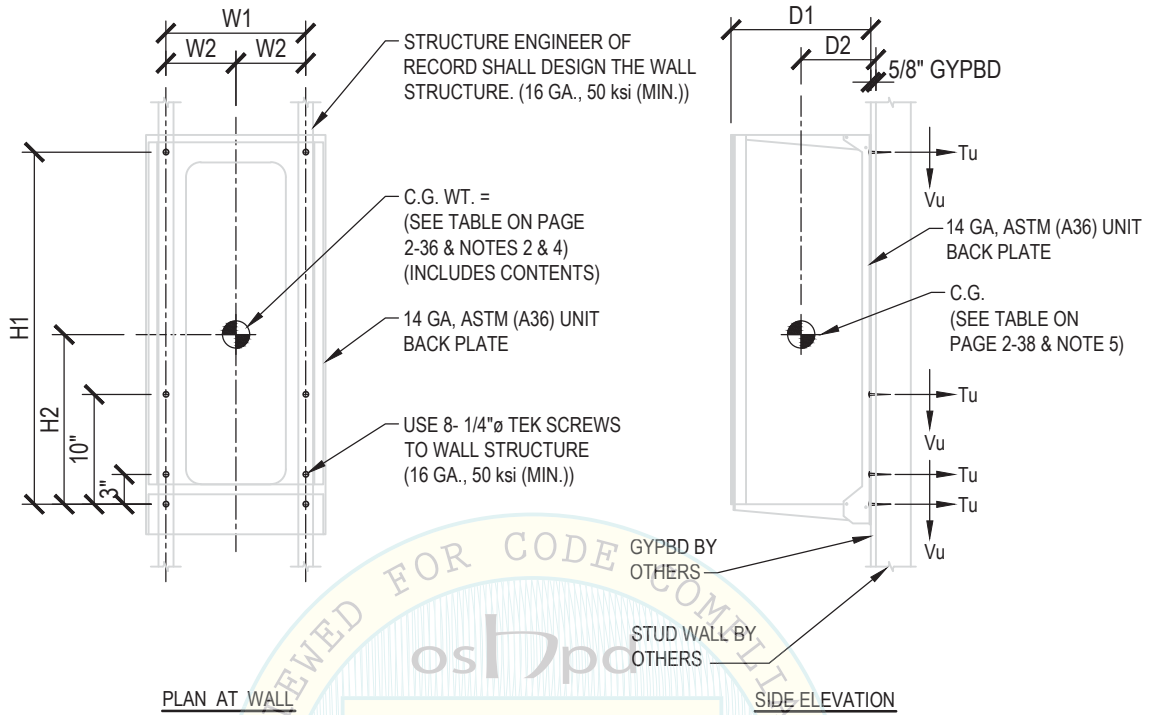


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STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-34



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.75 W_p$ ($S_{DS} = 1.00$, $a_p = 2.5$, $l_p = 1.5$, $R_p = 6.0$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.20 W_p$

SEISMIC COEFFICIENTS l_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCE SHOWN, IN ADDITION TO ALL OTHER LOADS.
4. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.
5. REFER TO TABLE ON PAGE 2-36 FOR ALL DIMENSIONS AND UNIT ATTACHMENT TO STRUCTURE.
6. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT.)

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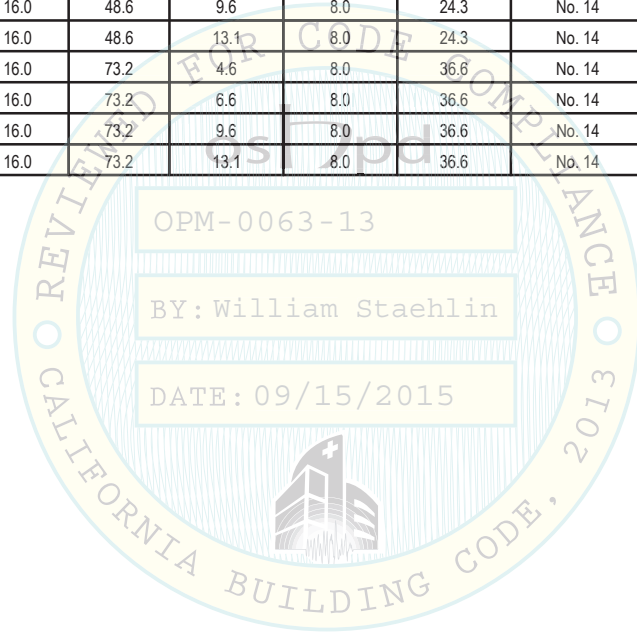


STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	October 24, 2013	PAGE: 2-35

SWING GATE WALL MOUNTED EQUIPMENT RACK, ($S_{DS} \leq 1.00$)

TABLE

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	Depth "D1" [in.]	Width "W1" [in.]	Height "H1" [in.]	C.G. Depth "D2" [in.]	G.G. Width "W2" [in.]	C.G. Height "H2" [in.]	Sheet Metal Screw Size	Metal Stud THK.	Tmax, LRFD [lb/screw]	Vmax, LRFD [lb/screw]	Unit Weight [lb]
SB708192408	201	8.0	16.0	18.9	4.6	8.0	9.5	No. 14	16 GA.	84	79	21
SB708192412	201	12.0	16.0	18.9	6.6	8.0	9.5	No. 14	16 GA.	106	96	23
SB708192418	180	18.0	16.0	18.9	9.6	8.0	9.5	No. 14	16 GA.	125	110	26
SB708192425	145	25.0	16.0	18.9	13.1	8.0	9.5	No. 14	16 GA.	131	111	33
SB708193008	201	8.0	16.0	24.2	4.6	8.0	12.1	No. 14	16 GA.	76	71	30
SB708193012	201	12.0	16.0	24.2	6.6	8.0	12.1	No. 14	16 GA.	95	86	32
SB708193018	201	18.0	16.0	24.2	9.6	8.0	12.1	No. 14	16 GA.	125	107	35
SB708193025	165	25.0	16.0	24.2	13.1	8.0	12.1	No. 14	16 GA.	131	109	39
SB708194408	201	8.0	16.0	38.2	4.6	8.0	19.1	No. 14	16 GA.	66	61	32
SB708194412	201	12.0	16.0	38.2	6.6	8.0	19.1	No. 14	16 GA.	81	71	34
SB708194418	201	18.0	16.0	38.2	9.6	8.0	19.1	No. 14	16 GA.	104	87	38
SB708194425	201	25.0	16.0	38.2	13.1	8.0	19.1	No. 14	16 GA.	132	105	44
SB708195408	201	8.0	16.0	48.6	4.6	8.0	24.3	No. 14	16 GA.	63	58	34
SB708195412	201	12.0	16.0	48.6	6.6	8.0	24.3	No. 14	16 GA.	76	66	37
SB708195418	201	18.0	16.0	48.6	9.6	8.0	24.3	No. 14	16 GA.	96	79	40
SB708195425	201	25.0	16.0	48.6	13.1	8.0	24.3	No. 14	16 GA.	122	94	46
SB708197908	201	8.0	16.0	73.2	4.6	8.0	36.6	No. 14	16 GA.	58	53	39
SB708197912	201	12.0	16.0	73.2	6.6	8.0	36.6	No. 14	16 GA.	69	60	41
SB708197918	201	18.0	16.0	73.2	9.6	8.0	36.6	No. 14	16 GA.	87	70	45
SB708197925	201	25.0	16.0	73.2	13.1	8.0	36.6	No. 14	16 GA.	109	81	51

