



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

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

OFFICE USE ONLY

**APPLICATION #: OPM-0544**

**OSHPD Preapproval of Manufacturer's Certification (OPM)**

Type:  New  Renewal/Update

**Manufacturer Information**

Manufacturer: 2 Way Industries

Manufacturer's Technical Representative: Jason Way

Mailing Address: 23 Patiki Rd, Avondale, na 1026

Telephone: (828) 004-5900

Email: info@2way.co.nz

**Product Information**

Product Name: Gridlok

Product Type: Suspended Ceiling Brace System

Product Model Number: GRD 10, GRD 10CT, GRD 10P

General Description: Rigid Brace System Designed to be used with suspended ceiling frid systems

**Applicant Information**

Applicant Company Name: Bracelok

Contact Person: Bryce Hodgson

Mailing Address: 2550 Haas Street, Escondido, CA 92025

Telephone: (619) 917-1688

Email: bryce.hodgson@bracelok.com

Title: President

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STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
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**Registered Design Professional Preparing Engineering Recommendations**

Company Name: DEGENKOLB ENGINEERS

Name: Alvaro Celestino

California License Number: S5580

Mailing Address: 225 Broadway Suite 1325, San Diego, CA 92101

Telephone: (213) 309-2044

Email: acelestino@degenkolb.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): AC261 §4.0

\*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: 3/2/2021

Name: Jeffrey Kikumoto

Title: Senior Structural Engineer

Condition of Approval (if applicable): \_\_\_\_\_



**GENERAL NOTES**

**I. GENERAL**

- THIS OSHPD PRE-APPROVAL OF MANUFACTURE'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 PRE-APPROVAL IS VALID THROUGHOUT THE STATE OF CALIFORNIA AND IS VALID FOR ACOUSTICAL TILE OR LAY IN PANEL CEILING GRIDS INSTALLED AT THE S<sub>DS</sub> LIMITATIONS AS SHOWN ON SHEET S3.
- THIS PRE-APPROVAL IS LIMITED TO CEILING ASSEMBLIES LISTED IN TABLE 1 ON SHEET S2; HAVING MAXIMUM DEAD WEIGHT OF 4 PSF, INCLUDING LIGHTING FIXTURES (LUMINERIES) AND MECHANICAL SERVICES, EACH WEIGHING LESS THAN 56 LBS AND ATTACHED TO THE CEILING FRAME SYSTEM. HEAVIER SYSTEMS AND THOSE SUPPORTING LATERAL FORCES FROM PARTITION WALLS ARE OUTSIDE THE SCOPE OF THIS OPM.

**II. RESPONSIBILITIES OF THE STRUCTURAL ENGINEER OF RECORD**

- VERIFY MATERIALS AND WORKMANSHIP TO CONFORM WITH THE 2019 EDITION OF THE CALIFORNIA BUILDING CODE AND THE REQUIREMENTS OF THIS PRE-APPROVAL DOCUMENT.
- VERIFY THE ADEQUACY OF THE EXISTING FRAMING TO SUPPORT THE LOADS INDICATED ON TABLE 1, SHEET S3, IN ADDITION TO ALL OTHER LOADS.
- VERIFY ANCHORS ARE AT ADEQUATE DISTANCES FROM OPENINGS AND EDGES OF SLABS AS NOTED IN THE GENERAL NOTES SECTION IV.
- VERIFY ANCHORS ARE AT ADEQUATE DISTANCES FROM NEW OR EXISTING ANCHORS AS NOTED IN THE GENERAL NOTES SECTION IV.
- DESIGN ANY SUPPLEMENTARY MEMBERS AND THEIR ATTACHMENTS OTHER THAN THOSE DETAILED WITHIN THIS PRE-APPROVAL.
- VERIFY THAT THE INSTALLATION IS IN CONFORMANCE WITH THE 2019 CBC AND WITH THE DETAILS SHOWN IN THIS PRE-APPROVAL.
- VERIFY THAT THE SITE SEISMIC PARAMETERS DON'T EXCEED WHAT IS PERMITTED UNDER THIS OPM
- WHEN USING HILTI KB1 EXPANSION ANCHOR INTO CMU WALL, SEOR MUST VERIFY:
  - MASONRY IS NOT CRACKED AS DEFINED IN ICC-ES ACO1 §2.3; CALCULATION REQ'D TO SHOW MASONRY WALL WOULD NOT CRACK UNDER THE DESIGN EARTHQUAKE LOADS UNDER ALL SERVICE LOAD CONDITIONS; WALL HAS TO REMAIN ELASTIC.
  - MASONRY WALL FULLY GROUTED IN ACCORDANCE w/ ER-677 §4.2.
  - LIMITATIONS IN ACCORDANCE w/ ER-677 §2.0 IS SATISFIED.

**III. COLD-FORMED METAL FRAMING**

- STUDS: ASTM C955 AND ASTM A1003, "C" SHAPED WITH LIPPED FLANGES AND PUNCHED WEB. PROVIDE G60 COATING MINIMUM.
  - 43 MIL (18 GAGE) AND LIGHTER: GRADE 33 TYPE H
  - 54 MIL (16 GAGE) AND HEAVIER: GRADE 50 TYPE H STUDS.
- FRAMING DESIGNATIONS ON PLANS ARE BASED ON THE STEEL STUD MANUFACTURER'S ASSOCIATION (SSMA) PRODUCT TECHNICAL GUIDE (ICC-ESR-3064P).

- SHEET METAL SCREWS: SELF-DRILLING, SELF-TAPPING, HDG PER ASTM A153. PAN OR HEX WASHER HEAD AS REQUIRED BY FINISH.
  - PRODUCTS: ITW-BUILDEX TEKS SELF-DRILLING FASTENERS (ICC-ESR-1976), GRABBER DRIVALL (ICC-ESR-1271) UNLESS OTHERWISE NOTED IN THE FOLLOWING SHEETS.

- MINIMUM SCREW SPACING AND EDGE DISTANCE TO BE 3/4" UNLESS OTHERWISE NOTED IN THE FOLLOWING SHEETS.
- POWDER ACTUATED FASTENERS FOR HANGER WIRES: HILTI LOW-VELOCITY FASTENERS (ICC-ESR-2269).

BASE MATERIAL	FASTENERS	MINIMUM EMBEDMENT	MINIMUM EDGE DISTANCE	MINIMUM SPACING
STEEL	HILTI X-U	PER MANUF	1/2"	1"
CONCRETE	HILTI X-U	1"	3"	5 1/2"

WHERE DETAILS REFER TO 0.145" DIAMETER PAF, THE SHOT PINS ARE TO BE PER ESR 1799, 2024, 2138, OR 2269. INSTALL PER ICC REPORT. MIN EMBED IN SAND LIGHT WEIGHT CONCRETE (LWC) OVER METAL DECK AND SOLID NORMAL WEIGHT CONCRETE (NWC) SLAB TO BE 1 1/4". MIN SPACING TO BE 5.1" AND MIN EDGE DISTANCE TO BE 4".

- PAF FOR HANGER WIRES MUST NOT BE USED IN PRE-STRESSED CONCRETE UNLESS NON-DESTRUCTIVE TESTING METHODS ARE USED TO LOCATE STRAND AND REINFORCEMENT PRIOR TO FASTENER INSTALLATION.

**IV. MECHANICAL ANCHORS**

- EXPANSION ANCHORS INTO CONCRETE: HILTI KB-TZ (ICC ESR-1917). EXPANSION ANCHORS INTO CMU: IAPMO ER-677.
- INSTALL ANCHORS IN ACCORDANCE WITH LATEST ICC-ESR OR IAPMO REPORT, AS APPLICABLE, AND MANUFACTURER INSTRUCTIONS.
- IF REINFORCEMENT IS ENCOUNTERED DURING DRILLING, ABANDON AND SHIFT THE HOLE LOCATION TO AVOID THE REINFORCEMENT. PROVIDE A MINIMUM OF 2 ANCHOR DIAMETERS OR 1 INCH, WHICHEVER IS LARGER, OF SOUND CONCRETE BETWEEN THE ANCHOR AND THE ABANDONED HOLE. FILL THE ABANDONED HOLE WITH NON-SHRINK GROUT APPROVED BY THE ENGINEER OF RECORD. NOTIFY THE ENGINEER OF RECORD IF ANY REINFORCING IS DAMAGED.
- ANCHORS WILL BE PROOF-TESTED BY OWNER'S TESTING AND INSPECTION AGENCY. WITH A REPORT OF THE TEST RESULTS SUBMITTED TO OSHPD.
- IF ANY ANCHOR FAILS TESTING, REPLACE ANCHOR AND TEST ADDITIONAL ANCHORS OF THE SAME CATEGORY NOT PREVIOUSLY TESTED UNTIL TWENTY (20) CONSECUTIVE ANCHORS PASS, THEN RESUME INITIAL TESTING FREQUENCY.
- TEST ANCHORS NO SOONER THAN 24 HOURS AFTER INSTALLATION.

- TEST WEDGE ANCHORS PER THE FOLLOWING METHOD:
  - TORQUE WRENCH METHOD: TEST ANCHORS TO THE TORQUE LOAD INDICATED IN THE TABLE BELOW WITHIN THE FOLLOWING LIMITS:
    - ONE-HALF TURN OF THE NUT.

	WEDGE	
	ANCHOR DIA. (IN)	TORQUE LOAD (FT-LBS)
KB-TZ	1/2	40
	5/8	60
KB1	1/2	25

- FOR POST INSTALLED ANCHORS USED FOR NONSTRUCTURAL APPLICATIONS, 50 PERCENT OR ALTERNATE BOLTS IN A GROUP, INCLUDING AT LEAST ONE-HALF THE ANCHORS IN EACH GROUP, MUST BE TESTED.
- MINIMUM EDGE DISTANCE: SEE SHEET S11.
- MINIMUM SPACING (FROM NEW OR EXISTING ADJACENT ANCHORS): SEE SHEETS S11, S12 AND S13.

**V. STRUCTURAL TESTS, INSPECTIONS, AND OBSERVATIONS**

- AN INDEPENDENT APPROVED TESTING AGENCY AND SPECIAL INSPECTORS, CONFORMING TO 2019 CBC SECTION 1703A, WILL BE RETAINED BY THE OWNER TO PERFORM THE FOLLOWING TESTS AND INSPECTIONS. PROVIDE ACCESS AND FURNISH SAMPLES TO THE AGENCY AS REQUIRED.
- THE FOLLOWING ITEMS REQUIRE TESTS AND INSPECTIONS IN ACCORDANCE WITH THE REQUIREMENTS OF THE CHAPTER "STRUCTURAL TESTS AND INSPECTIONS" OF THE CODE.
  - MECHANICAL ANCHORS:
    - VERIFY TYPE OF ANCHOR, ANCHOR DIMENSIONS, CONCRETE TYPE AND COMPRESSIVE STRENGTH, PREDRILLED HOLE DIMENSIONS, ANCHOR SPACING, EDGE DISTANCE, SLAB THICKNESS AND ANCHOR EMBEDMENT.
    - PROOF-TEST AS INDICATED IN THE MECHANICAL ANCHORS SECTION OF THESE GENERAL NOTES.

**VI. DESIGN CRITERIA**

- APPLICABLE CODE: 2019 CALIFORNIA BUILDING CODE.
- SEISMIC DESIGN: SEISMIC FORCE  $F_p$  (LRFD) =  $\frac{0.4 * S_{DS} * a_p}{(R_p / I_p)} (1 + 2 * z/h) W_p$

WHERE:  
 S<sub>DS</sub> = VARIES SEE SCHEDULE ON SHEET S3  
 I<sub>p</sub> = 1.5  
 z/h ≤ 1.0  
 R<sub>p</sub> = 2.5 FOR CEILINGS  
 a<sub>p</sub> = 1.0 FOR CEILINGS  
 Ω = 2.0 FOR CEILINGS



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BRACELOK™ GRIDLOK-10P, GRIDLOK-10CT  
 AND GRIDLOK-10 CONNECTORS  
 GRIDLOK OPM-0544-19  
 Title: GENERAL NOTES

Drawn: JEB Job number: B8769007.01  
 Design: PGM/LH Rev:  
 Check: AC Scale: NTS  
 Date: 12/07/2020

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**GENERAL NOTES, CONT**

**VII. HOW TO USE THIS PRE-APPROVAL**

1. REVIEW AND UNDERSTAND ALL GENERAL NOTES AND FIGURES BEFORE PROCEEDING.
2. SELECT A GRIDLOK CLIP TO MATCH THE CEILING GRID ICC REPORT PER SHEET S2.
3. DETERMINE THE MAXIMUM ALLOWABLE GRIDLOCK SPACING BASED ON THE SITE SEISMICITY ( $S_{Ds}$ ) FROM TABLE 1 ON SHEET S3.
4. BASED ON THE PLENUM HEIGHT 'H' AND THE CHOSEN GRIDLOK SPACING CHOSEN ON STEP 3 ABOVE, SELECT BRACE SIZE PER TABLE 1 ON SHEET S4. BRACE STUDS MUST NOT BE REPLACED BY WIRE.
5. BASED ON THE PLENUM HEIGHT 'H' AND THE CHOSEN GRIDLOK SPACING CHOSEN ON STEP 3 ABOVE, SELECT VERTICAL STRUT SIZE PER TABLE 2 ON SHEET S4. VERTICAL STRUTS MUST NOT BE REPACED BY WIRE.
6. BASED ON THE DECK TYPE SELECT THE APPROPRIATE CONNECTION TO THE SUPPORTING STRUCTURE ABOVE PER TABLE 3 ON SHEET S4.
7. RDP TO DETERMINE THE IMPACT ON THE EXISTING STRUCTURE FROM THE GRIDLOK BASED ON THE PROVIDED 'F' ASD FORCE ON TABLE 1 ON SHEET S3.

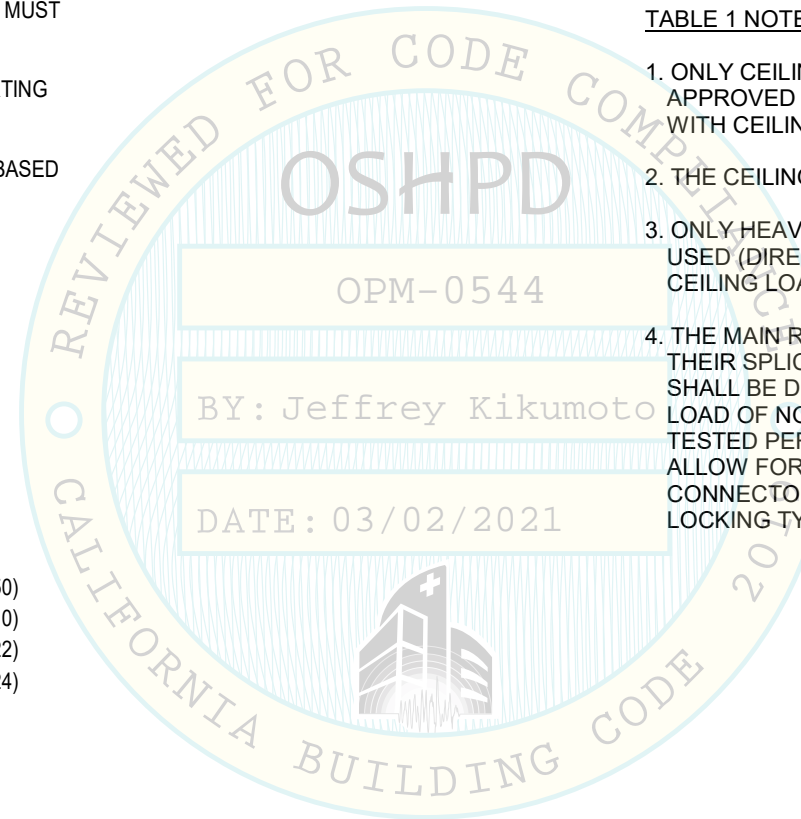
**SHEET LIST**

S1 GENERAL NOTES	S10A GRIDLOK PARTS
S2 GENERAL NOTES AND SCHEDULES	S11 CONNECTION DETAILS
S3 GENERAL PLAN AND SCHEDULES	S12 CONNECTION DETAILS
S4 3D SECTION AND SCHEDULES	S13 CONNECTION DETAILS
S5 SECTIONS	S14 CONNECTION DETAILS
S6 GRIDLOK-10P ASSEMBLY DETAILS	S15 CONNECTION DETAILS
S7 GRIDLOK-10 ASSEMBLY DETAILS	S15A WALL CONNECTION DETAILS
S8 GRIDLOK-10CT ASSEMBLY DETAILS	S16 CONNECTION DETAILS
S9 GRIDLOK PARTS	S17 OPD-0002-13 DETAILS (CL2.60, CL2.50)
S10 GRIDLOK PARTS	S18 OPD-0002-13 DETAILS (CL0.02, CL4.10)
	S19 OPD-0002-13 DETAILS (CL4.21, CL4.22)
	S20 OPD-0002-13 DETAILS (CL4.23, CL4.24)
	S21 OPD-0002-13 DETAILS (CL4.25)

TABLE 1: GRIDLOK ASSEMBLY SCHEDULE		
CEILING GRID ASSEMBLY	GRIDLOK ASSEMBLY	ASSEMBLY DETAIL
WORTHINGTON ARMSTRONG VENTURE (ICC ESR-1308)	GRIDLOK-10P	1/S6
USG LLC (ICC ESR-1222)	GRIDLOK-10	1/S7
CERTAIN TEED CORPORATION (ICC ERS-3336)	GRIDLOK-10CT	1/S8

**TABLE 1 NOTES:**

1. ONLY CEILING GRIDS THAT MEET THE ICC REPORTS LISTED ABOVE ARE APPROVED FOR USE WITH THIS OPM. MATCH GRIDLOK ASSEMBLY CLIP WITH CEILING GRID TYPE PER TABLE ABOVE.
2. THE CEILING SYSTEMS ARE LIMITED TO INTERIOR APPLICATIONS.
3. ONLY HEAVY-DUTY MAIN TEES DEFINED IN SPECIFICATION C635 SHALL BE USED (DIRECT HUNG; MIN LOAD CARRYING CAPABILITY = 16.0 PLF; CEILING LOAD = 4 PSF).
4. THE MAIN RUNNERS AND CROSS RUNNERS OF THE CEILING SYSTEM AND THEIR SPLICES, INTERSECTION CONNECTORS, AND EXPANSION DEVICES SHALL BE DESIGNED & CONSTRUCTED TO CARRY A MEAN ULTIMATE TEST LOAD OF NOT LESS THAN 180 LBS IN COMPRESSION AND IN TENSION WHEN TESTED PER TEST METHODS E3090/E3090M. THE TENSILE TEST SHALL ALLOW FOR A 5° OFFSET OF THE CONNECTION IN ANY DIRECTION. THE CONNECTORS AT SPLICES AND INTERSECTIONS SHALL BE THE MECHANICAL LOCKING TYPE.



