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

OFFICE USE ONLY

APPLICATION #: OPM-0587

OSHPD Preapproval of Manufacturer's Certification (OPM)

Type: [X] New [ ] Renewal/Update

Manufacturer Information

Manufacturer: Gammex, business trade name Sun Nuclear Corporation

Manufacturer's Technical Representative: Mike Keller

Mailing Address: 7600 Discovery Dr., Middleton, WI 53562

Telephone: (608) 828-7000 Email: michaelkeller@sunnuclear.com

Product Information

Product Name: CT SIM+

Product Type: Hospital Laser System

Product Model Number: CT SIM+ Post, CT SIM+ Bridge, CT SIM+ Arm Option 1, CT SIM+ Arm Option 2

General Description: Floor, bridge, wall, and ceiling mounted laser systems used for precision patient positioning and marking during radiation therapy

Applicant Information

Applicant Company Name:

Contact Person: Frank Eckwright

Mailing Address: 1199 Shoreline Dr Ste 310, Boise, ID 83702

Telephone: (208) 342-5989 Email: feckwright@wegai.com

Title:

Registered Design Professonal Preparing Engineering Recommendations

Company Name: W.E. GUNDY & ASSOCIATES, INC.

Name: Frank Eckwright California License Number: CE82375

Mailing Address: 1199 Shoreline Dr, Ste 310, Boise, ID 83702

Telephone: (208) 342-5989 Email: feckwright@wegai.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: 11/10/2021

Name: Jeffrey Kikumoto Title: Senior Structural Engineer

Condition of Approval (if applicable):

Frank Eckwright, PE
W.E. Gundy & Associates, Inc.
(208) 342-5989
feckwright@wegai.com

GENERAL NOTES

1. THIS OSHPD PREAPPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2019. THE DEMAND (DESIGN FORCES) FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2019
2. SEISMIC DEMAND CRITERIA PER 2019 CBC AND ASCE 7-16:

   a_p = 1.0, R_p = 1.5, I_p = 1.50, Ω_0 = 2.0
   - S_{DS} = 2.50 & z/h = 0.0, $E_h = F_p$ = 1.13 W_p
   - S_{DS} = 1.60 & z/h = 1.0, $E_h = F_p$ = 1.92 W_p
   - S_{DS} = 2.50 & z/h = 1.0, $E_h = F_p$ = 3.0 W_p

   E_V = 0.5 W_p
3. THIS PREAPPROVAL COVERS ONLY THE SUPPORTS AND ATTACHMENTS OF THE EQUIPMENT TO THE STRUCTURE
4. ALL LOADS SHOWN ON THE DRAWINGS ARE FACTORED LOADS AND SHALL BE USED FOR STRENGTH DESIGN UNLESS NOTED OTHERWISE
5. MINIMUM MATERIAL PROPERTIES:
   a. CONCRETE:
      i. SLABS/BEAMS: NORMAL WEIGHT, THICKNESS ≥4", 3,000 psi ≤ f`c ≤ 8,000PSI
      ii . SLAB ON METAL DECK: NORMAL WEIGHT OR SAND LIGHTWEIGHT, f`c ≥ 3,000
   b. STEEL:
      i. THREADED ROD: A36 (Fu = 58 KSI) OR A193 GR. B7 (Fu = 125 KSI)
      ii. BOLT: A307 (Fu = 60 KSI MIN)
      iii. NUT: ASTM A563A HEX NUT
      iv. WASHER: ASTM 844 FLAT WASHER OR F594E 316SS FLAT WASHER (0.53 I.D. x 1.25 O.D. x 0.12 T)
      v. HOT ROLLED STEEL ANGLE: Fy = 36 KSI MIN.
      vi. STRUT: 1 5/8" x 1 5/8" x 12GA SOLID STRUT, COLD ROLLED STEEL MEETING ASTM A1011SS GRADE 33
      MINIMUM STRUT SECTION PROPERTIES:

WEIGHT (lb/ft)	*AREA (in^2)*	*I_{XX} (in^4)*	*S_{XX} (in^3)*	*r_X (in)*	*I_{YY} (in^4)*	*S_{YY} (in^3)*	*r_Y (in)*
1.89	*0.544*	*0.18*	*0.195*	*0.575*	*0.233*	*0.287*	*0.655*

      vii. METAL DECK: 20GA THICK
   c. POST-INSTALLED CONCRETE ANCHORS:
      i. HILTI KB-TZ2 (ICC ESR-4266 REVISED JULY 2021)
   d. MASON WEST COMPONENTS:
      i. MW-SSN-1/2 (1020 MILD STEEL SPEC. GB 700 GRADE Q235B)
      ii. MW-BON-1/2 (1020 MILD STEEL SPEC. GB 700 GRADE Q235B)
   e. SHEET METAL SCREWS:
      i. ITW BUILDEX TEKS (ICC ESR-1976 REISSUED JULY 2020)

REGISTERED PROFESSIONAL ENGINEER
FRANK ECKWRIGHT
C82375
CIVIL
STATE OF CALIFORNIA
11/10/2021

SUN NUCLEAR corporation

Project No. OPM-0587-19	Date:2021.11.08	
Drawn By: RG	Checked By: FE	Scale: NTS

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GENERAL NOTES CONTINUED

6. POST-INSTALLED ANCHORS SHALL BE INSTALLED PER THE REQUIREMENTS OF THE EVALUATION SERVICE REPORT (ICC ESR-4266) AND THE PARAMETERS GIVEN IN THESE DRAWINGS.
7. TESTING OF POST-INSTALLED ANCHORS SHALL BE ACCORDING TO 2019 CBC SECTION 1910A.5. A MINIMUM OF 50% OF POST-INSTALLED ANCHORS SHALL BE TESTED NO LESS THAN 24 HOURS AFTER INSTALLATION. A CALIBRATED TORQUE WRENCH SHALL BE USED TO VERIFY THE INSTALLATION TORQUE IS OBTAINED WITHIN ½ TURN OF THE NUT. ALL TESTS SHALL BE CONDUCTED BY AN APPROVED INDEPENDENT AGENCY EMPLOYED BY THE FACILITY OWNER PER CBC §1704A & 1910A.5, and CAC 7-149. ALL REPORTS SHALL BE SENT TO THE INSPECTOR OF RECORD (IOR), OWNER, & THE ARCHITECT OR ENGINEER IN RESPONSIBLE CHARGE.
8. IF ANY ANCHOR FAILS TESTING, ALL OF THE ANCHORS OF THE SAME TYPE SHALL BE TESTED, WHICH ARE INSTALLED BY THE SAME TRADE, NOT PREVIOUSLY TESTED UNTIL TWENTY (20) CONSECUTIVE ANCHORS PASS, THEN RESUME THE INITIAL TEST FREQUENCY.
9. DESIGN IS CONTROLLED BY SEISMIC FORCES. NON-SEISMIC FORCES SUCH AS GRAVITY ARE OUTSIDE THE SCOPE OF THIS OPM.
10. BOLTS THROUGH CONCRETE ON METAL DECK
    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 NOTED OTHERWISE
    b. THROUGH BOLT HOLES SHALL BE 1/16" LARGER THAN BOLT SIZE (HOLE SIZE = BOLT SIZE + 1/16) FOR CONCRETE
    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.

RESPONSIBILITIES OF THE BUILDING STRUCTURAL ENGINEER OF RECORD

1. VERIFY THE INSTALLATION CONFORMS TO CBC 2019 AND THIS OPM, INCLUDING MATERIAL PROPERTIES AND DIMENSIONS OF THE SUPPORT.
2. VERIFY THE PROJECT SPECIFIC S_{DS} AND Z/H VALUES DO NOT RESULT IN SEISMIC FORCES EXCEEDING THE VALUES IN THIS OPM.
3. VERIFY ALL ANCHORS ARE A MINIMUM OF 12” FROM ALL CONCRETE EDGES AND ARE SUFFICIENTLY SPACED FROM ANY NEW OR EXISTING ANCHORS.
4. VERIFY ACCEPTABLE COVER IS PROVIDED FOR POST-INSTALLED ANCHORS INTO UPPER FLUTE OF SLAB ON METAL DECK.