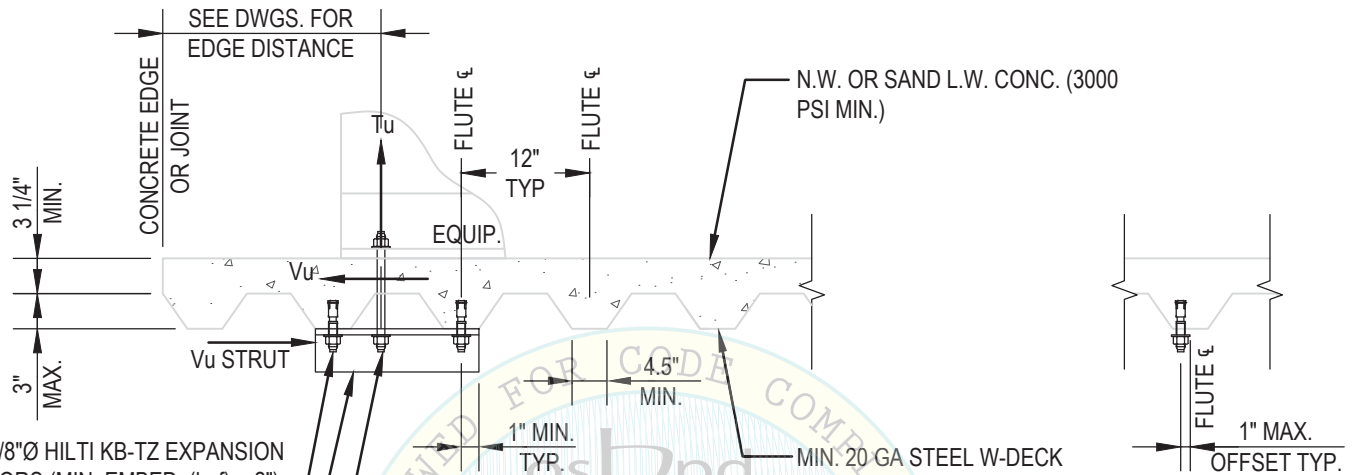


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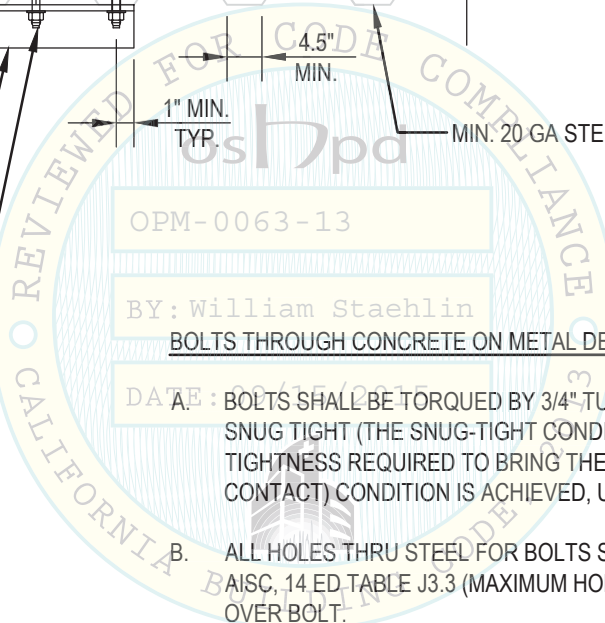
STRUCTURAL ENGINEER: ZUBAIR SHEIKH
DATE: October 24, 2013 PAGE: 2-36



USE 3/8"Ø HILTI KB-TZ EXPANSION ANCHORS (MIN. EMBED. (hef) = 2") (2 ANCHORS MIN PER STRUT)

L3x3x3/8" 15" LONG MIN.

HEX NUT TOP & BOT. OF FLANGE (TYP) AT CONDITIONS WHERE NUT CANNOT BE PROVIDED AT TOP SIDE OF STRUT, PROVIDE TAPPED HOLE THROUGH STRUT FLANGE.



OPM-0063-13

BY: William Staehlin

BOLTS THROUGH CONCRETE ON METAL DECK

DATE: 09/15/2015

A. BOLTS SHALL BE TORQUED BY 3/4" TURN OF THE NUTS AFTER THE SNUG TIGHT (THE SNUG-TIGHT CONDITION IS DEFINED AS THE TIGHTNESS REQUIRED TO BRING THE CONNECTED PLIES INTO FIRM CONTACT) CONDITION IS ACHIEVED, UNLESS OTHERWISE NOTED.

B. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT.

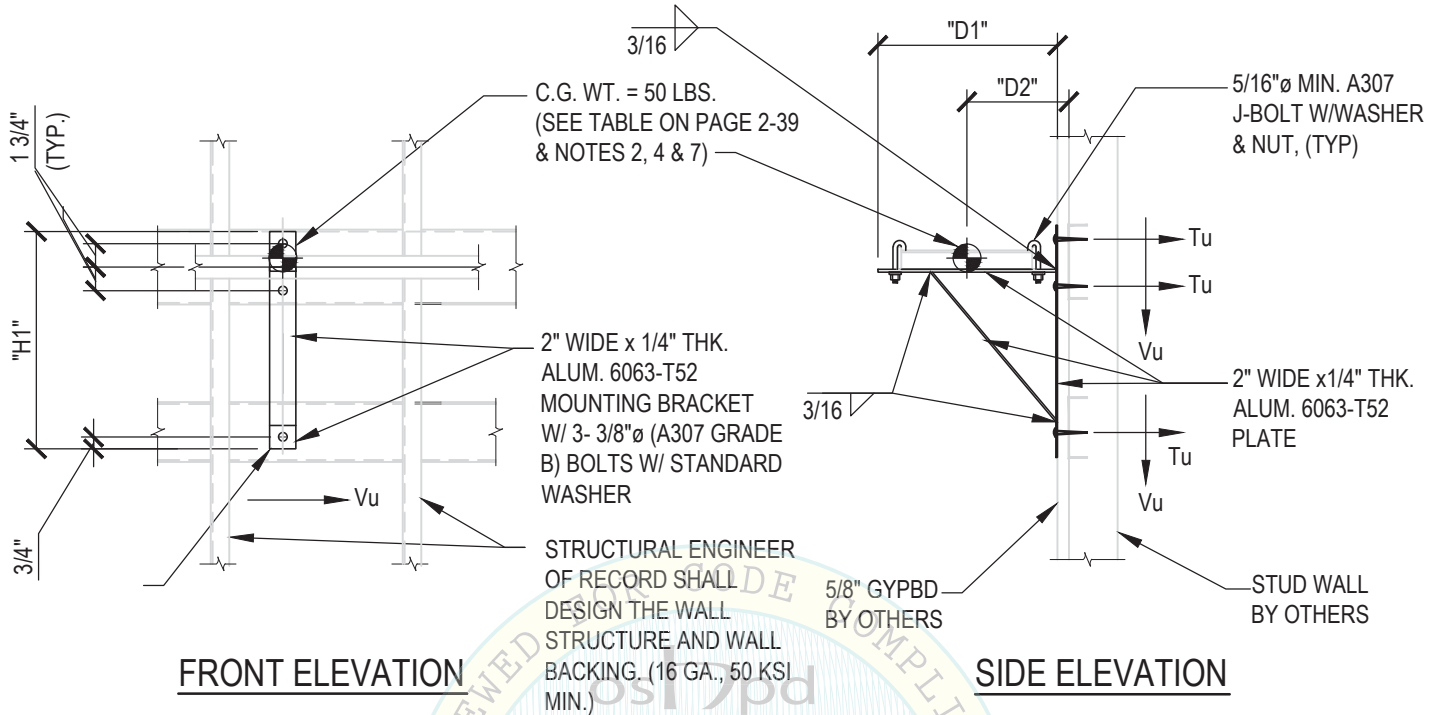
C. THROUGH-BOLTS IN CONCRETE SHALL RECEIVE SPECIAL INSPECTION AND TESTING (THROUGH BOLTS WITH STEEL TO STEEL CONNECTION IN TENSION DO NOT REQUIRE TENSION TESTING) IN ACCORDANCE WITH REQUIREMENTS FOR POST-INSTALLED ANCHORS.

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STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	October 24, 2013	PAGE: 2-37



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $1.45 W_p$ ($S_{DS} = 1.93$, $a_p = 2.5$, $I_p = 1.5$, $R_p = 6.0$, $z/h \leq 1.0$)

VERTICAL FORCE (E_v) = $0.39 W_p$

SEISMIC COEFFICIENTS I_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL FRAMING)

2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCE SHOWN, IN ADDITION TO ALL OTHER LOADS.

4. EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN ON TABLE.

5. REFER TO TABLE ON PAGE 2-39 FOR ALL DIMENSIONS AND BRACKET ATTACHMENT TO STRUCTURE.

6. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT.

7. THE SUPPORT SPACING OF CABLE RUNWAYS SHALL BE CALCULATED BASED ON TRIBUTARY WEIGHT OF THE CABLE RUNWAY INCLUDING SELF WEIGHT LISTED ON THE TABLE ON PAGE 2-39, FOR EXAMPLE ; IF CABLE RUNWAY WEIGHT=10 lbs/ft, THEN SUPPORT SPACING SHOULD NOT MORE THAN $(50 \text{ lbs}) / (10 \text{ lbs/ft}) = 5 \text{ ft ON CENTER}$.

8. THE WEIGHT OF THE CABLE RUNWAY INCLUDING CONTENTS AND SELF WEIGHT FOR EACH SPECIFIC PROJECT SHALL BE CALCULATED PRIOR TO DETERMINING THE SUPPORT SPACING AS MENTIONED ABOVE IN NOTE 7. IN ABSENCE OF SUCH CALCULATIONS THE RATED CAPACITY OF THE CABLE RUNWAY SHOULD BE USED INCLUDING THE SELF WEIGHT OF THE CABLE RUNWAY TO DETERMINE THE SUPPORT SPACING AS MENTIONED ABOVE IN NOTE 7.



