



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

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

OFFICE USE ONLY

APPLICATION #: OPM-0608

OSHPD Preapproval of Manufacturer's Certification (OPM)

Type: New Renewal/Update

Manufacturer Information

Manufacturer: Vertiv

Manufacturer's Technical Representative: Jonathan Harder

Mailing Address: 1050 Dearborn Dr, Columbus, OH 43085

Telephone: (614) 841-6182 Email: jonathan.harder@vertiv.com

Product Information

Product Name: Vertiv VR Heavy Duty Rack

Product Type: Server Rack

Product Model Number: Various, see attachment

General Description: Server Rack support and attachment

Applicant Information

Applicant Company Name: Vertiv

Contact Person: Jonathan Harder

Mailing Address: 1050 Dearborn Dr, Columbus, OH 43085

Telephone: (614) 841-6182 Email: jonathan.harder@vertiv.com

Title: Engineer

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

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

Registered Design Professional Preparing Engineering Recommendations

Company Name: JUNKER ENGINEERING GROUP
Name: Dan Junker California License Number: S6178
Mailing Address: 8950 Jefferson Ave, La Mesa, CA 91941
Telephone: (619) 606-5058 Email: dan@junkereng.com

OSHPD Special Seismic Certification Preapproval (OSP)

Special Seismic Certification is preapproved under OSP OSP Number: _____

Certification Method

Testing in accordance with: ICC-ES AC156 FM 1950-16
 Other(s) (Please Specify): _____

*Use of criteria other than those adopted by the California Building Standards Code, 2019 (CBSC 2019) 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 2019 may be used when approved by OSHPD prior to testing.

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

OSHPD Approval

Date: 6/1/2021
Name: Keh-Shin Chi Title: Senior Structural Engineer
Condition of Approval (if applicable): _____



SUPPORT & ATTACHMENT PRE-APPROVAL

OPM-0608



EQUIPMENT MANUFACTURER
EQUIPMENT TYPE
EQUIPMENT MODELS
APPROVED MOUNTING
APPROVED SUBSTRATE

VERTIV CO.
 SERVER RACK
 VR HEAVY DUTY, SEE TABLES
 RIGID FLOOR MOUNT
 CONCRETE
 SEE MATERIAL NOTES HEREIN

APPROVAL PARAMETERS

RISK CATEGORY
COMPONENT IMPORTANCE FACTOR, I_p
COMPONENT CG / BUILDING HEIGHT, z/h
COMPONENT AMPLIFICATION FACTOR, a_p
COMPONENT RESPONSE MODIFICATION FACTOR, R_p

IV
 1.5
 1.0 (INSTALLATION AT ANY LEVEL IN BUILDING)
 1.0
 2.5
 (COMMUNICATION EQUIPMENT, COMPUTERS,
 INSTRUMENTATION & CONTROLS PER ASCE7-16, TABLE 13.6-1)

OVERSTRENGTH FACTOR Ω
SHORT PERIOD SPECTRAL DESIGN ACCELERATION, S_{DS}
HORIZONTAL SEISMIC DESIGN FORCE, E_h
VERTICAL SEISMIC DESIGN FORCE, E_v

2
 0.8g, 1.6g, 2.5g
 0.576*Wp, 1.152*Wp, 1.8*Wp
 0.2*S_{DS}*Wp = 0.16*Wp, 0.32*Wp, 0.5*Wp

GENERAL NOTES:

- THIS OSHPD PREAPPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2019. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM MUST BE BASED ON THE CBC 2019.
- THIS DOCUMENT CONSTITUTES APPROVAL FOR THE COMPONENT SUPPORTS & ATTACHMENTS ONLY. THE COMPONENT ITSELF IS NOT CONSIDERED.
- THE SUPPORT & ATTACHMENT DETAILS IN THIS PRE-APPROVAL MAY BE USED FOR INSTALLATION AT ANY HEIGHT IN A BUILDING AND AT ANY LOCATION IN THE UNITED STATES WHERE $S_{DS} \leq 2.5g$.
- ALL ANCHOR FORCES SHOWN ON THE DRAWINGS ARE LRFD FACTORED LOADS AND SHALL BE USED FOR STRENGTH STRESS DESIGN.
- ALL SUPPORTING SUBSTRATE MUST MEET MINIMUM SPECIFICATIONS PRESENTED BELOW.
- THIS PRE-APPROVAL CONSIDERS THE SUPPORT & ATTACHMENT OF THE UNIT ONLY. DESIGN OF SUPPORTING FLOOR SUBSTRATE SHALL BE BY THE STRUCTURAL ENGINEER OF RECORD.
- THIS DOCUMENT MAY ONLY BE USED WITH THE EXPRESS WRITTEN CONSENT OF THE MANUFACTURER LISTED ABOVE FOR THE SPECIFIC PROJECT SITE AND INSTALLATION LOCATION. THIS DOCUMENT IS INVALID WITH SUCH CONSENT.

RESPONSIBILITIES OF THE STRUCTURAL ENGINEER OF RECORD:

- DESIGN SUPPORTING SUBSTRATE AS NOTED ON THESE APPROVAL DOCUMENTS. THE SEOR SHALL ALSO VERIFY THE ADEQUACY OF THE STRUCTURES WHICH SUPPORT THE EQUIPMENT FOR THE LOADS IMPOSED ON THEM BY THE EQUIPMENT AS WELL AS ALL OTHERS APPLICABLE LOADS.
- VERIFY THAT THE ACTUAL EQUIPMENT WEIGHT, CG LOCATION, ANCHOR LOCATIONS, ANCHOR DETAILS, AND THE MATERIAL AND GAGE OF THE UNIT WHERE ATTACHMENTS ARE MADE CONFORM TO THE INFORMATION SHOWN ON PRE-APPROVAL DOCUMENTS.
- PROVIDE SUPPORTING STRUCTURE TO SUPPORT FORCES SHOWN IN ADDITION TO ALL OTHER RELEVANT LOADS.
- VERIFY THAT THE INSTALLATION IS IN CONFORMANCE WITH THE 2019 CBC AND WITH THE DETAILS, MATERIALS, AND GAGE OF THE UNIT WHERE ATTACHMENTS ARE MADE AGREE WITH THE INFORMATION SHOWN ON THE PREAPPROVAL DOCUMENTS.
- VERIFY THAT PROJECT SPECIFIC VALUES OF S_{DS} & z/h RESULT IN SEISMIC FORCES (E_h , E_v) THAT DO NOT EXCEED THE VALUES ON LISTED HEREIN.



<p>8950 Jefferson Ave. La Mesa, Ca 91941 619.606.5058 dan@junkereng.com</p>	PROJECT TITLE:	DOC #:	2020-161-DRAW-01-03
	VERTIV VR HEAVY DUTY RACK SUPPORT & ATTACHMENTS, CA OSHPD	PROJ #:	2020-161
	ADDRESS	DR:	VL
	SHEET TITLE:	CH:	DJ
	GENERAL NOTES, MODEL, & ANCHOR INFO	AP:	DJ
	ISSUED FOR:	DATE:	04/29/2021
APPROVAL	SCALE:	AS-NOTED	SHEET No. 1
			SHEET 1 of 5