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CT SIM+ POST

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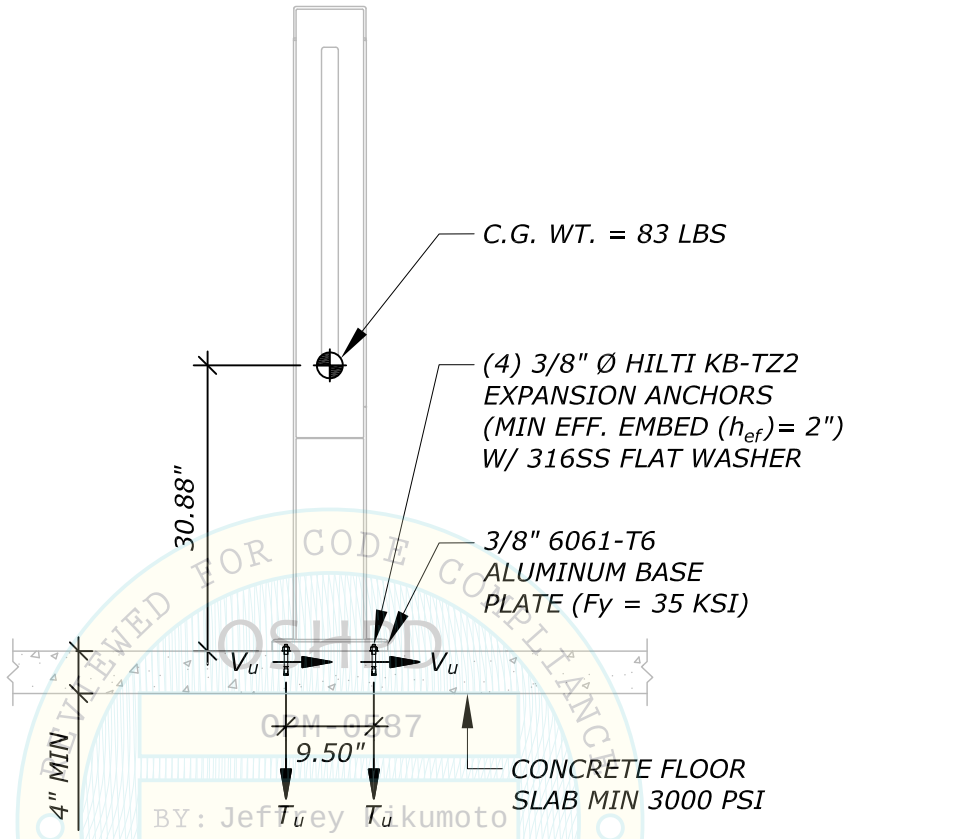
SEISMIC ANCHORAGE

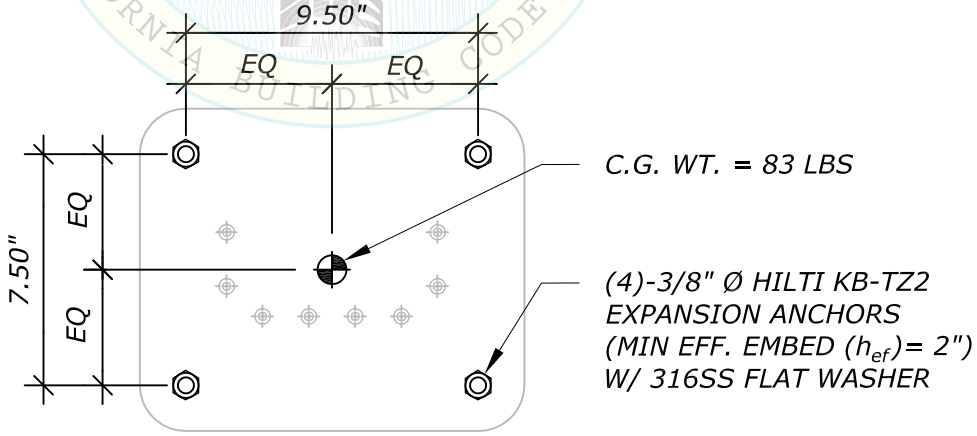
(AT SLAB-ON-GRADE,
S_{DS} ≤ 2.50g, z/h = 0)



T_u (MAX) = 336 LBS
V_u (MAX) = 49 LBS

ELEVATION

TYPE	DIA	EFF EMBED (h_{ef})	HOLE DEPTH (ho)	C_{min}	S_{min}	REQUIRED TORQUE
HILTI KB-TZ2	3/8"	2.0"	2.75"	2.5"	6"	30 ft-lbs



PLAN VIEW - BASE

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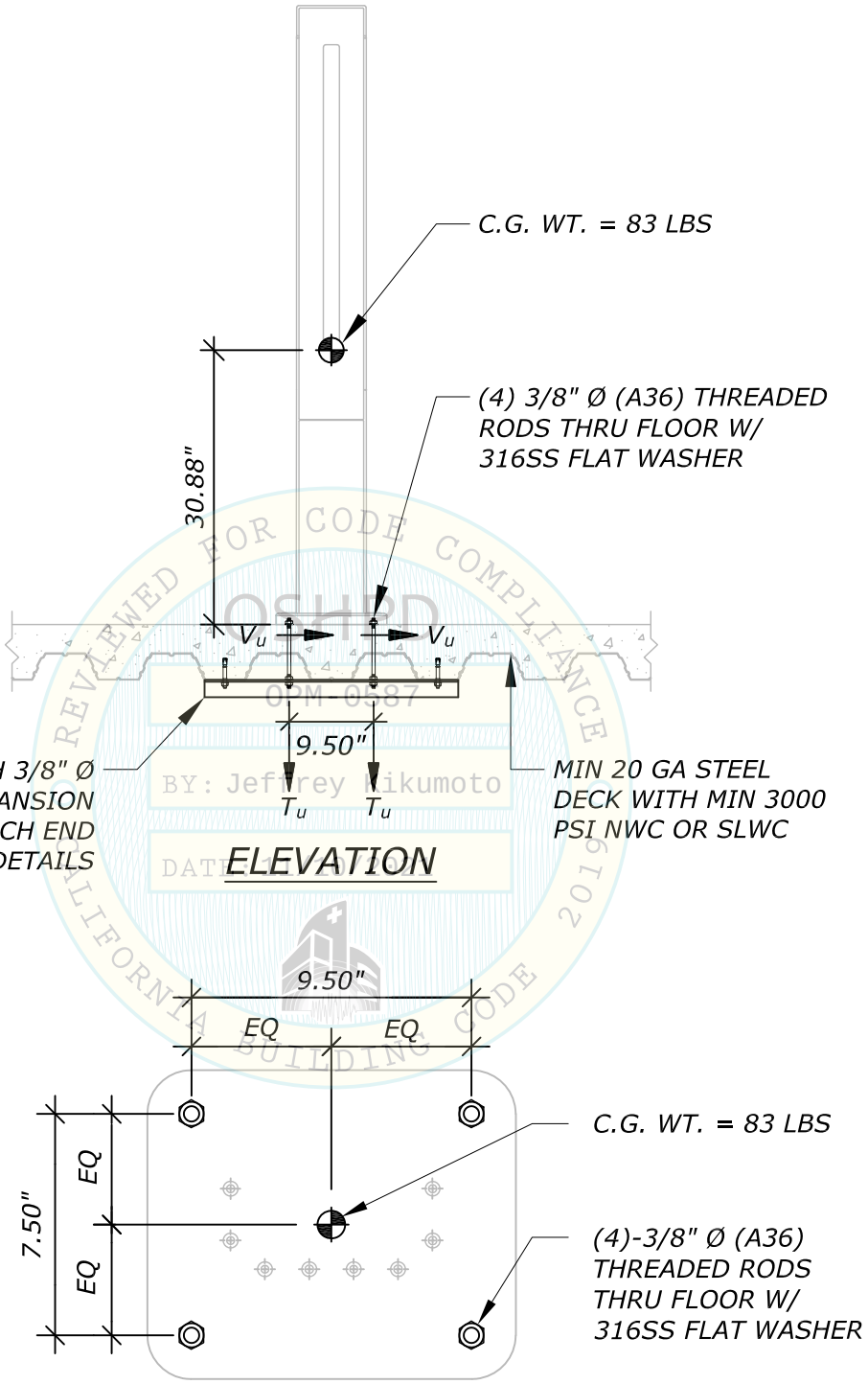
SEISMIC ANCHORAGE

(AT SLAB ON METAL DECK,
S_{DS} ≤ 2.50g, z/h ≤ 1.0)