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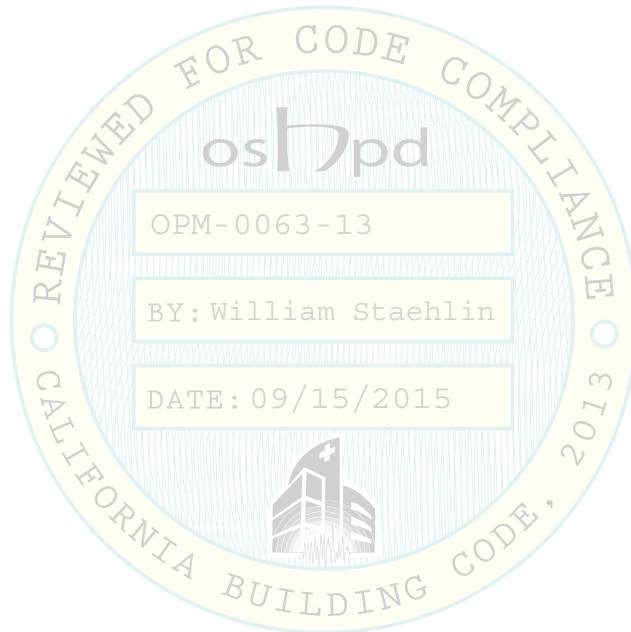
STRUCTURAL ENGINEER:		ZUBAIR SHEIKH
DATE:	PAGE:	2-38
October 24, 2013		

WALL MOUNTED CABLE RUNWAY BRACKET, ($S_{DS} \leq 1.93$)

TABLE

BRACKET MODEL NUMBER	WEIGHT * "Wp" [lb]	Depth "D1" [in.]	Height "H1" [in.]	C.G. Depth "D2" [in.]	Bolt-to-Bolt "H2" [in.]	Steel Bolt Size A307	Tumax, LRFD [lb/bolt]	Vumax, LRFD [lb/bolt]
SB213AL06K	50	7.88	10	5	4.2	3/8"	437	147
SB213AL12K	50	13.88	13.2	7.565	8.2	3/8"	620	202
SB213AL18K	50	19.88	19.2	10.565	14.2	3/8"	839	267

* Maximum load carrying capacity



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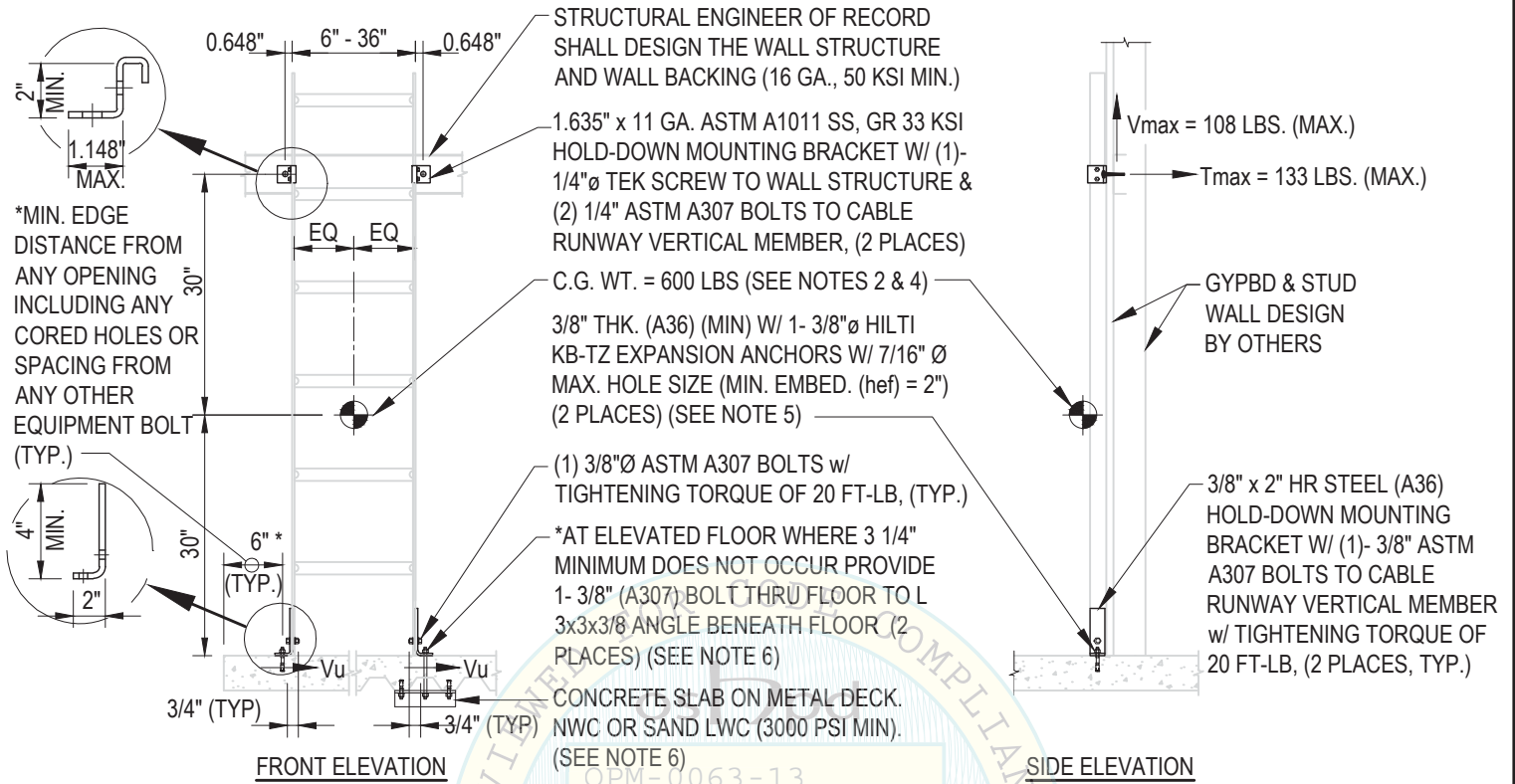
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STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	2-39

**CABLE RUNWAY WALL MOUNTED & FLOOR MOUNTED
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB OR
3,000 PSI SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA (MIN), ($S_{DS} \leq 1.00$)**

DETAIL



GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.

HORIZONTAL FORCE (E_h) = $0.72 W_p (S_{DS} = 1.00, a_p = 1.0, I_p = 1.5, R_p = 2.5, z/h \leq 1.0)$

VERTICAL FORCE (E_v) = $0.20 W_p$

- SEISMIC COEFFICIENTS I_p USED IS FROM CBC-2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6-1, (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS)
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS IS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
 - ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCE SHOWN, IN ADDITION TO ALL OTHER LOADS.
 - EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN.
 - REFER TO SECTION 1 NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
 - REFER TO PAGE 2-42 FOR MIN. STEEL DECK REQUIREMENTS AND ANGLE DETAIL.
 - ALL HOLES THRU STEEL FOR BOLTS SHALL BE OVERSIZED BY THE BOLT DIAMETER + 1/16".
 - ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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by **EATON**

