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

OFFICE USE ONLY

APPLICATION #: OPM-0631

OSHPD Preapproval of Manufacturer's Certification (OPM)

Type: [X] New [ ] Renewal/Update

Manufacturer Information

Manufacturer: Hospital Systems, Inc.

Manufacturer's Technical Representative: Kathie CAMBELL

Mailing Address: 750 Garcia Avenue, Pittsburg, CA 94565

Telephone: (925) 427-7800 Email: kcampbell@hsiheadwalls.com

Product Information

Product Name: HSI Array Stud Series Headwall

Product Type: Hospital Patient Headwall

Product Model Number: ARRAY

General Description: Patient Headwall

Applicant Information

Applicant Company Name: CYS STRUCTURAL ENGINEERS

Contact Person: DIETER SIEBALD

Mailing Address: 2495 Natomas Park Drive, #650, SACRAMENTO, CA 95624

Telephone: (916) 920-2020 Email: dieters@cyseng.com

Title: STRUCTURAL ENGINEER

Registered Design Professonal Preparing Engineering Recommendations

Company Name: CYS STRUCTURAL ENGINEERS, INC.

Name: Dieter Siebald California License Number: S4346

Mailing Address: 2495 Natomas Park Drive, Suite 650, Sacramento, CA 95833

Telephone: (916) 920-2020 Email: dieters@cyseng.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: 6/17/2021

Name: Jeffrey Kikumoto Title: Senior Structural Engineer

Condition of Approval (if applicable):

ARRAY STUD SERIES HEADWALL

HSI Hospital Systems, Inc. The Headwall Experts

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OPM–0631

NOTES:

1. THESE DRAWINGS ARE PREPARED FOR HOSPITAL SYSTEMS, INC., PITTSBURG, CA.
2. THE CONTRACTOR AND INSPECTOR OF RECORD SHALL OBTAIN A COPY OF THIS PRE–APPROVAL FROM THE OFFICE OF STATEWIDE HEALTH PLANNING & DEVELOPMENT (OSHPD) PRE–APPROVAL PROGRAMS WEBSITE.
3. THIS PRE–APPROVAL COVERS THE SUPPORTS AND ATTACHMENTS OF THE EQUIPMENT TO THE SUPPORTING STRUCTURE. THE EQUIPMENT IS SUPPLIED BY THE MANUFACTURER. THE EXPANSION ANCHORS, SCREWS & BACKING PLATES SHOWN IN THIS OPM SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR.

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SHEET TITLE: TABLE OF CONTENTS

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Job No:	21031
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GENERAL NOTES:

1. THIS OSHPD PRE–APPROVAL 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.
2. IT IS THE RESPONSIBILITY OF THE STRUCTURAL ENGINEER OF RECORD FOR A SITE SPECIFIC PROJECT TO VERIFY:
   - A. THE ADEQUACY OF THE NEW OR (E) STRUCTURE TO RESIST THE FORCES & WT SPECIFIED FOR EA EQUIP IN ADDITION TO ALL OTHER LOADS. PROVIDE & DESIGN SUPPLEMENTARY MEMBERS AS REQ.
   - B. THAT THE ANCHORS ARE LOCATED AT AN ADEQUATE DISTANCE FROM ANY WALL EDGES OR OPENINGS.
   - C. THAT THE ANCHORS ARE LOCATED AT AN ADEQUATE DISTANCE FROM ANY NEW OR (E) ANCHORS.
   - D. THAT THE INSTALLATION IS IN CONFORMANCE W/ THE CBC 2019 & W/ THE DETAILS SHOWN IN THIS PRE–APPROVAL.
   - E. THAT THE ACTUAL EQUIP'S WT, CENTER OF GRAVITY (CG) LOCATION, ANCHOR LOCATIONS, ANCHOR DETAILS, & THE MATERIAL & GA OF THE EQUIP WHERE ATTACHMENTS ARE MADE, AGREE W/ THE INFO SHOWN ON THE PRE–APPROVAL DOCUMENTS.
   - F. THAT THE PROJECT SPECIFIC VALUES OF S_{DS} & z/h RESULT IN SEISMIC FORCES THAT DO NOT EXCEED THE VALUES PROVIDED IN THE DESIGN CRITERIA.
   - G. THAT WHEN USING HILTI KH–EZ SCREW ANCHORS TO A FULLY GROUTED CMU WALL THAT THE MASONRY IS NOT CRACKED AS DEFINED IN ICC–ES AC106 SECTION 1.4.8; CALCULATIONS ARE REQ TO SHOW MASONRY WALL WOULD NOT CRACK UNDER THE DESIGN EARTHQUAKE LOADS UNDER ALL SERVICE LOAD CONDITIONS; WALL HAS TO REMAIN ELASTIC.
   - H. MASONRY WALL SHALL BE FULLY GROUTED IN ACCORDANCE W/ ESR–3056.
   - I. CONDITION OF USE REQUIREMENTS IN ACCORDANCE W/ ESR–3056 SECTION 5.0 IS SATISFIED.
3. SMS PER ICC–ES ESR 1976, OR EQ.
4. SDS SCREWS PER ICC–ESR 2236.
5. A. SCREW ANCHORS INSTALLED IN NWC SHALL BE HILTI KWIK HUS–EZ COMPLYING W/ ESR–3027 REVISED APRIL 2021.
   - B. INSTALLATION: INSTALL THE ANCHORS IN ACCORDANCE W/ THE REQUIREMENTS GIVEN IN THE ICC EVALUATION REPORT FOR THE SPECIFIC ANCHOR & THE PARAMETERS GIVEN IN THE TABLE ON PG 3.
   - C. JOB TESTING: FOR VERIFYING SATISFACTORY INSTALLATION WORKMANSHIP, PERFORM JOBSITE TESTING IN ACCORDANCE W/ THE TEST LOAD TABLE PROVIDED IN THIS DOCUMENT. TENSION TEST 50% OF THE INSTALLED ANCHORS. FOR TENSION TESTING, THE TEST LOAD MAY BE APPLIED BY ANY METHOD THAT WILL EFFECTIVELY MEASURE THE TENSION IN THE ANCHOR SUCH AS DIRECT PULL WITH A HYDRAULIC JACK. ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE SPECIAL INSPECTOR & REPORT OF TEST RESULTS SHALL BE SUBMITTED TO THE INSPECTOR OF RECORD, OWNER & ARCHITECT OR ENGINEER IN RESPONSIBLE CHARGE. IF ANY ANCHOR FAILS THE TEST, TEST ALL ANCHORS. THE TEST SHALL BE PERFORMED 24 HOURS OR MORE AFTER INSTALLATION. TESTING MAY BE DONE PRIOR TO EQUIP INSTALLATION. ALSO REFER TO 2019 CBC 1910.5 "TESTS FOR POST–INSTALLED ANCHORS IN CONCRETE".
   - D. FAILURE/ACCEPTANCE CRITERIA: THE FOLLOWING CRITERIA APPLY FOR THE ACCEPTANCE OF INSTALLED ANCHORS:
     - HYDRAULIC RAM METHOD: APPLY & HOLD TEST LOAD FOR A MIN OF 15 SECONDS. THE ANCHOR SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE APPLICABLE TEST LOAD WHERE WASHERS ARE USED. A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER UNDER THE NUT BECOMES LOOSE OR BY A CONTINUOUS LOSS OF JACKING PRESSURE.

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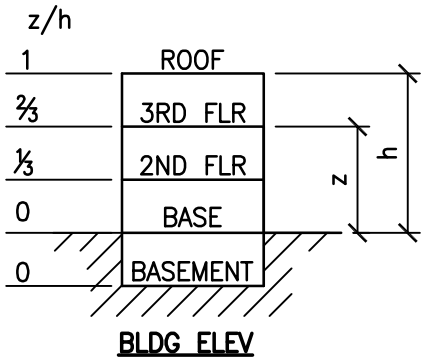
GENERAL NOTES CONTINUED:

6. SCREW ANCHORS INSTALLED IN FULLY GROUTED CMU WALLS SHALL BE HILTI KH-EZ COMPLYING W/ ESR-3056. INSTALLATION IN MORTAR JTS IS PROHIBITED & ALL ANCHORS MUST BE SPACED 1¼" MIN AWAY FROM ALL JTS.

7. SEISMIC SUPPORTS & ATTACHMENTS SPECIFIED & PRESENTED IN THIS PRE-APPROVAL:



BLDG ELEV

CASE 1: SEISMIC SUPPORTS & ATTACHMENT DETAILS LOCATED AT UPPER FLRS ABV THE BASE OF A BLDG (z/h<=0.9), MAY BE USED AT ANY GEOGRAPHICAL LOCATION IN THE STATE OF CALIFORNIA WHERE S_{DS} IS LESS THAN OR EQ TO 2.50.