PLAN VIEW - BASE

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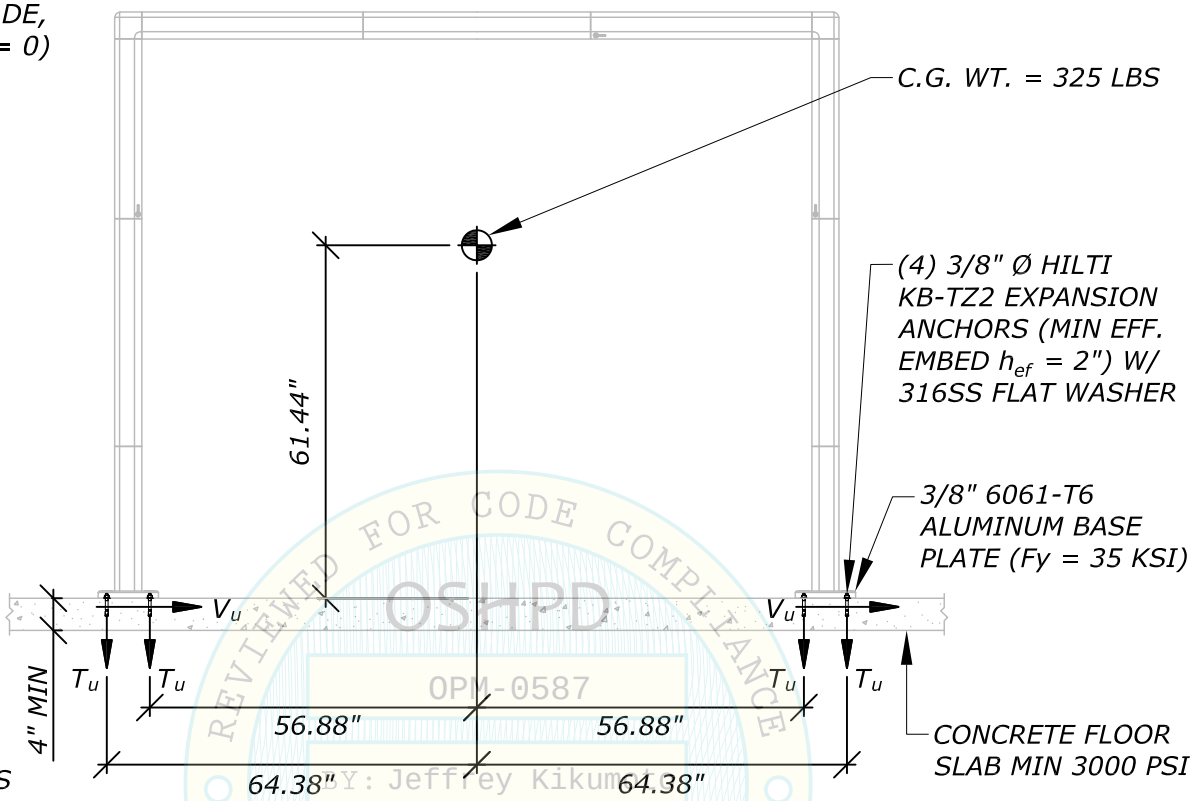
SEISMIC ANCHORAGE

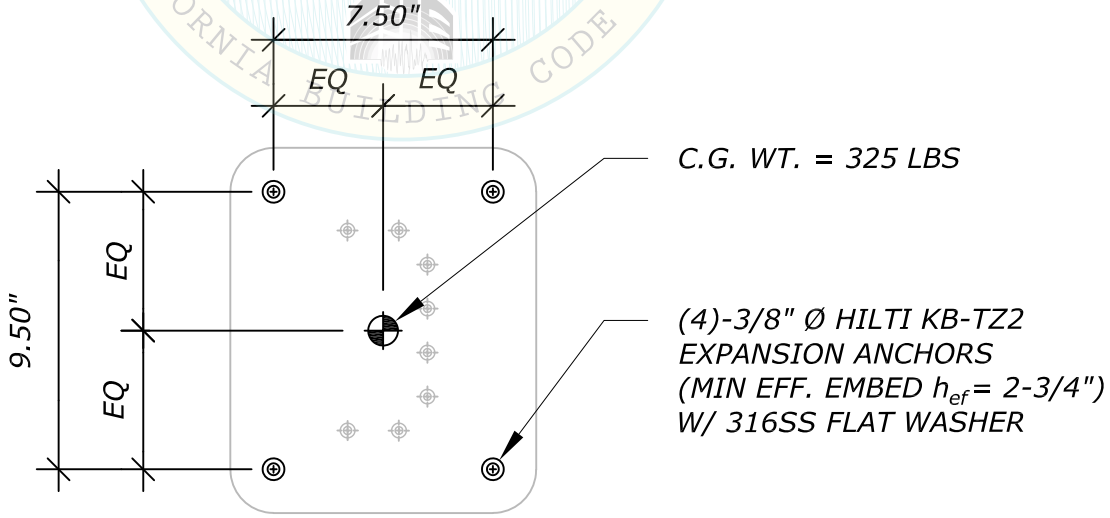
(AT SLAB-ON-GRADE,
S_{DS} ≤ 2.50g, z/h = 0)



T_u (MAX) = 554 LBS
V_u (MAX) = 88 LBS

ELEVATION

TYPE	DIA	EFF EMBED (h_{ef})	HOLE DEPTH (ho)	C_{min}	S_{min}	Required Torque
HILTI KB-TZ2	3/8"	2"	2.5"	2.50"	6.0"	30 ft-lbs



PLAN VIEW - BASE

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Project No. OPM-0587-19	Date:2021.11.08	
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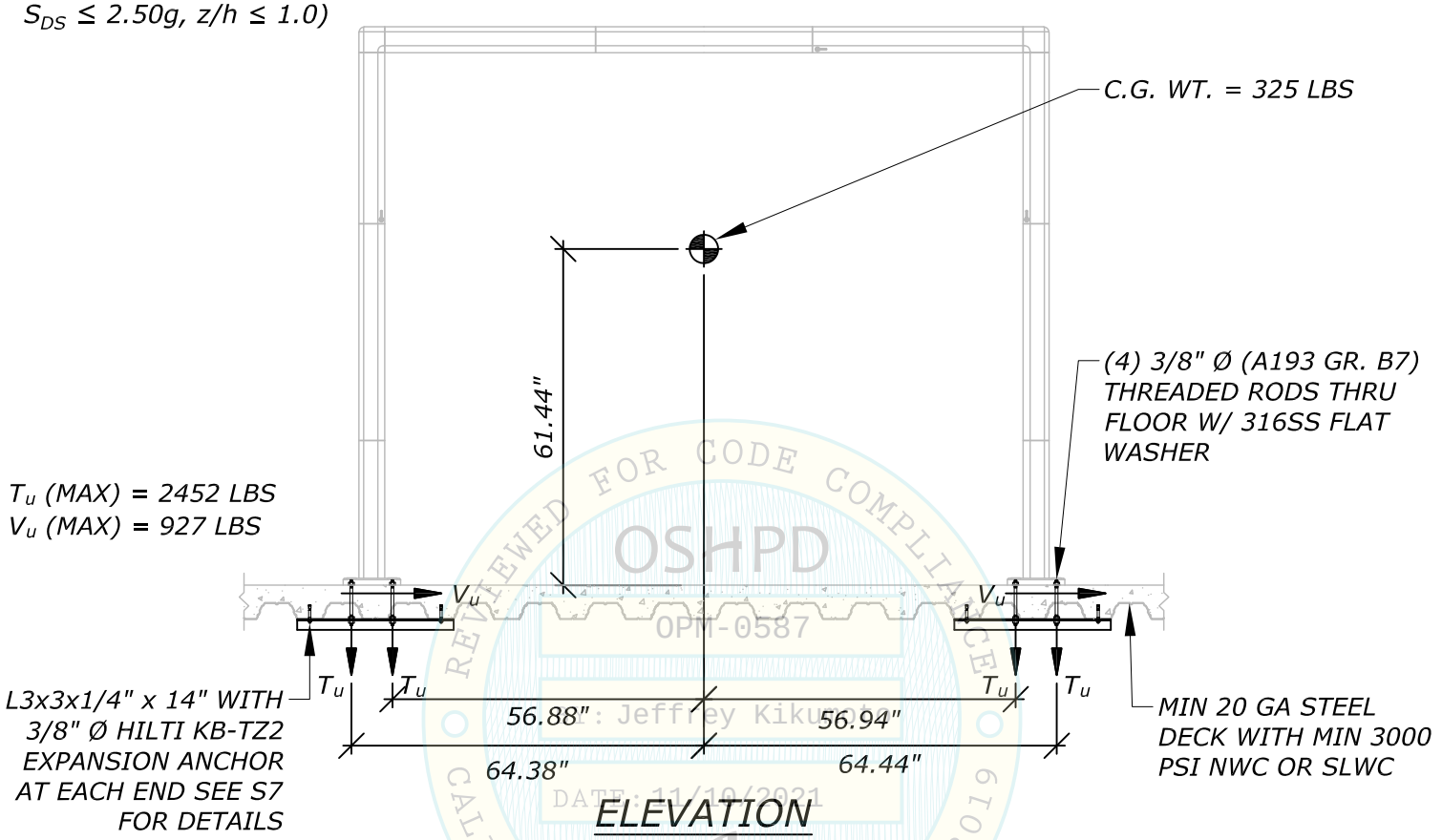
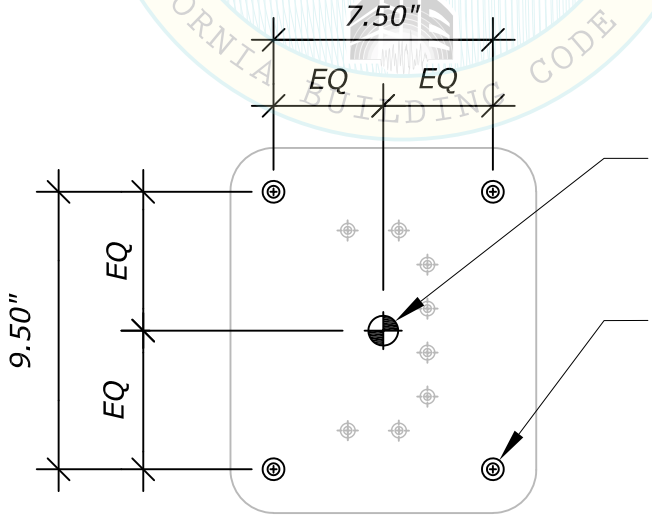
SEISMIC ANCHORAGE