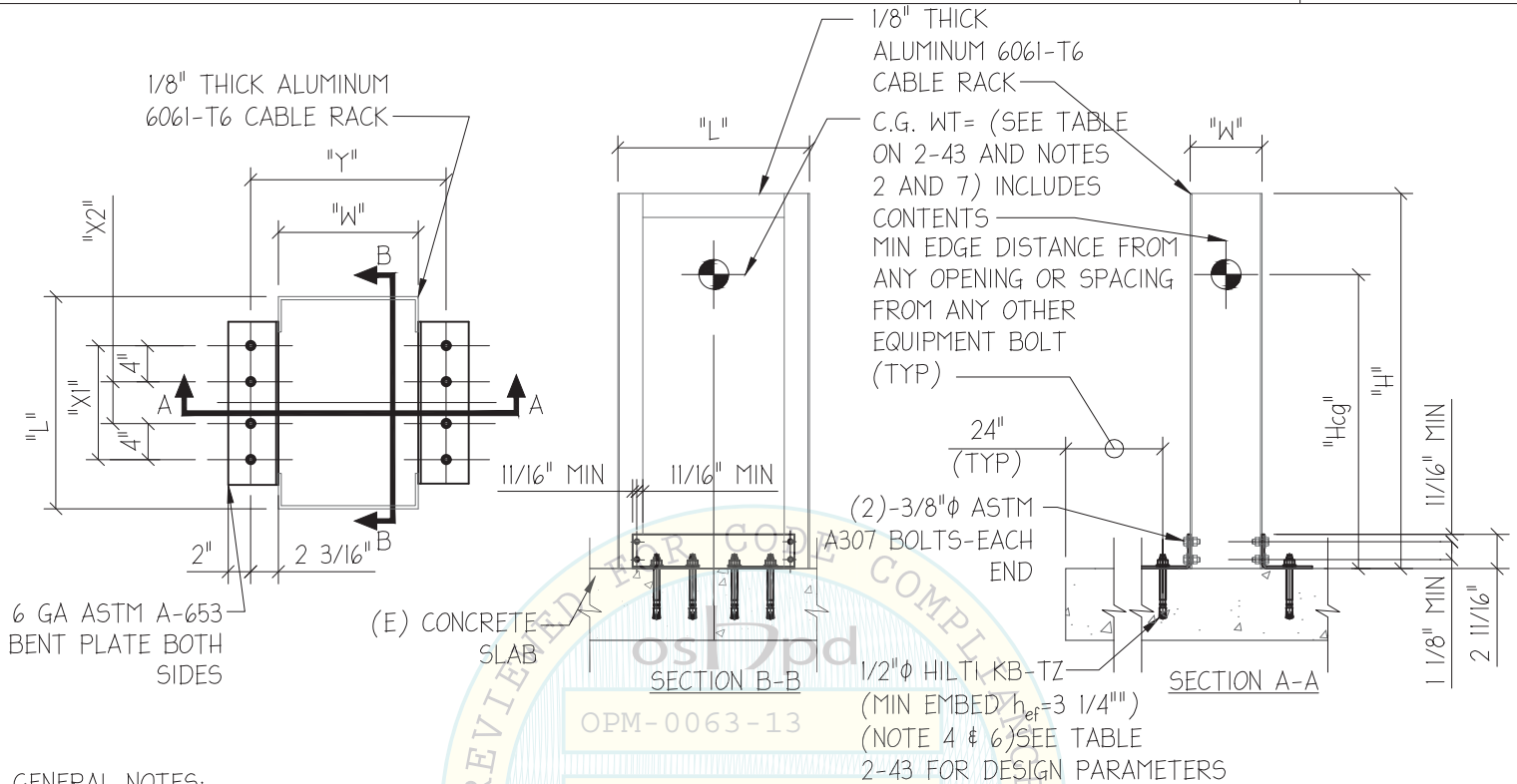
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STRUCTURAL ENGINEER:	
ZUBAIR SHEIKH	
DATE:	PAGE:
October 24, 2013	2-40

CABLE MANAGEMENT HIGH DENSITY RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB ($S_{DS} \leq 2.0$)

DETAIL



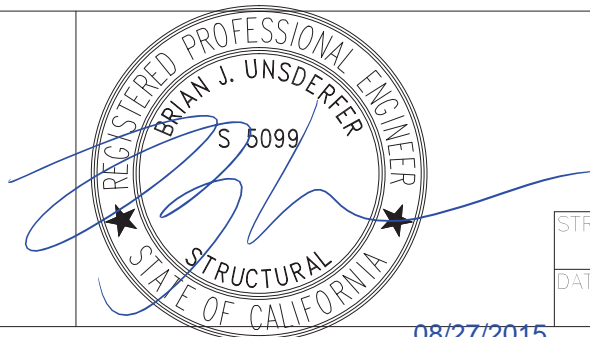
GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013.
- THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.50 W_p * S_{DS}$ ($a_p=2.5, R_p=6.0, \Omega_o=2.5, z/h \le 1.0, I_p=1.5$)
 VERTICAL FORCE (E_v) = $0.2 * S_{DS} * W_p$
- SEISMIC COEFFICIENTS I_p USED FROM CBC 2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6.1 (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL)
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LISTS OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER TO PAGE 2-44 FOR MIN. STEEL DECK REQUIREMENTS
- REFER TO SECTION I NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES AND S2-43 FOR DESIGN PARAMETERS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN.
- FOR DIMENSIONS, SEE TABLE ON 2-43
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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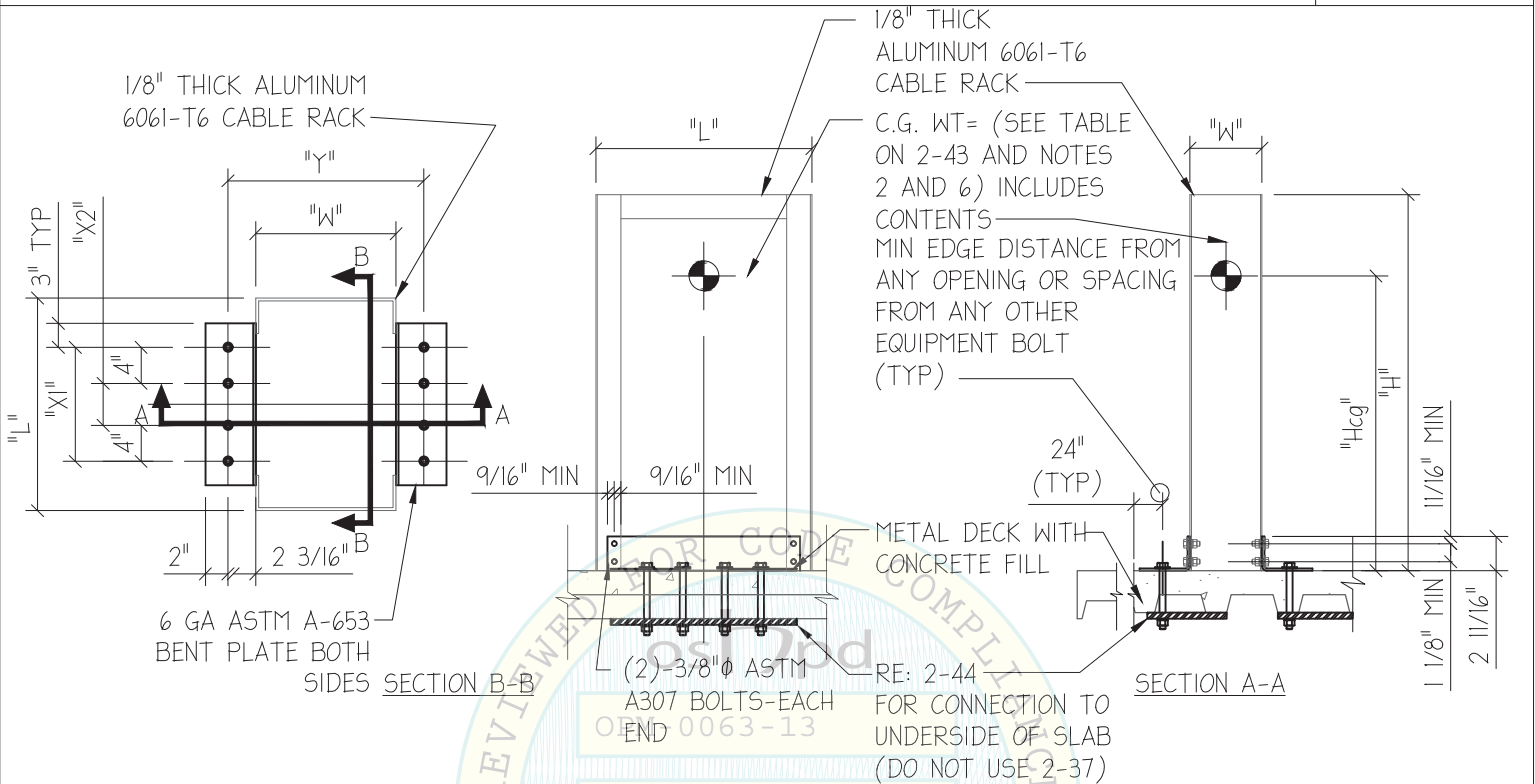
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STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-41

CABLE MANAGEMENT HIGH DENSITY RACK
 ATTACHMENT TO SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA
 MIN ($S_{DS} \leq 2.0$)

DETAIL



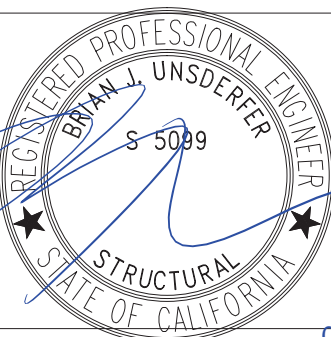
GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013.
- THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.50 W_p * S_{DS}$ ($a_p=2.5, R_p=6.0, S_0=2.5, z/h \le 1.0, I_p=1.5$)
 VERTICAL FORCE (E_v) = $0.2 * S_{DS} * W_p$
- SEISMIC COEFFICIENTS I_p USED FROM CBC 2013, SECTION 1616A.1.7, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6.1 (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL)
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOW, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LISTS OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER TO PAGE 2-44 FOR MIN. STEEL DECK REQUIREMENTS
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN.
- FOR DIMENSIONS, SEE TABLE ON 2-43
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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STRUCTURAL ENGINEER	
BRIAN J. USDERFER	
DATE	PAGE
August 17, 2015	2-42