TABLE 1: SCREW ANCHORS INSTALLATION PARAMETERS

CONDITION OF WALL ANCHORAGE	ANCHOR DIA (INCH) da	INSTALLATION EMBED (INCH) hnom	EFFECTIVE EMBED (INCH) hef	HOLE DEPTH (INCH) ho	MIN WALL THK (INCH) h_{min}	MIN EDGE DISTANCE (INCH)	MIN ANCHOR SPCG (INCH)	TENSION TEST (LBS)
CONC	½	3.00	2.16	3.375	6	6	3.75	1800
CMU	½	4.50	4.25	4.625	7.625	8	4	910

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SHEET TITLE: GENERAL NOTES (CONTINUED)

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ABBREVIATIONS:

Ω_o	SEISMIC OVERSTRENGTH FACTOR
@	AT
AB	ANCHOR BOLT
ABV	ABOVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ALLOWABLE STRESS DESIGN
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
BLDG	BUILDING
BLW	BELOW
BOTT	BOTTOM
CBC	CALIFORNIA BUILDING CODE
CG	CENTER OF GRAVITY
℄	CENTERLINE
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONT	CONTINUOUS
DF	DOUG FIR
DIA (ø)	DIAMETER
DL	DEAD LOAD
(E)	EXISTING
EA	EACH
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
f'c	MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE
f'm	MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF MASONRY
FLG	FLANGE
FLR	FLOOR
FT (')	FOOT/FEET
Fp	HORIZONTAL SEISMIC FORCE PER ASCE 7-16 SEISMIC FORCE REQUIREMENTS
Fv	VERTICAL SEISMIC DESIGN FORCE PER ASCE 7-16 SECTION 12.4-4 SEISMIC DESIGN FORCE REQUIREMENTS
Fy	SPECIFIED MINIMUM YIELD STRESS OF STEEL
GA	GAUGE
GR	GRADE
GWB	GYPSUM WALLBOARD
HORIZ	HORIZONTAL
HT	HEIGHT
ICC	INTERNATIONAL CODE COUNCIL
IN (")	INCH
INFO	INFORMATION
JT	JOINT
KSI	KIPS PER SQUARE INCH
LBS	POUNDS
LL	LIVE LOAD
LRFD	LOAD AND RESISTANCE FACTOR DESIGN
MAX	MAXIMUM
MFR	MANUFACTURER
MIN	MINIMUM
MTL	METAL
NO. (#)	NUMBER OR POUNDS
NWC	NORMAL WEIGHT CONCRETE
OPM	OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION
OSHPD	OFFICE OF STATEWIDE HEALTH PLANNING & DEVELOPMENT
PCF	POUNDS PER CUBIC FOOT
PERP	PERPENDICULAR
PG	PAGE
PL	PLATE
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
REQ	REQUIRED
SEOR	STRUCTURAL ENGINEER OF RECORD
SLWC	SAND-LIGHTWEIGHT CONCRETE
SMS	SHEET METAL SCREW
SPCG	SPACING
STL	STEEL
T&B	TOP & BOTTOM
T	TENSION
THK	THICK/THICKNESS
Tu	SUPPORTS & ATTACHMENTS TENSION REACTION DUE TO SEISMIC FORCE
TYP	TYPICAL
V	SHEAR
Vu	SUPPORTS & ATTACHMENTS SHEAR REACTION DUE TO SEISMIC FORCE
W/	WITH
Wp	OPERATING WEIGHT
WS	WOOD SCREW
WT	WEIGHT

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SHEET TITLE: ABBREVIATIONS

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ARRAY STUD SERIES HEADWALL

DESIGN CRITERIA

SUPPORT & ATTACHMENT DESIGN IS PER 2019 CBC AT LRFD LEVEL FORCES. OTHER RIGID COMPONENTS: LOW DEFORMABILITY ELEMENTS & ATTACHMENTS. PER TABLE 13.5-1 OF ASCE 7-16 SUPPLEMENT #1

a_p = 1.0 R_p = 1.5 I_p = 1.5 Ω_0 = 1.5

W_p AS SHOWN IN TABLE BLW

FOR CASE 1 – UPPER FLRS ABV THE BASE, z/h <= 0.9
S_{DS} = 2.50 F_p = 2.80 W_p F_v = 0.50 W_p

LOAD COMBINATIONS

(1.2+0.2 S_{DS}) D+1.0E+L LRFD
(1.0+0.14 S_{DS}) D+0.7E ASD
LOAD COMBINATIONS WERE RUN FOR 100% OF HORIZONTAL FORCE IN ONE DIRECTION & 30% OF HORIZONTAL FORCE IN THE PERP DIRECTION.

HEADWALL WEIGHTS

THE FOLLOWING TABLE PRESENTS THE OPERATING WTS (W_p) IN POUNDS FOR EA UNIT. ALL MODELS CONSIST OF 4 OR 5 PANELS, EA WEIGHING 200#.