2020-161-S1-S4.dwg Plotted: Apr. 29, 2021-11:31am

MODEL NUMBER	U	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	RACK WEIGHT (lbs)	MAX PAYLOAD (lbs)
VR9104	24	47.8	23.6	43.3	237.60	1500
VR9304	24	47.8	23.6	47.8	253.00	1500
VR9154	24	47.8	31.5	43.3	286.00	1500
VR9354	24	47.8	31.5	47.8	303.60	1500
VR9100	42	78.6	23.6	43.3	332.20	1500
VR9300	42	78.6	23.6	47.8	345.40	1500
VR9150	42	78.6	31.5	43.3	374.00	1500
VR9350	42	78.6	31.5	47.8	391.60	1500
VR9105	45	83.97	23.6	43.3	374.85	1500
VR9305	45	83.97	23.6	47.8	396.90	1500
VR9155	45	83.97	31.5	43.3	441.00	1500
VR9355	45	83.97	31.5	47.8	463.05	1500
VR9107	48	89.25	23.6	43.3	463.05	1500
VR9307	48	89.25	23.6	47.8	485.10	1500
VR9157	48	89.25	31.5	43.3	507.15	1500
VR9357	48	89.25	31.5	47.8	529.20	1500
VR9109	52	96.23	23.6	43.3	551.25	1500
VR9309	52	96.23	23.6	47.8	551.25	1500
VR9159	52	96.23	31.5	43.3	573.30	1500
VR9359	52	96.23	31.5	47.8	595.35	1500

A CERTIFIED RACK & PAYLOAD INFORMATION

MODEL NUMBER	MAX SDS (g)	ANCHOR TYPE	ANCHOR DIAMETER (inches)	EFF. EMBED LENGTH (inches)	f _c MIN (psi)	MIN CONCRETE EDGE DISTANCE (inches)	MIN SLAB THICKNESS (inches)	REQ'D TEST TENSION (lbs)
VR HEAVY DUTY (ALL)	0.8	HILTI KWIK BOLT TZ2	5/8	4	4,000	6.00	6.0	5,220
	1.6	HILTI HIT-Z w/ HY200 EPOXY	5/8	5.75	4,000	9.00	8.0	6,625
	2.5	HILTI HIT-Z w/ HY200 EPOXY	5/8	7.5	4,000	12.00	12.0	13,000

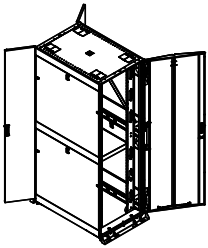
B ANCHOR SCHEDULE

- NOTES:**
- HILTI KB-TZ2 ANCHORS SHALL BE PROVIDED AND INSTALLED IN COMPLIANCE WITH ICC# ESR-4266.
 - ANCHORS USING HILTI HIT-HY 200 EPOXY SHALL BE PROVIDED AND INSTALLED IN COMPLIANCE WITH ICC# ESR-3187.
 - TESTING AND INSPECTION OF POST INSTALLED ANCHORS SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY EMPLOYED BY THE FACILITY OWNER PER 2019 CBC 1704A & 1910A.5 AND 2019 CAC 7-149. ALL REPORTS SHALL BE SENT TO THE INSPECTOR OF RECORD, OWNER, AND ARCHITECT OR ENGINEER IN RESPONSIBLE CHARGE.
 - AFTER AT LEAST 24 HOURS HAVE ELAPSED SINCE INSTALLATION, DIRECT PULL TENSION TEST AT LEAST 50% OF THE ANCHORS.
 - ACCEPTANCE CRITERIA: DIRECT TENSION TEST: THE ANCHOR SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE TEST LOAD. A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER BECOMES LOOSE.
 - IF ANY ANCHOR FAILS, TEST ALL ANCHORS.
 - ACCEPTANCE CRITERIA FOR POST-INSTALLED ANCHORS PER 2019 CBC 1910A.5.5: FIELD TESTS SHALL SATISFY THE REQUIREMENTS OF 2019 CBC 1910A.5.5 FOR THE HYDRAULIC RAM METHOD.