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 GRIDLOK OPM-0544-19  
 Title: GENERAL NOTES AND SCHEDULES

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Design: PGM/LH	Rev:
Check: AC	Scale: NTS
Date: 12/07/2020	

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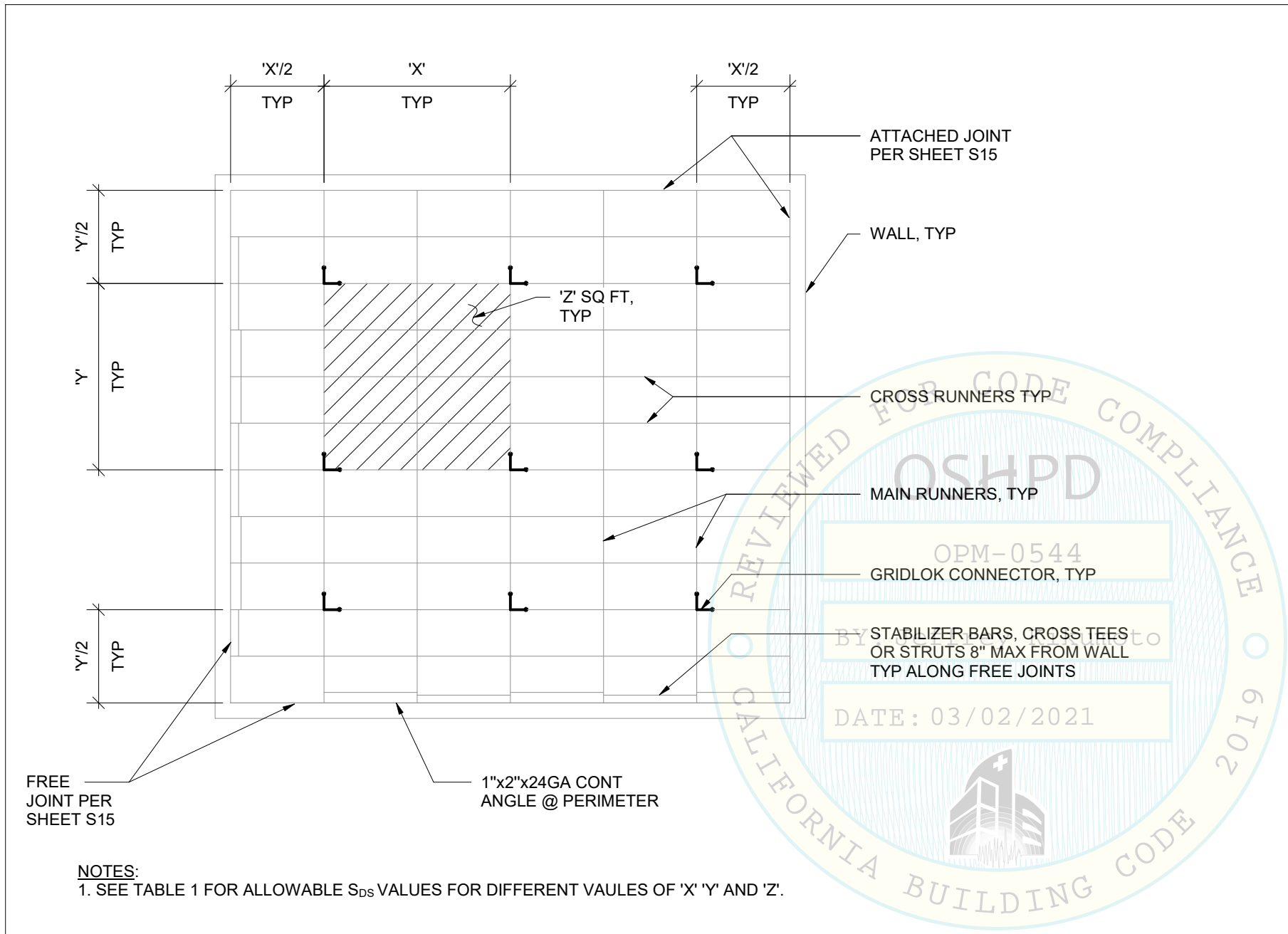
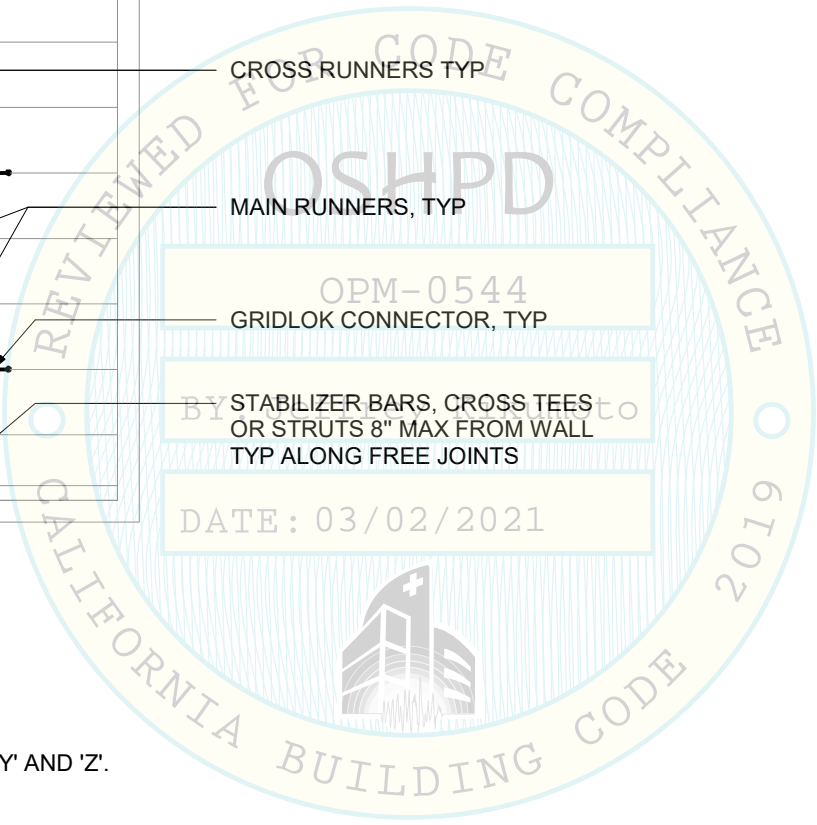


TABLE 1: GRIDLOK SPACING SCHEDULE				
S <sub>DS</sub>	'X' MAX	'Y' MAX	'Z' MAX	'F' ASD (LBS)
0.25 - 1.38	12'-0"	12'-0"	144 SF	400 LB
1.39 - 2.00	12'-0"	8'-0"	96 SF	400 LB
2.01 - 2.50	8'-0"	8'-0"	64 SF	400 LB

**TABLE 1 NOTES:**

- TABLE 1 ABOVE MAY BE USED FOR ALL FLOOR ELEVATIONS (z/h) IN A BUILDING, WHERE 'z' IS THE ELEVATION OF THE FLOOR AND 'h' IS THE ELEVATION OF THE ROOF, BOTH WITH RESPECT TO GRADE LEVEL.
- MAXIMUM ALLOWABLE BRACE SPACING FOR DIFFERENT VAULES OF S<sub>DS</sub> ARE BASED ON A MAXIMUM ALLOWABLE (ASD) GRIDLOK SYSTEM CAPACITY OF 400 LB.
- 'F' REFERS TO THE MAXIMUM ALLOWABLE (ASD) HORIZONTAL FORCE APPLIED TO THE GRIDLOK CONNECTOR FOR THE SEISMICITY AND SPACING INDICATED.



FREE JOINT PER SHEET S15

1"x2"x24GA CONT ANGLE @ PERIMETER

**NOTES:**  
1. SEE TABLE 1 FOR ALLOWABLE S<sub>DS</sub> VALUES FOR DIFFERENT VAULES OF 'X' 'Y' AND 'Z'.

**1 SUSPENDED CEILING GRID BRACING PLAN VIEW**  
1/8" = 1'-0"

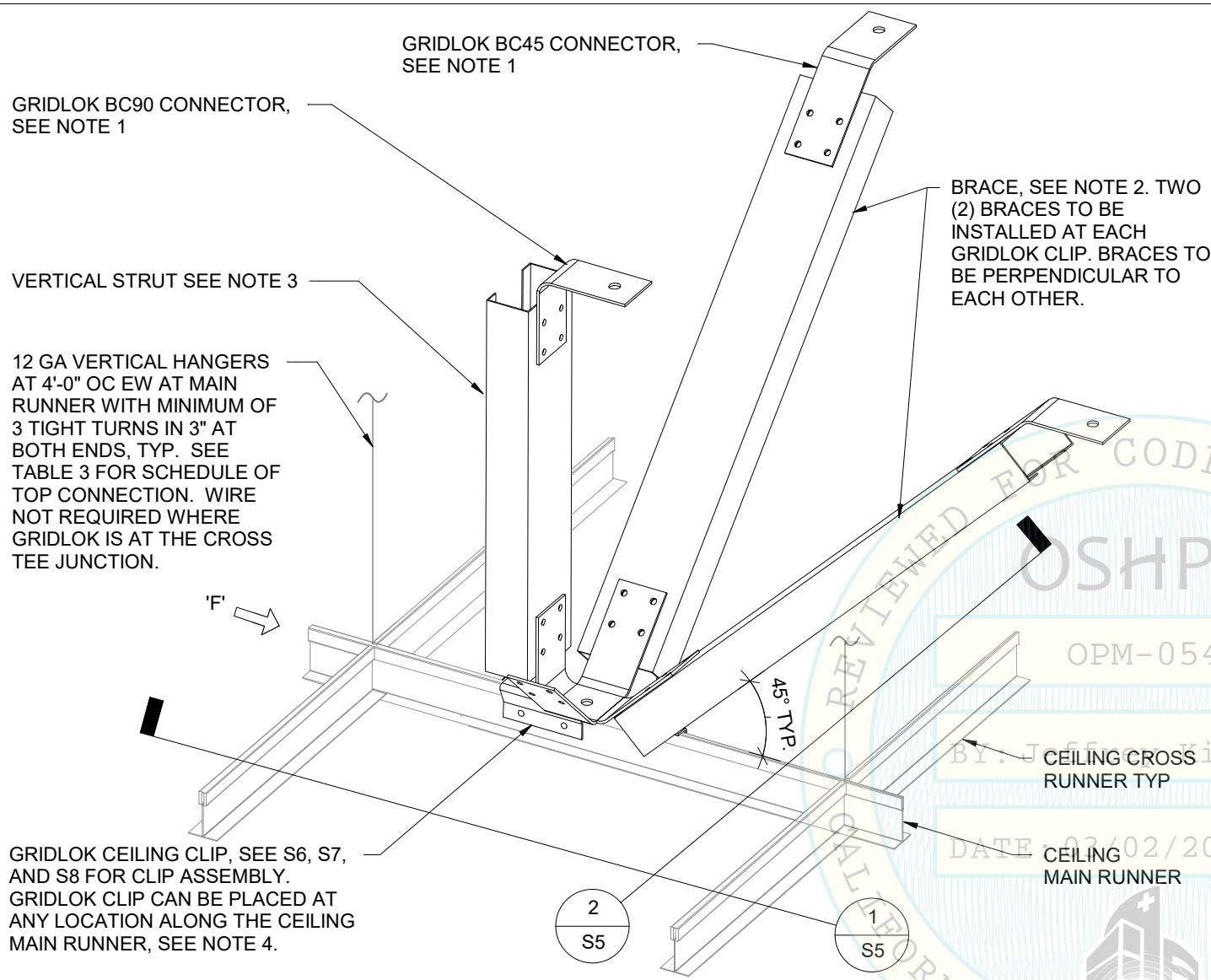


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Title: GENERAL PLAN AND SCHEDULES

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**NOTES:**

1. SEE TABLE 3 FOR SCHEDULE OF CONNECTION DETAIL OF GRIDLOK BC45 AND BC90 CONNECTORS TO THE FLOOR ABOVE FOR DIFFERENT STRUCTURAL SYSTEMS.
2. SEE TABLE 1 FOR SCHEDULE OF PLENUM HEIGHT 'H' BASED ON BRACE SIZE AND CHOSEN GRIDLOK SPACING.
3. SEE TABLE 2 FOR SCHEDULE OF PLENUM HEIGHT 'H' BASED ON VERTICAL STRUT SIZE AND CHOSEN GRIDLOK SPACING.
4. THE GRIDLOK ASSEMBLY CAN BE PLACED ANYWHERE ALONG THE MAIN RUNNER. THE GRIDLOK FLY-PLATE PIECE CAN BE ROTATED IN 90-DEGREE INTERVALS PROVIDED THE BRACES ARE ALIGNED WITH THE MAIN AND CROSS RUNNERS. THE GRIDLOK FLY-PLATE CAN BE ROTATED AT ANY ANGLE, FROM 0 TO 360 DEGREES, WHEN THE CENTERLINE OF THE GRIDLOK IS WITHIN 3" FROM THE INTERSECTION OF THE MAIN AND CROSS RUNNERS.

**1 GRIDLOK ASSEMBLY (ISOMETRIC)**  
NTS

**TABLE 1: MAXIMUM PLENUM HEIGHT 'H' FOR DIFFERENT BRACE SIZES AND S<sub>DS</sub> VALUES**

GRIDLOK SPACING	BRACE SIZE		250S125-33	250S162-33	362S162-33	(2) 250S162-33 BACK-TO-BACK
	S <sub>DS</sub>					
12'-0"x12'-0"	0.25 - 1.00		4'-6"	6'-0"	7'-6"	9'-6"
12'-0"x12'-0"	1.01 - 1.38		N/A	5'-0"	6'-6"	9'-6"
8'-0"x12'-0"	1.39 - 2.00		N/A	5'-0"	6'-6"	9'-6"
8'-0"x8'-0"	2.01 - 2.50		N/A	5'-6"	7'-6"	9'-6"

**TABLE 2: MAXIMUM PLENUM HEIGHT 'H' FOR DIFFERENT VERTICAL STRUT SIZES AND S<sub>DS</sub> VALUES**

GRIDLOK SPACING	VERTICAL STRUT SIZE		250S125-33	250S162-33	362S162-33
	S <sub>DS</sub>				
12'-0"x12'-0"	0.25 - 1.00		7'-0"	9'-6"	9'-6"
12'-0"x12'-0"	1.01 - 1.38		6'-6"	8'-0"	9'-6"
8'-0"x12'-0"	1.39 - 2.00		6'-0"	8'-0"	9'-6"
8'-0"x8'-0"	2.01 - 2.50		7'-0"	9'-0"	9'-6"

**TABLE 1 AND 2 NOTES:**

1. SEE S5 FOR DEFINITION OF 'H'.
2. SEE DETAIL 2/S16 FOR BRACE CONNECTION WHERE BACK-TO-BACK BRACES ARE REQUIRED.
3. 'GRIDLOK SPACING' CHOSEN PER TABLE 1 ON SHEET S3.

**TABLE 3: GRIDLOK CONNECTION SCHEDULE**

STRUCTURAL CONDITION OF FLOOR/ROOF ABOVE SUSPENDED CEILING	HANGER WIRE DETAIL	BC45 BRACE AND BC90 STRUT TOP CONNECTION DETAIL
CONCRETE OVER W3 DECK	1/S18	1/S12, 2/S12
CONCRETE OVER B DECK	1/S18	1/S13, 2/S13
CONCRETE SLAB, BEAM, OR JOIST	2/S18	1/S11
STRUCTURAL STEEL	1/S20	1/S14
SAWN TIMBER	2/S20	1/S15