HEADWALL UNIT WEIGHT (LBS)

MODEL NUMBER	LENGH L (IN)	WIDTH W (IN)	HEIGHT H (IN)	H_{CG} (IN)	WEIGHT W_p (LBS)
1905304	120.5	3.625	104	56	800
1905306	138.5	3.625	104	56	1000
1905307	124.75	3.625	104	56	1000
1905308	123	3.625	104	56	1000
1905309	120.25	3.625	104	56	1000
1905310	119.25	3.625	104	56	1000
1905311	117.75	3.625	104	56	1000
1905312	119	3.625	104	56	1000
1905313	133	3.625	104	56	1000
1905314	120	3.625	104	56	1000
1905315	118.75	3.625	104	56	1000
1905316	120	3.625	104	56	1000

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SHEET TITLE: DESIGN CRITERIA & HEADWALL WEIGHTS

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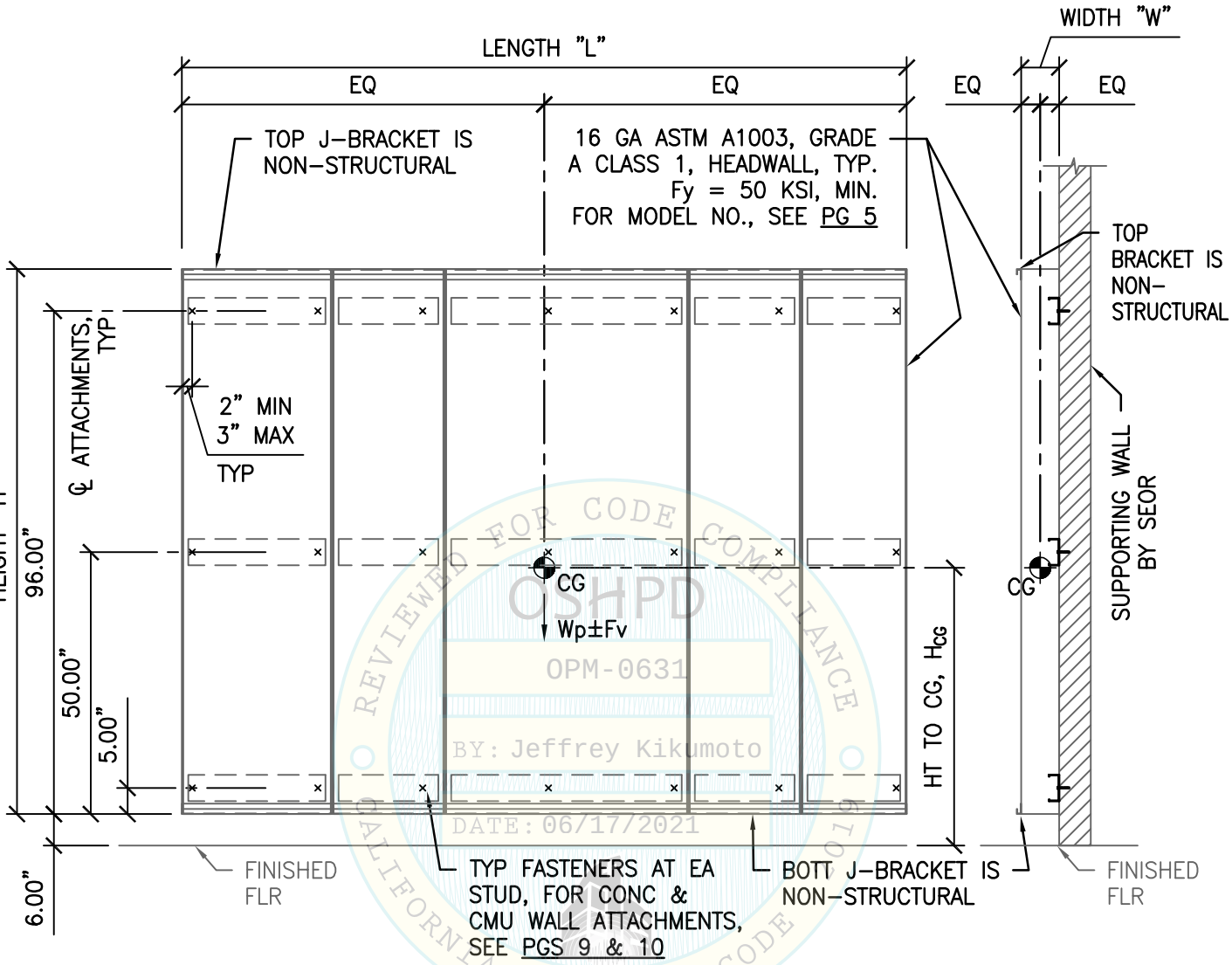