(AT SLAB ON METAL DECK, $S_{DS} \leq 2.50g$, $z/h \leq 1.0$)



ELEVATION



PLAN VIEW - BASE

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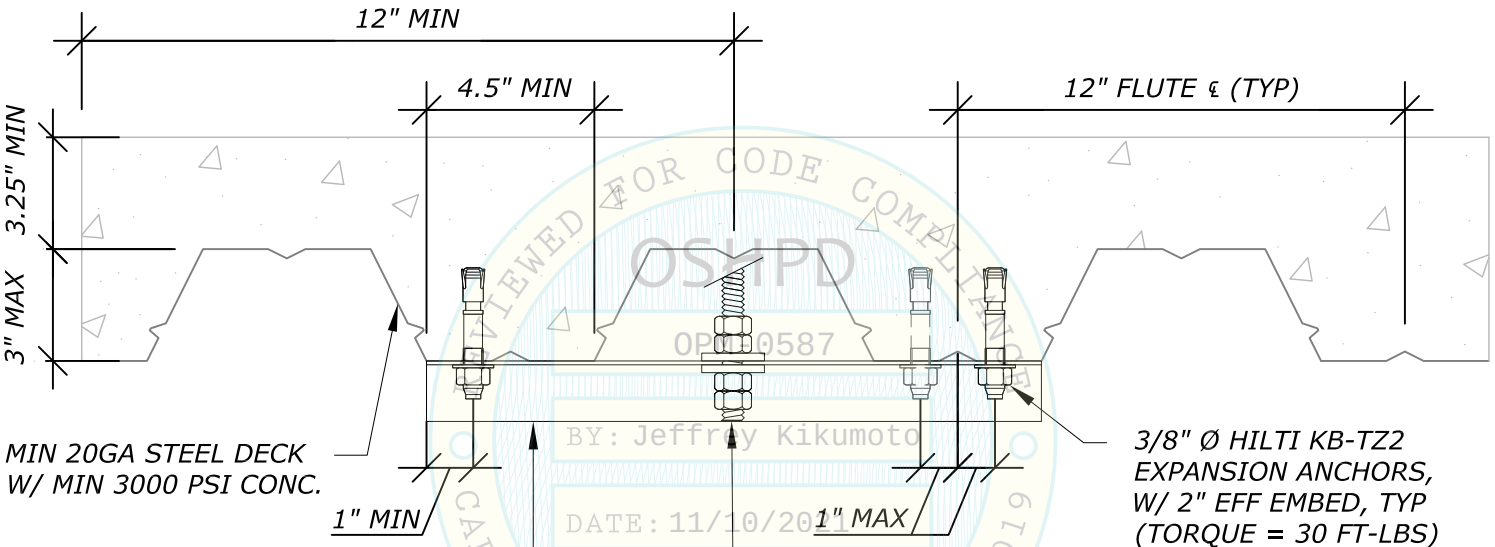
SEISMIC ANCHORAGE



ELEVATION - STRUT DESIGN

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CT SIM+ WALL

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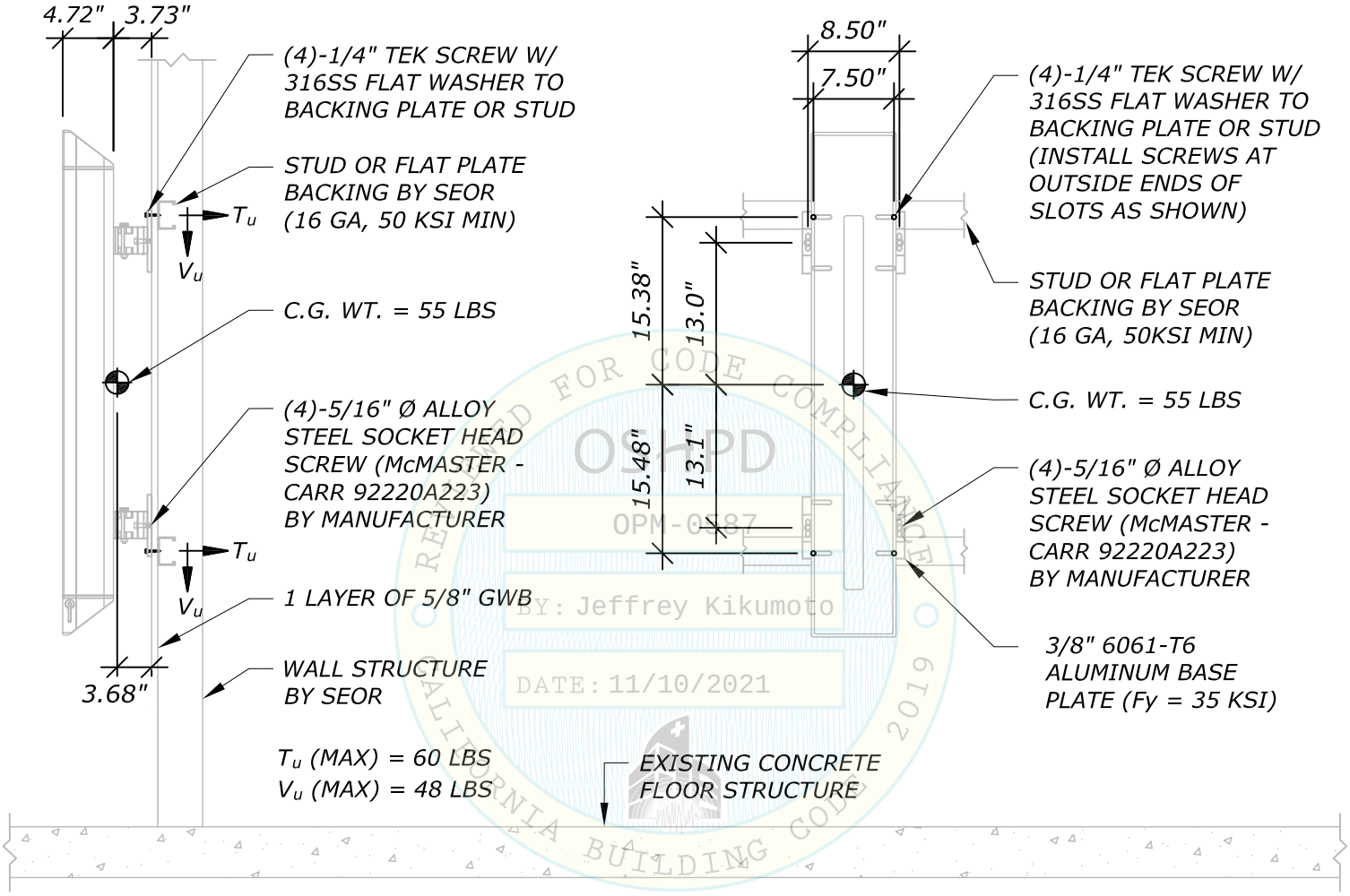
SEISMIC ANCHORAGE