CABLE MANAGEMENT HIGH DENSITY RACK
 ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB ($S_{DS} \leq 2.0$)

DETAIL

TWO POST EQUIPMENT RACK WITH ANGLE ATTACHMENT TO MIN. 3000 PSI NORMAL WEIGHT CONCRETE OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK- 20 GA (MIN), ($S_{DS} \leq 1.0$) ($z/h \leq 1.0$)

CATALOG NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	LENGTH "L" [in]	WIDTH "W" [in.]	HEIGHT "H" [in.]	C.G. Height "Hcg" [in]	Length along X-axis between Anchors "X1" [in]	Length along X-axis between Anchors "X2" [in]	Length along Y-axis between Anchors "Y" [in]	Unit Wt [lbs]	Vu max LRFD [lbs]	Tu max LRFD [lbs]
HD2T7A	620	23.62	16	84	56	13.5	5.5	20.37	63	96	620
HD2T7B	620	23.62	24	84	56	13.5	5.5	28.37	69	95	615
HD2T8A	520	23.62	16	96	64	13.5	5.5	20.37	72	83	628
HD2T8B	520	23.62	24	96	64	13.5	5.5	28.37	80	83	628

a. Tumax and Vumax LOADS IN TABLE HAVE BEEN AMPLIFIED BY THE $\Omega_0 = 2.5$ FACTOR PER ASCE 7-10, TABLE 13.6-1 TO SATISFY ACI 318-II APPENDIX D

TWO POST EQUIPMENT RACK WITH ANGLE ATTACHMENT TO MIN. 3000 PSI NORMAL WEIGHT CONCRETE OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK- 20 GA (MIN), ($S_{DS} \leq 2.0$) ($z/h \leq 1.0$)

UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	LENGTH "L" [in]	WIDTH "W" [in.]	HEIGHT "H" [in.]	C.G. Height "Hcg" [in]	Length along X-axis between Anchors "X1" [in]	Length along X-axis between Anchors "X2" [in]	Length along Y-axis between Anchors "Y" [in]	Unit Wt [lbs]	Vu max LRFD [lbs]	Tu max LRFD [lbs]
HD2T7A	165	23.62	16	84	56	13.5	5.5	20.37	63	84	633
HD2T7B	165	23.62	24	84	56	13.5	5.5	28.37	69	85	631
HD2T8A	145	23.62	16	96	64	13.5	5.5	20.37	72	74	638
HD2T8B	140	23.62	24	96	64	13.5	5.5	28.37	80	72	619

a. Tumax and Vumax LOADS IN TABLE HAVE BEEN AMPLIFIED BY THE $\Omega_0 = 2.5$ FACTOR PER ASCE 7-10, TABLE 13.6-1 TO SATISFY ACI 318-II APPENDIX D

TWO POST EQUIPMENT RACK WITH ANGLE ATTACHMENT TO MIN. 3000 PSI NORMAL WEIGHT CONCRETE OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK- 20 GA (MIN), ($S_{DS} \leq 0.86$) ($z/h \leq 1.0$)

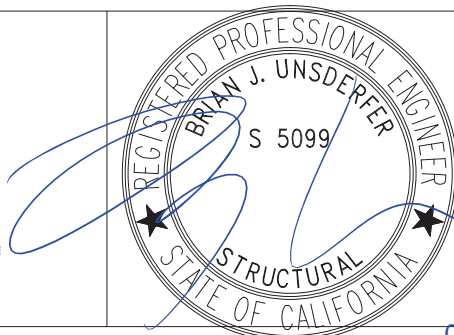
UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	LENGTH "L" [in]	WIDTH "W" [in.]	HEIGHT "H" [in.]	C.G. Height "Hcg" [in]	Length along X-axis between Anchors "X1" [in]	Length along X-axis between Anchors "X2" [in]	Length along Y-axis between Anchors "Y" [in]	Unit Wt [lbs]	Vu max LRFD [lbs]	Tu max LRFD [lbs]
HD2T7A	313	23.62	16	84	56	13.5	5.5	20.37	63	69	425
HD2T7B	371	23.62	24	84	56	13.5	5.5	28.37	69	83	505
HD2T8A	320	23.62	16	96	64	13.5	5.5	20.37	72	71	514
HD2T8B	380	23.62	24	96	64	13.5	5.5	28.37	80	84	612

a. Tumax and Vumax LOADS IN TABLE HAVE BEEN AMPLIFIED BY THE $\Omega_0 = 2.5$ FACTOR PER ASCE 7-10, TABLE 13.6-1 TO SATISFY ACI 318-II APPENDIX D

B-Line
 by **EATON**

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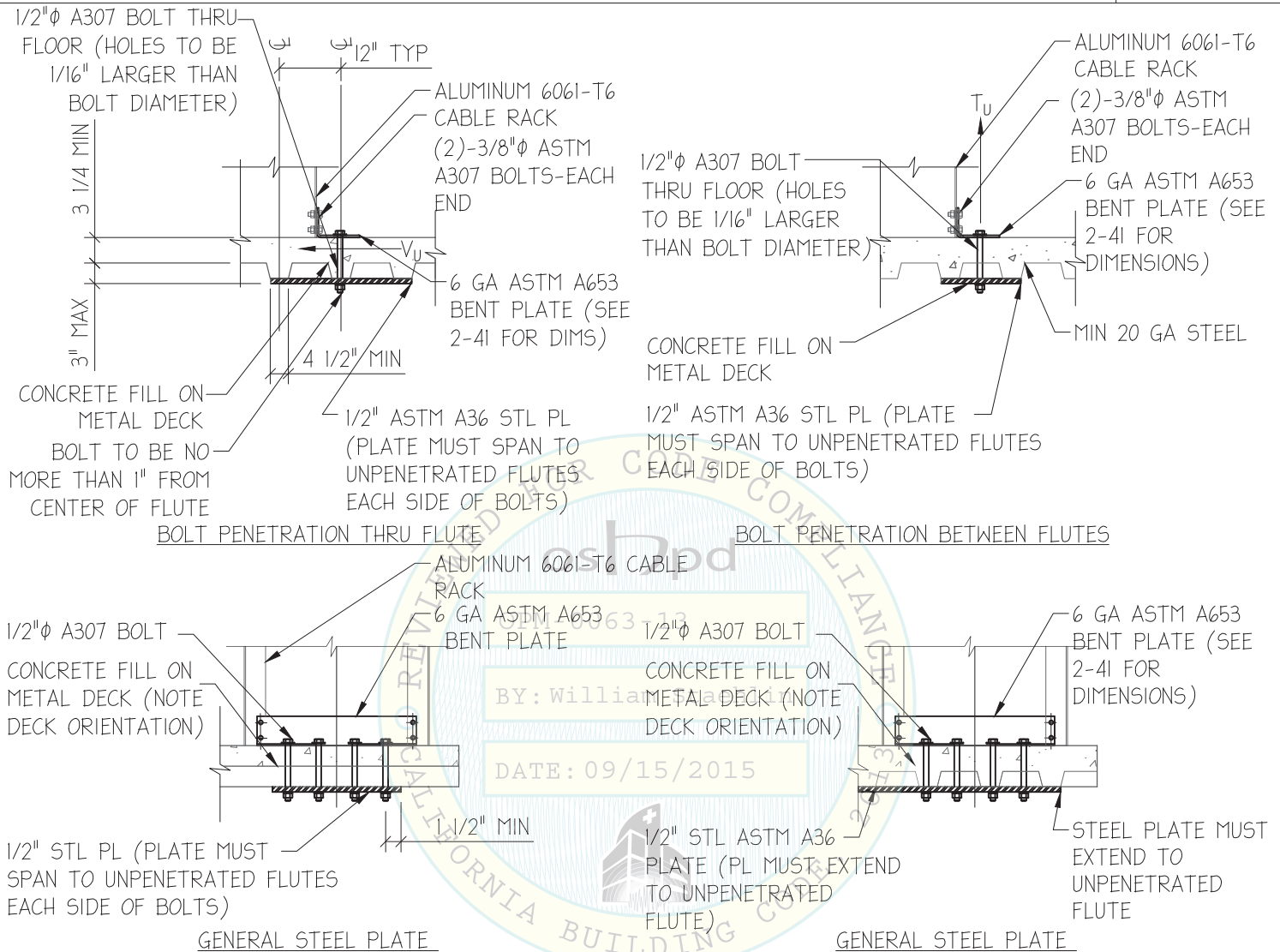


STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-43

08/27/2015

CABLE MANAGEMENT HIGH DENSITY RACK
 ATTACHMENT TO SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA MIN
 ($S_{DS} \leq 2.0$) METAL DECK PROFILES "B" OR "W".