FRONT ELEV

SIDE ELEV

NOTES:
1. FOR ATTACHMENT TO STUD WALLS, SEE PGS 7 & 8.
2. FOR ATTACHMENT TO CONC & CMU WALLS, SEE PGS 9 & 10.
3. FIVE PANEL UNIT, 1905306, IS SHOWN.
4. SEE PG 11 FOR INTERCONNECTION BTWN UNITS.

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SHEET TITLE: CABINET PLAN & ELEVATIONS

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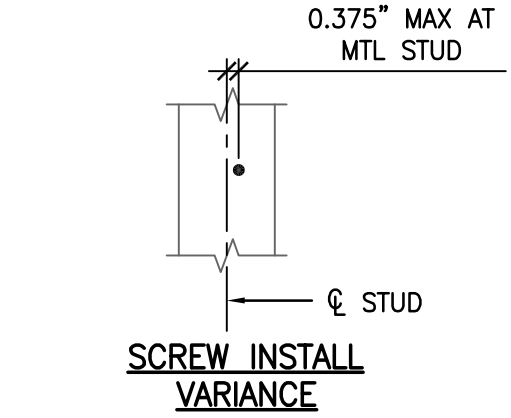
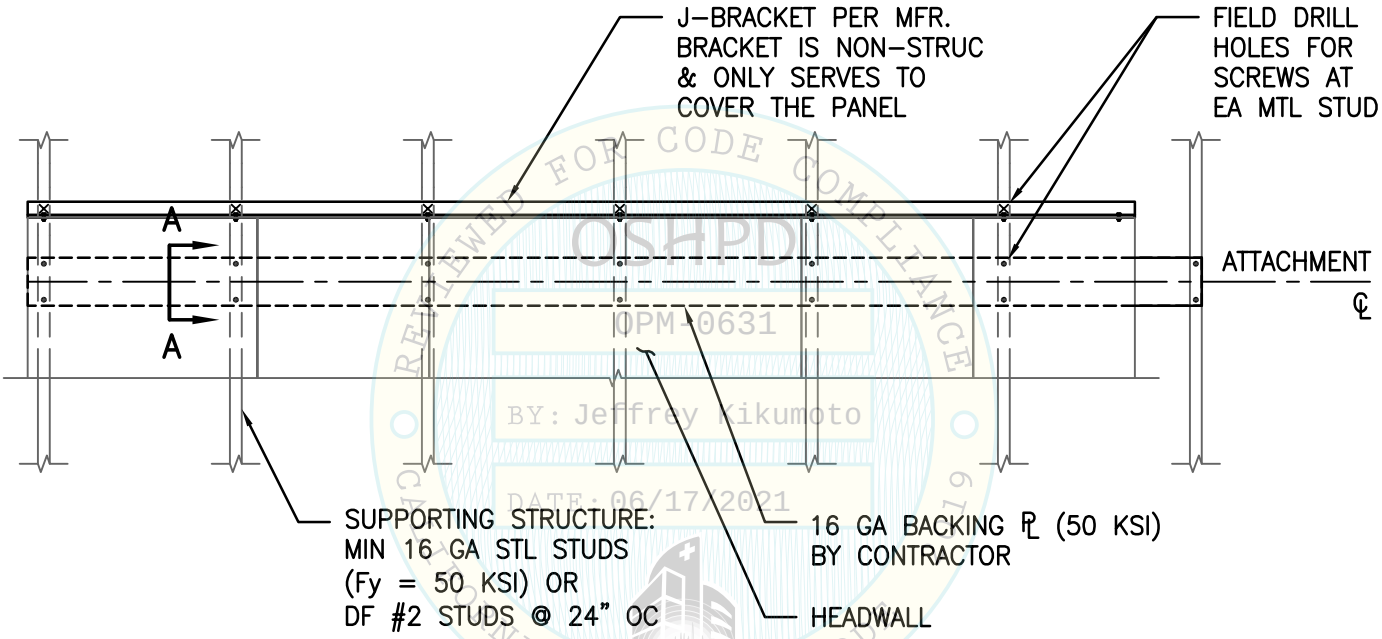


SCREW INSTALL VARIANCE

	MAX **ASD** FORCES AT EA SCREW (LBS) PLATE TO STUDS			
	DF #2		16 GA MTL	
	T	V	T	V
CASE 1	123#	179#	123#	179#



CONN PATTERN
TOP IS SHOWN, BOTT IS SIM.