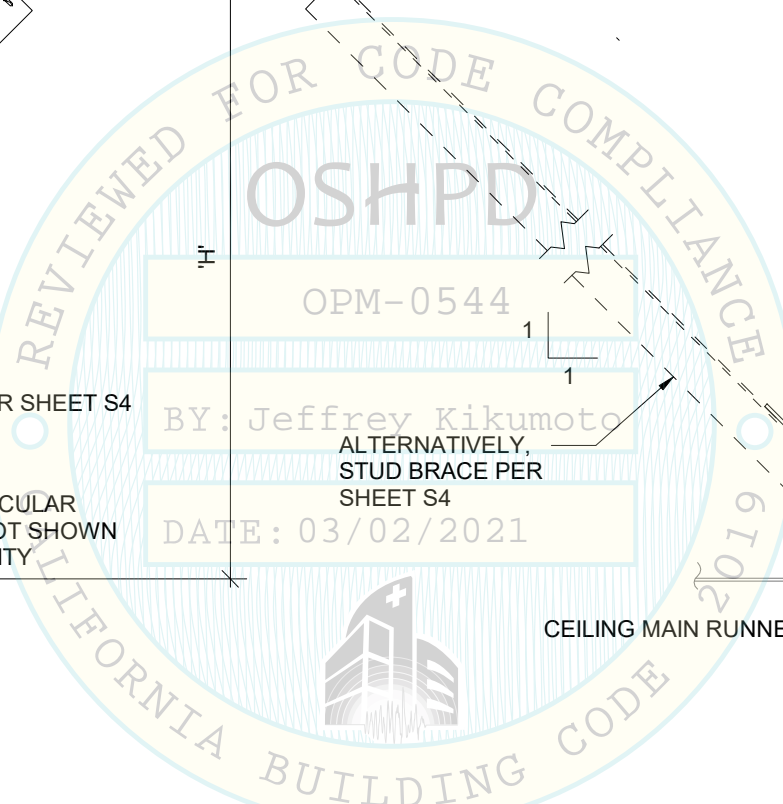
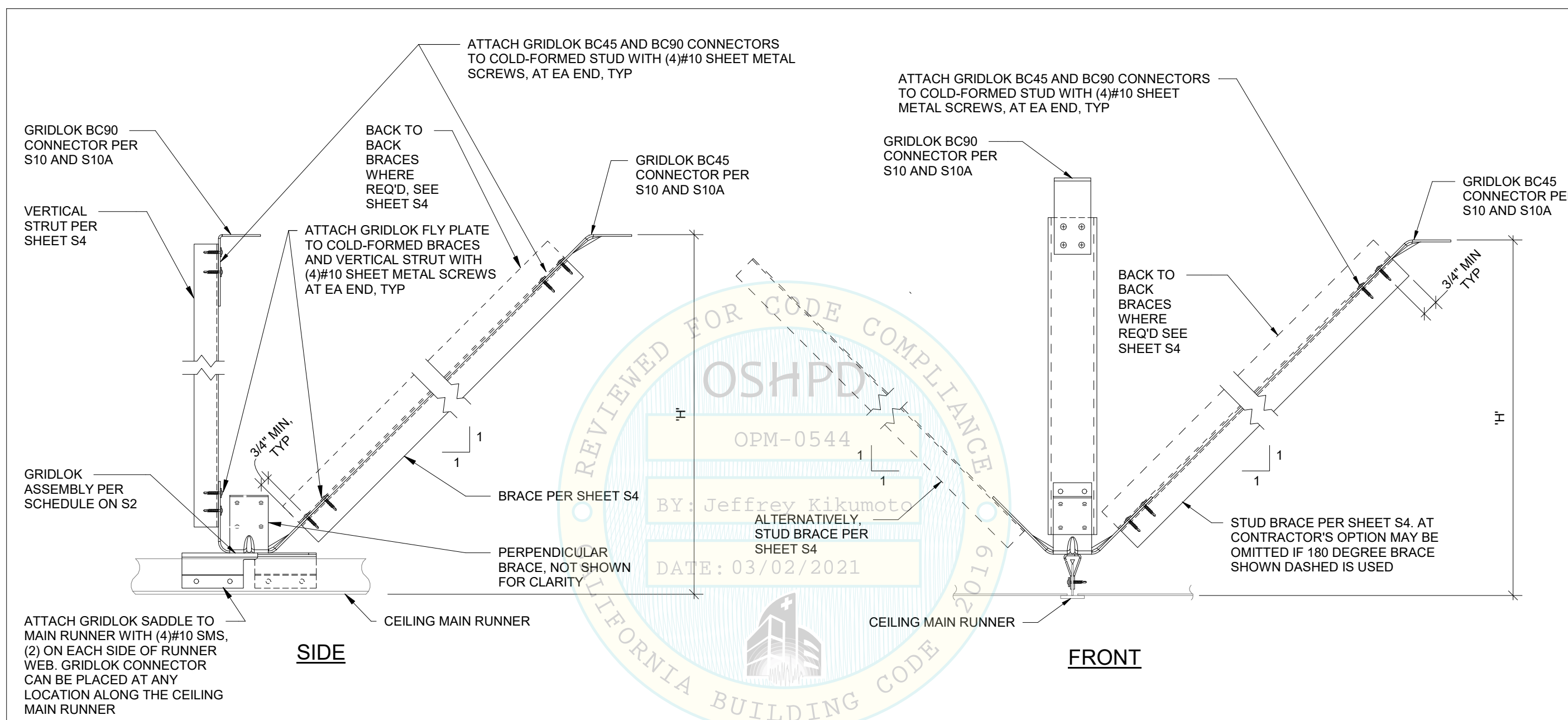


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Title: 3D SECTION AND SCHEDULES

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**NOTES:**  
 1. SEE TABLE 3 ON SHEET S4 FOR SCHEDULE OF CONNECTION DETAIL OF GRIDLOK BC45 AND BC90 CONNECTORS TO THE FLOOR ABOVE FOR DIFFERENT DECK TYPES.

**NOTES:**  
 1. SEE TABLE 3 ON SHEET S4 FOR SCHEDULE OF CONNECTION DETAIL OF GRIDLOK BC45 AND BC90 CONNECTORS TO THE FLOOR ABOVE FOR DIFFERENT DECK TYPES.  
 2. SEE 1/- FOR INFO NOT SHOWN OR NOTED.

**1 GRIDLOK ELEVATION**  
 NTS

**2 GRIDLOK ELEVATION**  
 NTS



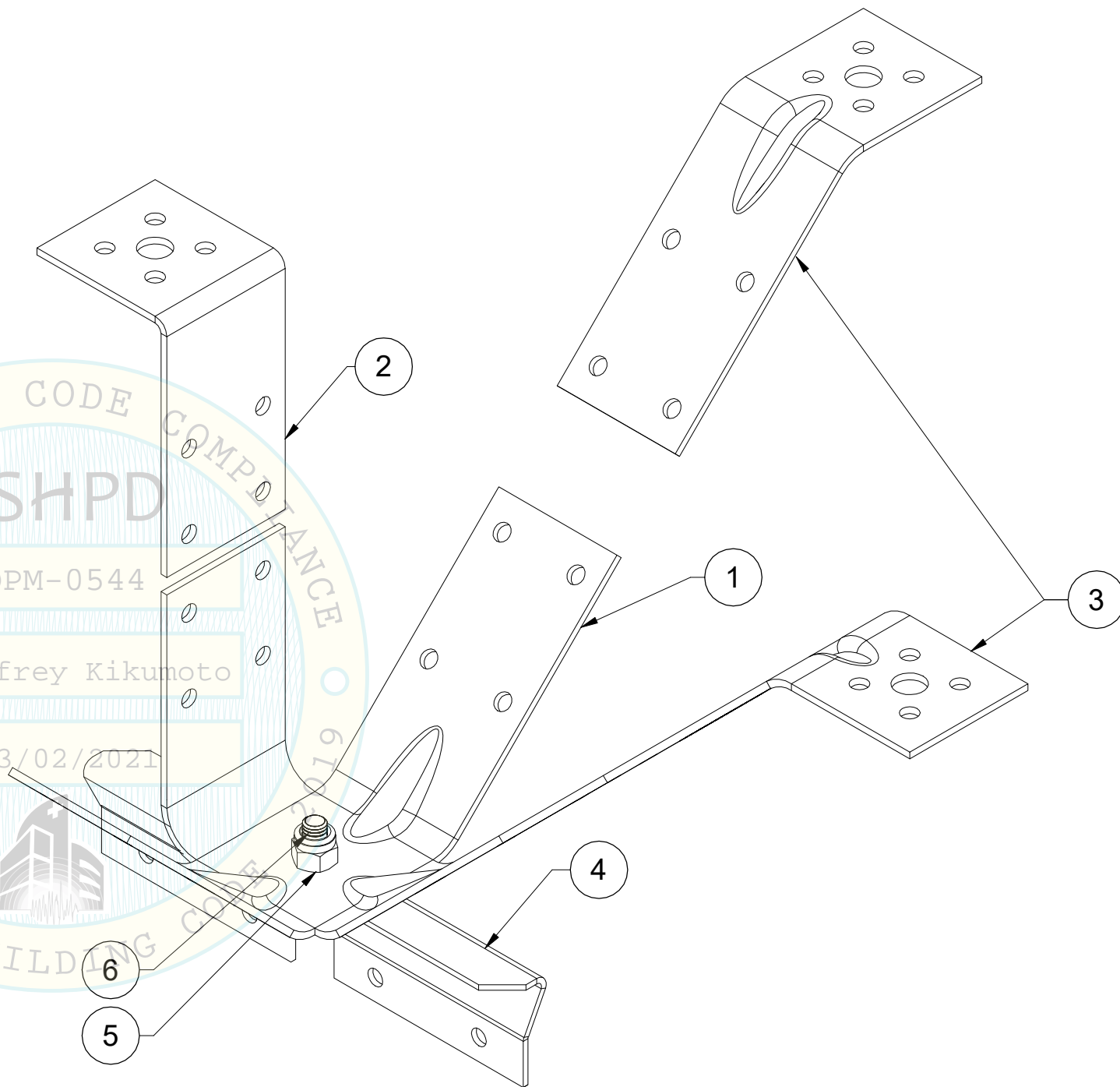
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ITEM NO.	PART NO.	GRIDLOK-10 P / QTY	DETAIL
1	GRIDLOK-FLY-PLATE	1	2/S9
2	GRIDLOK-BC90-CONNECTOR	1	1/S10 & 1/S10A
3	GRIDLOK-BC45-CONNECTOR	2	2/S10 & 2/S10A
4	GRIDLOK-10 P-SADDLE	1	1/S9
5	ISO 7041-M8-S	1	-
6	PEM FH-M8-18 X-S	1	-



**NOTES:**  
1. SEE SCHEDULE ON S2 FOR ACCEPTABLE CEILING GRID ASSEMBLY TO BE USED WITH GRIDLOK-10P ASSEMBLY.

**1 GRIDLOK-10 P ASSEMBLY**  
3/32" = 1'-0"



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San Diego, CA 92101  
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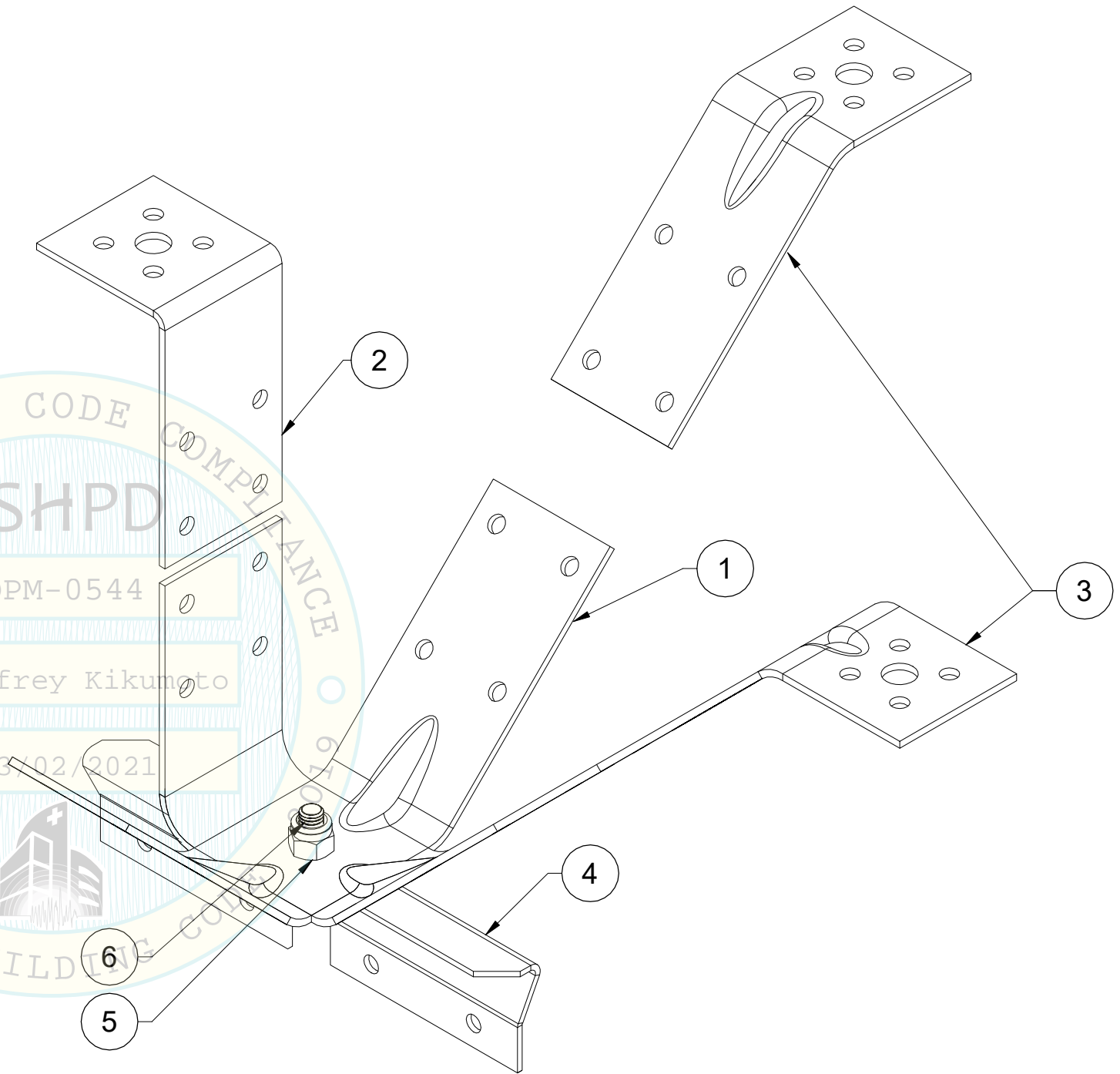
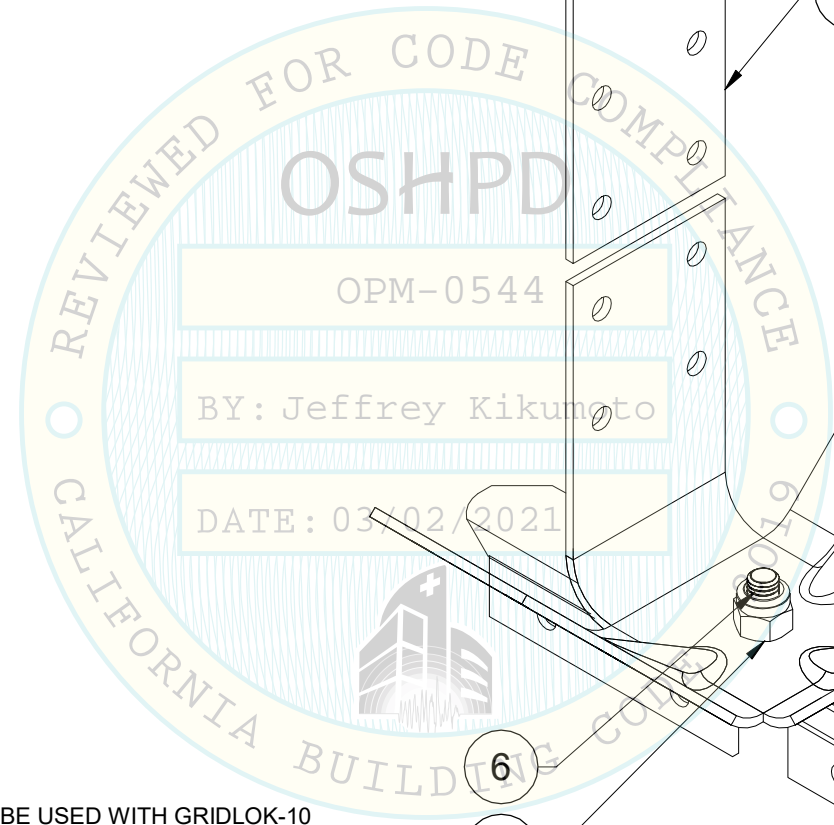
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AND GRIDLOK-10 CONNECTORS  
GRIDLOK OPM-0544-19  
Title: GRIDLOK-10P ASSEMBLY DETAILS

Drawn: JEB Job number: B8769007.01  
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ITEM NO.	PART NO.	GRIDLOK-10 / QTY	DETAIL
1	GRIDLOK-FLY-PLATE	1	2/S9
2	GRIDLOK-BC90-CONNECTOR	1	1/S10 & 1/S10A
3	GRIDLOK-BC45-CONNECTOR	2	2/S10 & 2/S10A
4	GRIDLOK-10-SADDLE	1	3/S9
5	ISO 7041-M8-S	1	-
6	PEM FH-M8-18 X-S	1	-



NOTES:  
 1. SEE SCHEDULE ON S2 FOR ACCEPTABLE CEILING GRID ASSEMBLY TO BE USED WITH GRIDLOK-10 ASSEMBLY.