DETAIL



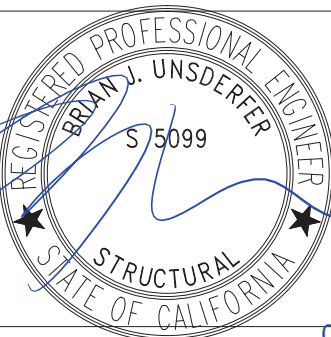
BOLTS THROUGH CONCRETE ON METAL DECK

1. BOLTS SHALL BE TORQUED BY 3/4" TURN OF THE NUTS AFTER THE SNUG TIGHT (THE SNUG-TIGHT CONDITION IS DEFINED AS THE TIGHTNESS REQUIRED TO BRING THE CONNECTED PLIES INTO FIRM CONTACT) CONDITION IS ACHIEVED, UNLESS OTHERWISE NOTED
2. ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT)
3. THROUGH-BOLTS IN CONCRETE SHALL RECEIVE SPECIAL INSPECTION AND TESTING (THROUGH BOLTS WITH STEEL TO STEEL CONNECTION IN TENSION DO NOT REQUIRE TENSION TESTING) IN ACCORDANCE WITH REQUIREMENTS FOR POST-INSTALLED ANCHORS

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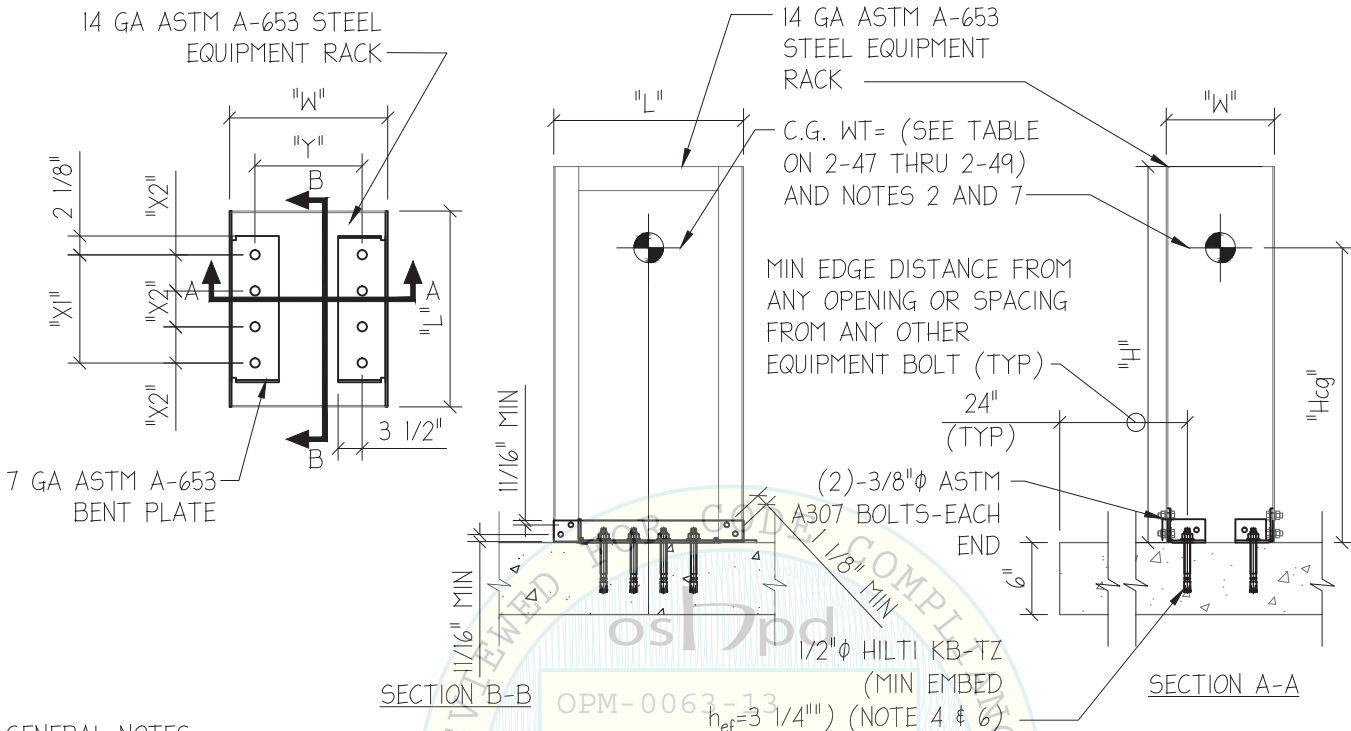
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STRUCTURAL ENGINEER	
BRIAN J. USDERFER	
DATE	PAGE
August 17, 2015	2-44

4-POST HIGH DENSITY EQUIPMENT RACK
ATTACHMENT TO MIN 3,000 PSI NORMAL WEIGHT CONCRETE SLAB ($S_{DS} \leq 1.12$)

DETAIL



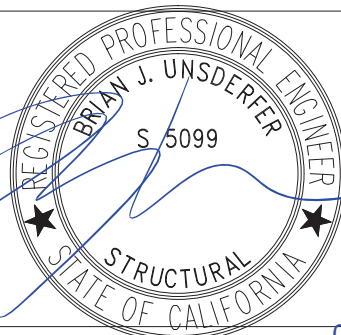
GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013.
- THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.50 W_p * S_{DS}$ ($a_p=2.5, R_p=6.0, \Omega_0=2.5, z/h \leq 1.0, I_p=1.5$)
 VERTICAL FORCE (E_v) = $0.2 * S_{DS} * W_p$
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LISTS OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER TO PAGE 2-50 FOR MIN. STEEL DECK REQUIREMENTS
- REFER TO SECTION I NOTE 3.0 FOR EXPANSION ANCHOR GENERAL NOTES.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN.
- FOR DIMENSIONS, SEE TABLE ON 2-47
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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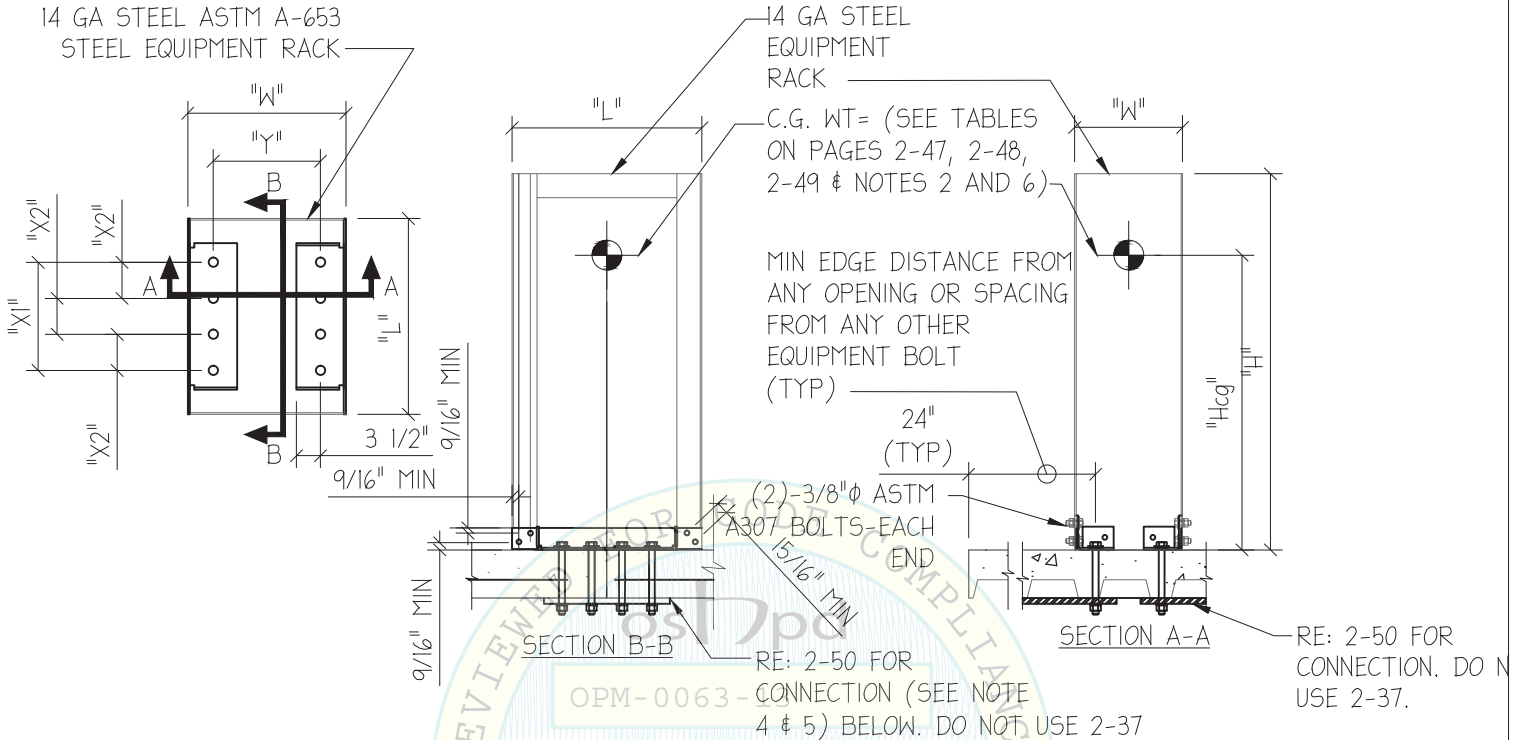
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STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-45

4-POST HIGH DENSITY EQUIPMENT RACK
 ATTACHMENT TO SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA MIN
 ($S_{Ds} \leq 1.12$) METAL DECK PROFILES "B" OR "W".