SHEET TITLE: ATTACHMENT TO STUD WALLS

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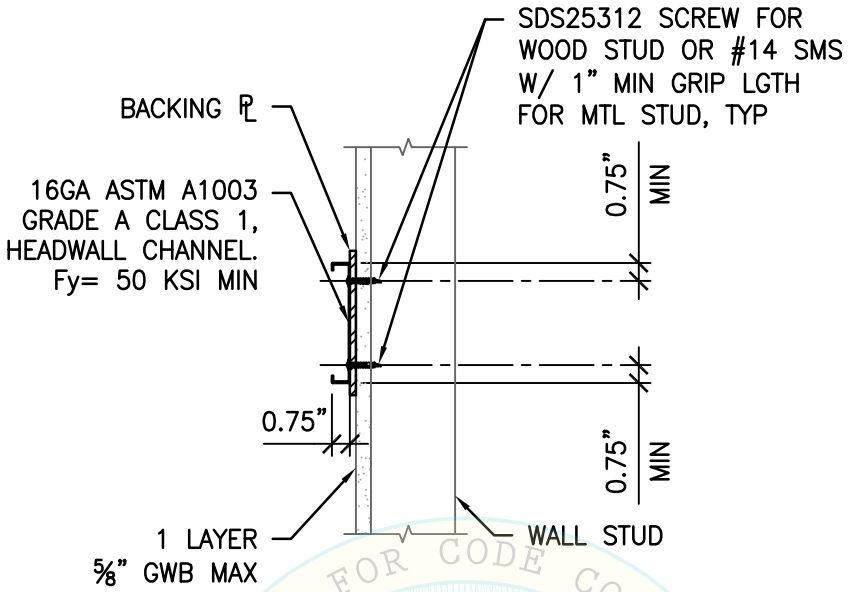
ARRAY STUD SERIES HEADWALL



SECTION A–A
AT BACKING PL
TO WALL STUD

NOTES:
1. CAPACITY OF SMS SCREW TO MTL WALL STUD IS BASED ON OSHPD'S OPD–0001–13, "2013 CBC STANDARD PARTITION WALL DETAILS", PG ST1.07, TABLE 2 – NON–PRYING CONDITION, FOR ONE LAYER OF 5/8" GWB, BTW STL SURFACES.
2. CAPACITY OF THE SDS SCREW IS BASED ON THE VALUES PROVIDED IN ESR–2236.

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SHEET TITLE: ATTACHMENT TO STUD WALLS

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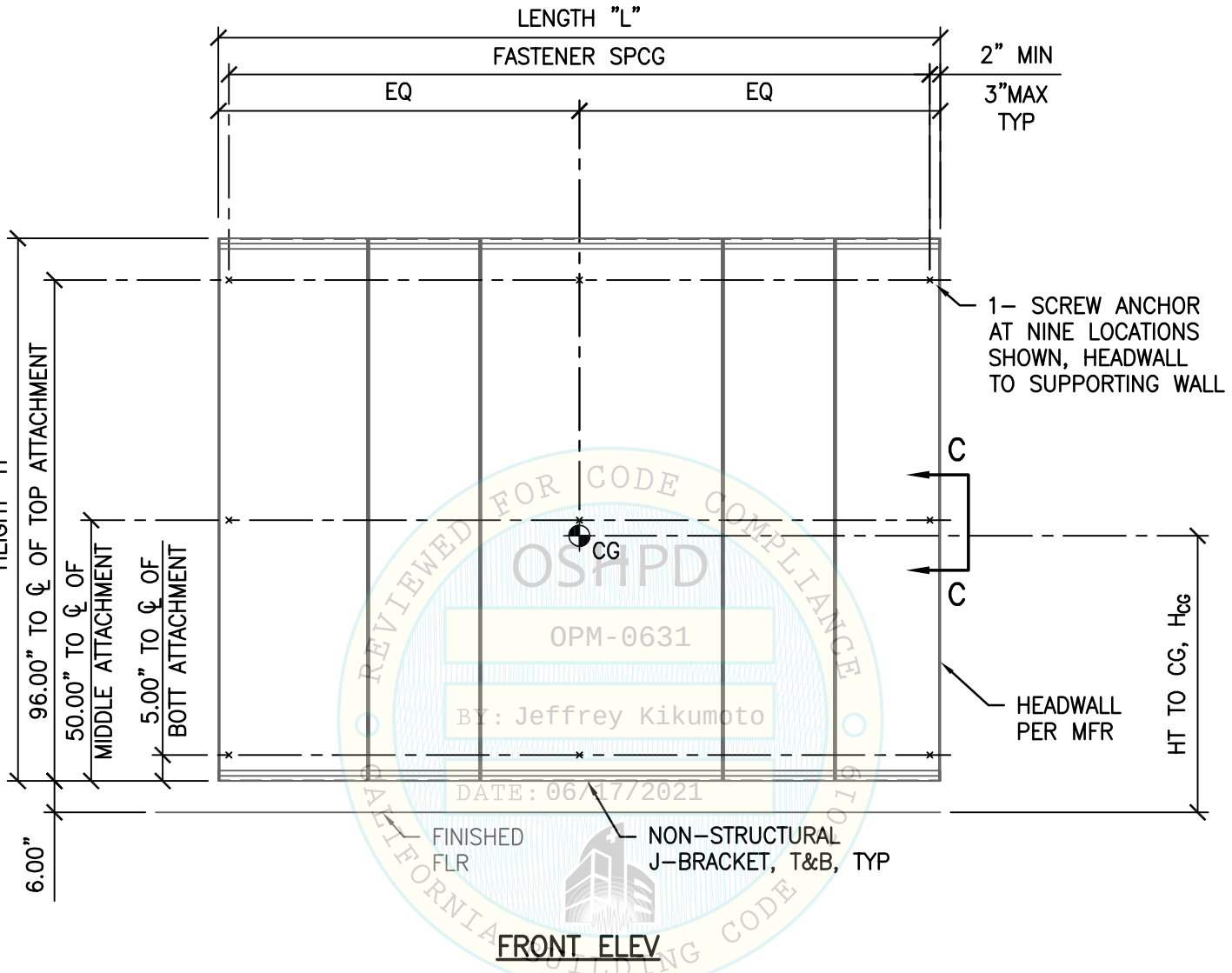