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	ADDRESS:	DR:	VL
	SHEET TITLE:	CH:	DJ
	GENERAL NOTES	AP:	DJ
	ISSUED FOR:	DATE:	04/29/2021
APPROVAL	SCALE:	AS-NOTED	SHEET 2 of 5

Plotted: Apr. 29, 2021-11:31am



NOTES:

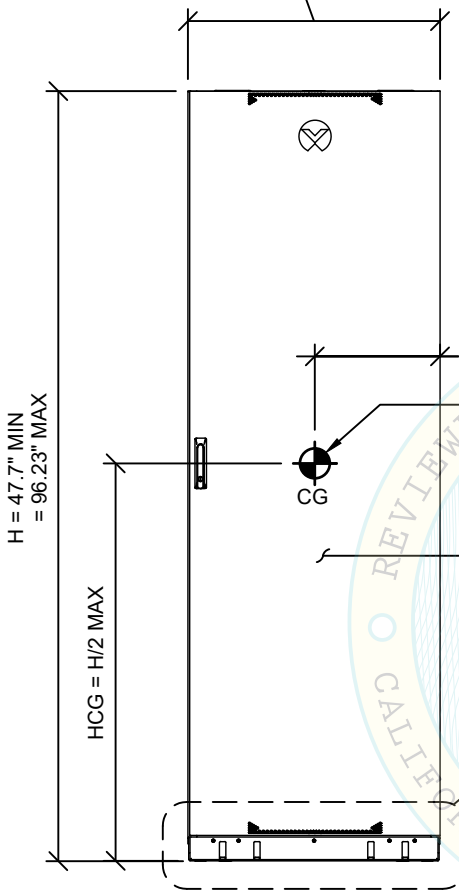
1. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
2. ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE RIGID BASE SUPPORT PER SHEET 2, DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL OTHER LOADS.
3. RACK MATERIAL AT BRACKET ATTACHMENT SHALL BE SPHC-JIS G3131 (Fu = 270MPa)
4. SEE GENERAL NOTES ON SHEET 1.
5. FULL THREAD ENGAGEMENT SHALL BE PROVIDED INTO COMPONENT MATERIAL. SEE FOLLOWING PAGES FOR MINIMUM COMPONENT MATERIAL THICKNESS AT ATTACHMENT.

ISOMETRIC VIEW

W = 23.6" MIN
= 31.3" MAX

VERTIV CO, CERTIFIES
THIS DOCUMENT AS AN
OUTLINE DRAWING
SIGNATURE: *Jonathan Harder*
NAME: Jonathan Harder
TITLE: Engineer
DATE: 04-29-21

W = 43.3" MIN
= 47.8" MAX



WCG = W/2 +/- 0.1W

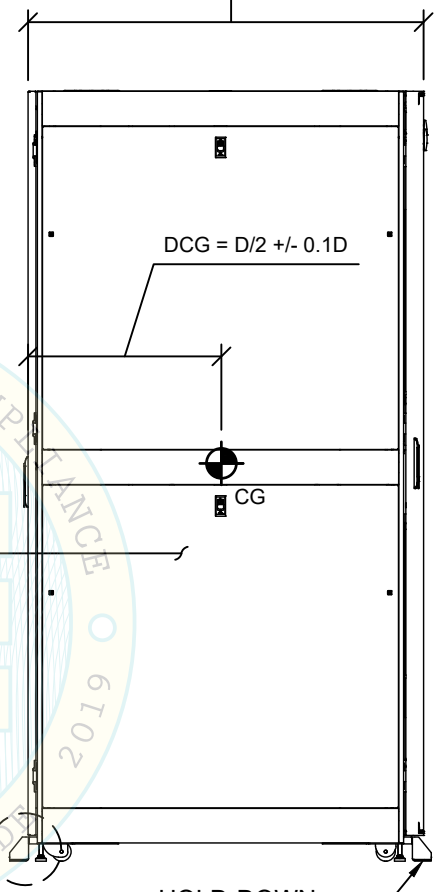
MAXIMUM WT = 595.35 lbs +
1500 lb (PAYLOAD) = 2095 lbs