**1 GRIDLOK-10 ASSEMBLY**  
 3/32" = 1'-0"



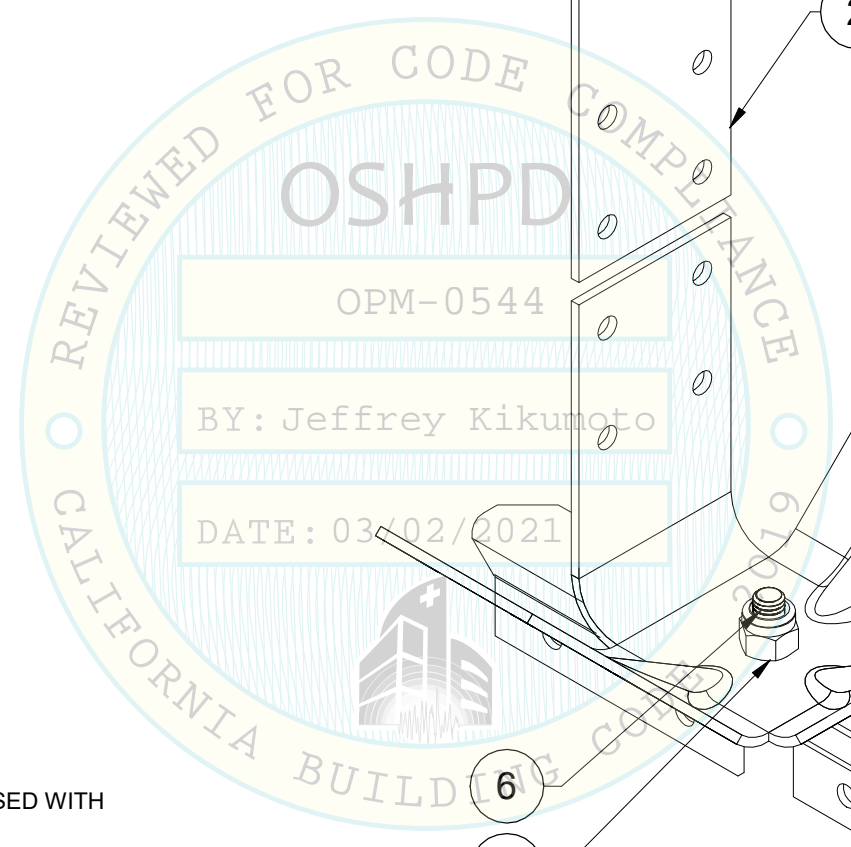
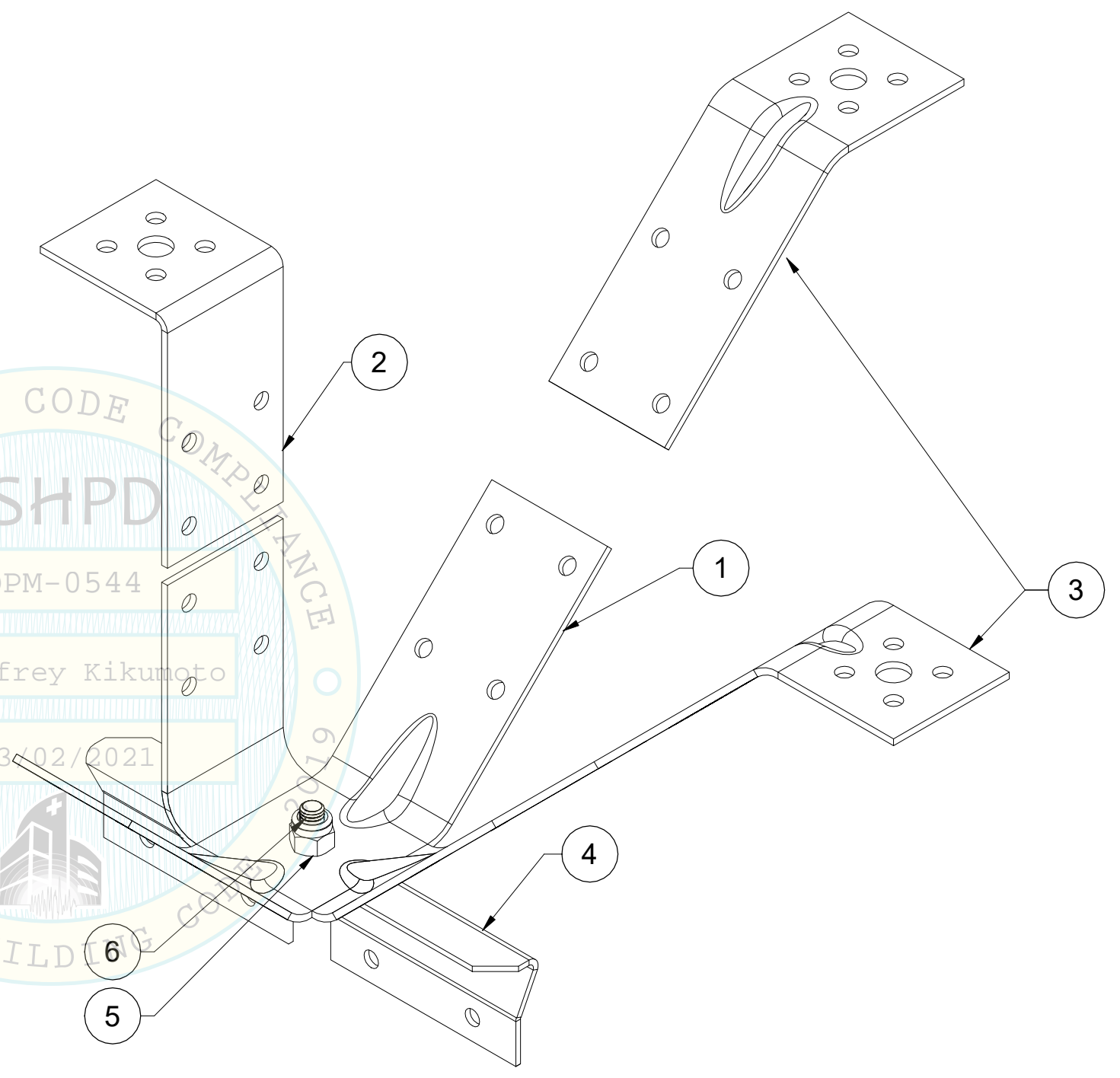
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 GRIDLOK OPM-0544-19  
 Title: GRIDLOK-10 ASSEMBLY DETAILS

Drawn: JEB Job number: B8769007.01  
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ITEM NO.	PART NO.	GRIDLOK-10 CT / QTY	DETAIL
1	GRIDLOK-FLY-PLATE	1	2/S9
2	GRIDLOK-BC90-CONNECTOR	1	1/S10 & 1/S10A
3	GRIDLOK-BC45-CONNECTOR	2	2/S10 & 2/S10A
4	GRIDLOK-10CT-SADDLE	1	3/S9
5	ISO 7041-M8-S	1	-
6	PEM FH-M8-18 X-S	1	-



**NOTES:**

1. SEE SCHEDULE ON S2 FOR ACCEPTABLE CEILING GRID ASSEMBLY TO BE USED WITH GRIDLOK-10CT ASSEMBLY.

**1 GRIDLOK-10CT ASSEMBLY**  
3/32" = 1'-0"



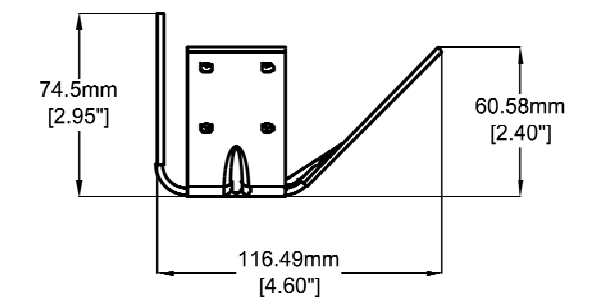
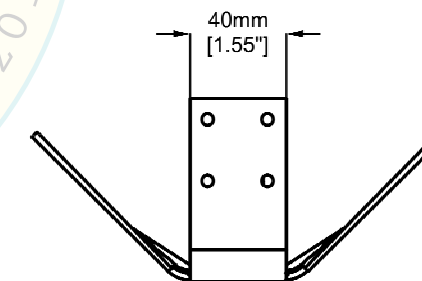
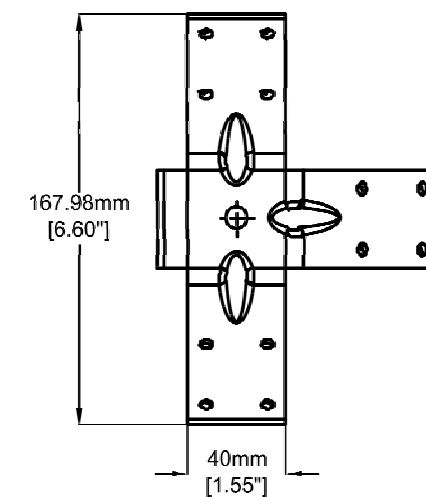
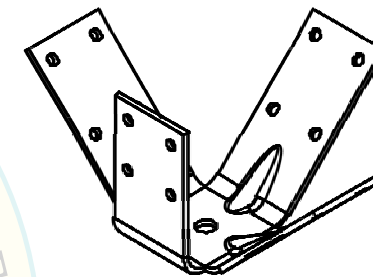
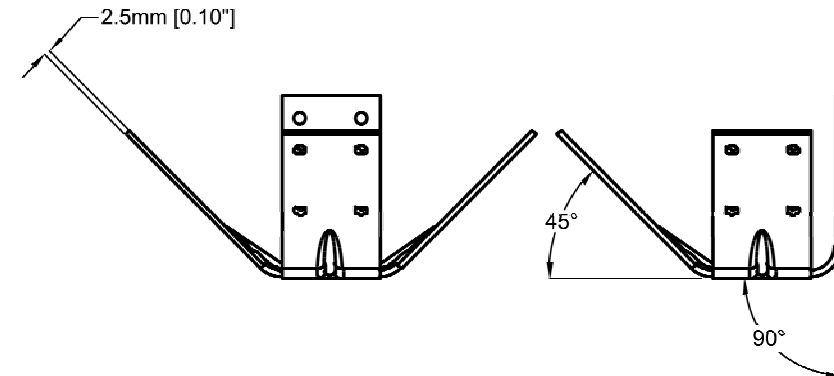
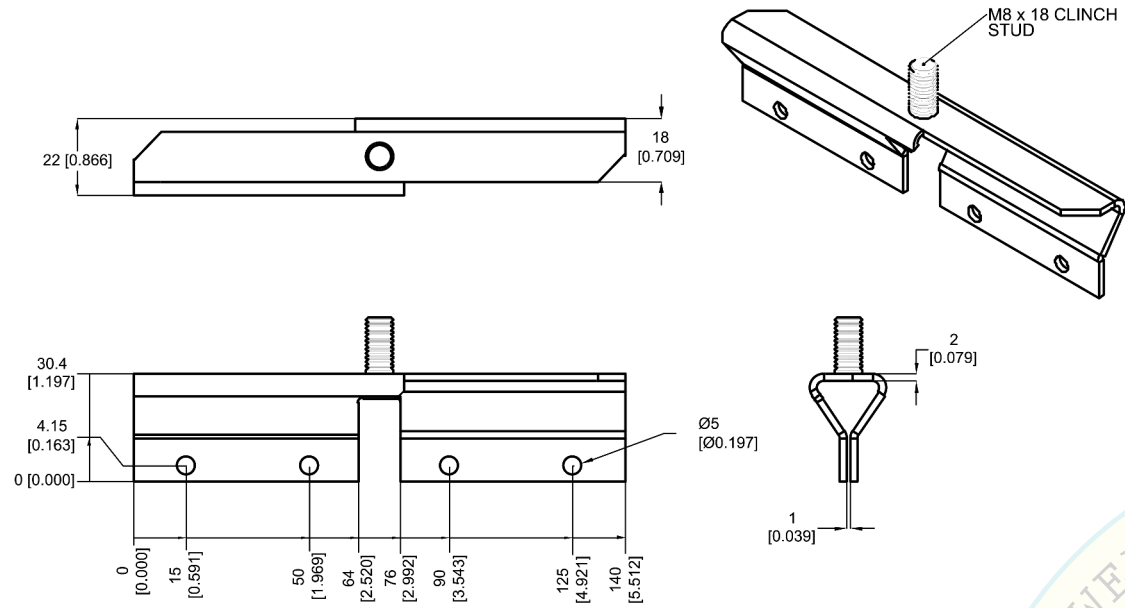
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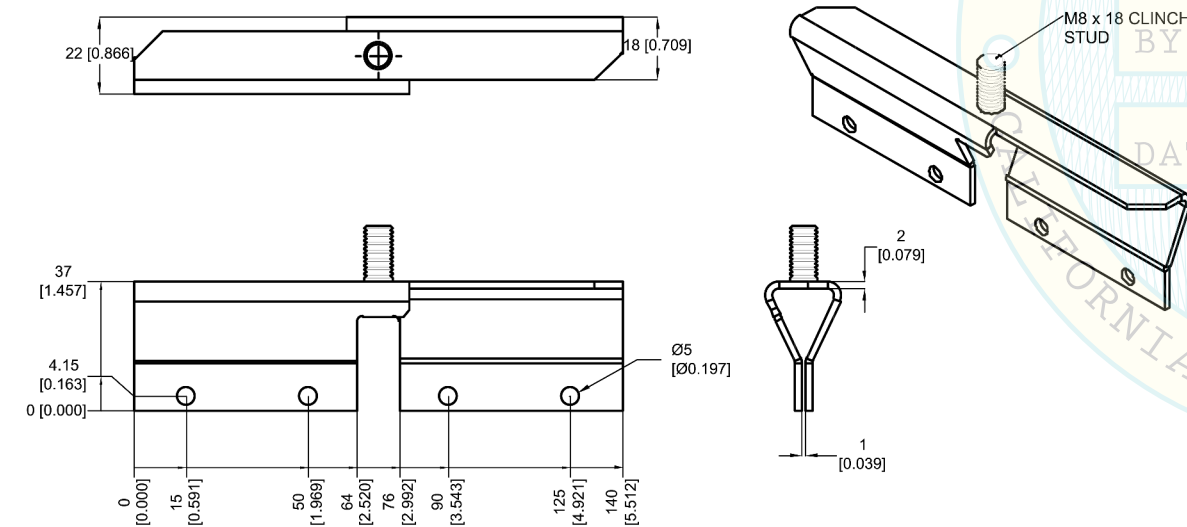
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OF Sheets

**NOTE:**  
ALL DIMENSIONS IN THIS SHEET ARE IN mm. IMPERIAL UNITS IN PARENTHESIS (INCHES).

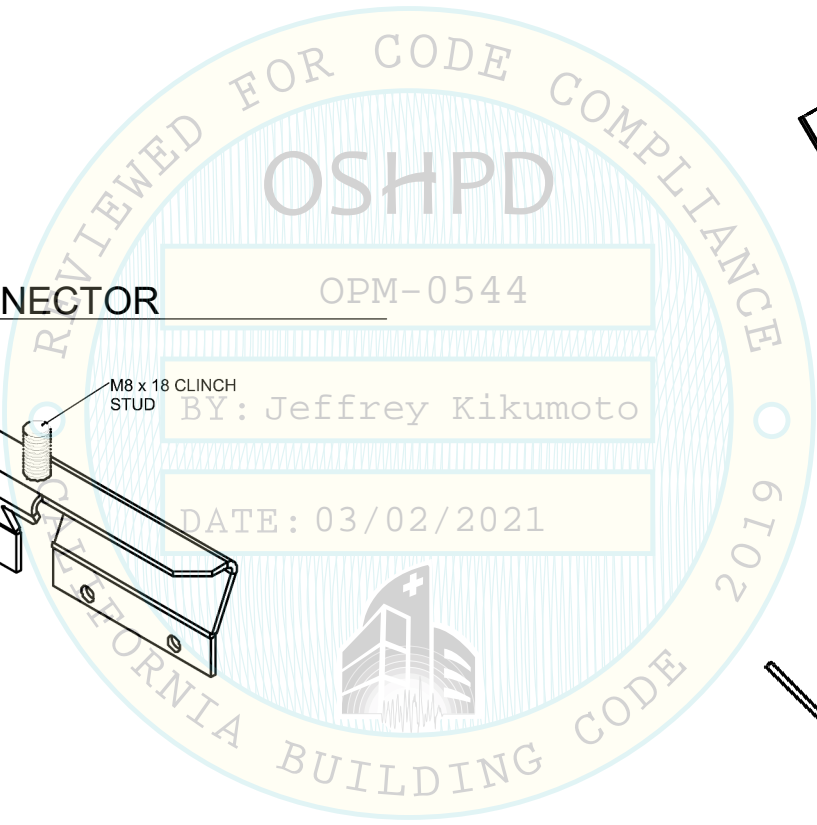


**3 GRIDLOK 10 AND GRIDLOK 10-CT SADDLE CONNECTOR**  
N.T.S.



**1 GRIDLOK 10-P SADDLE CONNECTOR**  
NTS

**2 GRIDLOK FLY-PLATE CONNECTOR**  
N.T.S.

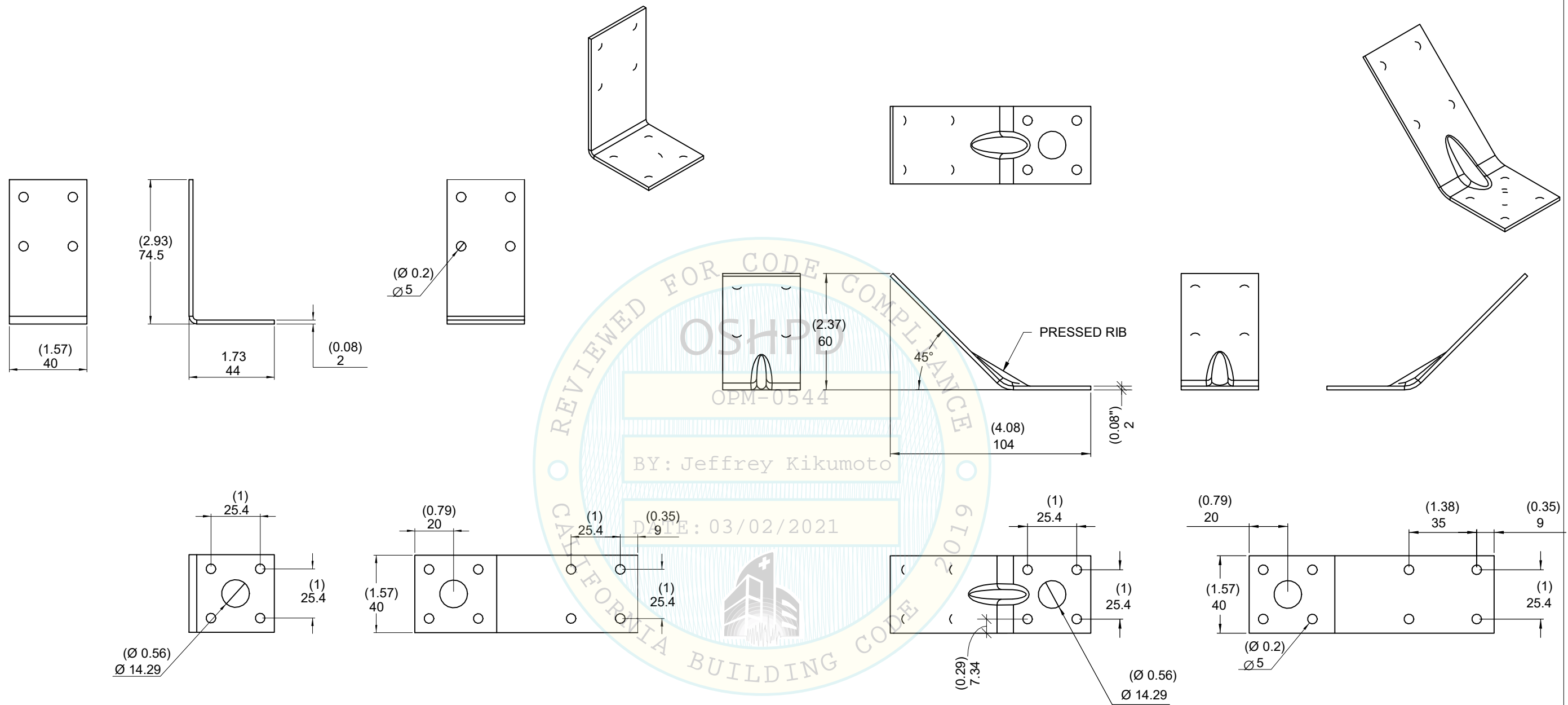


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**1** GRIDLOK TOP STRUT CONNECTOR (BC90) FOR 1/2" Ø BOLTS  
N.T.S.