(WALL MOUNTED, $S_{DS} \leq 2.50$, $z/h \leq 1.0$)



SIDE ELEVATION

FRONT ELEVATION

NOTE: THE WALL MOUNTED UNIT HAS TWO INTERCHANGEABLE MOUNTING BRACKET CONFIGURATIONS. THE CONFIGURATION SHOWN ABOVE IS THE WORST-CASE CONFIGURATION AS IT IS HEAVIER (55 LBS VS 52 LBS) AND HAS GREATER ECCENTRICITY FROM THE WALL (3.68" VS 3.22"). THE SUPPORT AND ATTACHMENTS REQUIREMENTS ARE THE SAME FOR BOTH MOUNTING BRACKET CONFIGURATIONS

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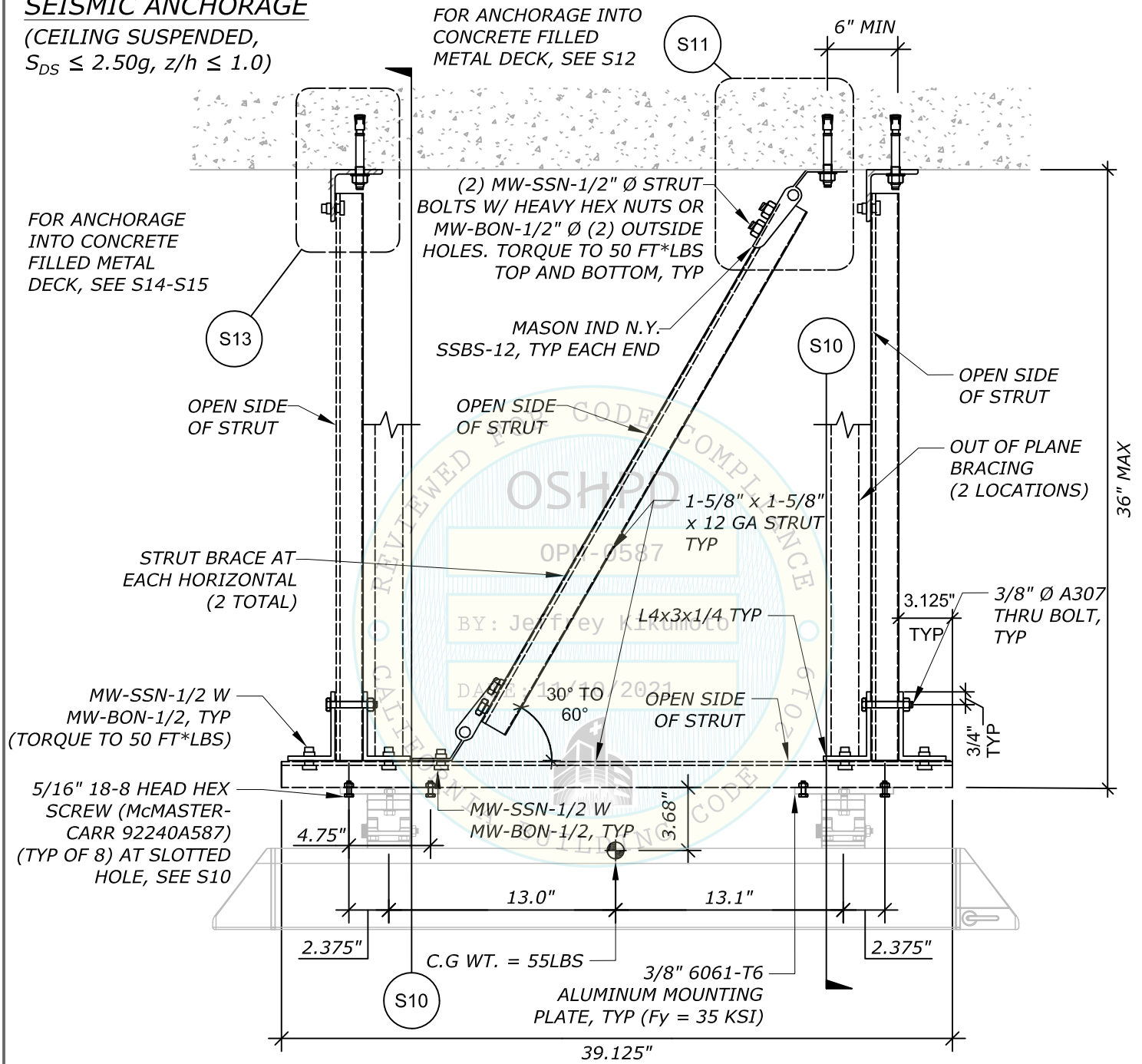
SEISMIC ANCHORAGE

(CEILING SUSPENDED,
$S_{DS} \leq 2.50g$, $z/h \leq 1.0$)



CEILING MOUNT - SIDE VIEW

REGISTERED PROFESSIONAL ENGINEER
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C82375
CIVIL
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11/10/2021

NOTE: THE CEILING MOUNTED UNIT HAS TWO INTERCHANGEABLE MOUNTING BRACKET CONFIGURATIONS. THE CONFIGURATION SHOWN ABOVE IS THE WORST-CASE CONFIGURATION AS IT IS HEAVIER (55 LBS VS 52 LBS) AND HAS GREATER ECCENTRICITY FROM THE CEILING (3.68" VS 3.22"). THE SUPPORT AND ATTACHMENTS REQUIREMENTS ARE THE SAME FOR BOTH MOUNTING BRACKET CONFIGURATIONS

SUN NUCLEAR corporation

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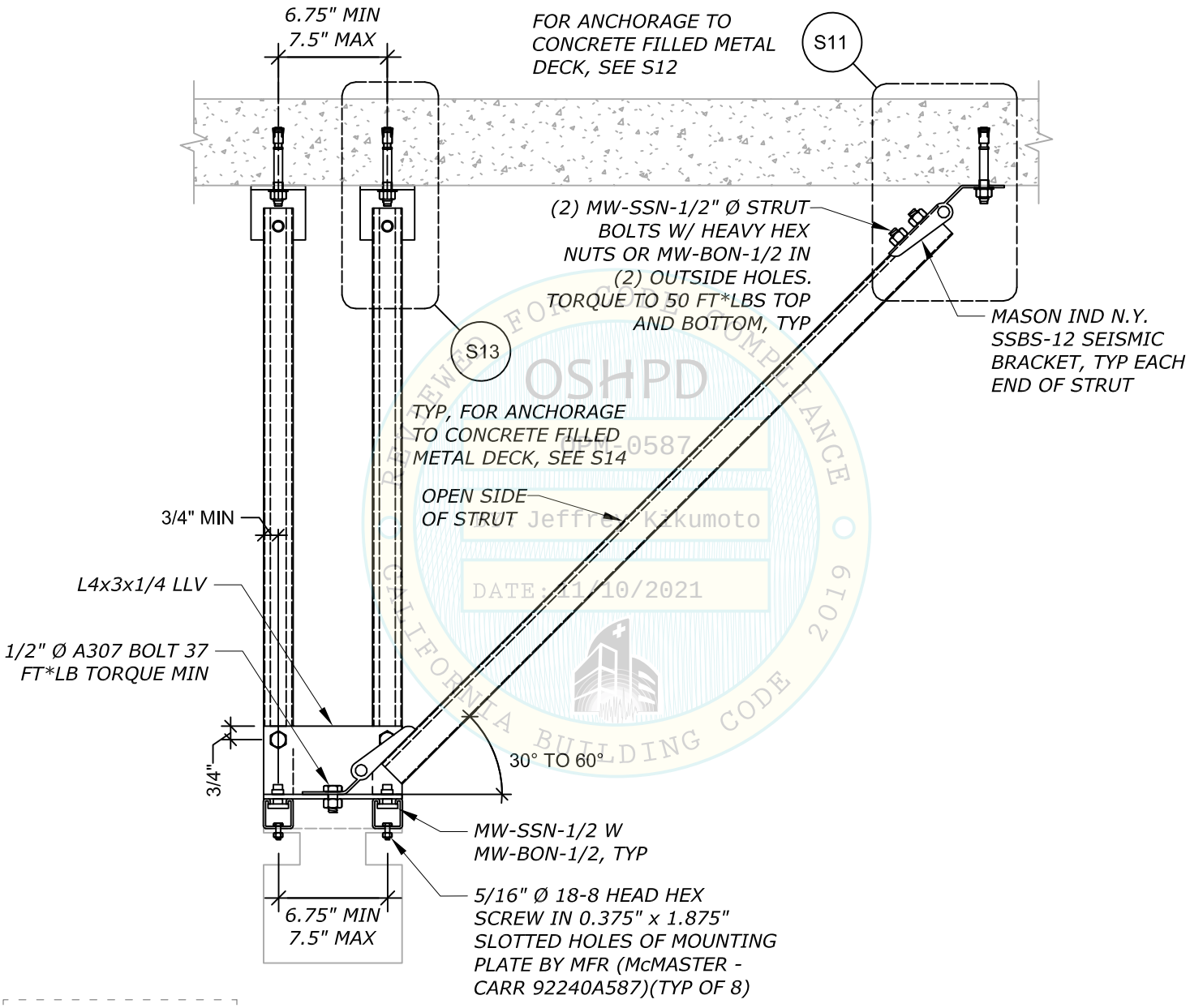
SEISMIC ANCHORAGE