FRONT ELEV

NOTE:
FIELD DRILL HOLES IN EQUIP BACKING ℄ FOR ATTACHMENT TO WALL.

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SHEET TITLE: ATTACHMENT TO CONCRETE OR CMU WALLS

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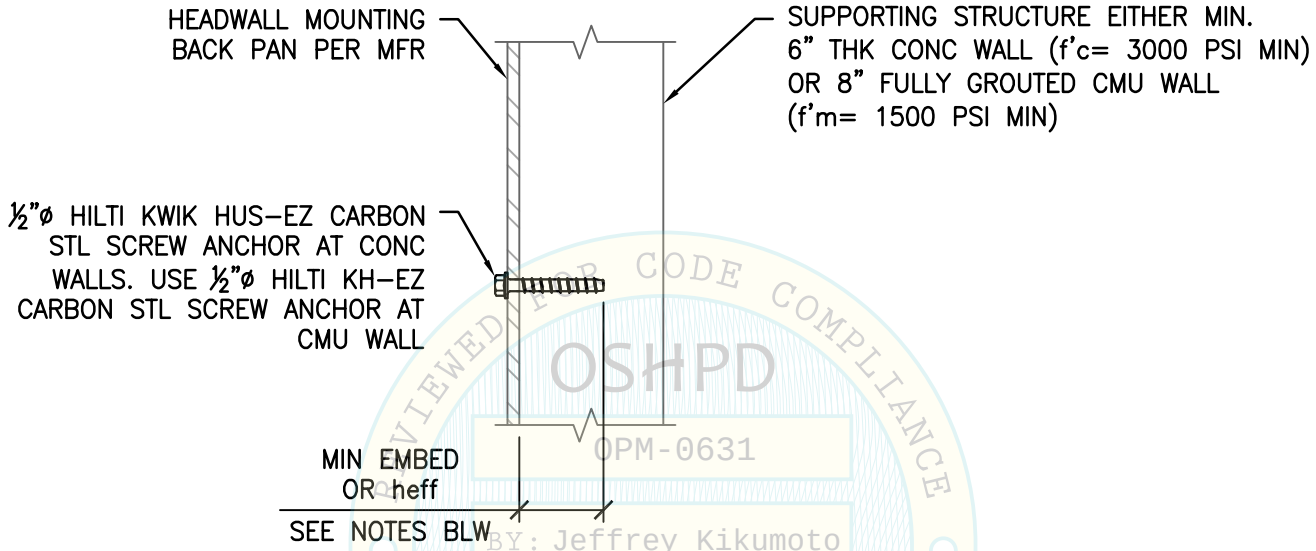
ARRAY STUD SERIES HEADWALL

	MAX LRFD FORCES AT EA SCREW (LBS)			
	CONC WALL		CMU WALL	
	$\Omega_o T_u$	$\Omega_o V_u$	$\Omega_o T$	$\Omega_o V$
CASE 1	467#	752#	467#	752#



SECTION C-C
AT HEADWALL TO CONC OR CMU WALL

NOTES:
1. DO NOT CUT OR DAMAGE (E) REBAR.
2. SEE PGS 2&3 FOR SCREW ANCHOR INFO NOT SHOWN.