**2** GRIDLOK TOP BRACE CONNECTOR (BC45) FOR 1/2" Ø BOLTS  
N.T.S.



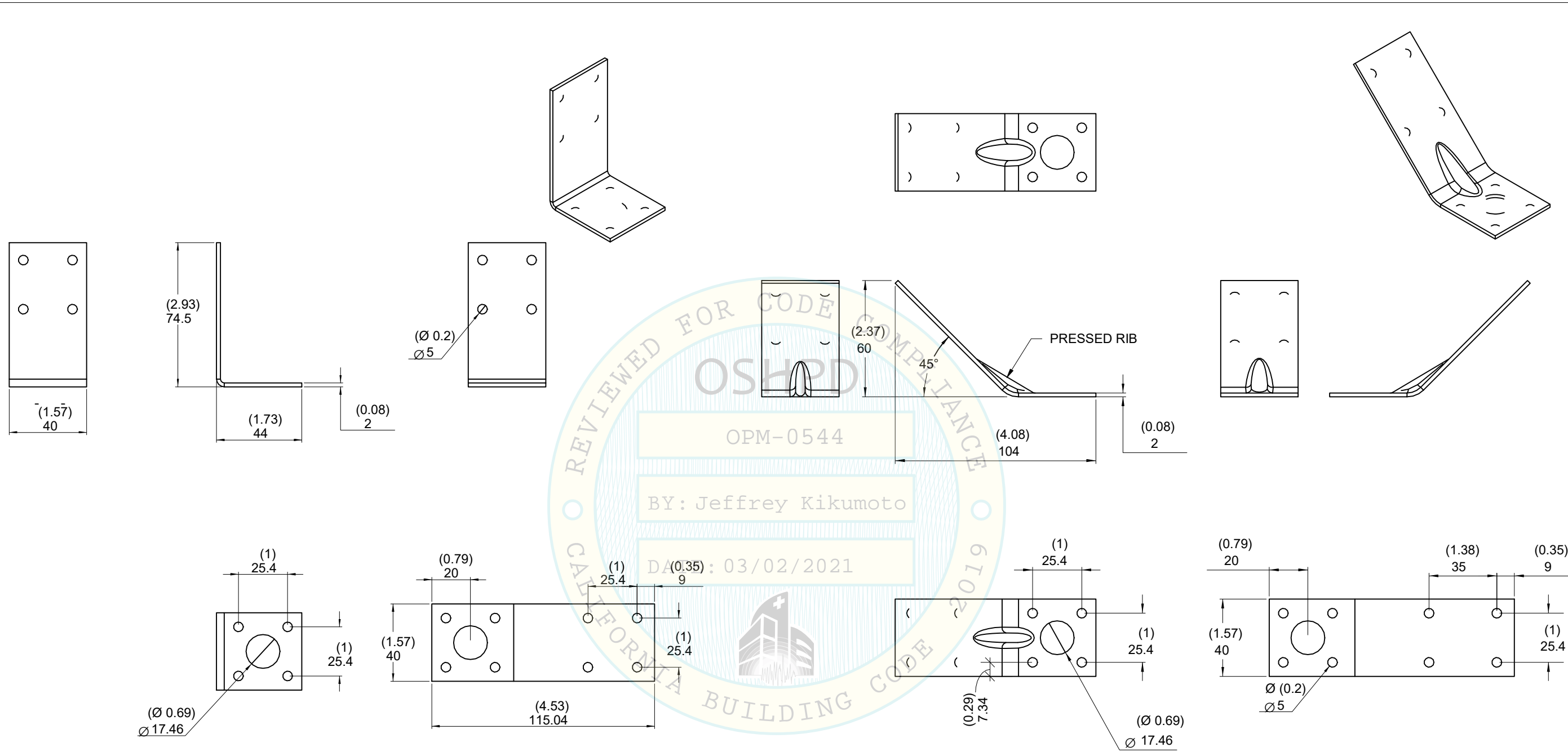
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**1** GRIDLOK TOP STRUT CONNECTOR (BC90) FOR 5/8" Ø BOLTS  
N.T.S.

**2** GRIDLOK TOP BRACE CONNECTOR (BC45) FOR 5/8" Ø BOLTS  
N.T.S.

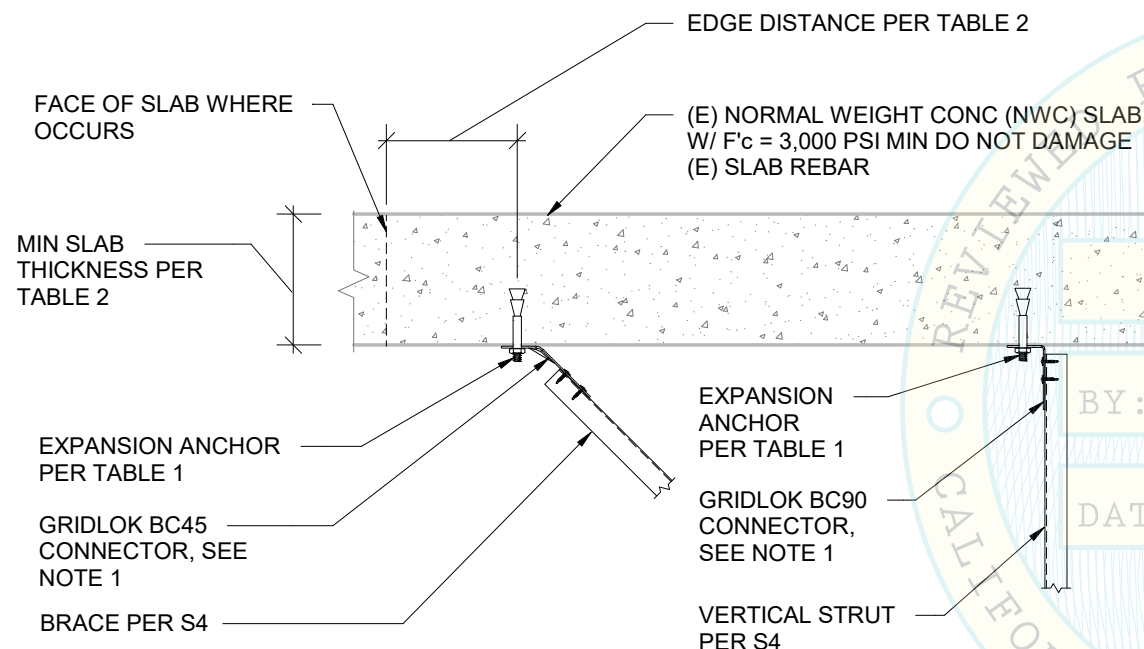


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**NOTES:**

1. AT CONTRACTOR'S OPTION, BC45 AND BC90 GRIDLOK CONNECTORS MAY BE REPLACED WITH CLIPS SHOWN IN DETAIL 1/S16.
2. SEE TABLE 2 FOR EXPANSION ANCHOR CONCRETE SLAB INSTALLATION CRITERIA.

GRIDLOCK SPACING \ ANCHOR Ø	1/2" W/ 2" EMBED	1/2" W/ 3.25" EMBED	5/8" W/ 4" EMBED
12'-0"x12'-0"	1.15	1.38	1.38
12'-0"x8'-0"	1.73	2.00	2.00
8'-0"x8'-0"	2.50	2.50	2.50

TABLE 1 NOTES:  
1. GRIDLOK SPACING AS CHOSEN PER SHEET S3.

NOMINAL ANCHOR DIAMETER (IN)	1/2"	1/2"	5/8"
EFFECTIVE MIN EMBEDMENT (IN)	2	3 1/4	4
MIN MEMBER THICKNESS NWC SLAB OR BEAM ONLY (IN)	4.5	6	7 1/4
MIN ANCHOR SPACING (IN)	6 3/4	9 3/4	12
MIN EDGE DISTANCE (IN)	6	7 1/2	8 3/4

**1 CONNECTION TO CONCRETE SLAB**  
N.T.S.

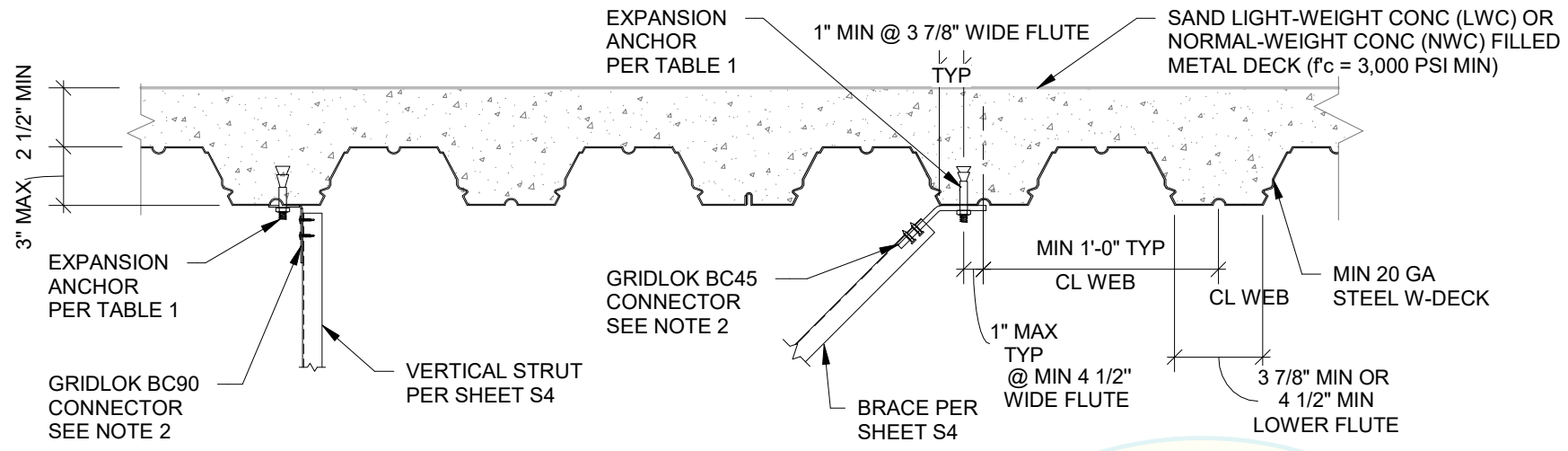


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**TABLE 1: MAXIMUM  $S_{ps}$  VALUES PER EXPANSION ANCHOR DIAMETER AND GRIDLOK SPACING (OPTION 1)**

GRIDLOCK SPACING	ANCHOR Ø	1/2" W/ 2" EMBED	1/2" W/ 3.25" EMBED	5/8" W/ 4" EMBED
12'-0"x12'-0"		0.75	1.33	1.38
12'-0"x8'-0"		1.12	1.99	2.00
8'-0"x8'-0"		1.68	2.50	2.50

**TABLE 2: MAXIMUM  $S_{ps}$  VALUES PER EXPANSION ANCHOR DIAMETER AND GRIDLOK SPACING (OPTION 2)**

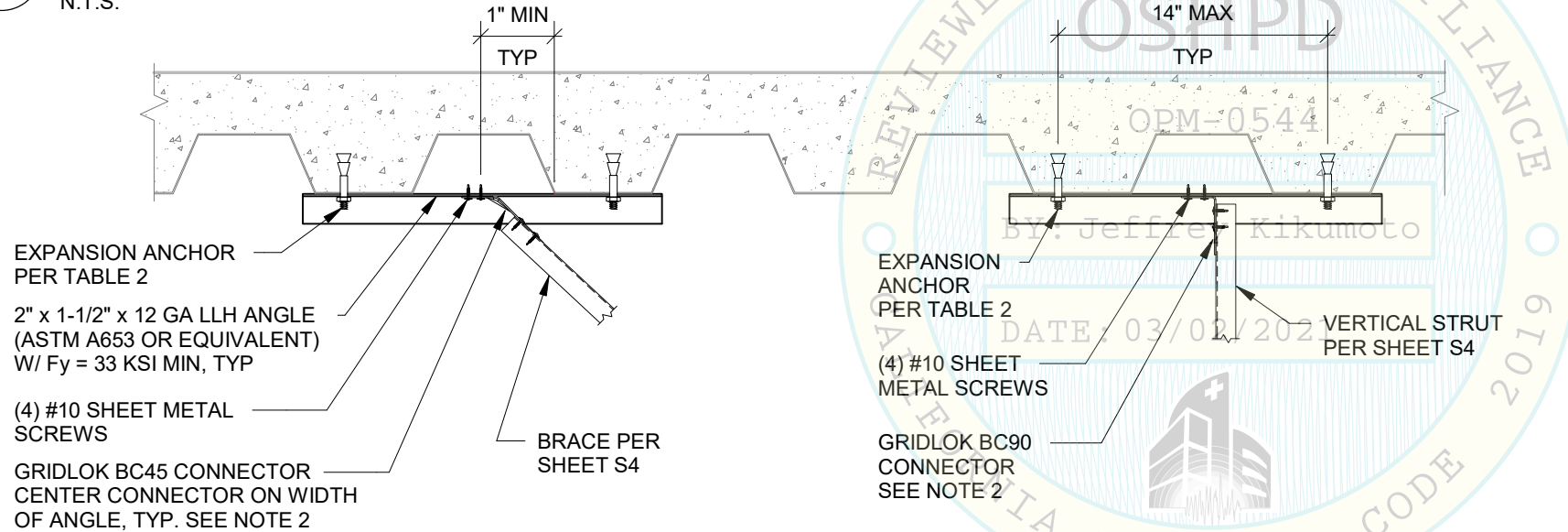
GRIDLOCK SPACING	ANCHOR Ø	1/2" W/ 2" EMBED	1/2" W/ 3.25" EMBED	5/8" W/ 4" EMBED
12'-0"x12'-0"		1.38	1.38	1.38
12'-0"x8'-0"		2.00	2.00	2.00
8'-0"x8'-0"		2.50	2.50	2.50

TABLE 1 AND 2 NOTES:  
 1. GRIDLOCK SPACING AS CHOSEN PER SHEET S3.  
 2. EFFECTIVE MIN EMBEDMENT ( $h_{ef}$ ) PER TABLE 3.

**TABLE 3: EXPANSION ANCHOR W3 DECK INSTALLATION CRITERIA**

NOMINAL ANCHOR DIAMETER (IN)	1/2"	1/2"	5/8"
EFFECTIVE MIN EMBEDMENT (IN)	2	3 1/4	4
MIN ANCHOR SPACING (IN)	6 3/4	9 3/4	12

**2 CONNECTION AT W3 DECK LOWER FLUTE (OPTION 1)**  
 N.T.S.



EXPANSION ANCHOR PER TABLE 2  
 2" x 1-1/2" x 12 GA LLH ANGLE (ASTM A653 OR EQUIVALENT) W/  $F_y = 33$  KSI MIN, TYP  
 (4) #10 SHEET METAL SCREWS  
 GRIDLOK BC45 CONNECTOR CENTER CONNECTOR ON WIDTH OF ANGLE, TYP. SEE NOTE 2  
 BRACE PER SHEET S4

EXPANSION ANCHOR PER TABLE 2  
 (4) #10 SHEET METAL SCREWS  
 GRIDLOK BC90 CONNECTOR SEE NOTE 2  
 VERTICAL STRUT PER SHEET S4

- NOTES:**  
 1. SEE GENERAL NOTES FOR ANCHOR REQUIREMENTS.  
 2. AT CONTRACTOR'S OPTION, BC45 AND BC90 GRIDLOK CONNECTORS MAY BE REPLACED WITH CLIPS SHOWN IN DETAIL 1/S16.  
 3. SEE DETAIL 2 FOR REMAINING INFORMATION NOT SHOWN ON DETAIL 1.  
 4. SEE TABLE 3 FOR EXPANSION ANCHOR W3 DECK INSTALLATION CRITERIA

**1 CONNECTION BETWEEN W3 DECK LOWER FLUTES (OPTION 2)**  
 N.T.S.

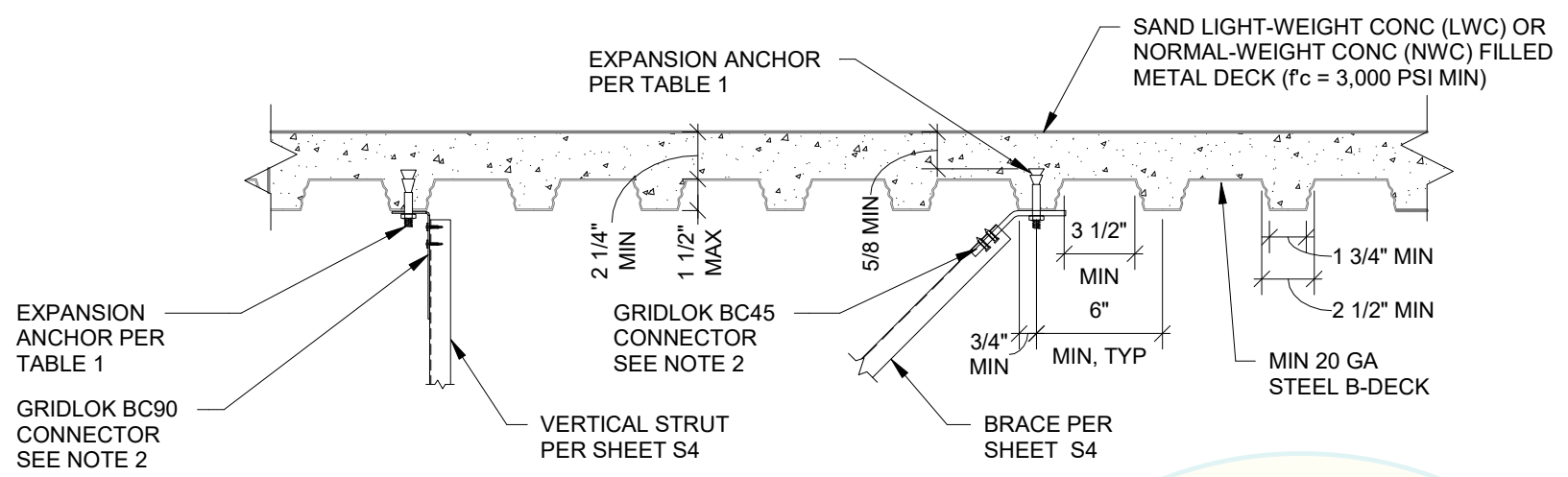


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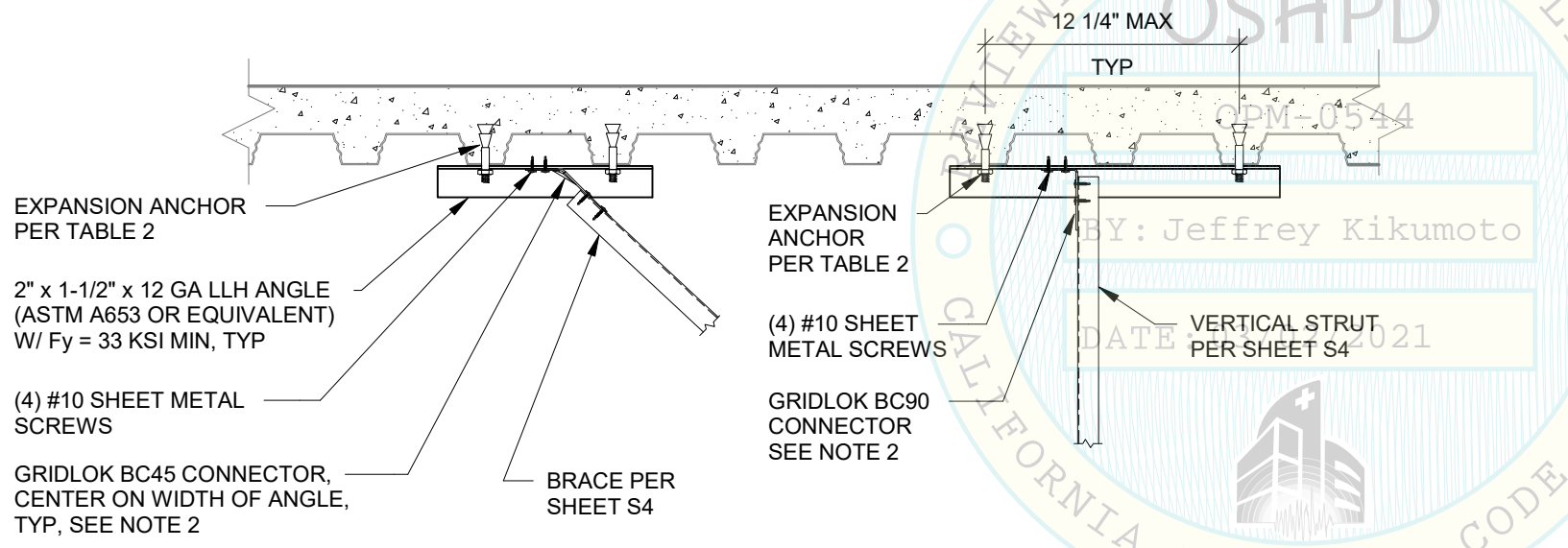
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**2 CONNECTION AT B DECK LOWER FLUTE (OPTION 1)**  
N.T.S.