(CEILING SUSPENDED,
$S_{DS} \leq 2.50g$, $z/h \leq 1.0$)



CEILING MOUNT - END VIEW

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SEISMIC ANCHORAGE

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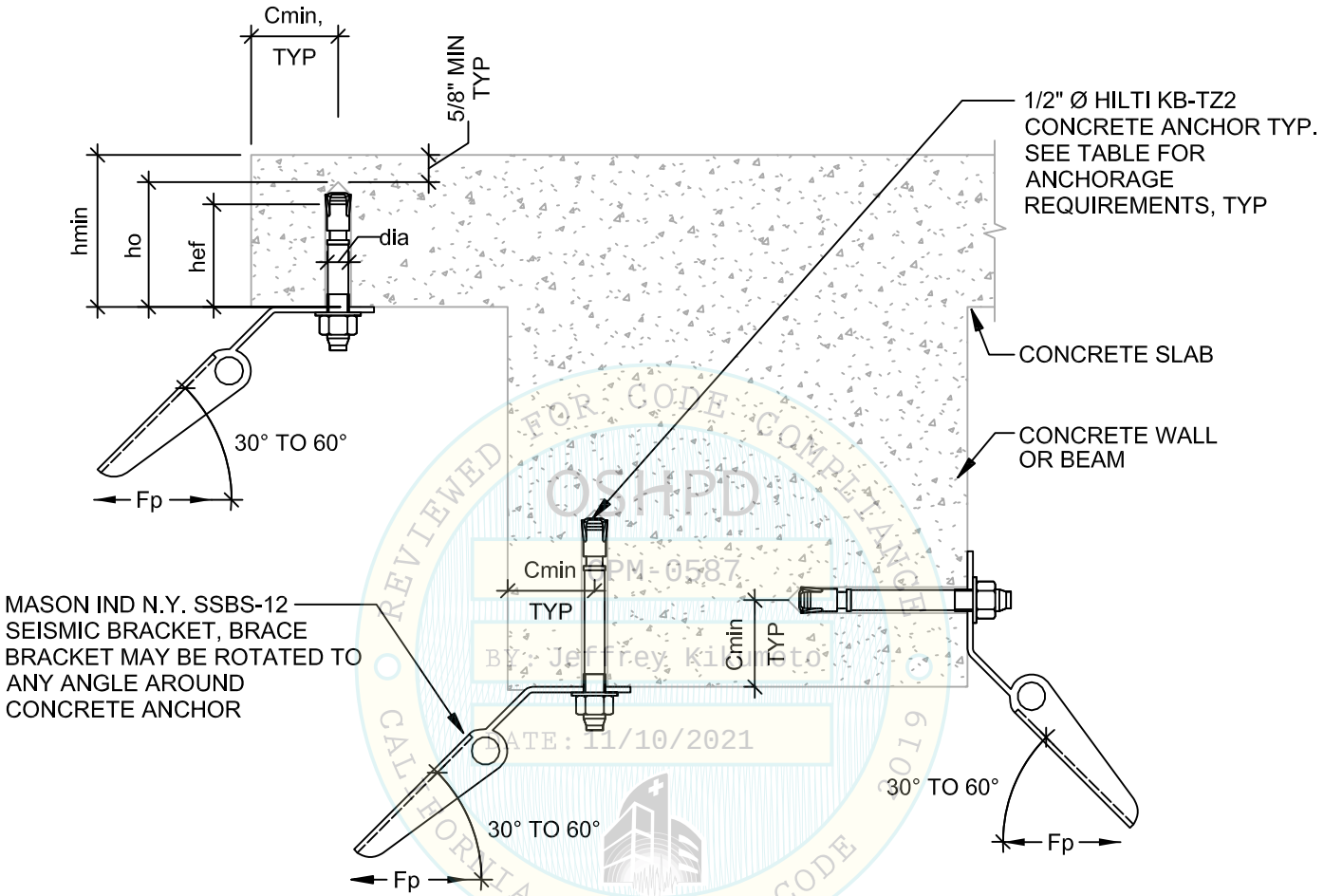

NOTE:
CONCRETE STRENGTH
SHALL BE MIN 3,000 PSI NWC

ALLOWABLE LATERAL LOAD, Fp = 370 lbs FOR 30° - 45°
= 220 lbs FOR 46° - 60°

SEISMIC BRACKET ANCHORAGE	*da (in)*	*hef (in)*	*ho (in)*	*Cmin (in)*	*REQUIRED TORQUE (ft-lbs)*	*hmin (in)*
CONCRETE SLAB/BEAM	*1/2"*	*2.0*	*2.75*	*2.75*	*50*	*4*

BRACKET ANCHORAGE INTO CONCRETE SLAB/BEAM

11/10/2021

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SEISMIC ANCHORAGE

(CEILING SUSPENDED,
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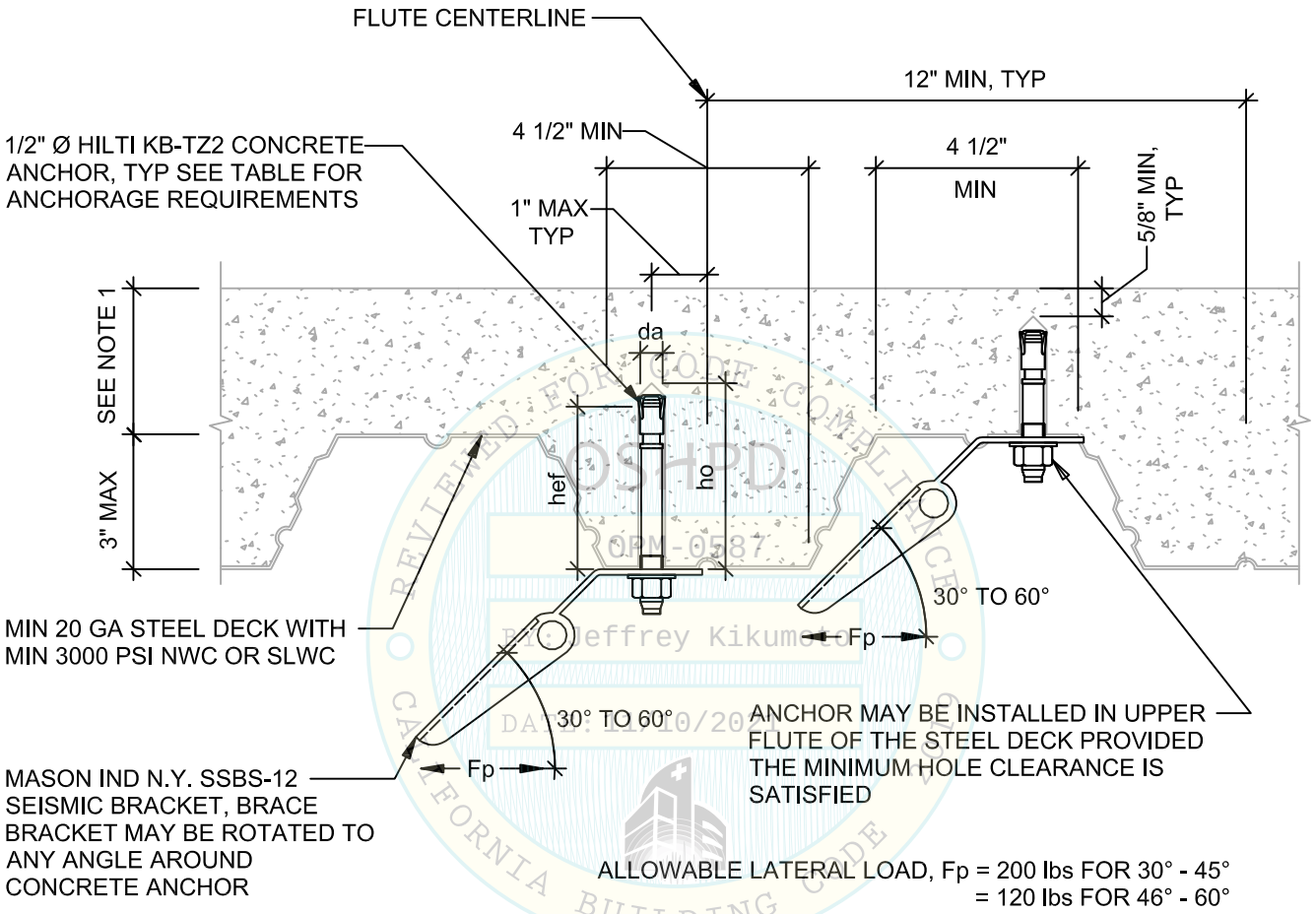