OPM-0608
APPROVE SERVER
RACK PER SHEET 2

BY: Keh-Shin Chi

DATE: 06/01/2021

SEE SHEET 4



A FRONT VIEW

B SIDE VIEW

1 RACK ELEVATIONS
SCALE: NTS

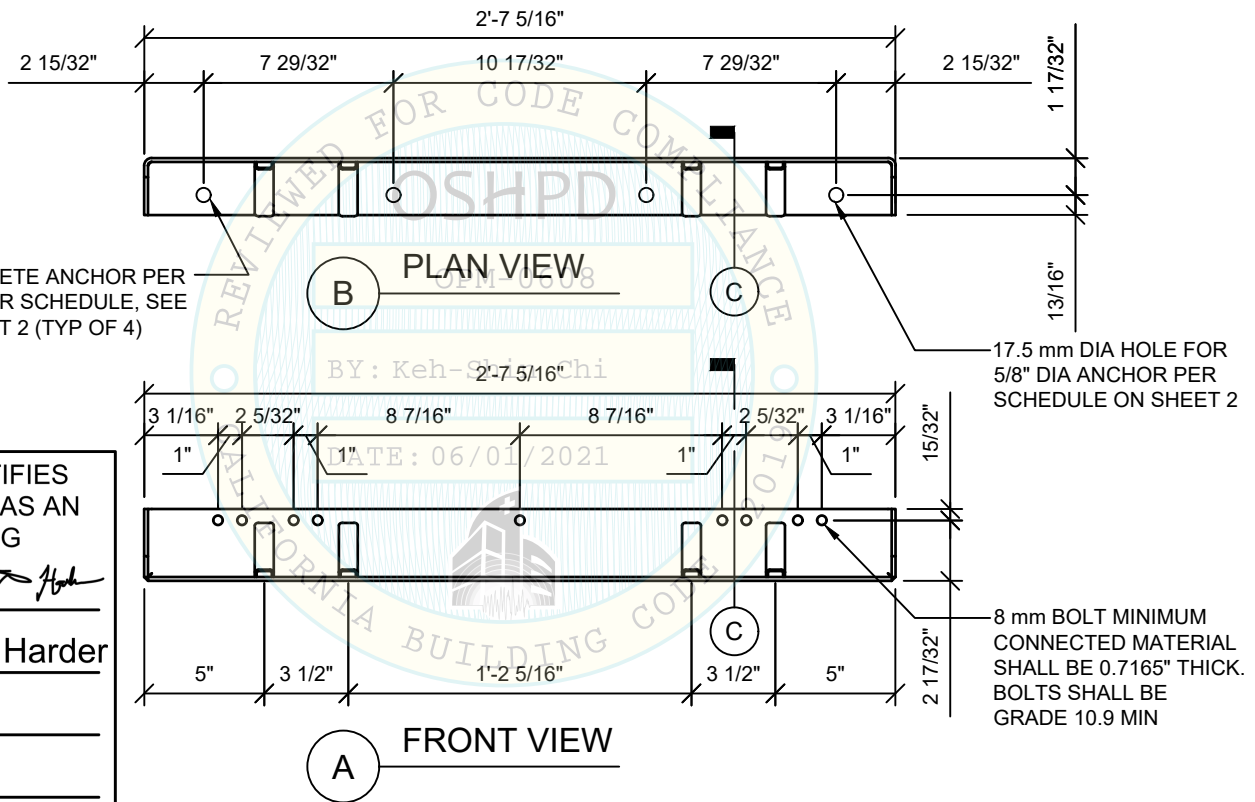
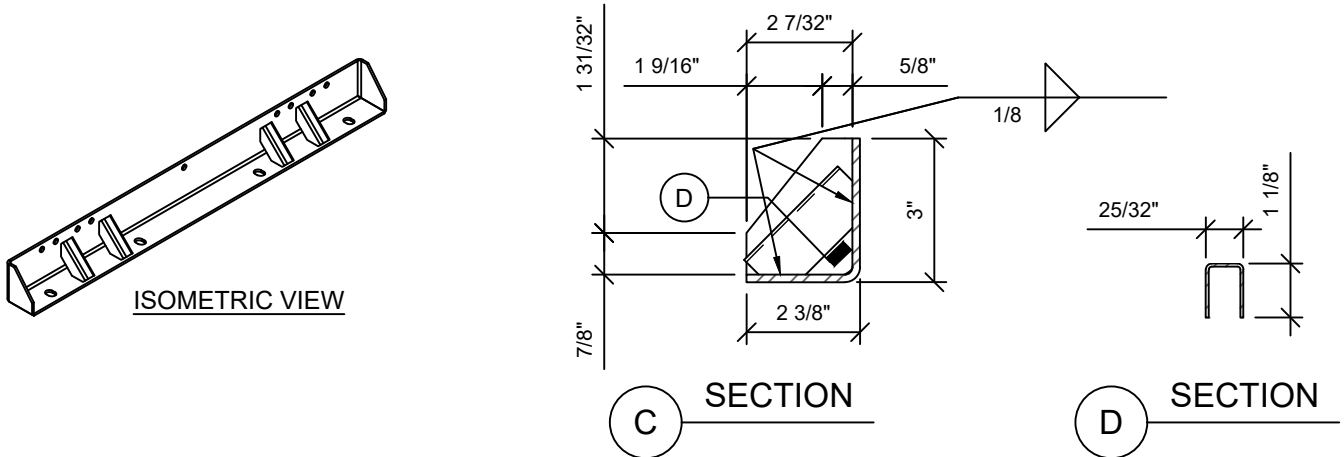