- NOTES:**
- SEE GENERAL NOTES FOR ANCHOR REQUIREMENTS.
  - AT CONTRACTOR'S OPTION, BC45 AND BC90 GRIDLOK CONNECTORS MAY BE REPLACED WITH CLIPS SHOWN IN DETAIL 1/S16.
  - SEE DETAIL 2 FOR REMAINING INFORMATION NOT SHOWN ON DETAIL 1.
  - SEE TABLE 3 FOR EXPANSION ANCHOR B DECK INSTALLATION CRITERIA

**1 CONNECTION BETWEEN B DECK LOWER FLUTES (OPTION 2)**  
N.T.S.

**TABLE 1: MAXIMUM  $S_{DS}$  VALUES PER EXPANSION ANCHOR DIAMETER AND GRIDLOK SPACING (OPTION 1)**

GRIDLOCK SPACING	ANCHOR Ø	1/2" W/ 2" EMBED	1/2" W/ 3.25" EMBED	5/8" W/ 4" EMBED
12'-0"x12'-0"		0.68	N/A	N/A
12'-0"x8'-0"		1.01	N/A	N/A
8'-0"x8'-0"		1.52	N/A	N/A

**TABLE 2: MAXIMUM  $S_{DS}$  VALUES PER EXPANSION ANCHOR DIAMETER AND GRIDLOK SPACING (OPTION 2)**

GRIDLOCK SPACING	ANCHOR Ø	1/2" W/ 2" EMBED	1/2" W/ 3.25" EMBED	5/8" W/ 4" EMBED
12'-0"x12'-0"		1.38	N/A	N/A
12'-0"x8'-0"		2.00	N/A	N/A
8'-0"x8'-0"		2.50	N/A	N/A

- TABLE 1 AND 2 NOTES:**
- 'N/A' INDICATES THAT ANCHOR CANNOT BE USED AT THIS CONDITION.
  - GRIDLOK SPACING AS CHOSEN PER SHEET S3.
  - EFFECTIVE MIN EMBEDMENT ( $h_{ef}$ ) PER TABLE 3.

**TABLE 3: EXPANSION ANCHOR B DECK INSTALLATION CRITERIA**

NOMINAL ANCHOR DIAMETER (IN)	1/2"
EFFECTIVE MIN EMBEDMENT (IN)	2
MIN ANCHOR SPACING (IN)	6 3/4



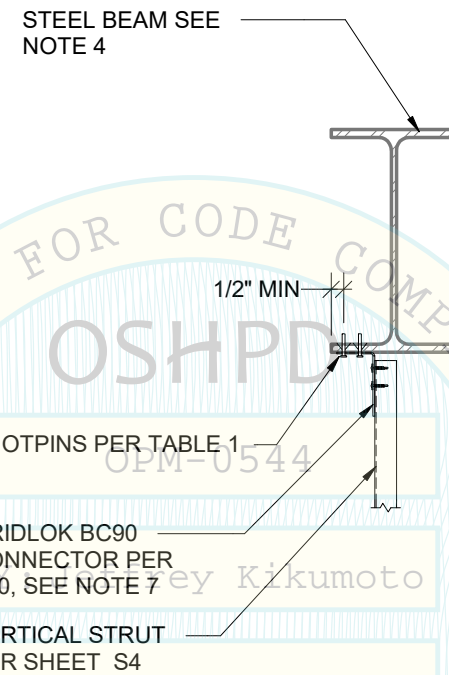
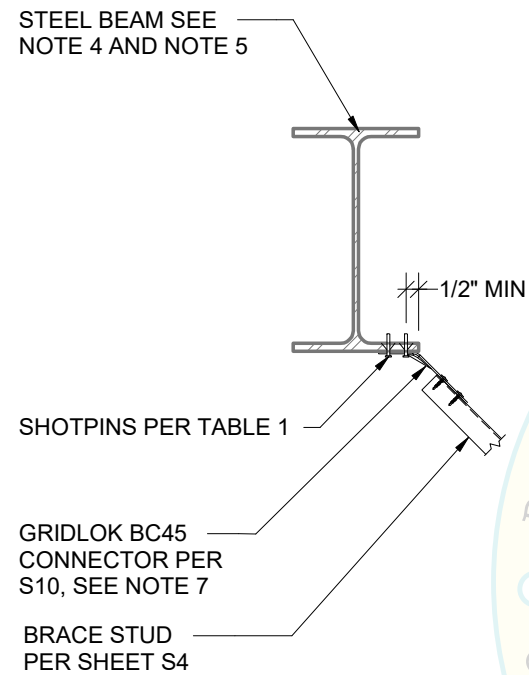
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GRIDLOK SPACING	NUMBER OF SHOTPINS	
	2 (SEE NOTE 1)	4
12'-0"x12'-0"	0.83	1.38
12'-0"x8'-0"	1.24	2.00
8'-0"x8'-0"	1.86	2.50

TABLE 1 NOTES:  
 1. SHOTPINS INSTALLED IN STAGGERED HOLES ON DIAGONAL.  
 2. GRIDLOK SPACING AS CHOSEN PER SHEET S3.

**NOTES:**

1. BEAM FLANGE THICKNESS SHALL NOT BE LESS THAN 3/16" OR MORE THAN 3/8"
2. FRAMING MEMBERS SHALL BE DESIGNED TO CARRY CEILING LOADS, RDP TO VERIFY.
3. RDP IN RESPONSIBLE CHARGE, I.O.R. AND CONTRACTOR SHALL VERIFY THAT NO PAF IS INSTALLED IN THE PROTECTED ZONE OF ANY STEEL MEMBER, SEE ANSI /AISC 341-10.
4. MINIMUM  $F_y = 36$  KSI FOR STEEL BEAM
5. RDP IN RESPONSIBLE CHARGE TO CONFIRM THAT STRUCTURAL STEEL BEAM IS SUFFICIENT TO DEVELOP THE LOAD WHERE THE BRACE IS PERPENDICULAR TO THE BEAM.
6. FOR PAF INSTALLED IN STEEL, THE FASTENER PENETRATION SHALL HAVE THE ENTIRE POINTED END OF THE FASTENER DRIVEN THROUGH THE STEEL MEMBER, EXCEPT AS NOTED IN CURRENT REPORTS FROM TESTING AGENCIES ACCEPTABLE TO OSHPD.
7. AT CONTRACTOR'S OPTION, GRIDLOK CONNECTOR MAY BE REPLACED WITH CLIP SHOWN IN DETAIL 1/S16

**1 CONNECTION TO STRUCTURAL STEEL**

1 1/2" = 1'-0"

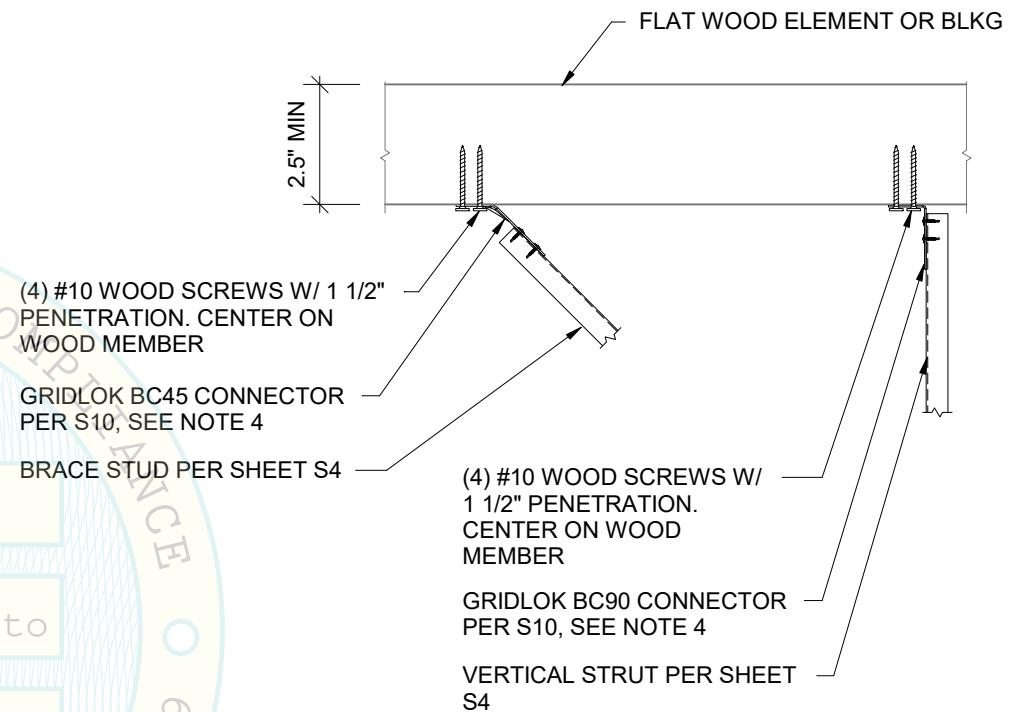
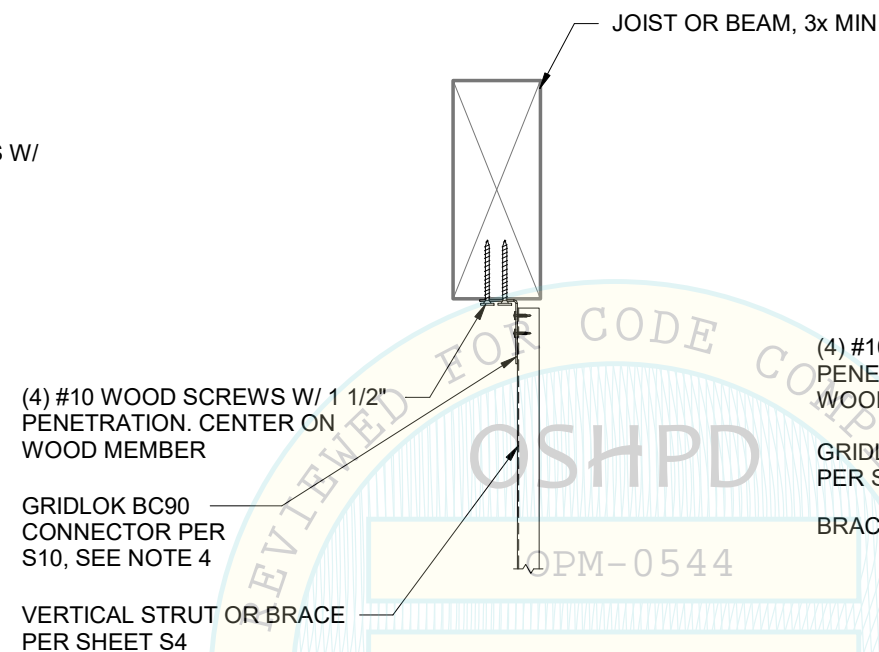
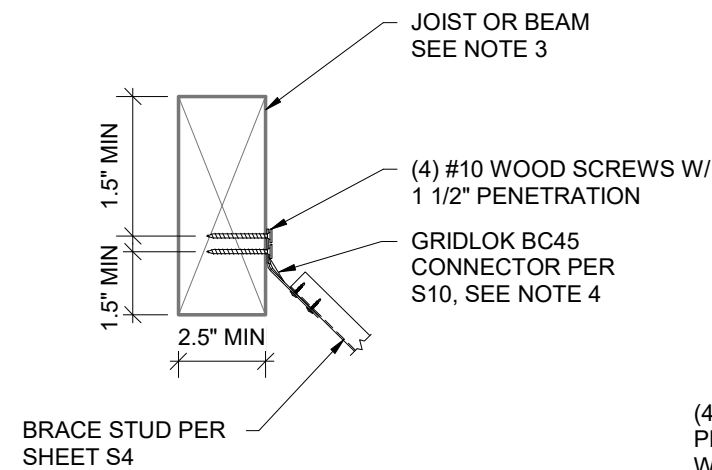


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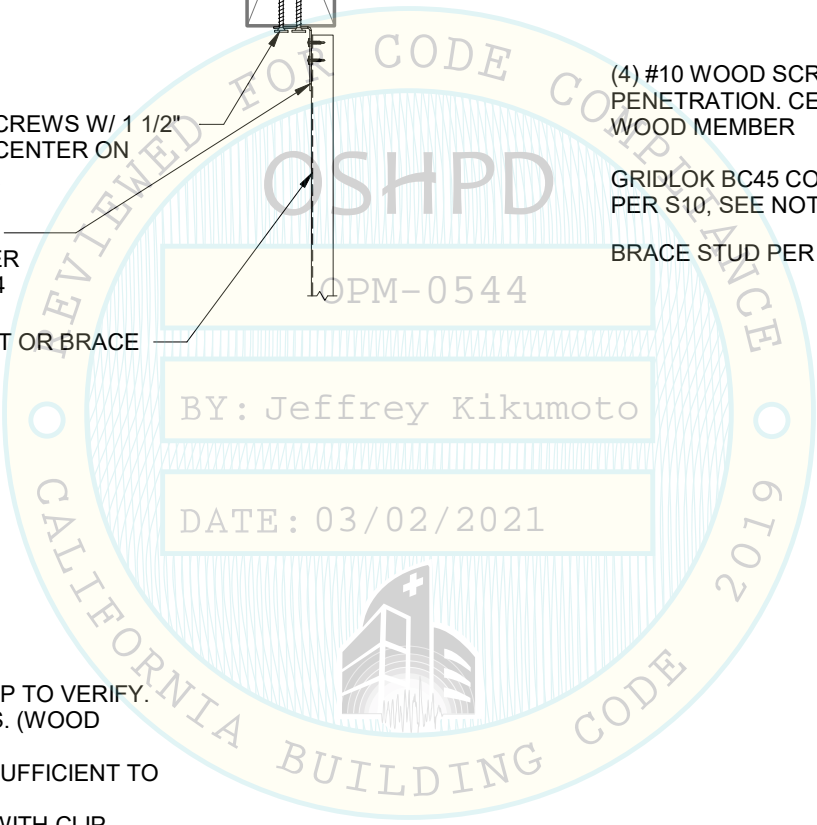
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**NOTES:**

1. FRAMING MEMBERS SHALL BE DESIGNED TO CARRY CEILING LOADS, RDP TO VERIFY.
2. SCREWS SHOWN ARE BASED ON DOUGLAS FIR LARCH WOOD MEMBERS. (WOOD SCREWS TO BE IN CONFORMANCE W/ B18.6.1)
3. RDP IN RESPONSIBLE CHARGE TO CONFIRM THAT THE WOOD BEAM IS SUFFICIENT TO CARRY THE LOAD FROM THE BRACE.
4. AT CONTRACTOR'S OPTION, GRIDLOK CONNECTOR MAY BE REPLACED WITH CLIP SHOWN IN DETAIL 1/S16



**1 CONNECTION TO SAWN TIMBER**

1 1/2" = 1'-0"