DETAIL

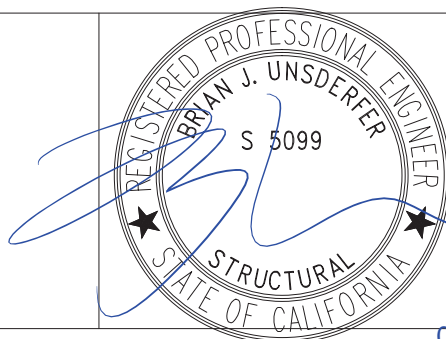


GENERAL NOTES:

- THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2013.
- THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2013.
 HORIZONTAL FORCE (E_h) = $0.50 W_p * S_{Ds}$ ($a_p=2.5, R_p=6.0, \Omega=2.5, z/h \leq 1.0, I_p=1.5$)
 VERTICAL FORCE (E_v) = $0.2 * S_{Ds} * W_p$
- SEISMIC COEFFICIENTS I_p USED FROM CBC 2013, SECTION 1616A.1.17, AND SEISMIC COEFFICIENTS a_p , AND R_p USED ARE FROM ASCE 7-10, TABLE 13.6.1 (MOTOR CONTROL CENTERS, PANEL BOARDS, SWITCH GEAR, INSTRUMENTATION CABINETS, AND OTHER COMPONENTS CONSTRUCTED OF SHEET METAL)
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL LOADS. SEE SECTION 1.0 NOTE 4.0 FOR LISTS OF STRUCTURAL ENGINEER OF RECORDS RESPONSIBILITIES.
- REFER TO PAGE 2-50 FOR MIN. STEEL DECK REQUIREMENTS.
- EQUIPMENT MANUFACTURER MUST DESIGN UNIT TO MAKE C.G. EQUAL TO OR LESS THAN THE C.G. HEIGHT DIMENSION SHOWN.
- FOR DIMENSIONS, SEE TABLE ON 2-47.
- ALL HOLES THRU STEEL FOR BOLTS SHALL BE STANDARD HOLE PER AISC, 14 ED TABLE J3.3 (MAXIMUM HOLE DIAMETER TO BE 1/16" OVER BOLT).

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STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-46

4-POST HIGH DENSITY EQUIPEMENT RACK
 ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB ($S_{DS} \leq 1.0$)

DETAIL

FOUR POST EQUIPMENT RACK WITH ANGLE ATTACHMENT TO MIN. 3000 PSI NORMAL WEIGHT CONCRETE OR SAND LIGHT WIEGHT CONCRETE OVER METAL DECK- 20 GA (MIN), ($S_{DS} \leq 1.0$) ($z/h \leq 1.0$)

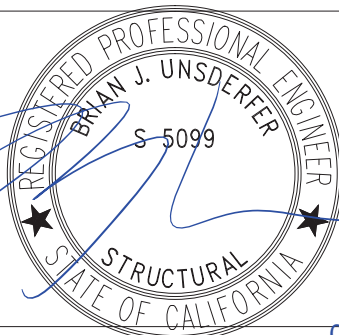
UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	LENGTH "L" [in]	WIDTH "W" [in.]	HEIGHT "H" [in.]	C.G. Height "Hcg" [in]	Length along X-axis between Anchors "X1" [in]	Length along X-axis between Anchors "X2" [in]	Length along Y-axis between Anchors "Y" [in]	Unit Wt [lbs]	Vu max LRFD [lbs]	Tu max LRFD [lbs]
HD4S7C	308	23.62	30	84	56	15	5	25.17	121	83	510
HD4T7C	308	23.62	30.	84	56	15	5	25.17	130	83	511
HD4S7D	305	23.62	36	84	56	15	5	31.17	125	82	505
HD4T7D	308	23.62	36	84	56	15	5	31.17	132	83	509
HD4S7E	304	23.62	42	84	56	15	5	38.17	130	82	504
HD4T7E	306	23.62	42	84	56	15	5	38.17	137	83	508
HD4S8C	265	23.62	30	96	64	15	5	25.17	132	71	517
HD4T8C	265	23.62	30	96	64	15	5	25.17	140	71	517
HD4S8D	265	23.62	36	96	64	15	5	31.17	135	71	514
HD4T8D	265	23.62	36	96	64	15	5	31.17	145	71	518
HD4S8E	265	23.62	42	96	64	15	5	38.17	140	71	516
HD4T8E	264	23.62	42	96	64	15	5	38.17	149	71	514

a. Tumax and Vumax LOADS IN TABLE HAVE BEEN AMPLIFIED BY THE $\Omega_0 = 2.5$ FACTOR PER ASCE 7-10, TABLE 13.6-1 TO SATISFY ACI 318-II APPENDIX D

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STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-47

4-POST HIGH DENSITY EQUIPMENT RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB ($S_{DS} \leq 1.12$)

DETAIL

FOUR POST EQUIPMENT RACK WITH ANGLE ATTACHMENT TO MIN. 3000 PSI NORMAL WEIGHT CONCRETE OR SAND LIGHT WIEGHT CONCRETE OVER METAL DECK- 20 GA (MIN), ($S_{DS} \leq 1.12$) ($z/h \leq 1.0$)

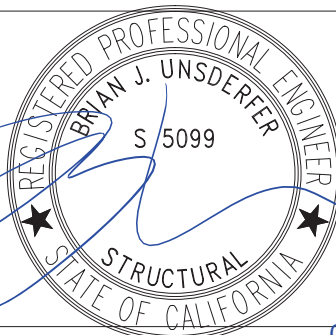
UNIT NUMBER	WEIGHT (Equip + Content) "Wp" [lb]	LENGTH "L" [in]	WIDTH "W" [in.]	HEIGHT "H" [in.]	C.G. Height "Hcg" [in]	Length along X-axis between Anchors "X1" [in]	Length along X-axis between Anchors "X2" [in]	Length along Y-axis between Anchors "Y" [in]	Unit Wt [lbs]	Vu max LRFD [lbs]	Tu max LRFD [lbs]
HD4S7C	192	23.62	30	84	56	15	5	25.17	121	77	517
HD4T7C	190	23.62	30.	84	56	15	5	25.17	130	76	511
HD4S7D	192	23.62	36	84	56	15	5	31.17	125	77	515
HD4T7D	192	23.62	36	84	56	15	5	31.17	133	77	517
HD4S7E	192	23.62	42	84	56	15	5	38.17	130	77	516
HD4T7E	192	23.62	42	84	56	15	5	38.17	137	77	515
HD4S8C	166	23.62	30	96	64	15	5	25.17	132	67	519
HD4T8C	166	23.62	30	96	64	15	5	25.17	140	67	522
HD4S8D	166	23.62	36	96	64	15	5	31.17	135	66	517
HD4T8D	166	23.62	36	96	64	15	5	31.17	145	67	520
HD4S8E	166	23.62	42	96	64	15	5	38.17	140	67	521
HD4T8E	166	23.62	42	96	64	15	5	38.17	149	67	521

a. Tumax and Vumax LOADS IN TABLE HAVE BEEN AMPLIFIED BY THE $\Omega_0 = 2.5$ FACTOR PER ASCE 7-10, TABLE 13.6-1 TO SATISFY ACI 318-II APPENDIX D

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STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-48