NOTE:
1. CONCRETE MUST BE 3 1/4" MIN IF ANCHORS ARE INSTALLED IN UPPER FLUTES, 2-1/2" MIN WHEN ANCHORS ARE INSTALLED IN LOWER FLUTES OF W-DECK AND 2-1/4" MIN WHEN ANCHORS ARE INSTALLED IN LOWER FLUTES OF B-DECK.

SEISMIC BRACKET ANCHORAGE	*da (in)*	*hef (in)*	*ho (in)*	*REQUIRED TORQUE (ft-lbs)*
CONCRETE FILLED METAL DECK	*1/2"*	*2.0*	*2.75*	*50*

BRACKET ANCHORAGE INTO CONCRETE FILLED METAL DECK

11/10/2021

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SEISMIC ANCHORAGE

(CEILING SUSPENDED,
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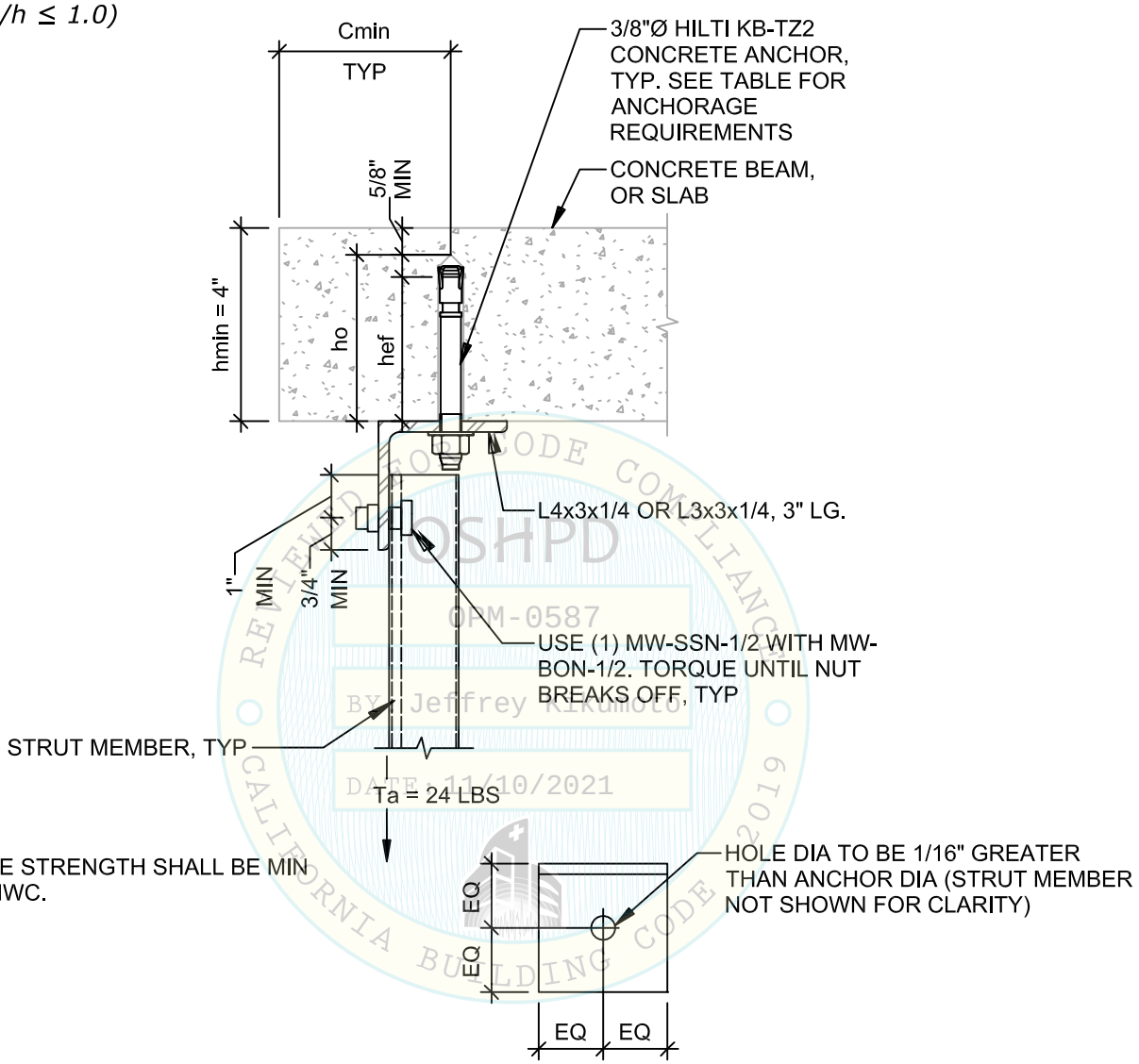

NOTE:
CONCRETE STRENGTH SHALL BE MIN 3000 PSI NWC.

ANGLE CLIP ATTACHMENT ANCHORAGE	da (in)	hef (in)	ho (in)	Cmin (in)	Min Spacing (in)	REQUIRED TORQUE (ft-lbs)
CONCRETE SLAB/BEAM	3/8"	2.0	2.75	2.5	6.0	30