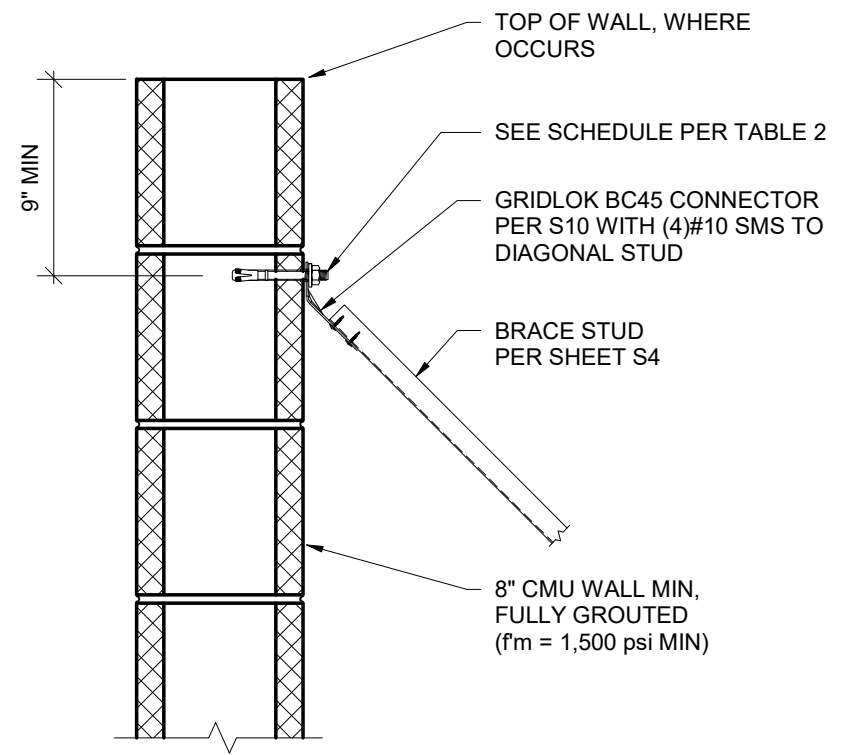
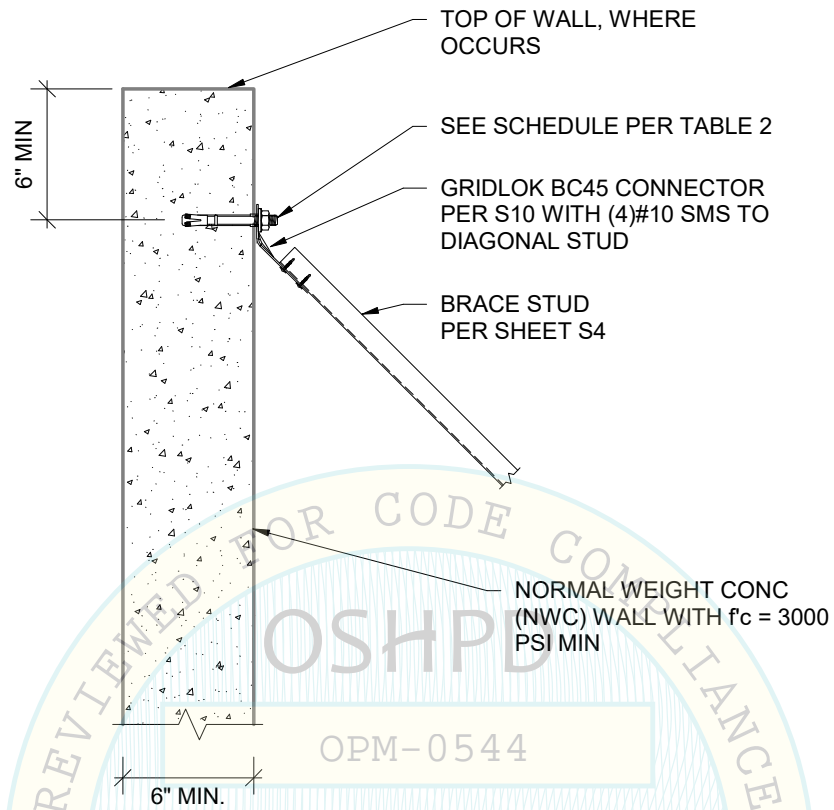
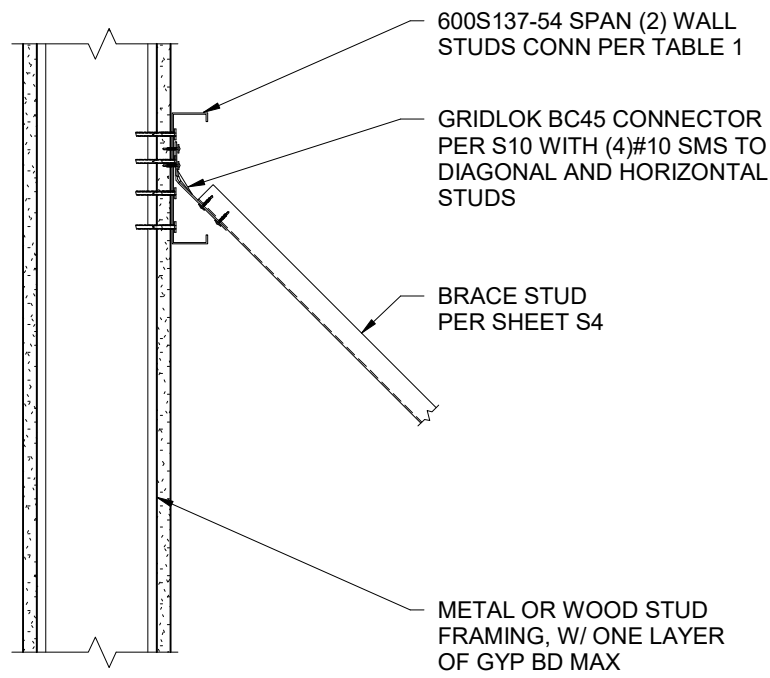


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**1 CONNECTION TO METAL/ WOOD STUD WALL**  
N.T.S.

**2 CONNECTION TO CONCRETE WALL**  
N.T.S.

**3 CONNECTION TO CMU WALL**  
N.T.S.

**TABLE 1: SCREW SCHEDULE**

WALL STUD/ GAUGE	CONN TO EACH WALL STUD
20 GA (33 ksi)	(5) #10x1 1/4" SMS
18 GA (33 ksi)	(4) #10x1 1/4" SMS
2x STUDS	(4) #10 WOOD SCREWS W/ 1 1/2" PENETRATION

**TABLE 2: ANCHOR SCHEDULE**

WALL TYPE	ANCHOR TYPE	DIAMETER (IN)	EFFECTIVE MIN EMBEDMENT (IN)
CONCRETE	KB-TZ	1/2	3 1/4
CMU	KB1	1/2	3 1/4

**TABLE NOTES:**  
 1. HILTI KB1 MASONRY ANCHOR MUST BE INSTALLED IN THE FACE OF CMU SHELLS A MINIMUM OF 1-3/8" FROM ANY VERTICAL MORTAR JOINT & LIMITED TO ONE ANCHOR PER CELL.  
 2. OVERSTRENGTH FACTOR AS REQUIRED FOR ANCHORAGE TO CONCRETE

**NOTES:**  
 1. RDP SHALL DESIGN OR VERIFY WALLS FOR THE CEILING LOADS



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AT CONTRACTOR'S OPTION THE BC45 CONNECTOR CLIP MAY BE REPLACED BY A 2" x 3" x 2" LONG x 12 GA BENT CLIP ASTM A653 SS GRADE 50. CONNECT TO BRACE WITH (4) #10 SMS WITH MAX 0.2" DIAMETER HOLE, MIN SPACING OF 1" AND MIN EDGE DISTANCE OF 1/2".

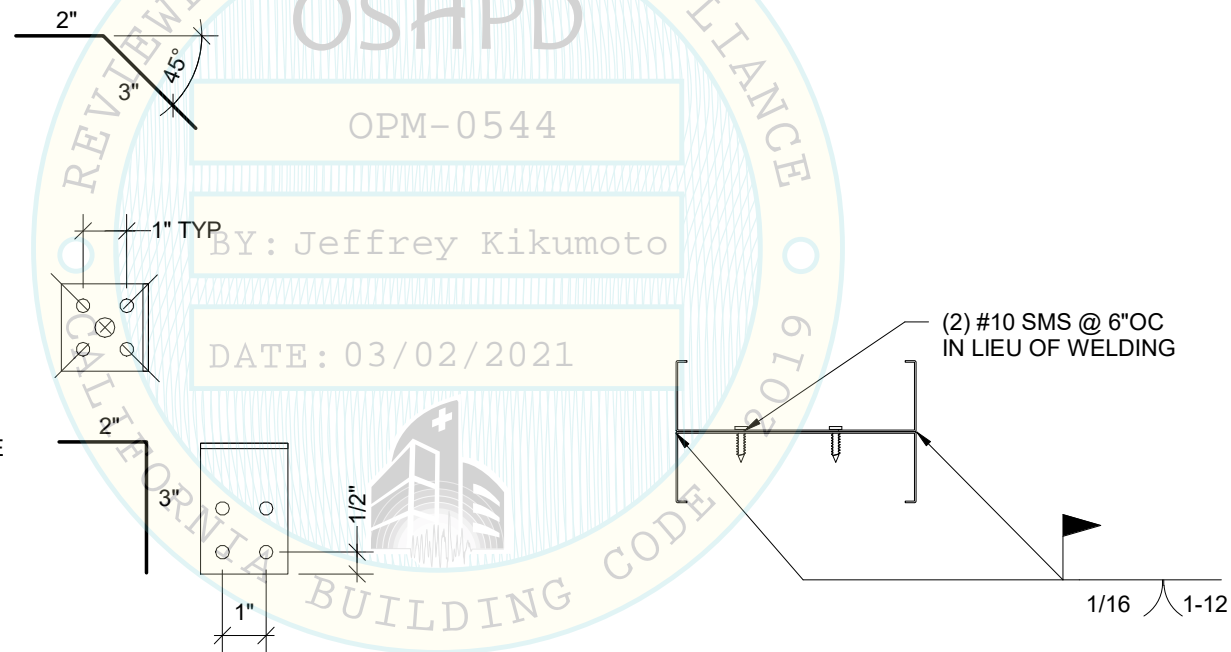
WHERE DETAIL SHOWS AN EXPANSION ANCHOR CONNECTION TO THE SLAB, PROVIDE STANDARD HOLE DIAMETER CENTERED IN THE BENT CLIP LEG. WHERE CONNECTION TO THE STRUCTURE IS MADE WITH SCREWS, OR SHOT-PINS TO STEEL, USE THE SAME NUMBER OF CONNECTORS AND LAYOUT/SPACING AS SHOWN IN THE DETAIL. BENT PL SIMILAR AS IN BELOW EXCEPT BENT AT 45°.

**GRIDLOK BC45 ALTERNATIVE**

AT CONTRACTOR'S OPTION THE BC45 CONNECTOR CLIP MAY BE REPLACED BY A 2" x 3" x 2" LONG x 12 GA BENT CLIP (LLV) ASTM A653 SS GRADE 50. CONNECT TO VERTICAL STRUT WITH (4) #10 SMS WITH MAX 0.2" DIAMETER HOLES, MIN SPACING OF 1" AND MIN EDGE DISTANCE OF 1/2".

WHERE DETAIL SHOWS AN EXPANSION ANCHOR CONNECTION TO THE SLAB, PROVIDE STANDARD HOLE DIAMETER CENTERED IN THE BENT CLIP LEG. WHERE CONNECTION TO THE STRUCTURE IS MADE WITH SCREWS, OR SHOT-PINS TO STEEL, USE THE SAME NUMBER OF CONNECTORS AND LAYOUT/SPACING AS SHOWN IN THE DETAIL.

**GRIDLOK BC90 ALTERNATIVE**



**1 ALTERNATIVE CLIPS FOR CONNECTION TO STRUCTURE**  
NTS

**2 BACK-TO-BACK BRACE SECTION**  
3" = 1'-0"



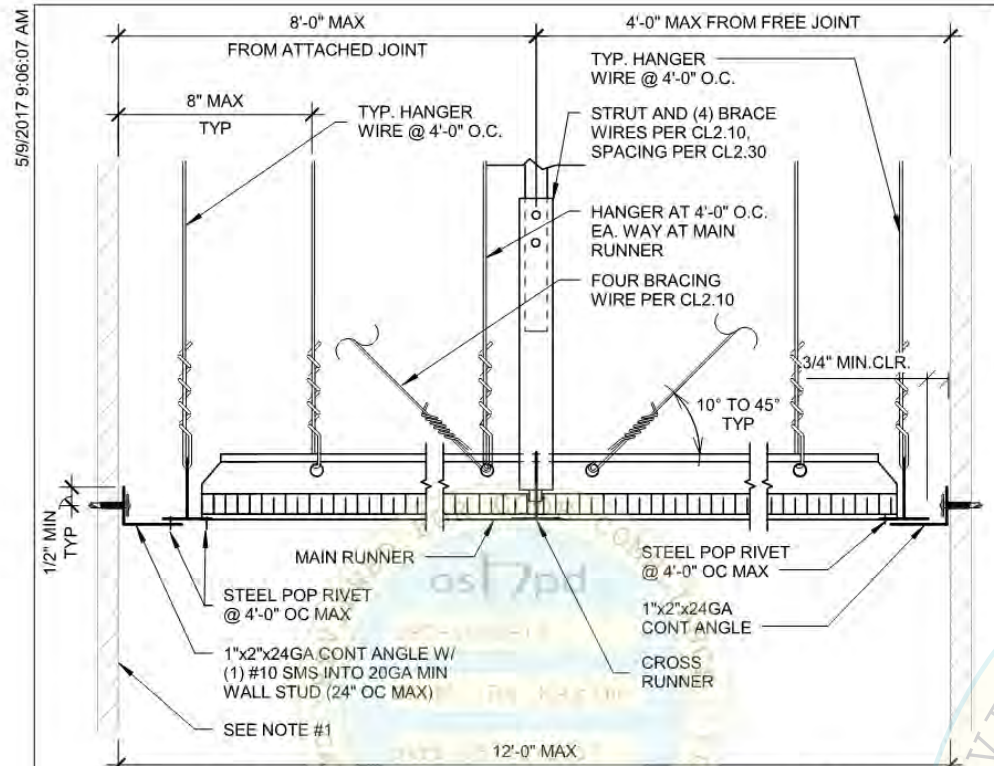
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**ATTACHED JOINT**                      **EXPANSION JOINT**

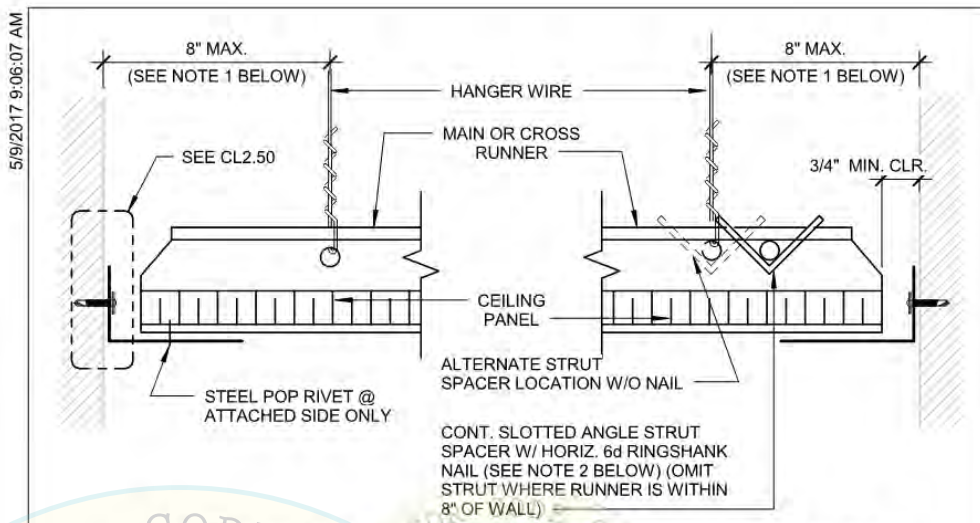
**ACCEPTABLE EXITWAY DETAILS**

- NOTES:**  
 1. PERIMETER WALLS SHALL BE DESIGNED TO CARRY TRIBUTARY LATERAL FORCES PER TABLE BELOW. RDP TO VERIFY. RDP TO SPECIFY CONNECTION OF BACKING TO STUDS

S <sub>DS</sub>	F <sub>p</sub>
S <sub>DS</sub> ≤ 1.15	9.3 plf
1.15 < S <sub>DS</sub> ≤ 1.73	14.0 plf
1.73 < S <sub>DS</sub> ≤ 2.50	20.9 plf

2. SEISMIC BRACING WIRES AND STRUTS IN ACCORDANCE WITH PAGES CL2.20, CL2.21, AND CL2.22 SHALL BE PERMITTED IN LIEU OF DESIGNING PERIMETER WALLS FOR SEISMIC FORCES AND BRACING SYSTEM SHOWN ON PAGE CL2.30 AND THIS PAGE.  
 3. STEEL POP RIVETS SHALL HAVE MINIMUM ALLOWABLE SHEAR STRENGTH OF 120# AND ULTIMATE SHEAR STRENGTH OF 300#.

Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No:
Sheet Title: TYPICAL CEILING SECTION AT EXITWAY CORRIDORS	<b>CL2.50</b>

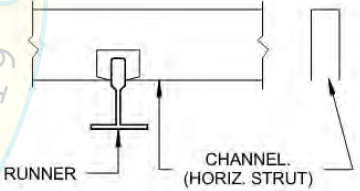


**ATTACHED JOINT**                      **FREE JOINT**

- PROVIDE #12 GAGE HANGER WIRES AT THE ENDS OF ALL MAIN AND CROSS RUNNERS WITHIN EIGHT (8) INCHES OF THE SUPPORT OR WITHIN ONE-FOURTH (1/4) OF THE LENGTH OF THE END TEE, WHICHEVER IS LESS, FOR THE PERIMETER OF THE CEILING AREA. PERIMETER WIRES ARE NOT REQUIRED WHEN THE LENGTH OF THE END TEE IS EIGHT (8) INCHES OR LESS.
- NAILS AT ENDS OF HORIZONTAL STRUTS ARE TO BE PLACED WITH NAIL HEAD TOWARD CENTER LINE OF SPAN OF STRUT.
- SPACERS MAY BE SLOTTED APPROVED ANGLES OR CHANNELS WITH "DIAMOND POINTS" OF SPRING STEEL WHICH SNAP TIGHT TO PREVENT MOVEMENT OF STRUT.
- STEEL POP RIVETS SHALL HAVE MINIMUM ALLOWABLE SHEAR STRENGTH OF 120# AND ULTIMATE SHEAR STRENGTH OF 300#.

BY: Jeffrey Kikumoto

DATE: 03/02/2021



**APPROVED SPACER**

Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No:
Sheet Title: CEILING PERIMETER INCLUDING NON-EXITWAY CORRIDORS	<b>CL2.60</b>

**SHEET NOTES:**  
 1. NOTES AND DETAIL CALLOUTS IN SPECIFIC DETAILS TAKE PRECEDENCE OVER THE "OPD" DETAILS CALLED OUT ON THIS SHEET.