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	VERTIV VR HEAVY DUTY RACK SUPPORT & ATTACHMENTS, CA OSHPD	PROJ #:	2020-161	SHEET No. 3
	ADDRESS	DR:	VL	
	SHEET TITLE:	CH:	DJ	
	RACK ELEVATIONS	AP:	DJ	
	ISSUED FOR:	DATE:	04/29/2021	
APPROVAL	SCALE:	AS-NOTED	SHEET 3 of 5	

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NOTES:

1. PLATE THICKNESS SHALL BE 0.276" (7mm) UNLESS OTHERWISE NOTED)
2. MATERIAL OF BRACKET SHALL BE ASTM A36 (fy = 36 kips MIN).
3. THIS BRACKET SHALL BE USED WITH 31.5" WIDE CABINETS PER SHEET 2.



VERTIV CO, CERTIFIES THIS DOCUMENT AS AN OUTLINE DRAWING

SIGNATURE: *Jonathan Harder*

NAME: Jonathan Harder

TITLE: Engineer

DATE: 04-29-21



**HOLD DOWN BRACKET DETAIL
(31.5" WIDE RACK, SEE SHEET 2)**

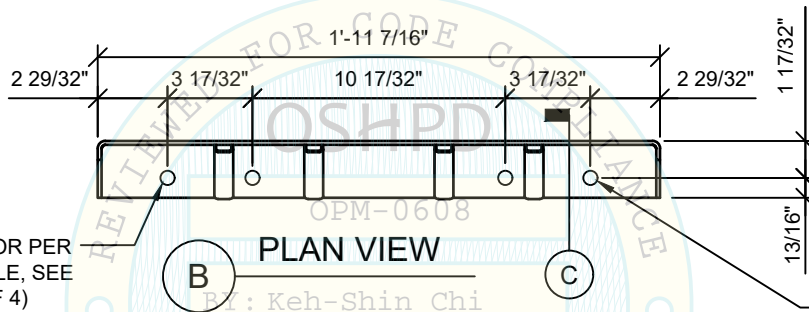
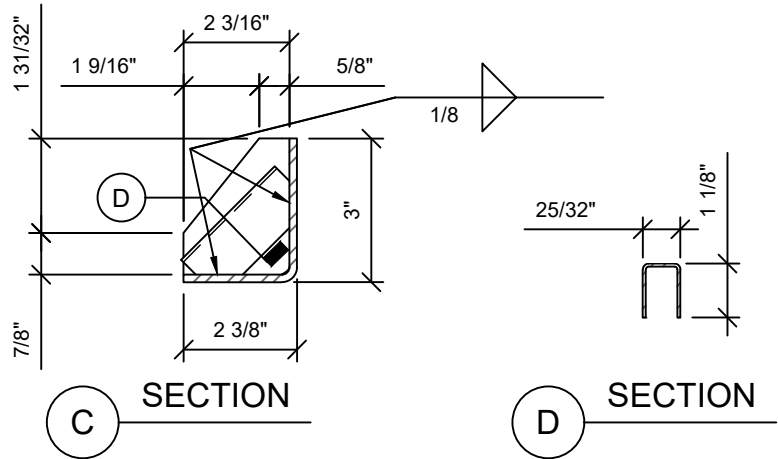
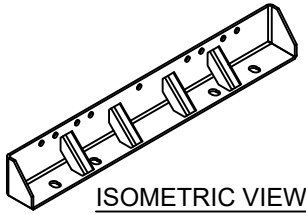
1 SCALE: NTS

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	ADDRESS	DR:	VL	<p>4</p>
	SHEET TITLE:	CH:	DJ	
	SUPPORT BRACKET 1	AP:	DJ	