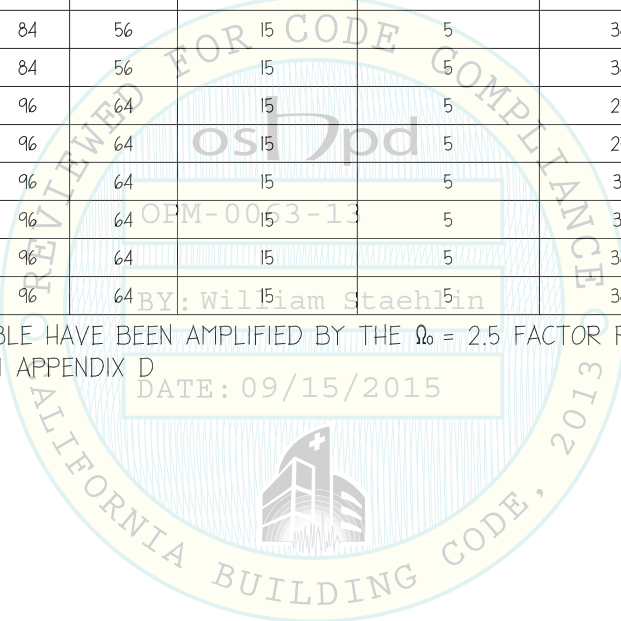
4-POST HIGH DENSITY EQUIPMENT RACK
ATTACHMENT TO MIN. 3,000 PSI NORMAL WEIGHT CONCRETE SLAB ($S_{DS} \leq 0.44$)

DETAIL

FOUR POST EQUIPMENT RACK WITH ANGLE ATTACHMENT TO MIN. 3000 PSI NORMAL WEIGHT CONCRETE OR SAND LIGHT WEIGHT CONCRETE OVER METAL DECK- 20 GA (MIN), ($S_{DS} \leq 0.44$) ($z/h \leq 1.0$)

UNIT NUMBER	WEIGHT (Equip + Content) "W" [lb]	LENGTH "L" [in.]	WIDTH "W" [in.]	HEIGHT "H" [in.]	C.G. Height "Hcg" [in.]	Length along X-axis between Anchors "X1" [in.]	Length along X-axis between Anchors "X2" [in.]	Length along Y-axis between Anchors "Y" [in.]	Unit Wt [lbs]	Vu max LRFD [lbs]	Tu max LRFD [lbs]
HD4S7C	640	23.62	30	84	56	15	5	25.17	121	76	272
HD4T7C	648	23.62	30	84	56	15	5	25.17	130	77	275
HD4S7D	645	23.62	36	84	56	15	5	31.17	125	76	273
HD4T7D	652	23.62	36	84	56	15	5	31.17	133	77	277
HD4S7E	829	23.62	42	84	56	15	5	38.17	130	98	352
HD4T7E	836	23.62	42	84	56	15	5	38.17	137	99	355
HD4S8C	651	23.62	30	96	64	15	5	25.17	132	77	360
HD4T8C	660	23.62	30	96	64	15	5	25.17	140	78	365
HD4S8D	655	23.62	36	96	64	15	5	31.17	135	78	363
HD4T8D	664	23.62	36	96	64	15	5	31.17	145	79	368
HD4S8E	840	23.62	42	96	64	15	5	38.17	140	99	465
HD4T8E	849	23.62	42	96	64	15	5	38.17	149	100	470

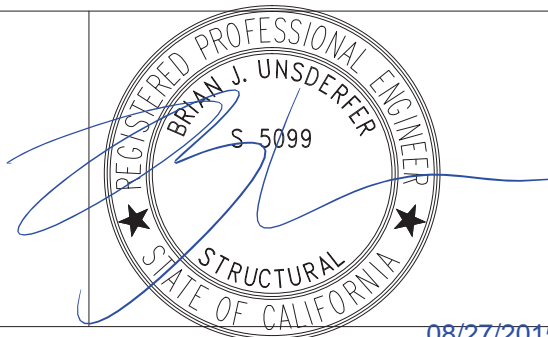
a. Tumax and Vumax LOADS IN TABLE HAVE BEEN AMPLIFIED BY THE $\Omega_0 = 2.5$ FACTOR PER ASCE 7-10, TABLE 13.6-1 TO SATISFY ACI 318-II APPENDIX D



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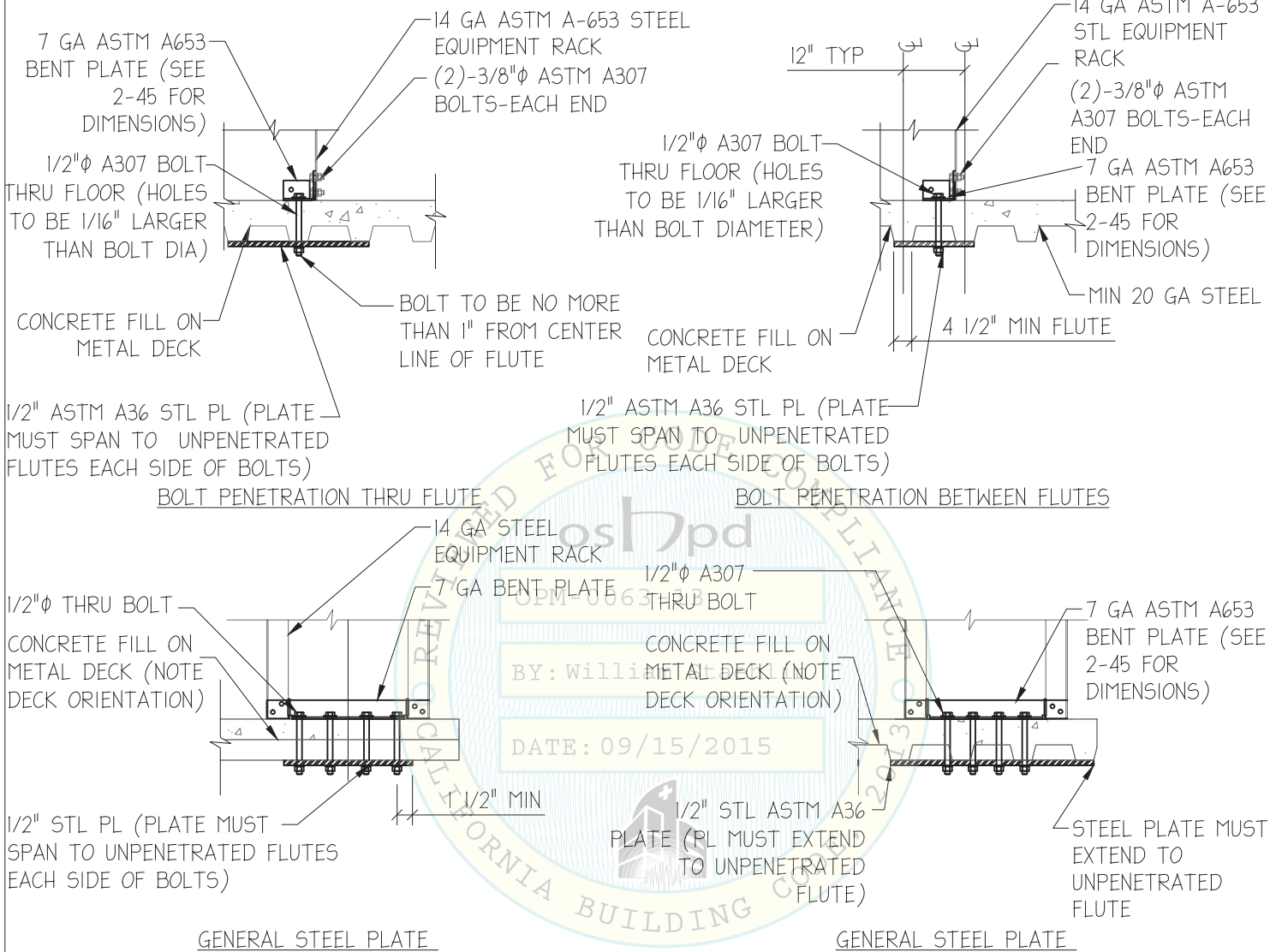
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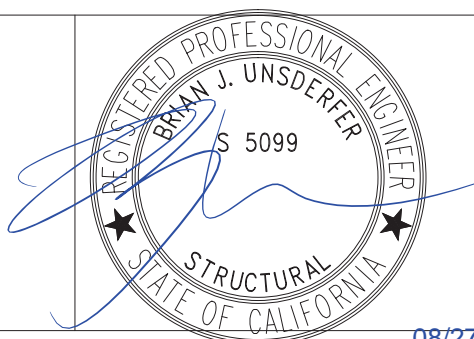
STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-49

4-POST HIGH DENSITY EQUIPMENT RACK
 ATTACHMENT TO SAND LIGHT WEIGHT CONCRETE OVER METAL DECK - 20 GA MIN
 ($S_{DS} \leq 1.12$) METAL DECK PROFILES "B" OR "W".

DETAIL



BY: William Staehlin
 DATE: 09/15/2015



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STRUCTURAL ENGINEER		BRIAN J. USDERFER	
DATE	August 17, 2015	PAGE	2-50