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SHEET TITLE: ATTACHMENT TO CONC OR CMU WALLS

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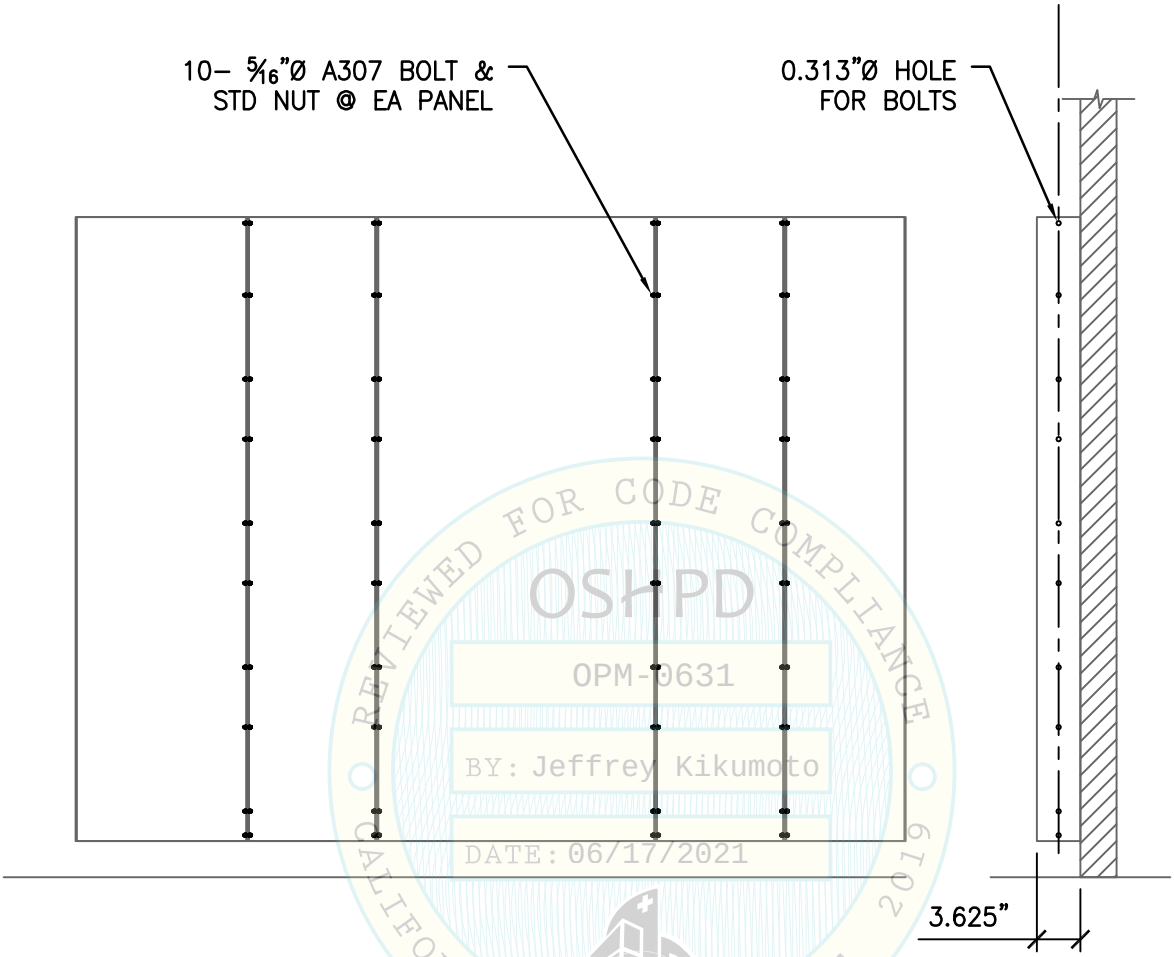

FRONT ELEV

SIDE ELEV

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NOTE:
1. ATTACHMENT BRACKETS TO STRUCTURE NOT SHOWN FOR CLARITY

SHEET TITLE: PANEL INTERCONNECTION DETAILS

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