ISSUED FOR:	DATE:	04/29/2021		
APPROVAL	SCALE:	AS-NOTED	SHEET 4 of 5	

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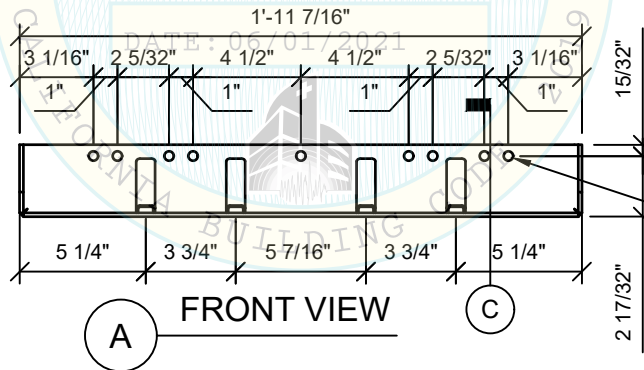
NOTES:

1. PLATE THICKNESS SHALL BE 0.276" (7mm) UNLESS OTHERWISE NOTED)
2. MATERIAL OF BRACKET SHALL BE ASTM A36 (fy = 36 kips MIN).
3. THIS BRACKET SHALL BE USED WITH 23.6" WIDE CABINETS PER SHEET 2.



CONCRETE ANCHOR PER ANCHOR SCHEDULE, SEE B/SHEET 2 (TYP OF 4)

17.5 mm DIA HOLE FOR 5/8" DIA ANCHOR PER SCHEDULE ON SHEET 2



8 mm BOLT MINIMUM CONNECTED MATERIAL SHALL BE 0.7165" THICK. BOLTS SHALL BE GRADE 10.9 MIN

VERTIV CO, CERTIFIES THIS DOCUMENT AS AN OUTLINE DRAWING
 SIGNATURE: *Jonathan Harder*
 NAME: Jonathan Harder
 TITLE: Engineer
 DATE: 04-29-21

HOLD DOWN BRACKET DETAIL (23.6" WIDE RACK, SEE SHEET 2)

1

SCALE: NTS



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	ADDRESS	DR:	VL	5
	SHEET TITLE:	CH:	DJ	
	SUPPORT BRACKET 2	AP:	DJ	
ISSUED FOR:	APPROVAL	DATE:	04/29/2021	SHEET 5 of 5
		SCALE:	AS-NOTED	