ANGLE CLIP ATTACHMENT TO CONCRETE SLAB/BEAM

11/10/2021

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SEISMIC ANCHORAGE

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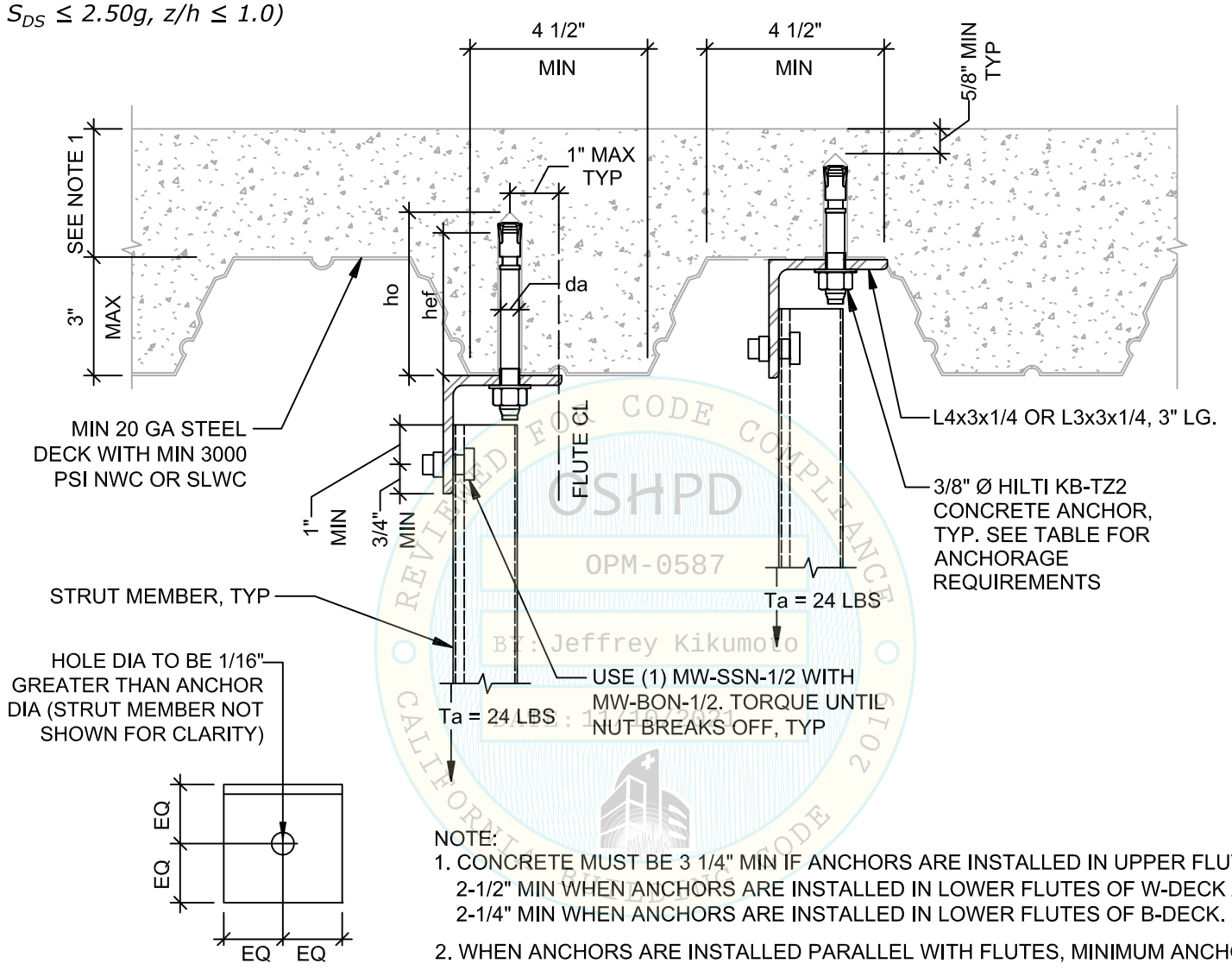

NOTE:
1. CONCRETE MUST BE 3 1/4" MIN IF ANCHORS ARE INSTALLED IN UPPER FLUTES, 2-1/2" MIN WHEN ANCHORS ARE INSTALLED IN LOWER FLUTES OF W-DECK AND 2-1/4" MIN WHEN ANCHORS ARE INSTALLED IN LOWER FLUTES OF B-DECK.
2. WHEN ANCHORS ARE INSTALLED PARALLEL WITH FLUTES, MINIMUM ANCHOR SPACING SHALL BE 6" OR 1.5x FLUTE WIDTH, WHICH EVER IS GREATER

ANGLE CLIP ATTACHMENT ANCHORAGE	*da (in)*	*hef (in)*	*ho (in)*	*Cmin (in)*	*REQUIRED TORQUE (ft-lbs)*
CONCRETE FILLED METAL DECK	*3/8"*	*2.0*	*2.75*	*2.5*	*30*

ANGLE CLIP ATTACHMENT TO CONCRETE FILLED METAL DECK

11/10/2021

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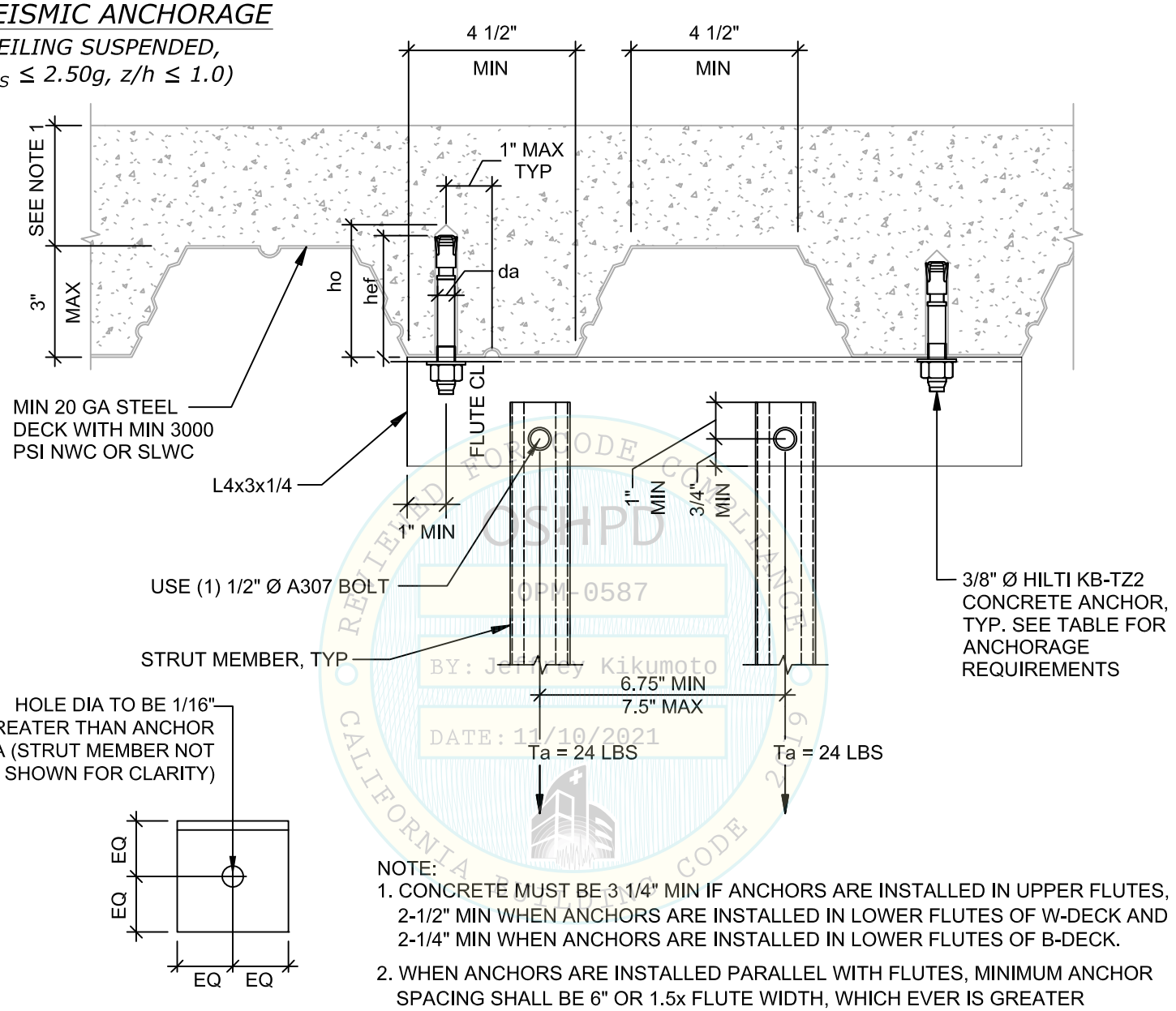
SEISMIC ANCHORAGE

(CEILING SUSPENDED,
S_{DS} ≤ 2.50g, z/h ≤ 1.0)



HOLE DIA TO BE 1/16" GREATER THAN ANCHOR DIA (STRUT MEMBER NOT SHOWN FOR CLARITY)

NOTE:
1. CONCRETE MUST BE 3 1/4" MIN IF ANCHORS ARE INSTALLED IN UPPER FLUTES, 2-1/2" MIN WHEN ANCHORS ARE INSTALLED IN LOWER FLUTES OF W-DECK AND 2-1/4" MIN WHEN ANCHORS ARE INSTALLED IN LOWER FLUTES OF B-DECK.
2. WHEN ANCHORS ARE INSTALLED PARALLEL WITH FLUTES, MINIMUM ANCHOR SPACING SHALL BE 6" OR 1.5x FLUTE WIDTH, WHICH EVER IS GREATER

ANGLE CLIP ATTACHMENT ANCHORAGE	*da (in)*	*hef (in)*	*ho (in)*	*Cmin (in)*	*REQUIRED TORQUE (ft-lbs)*
CONCRETE FILLED METAL DECK	*3/8"*	*2.0*	*2.75*	*4.5*	*30*

ALTERNATE ANGLE CLIP ATTACHMENT TO CONCRETE FILLED METAL DECK

REGISTERED PROFESSIONAL ENGINEER
FRANK ECKWRIGHT
C82375
CIVIL
STATE OF CALIFORNIA
11/10/2021

SUN NUCLEAR corporation

Project No. OPM-0587-19	Date:2021.11.08	
Drawn By: RG	Checked By: FE	Scale: NTS

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