1 **TYPICAL CEILING SECTION AT EXITWAY CORRIDORS**

2 **CEILING PERIMETER INCLUDING NON-EXITWAY CORRIDORS**



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12. EXPANSION JOINTS, SEISMIC SEPARATIONS, AND PENETRATIONS:

- a. EXPANSION JOINTS SHALL BE PROVIDED IN THE CEILING AT INTERSECTIONS OF CORRIDORS AND AT JUNCTIONS OF CORRIDORS WITH LOBBIES OR OTHER SIMILAR AREAS.
- b. FOR CEILING AREAS EXCEEDING 2500 SQUARE FEET, A SEISMIC SEPARATION JOINT SHALL BE PROVIDED TO DIVIDE THE CEILING INTO AREAS NOT EXCEEDING 2500 SQ. FT.
- c. PENETRATIONS THROUGH THE CEILING FOR SPRINKLER HEADS AND OTHER SIMILAR DEVICES THAT ARE NOT INTEGRALLY TIED TO THE CEILING SYSTEM IN THE LATERAL DIRECTION SHALL HAVE A TWO (2) INCH OVERSIZED RING, SLEEVE OR ADAPTER THROUGH THE CEILING TILE TO ALLOW FREE MOVEMENT OF ONE (1) INCH IN ALL HORIZONTAL DIRECTIONS. A FLEXIBLE SPRINKLER HOSE FITTING THAT CAN ACCOMMODATE ONE (1) INCH OF CEILING MOVEMENT SHALL BE PERMITTED TO BE USED IN LIEU OF THE OVERSIZED RING, SLEEVE OR ADAPTER. SUCH FLEXIBLE SPRINKLER HOSE SHALL BE ADEQUATELY SUPPORTED FROM SOFFIT SO AS NOT TO EXCEED THE MAXIMUM TRIBUTARY WEIGHT OF THE CEILING.

13. LATERAL FORCE BRACING:

LATERAL FORCE BRACING IS REQUIRED IN ACCORDANCE WITH THIS SECTION FOR ALL CEILING AREAS, UON.  
 EXCEPTION: LATERAL FORCE BRACING MAY BE OMITTED FOR SUSPENDED ACOUSTICAL CEILING SYSTEMS WITH A CEILING AREA OF 144 SQ. FT. OR LESS, WHEN PERIMETER SUPPORT IN ACCORDANCE WITH ASTM E580 ARE PROVIDED AND PERIMETER WALLS ARE DESIGNED TO CARRY THE CEILING LATERAL FORCES.

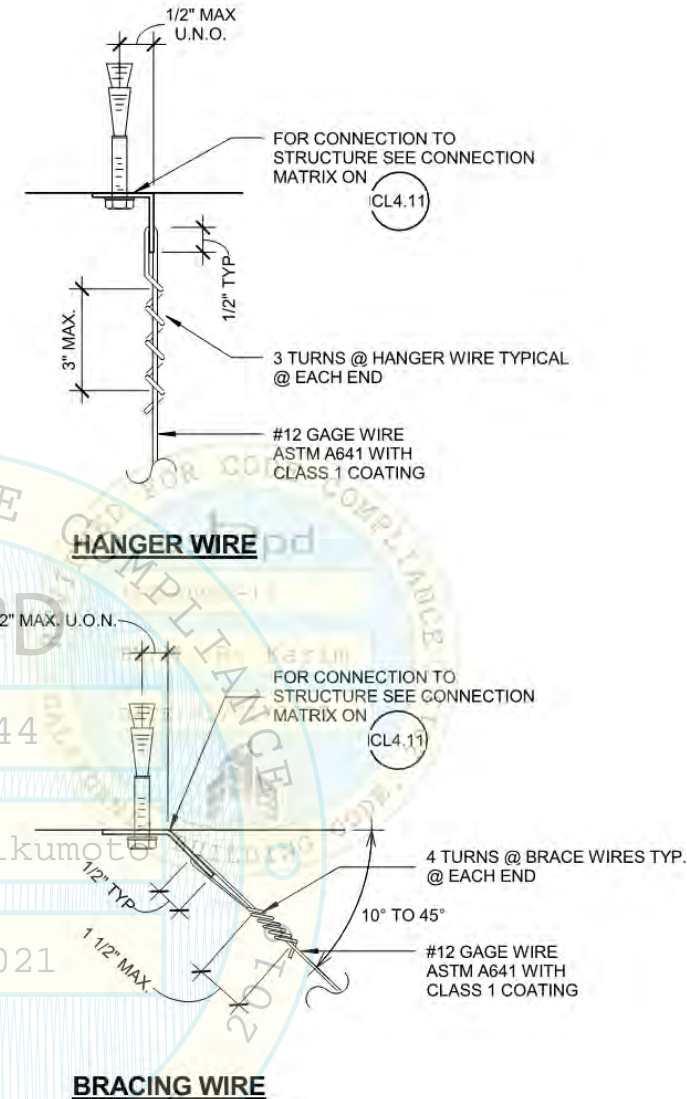
- a. PROVIDE LATERAL-FORCE BRACING ASSEMBLIES CONSISTING OF A STRUT AND FOUR (4) #12 GAGE BRACING WIRES ORIENTED 90 DEGREES FROM EACH OTHER.
- b. LATERAL-FORCE BRACING ASSEMBLIES SHALL BE SPACED IN ACCORDANCE WITH CL2.20 THROUGH CL2.22 AND CL2.30 FROM EACH WALL AND AT THE EDGES OF ANY CHANGE OF ELEVATION OF THE CEILING.
- c. THE SLOPE OF BRACING WIRES MAY BE FROM 10 TO 45 DEGREES BUT MAY NOT EXCEED 45 DEGREES FROM THE PLANE OF THE CEILING AND WIRES SHALL BE TAUT.
- d. STRUTS SHALL BE ADEQUATE TO RESIST THE VERTICAL COMPONENT INDUCED BY THE BRACING WIRES, AND SHALL NOT BE MORE THAN 1 (HORIZONTAL) IN 6 (VERTICAL) OUT OF PLUMB.

14. ATTACHMENT OF HANGER AND BRACING WIRES:

- a. FASTEN #12 HANGER WIRES WITH NOT LESS THAN THREE (3) TIGHT TURNS IN 3 INCHES. HANGER WIRE LOOPS SHALL BE TIGHTLY WRAPPED AND SHARPLY BENT TO PREVENT ANY VERTICAL MOVEMENT OR ROTATION OF THE MEMBER WITHIN THE LOOPS.
- b. FASTEN #12 BRACING WIRES WITH FOUR (4) TIGHT TURNS. MAKE ALL TIGHT TURNS WITHIN A DISTANCE OF 1 1/2" INCHES.
- c. HANGER OR BRACING WIRE ANCHORED TO THE STRUCTURE SHOULD BE INSTALLED IN SUCH A MANNER THAT THE DIRECTION OF THE ANCHOR ALIGNS AS CLOSELY AS POSSIBLE WITH THE DIRECTION OF THE WIRE.
- d. SEPARATE ALL CEILING HANGER AND BRACING WIRES AT LEAST SIX (6) INCHES FROM ALL UNBRACED DUCTS, PIPES CONDUITS, ETC.
- e. HANGER WIRES SHALL NOT BE ATTACHED TO OR BEND AROUND INTERFERING MATERIAL OR EQUIPMENT. PROVIDE TRAPEZE OR OTHER SUPPLEMENTARY SUPPORT MEMBERS AT OBSTRUCTIONS TO TYPICAL HANGER SPACING. PROVIDE ADDITIONAL HANGERS, STRUTS OR BRACES AS REQUIRED AT ALL CEILING BREAKS, SOFFITS, OR DISCONTINUOUS AREAS.
- f. HANGER WIRES THAT ARE MORE THAN 1 (HORIZONTAL) IN 6 (VERTICAL) OUT OF PLUMB SHALL REQUIRE PROJECT SPECIFIC DESIGN.
- g. WHEN DRILLED-IN CONCRETE ANCHORS OR PAF ARE USED IN REINFORCED CONCRETE FOR HANGER WIRES, 1 OUT OF 10 WIRE/ ANCHOR ASSEMBLIES SHALL BE FIELD TESTED FOR 200 LBS. IN TENSION. WHEN DRILLED-IN CONCRETE ANCHORS ARE USED FOR BRACING WIRES, 1 OUT OF 2 WIRE/ANCHOR ASSEMBLIES SHALL BE FIELD TESTED FOR 440 LBS. IN TENSION IN THE DIRECTION OF THE WIRE. PAF IN CONCRETE ARE NOT PERMITTED FOR BRACING WIRES.

Section Title : OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No.:
Sheet Title : GENERAL NOTES - PAGE 3 OF 4	CL0.02

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Section Title : OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No.:
Sheet Title : HANGER AND BRACING WIRE CONNECTION - TYPICAL WIRE TURNS	CL4.10

SHEET NOTES:

- 1. NOTES AND DETAIL CALLOUTS IN SPECIFIC DETAILS TAKE PRECEDENCE OVER THE "OPD" DETAILS CALLED OUT ON THIS SHEET.
- 2. FOR THE SCOPE OF THIS OPM, BRACING WIRES HAVE BEEN REPLACED BY THE GRIDLOK BRACING SYSTEM AND ARE NOT APPLICABLE FOR USE UNDER THIS OPM. GRIDLOK BRACES TO BE INSTALLED AT 45 DEGREES AS INDICATED ON SPECIFIC DETAIL SHEETS.

1 GENERAL NOTES - PAGE 3 OF 4

2 HANGER AND BRACING WIRE CONNECTION - TYPICAL WIRE TURNS



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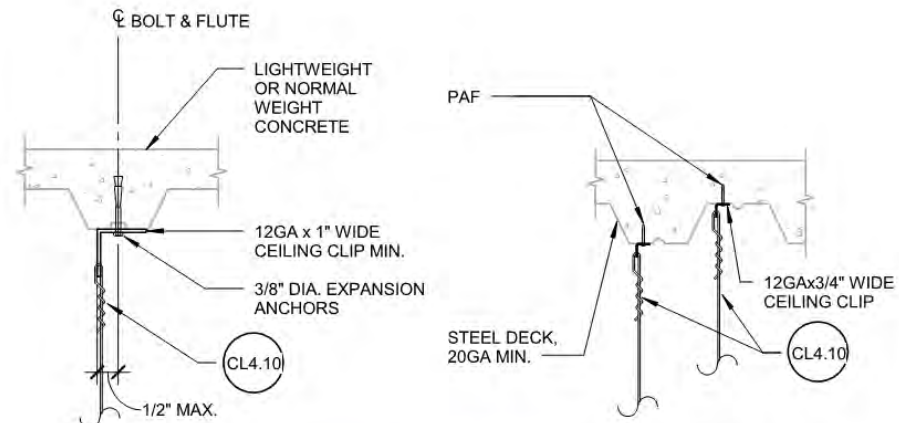
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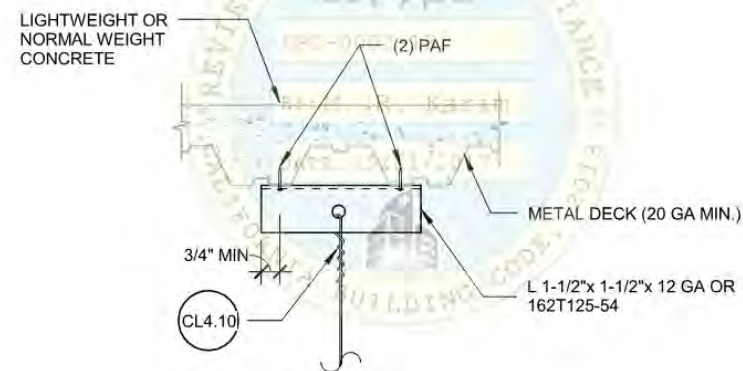


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**OPTION 1**

**OPTION 2**



**OPTION 3**

**NOTES:**

1. LOAD TEST IN ACCORDANCE WITH GENERAL NOTE 14(g), PAGE CL0.02 SHALL BE REQUIRED
2. REFER TO CL4.10 FOR ADDITIONAL DETAILS

Section Title : OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No.
Sheet Title : HANGER WIRE CONNECTION TO CONCRETE OVER METAL DECK	CL4.21

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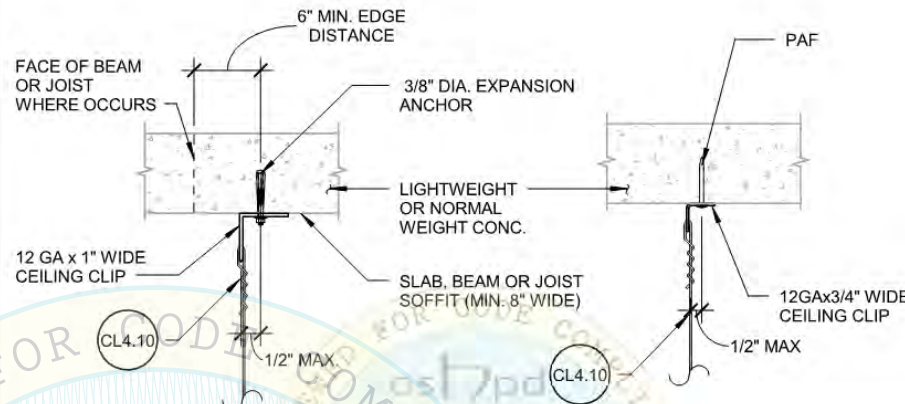
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**HANGER WIRE CONNECTION TO CONCRETE OVER METAL DECK**

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**OPTION 1**

**OPTION 2**

**NOTES:**

1. LOAD TEST IN ACCORDANCE WITH GENERAL NOTE 14(g), PAGE CL0.02 SHALL BE REQUIRED
2. PRIOR TO INSTALLATION, REINFORCING/PRESTRESSING BAR LOCATIONS SHALL BE DETERMINED BY NON-DESTRUCTIVE TESTING
3. REFER TO CL4.10 FOR ADDITIONAL DETAILS

Section Title : OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No.
Sheet Title : HANGER WIRE CONNECTION TO CONCRETE SLAB, BEAM, OR JOIST	CL4.22

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**HANGER WIRE CONNECTION TO CONCRETE SLAB, BEAM, OR JOIST**

**SHEET NOTES:**

1. NOTES AND DETAIL CALLOUTS IN SPECIFIC DETAILS TAKE PRECEDENCE OVER THE "OPD" DETAILS CALLED OUT ON THIS SHEET.
2. FOR THE SCOPE OF THIS OPM, BRACING WIRES HAVE BEEN REPLACED BY THE GRIDLOK BRACING SYSTEM AND ARE NOT APPLICABLE FOR USE UNDER THIS OPM.



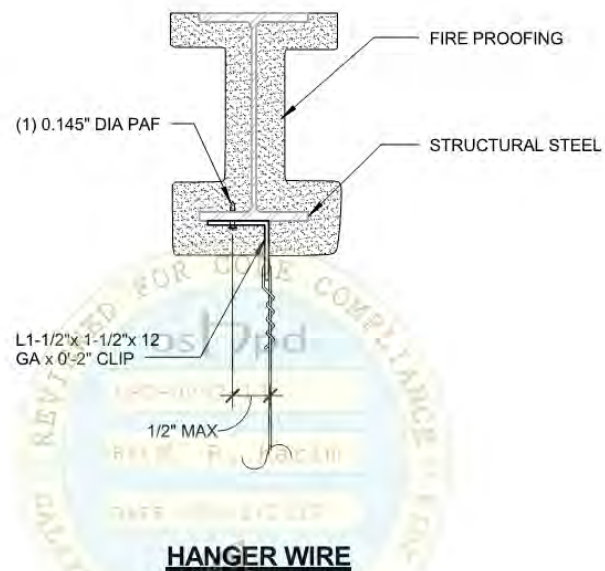
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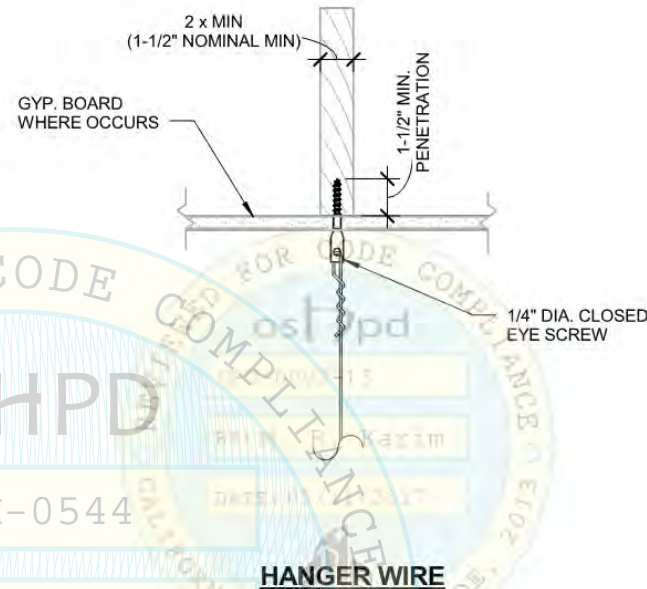


**NOTES:**

1. BEAM FLANGE THICKNESS SHALL NOT BE LESS THAN 3/16\"
2. FRAMING MEMBERS SHALL BE DESIGNED TO CARRY THE CEILING LOADS, RDP TO VERIFY
3. RDP IN RESPONSIBLE CHARGE, I.O.R. AND CONTRACTOR SHALL VERIFY THAT NO PAF IS INSTALLED IN THE PROTECTED ZONE OF ANY STEEL MEMBER, SEE ANSI/AISC 341-10.

Section Title : OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No.
Sheet Title : HANGER WIRE CONNECTION TO STRUCTURAL STEEL	CL4.23

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**NOTES:**

1. FRAMING MEMBERS SHALL BE DESIGNED TO CARRY THE CEILING LOADS, RDP TO VERIFY
2. RDP SHALL VERIFY THAT SCREWS AT THE BOTTOM FLANGE OF TRUSS IS ACCEPTABLE

Section Title : OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No.
Sheet Title : HANGER WIRE CONNECTION TO SAWN TIMBER	CL4.24

**SHEET NOTES:**

1. NOTES AND DETAIL CALLOUTS IN SPECIFIC DETAILS TAKE PRECEDENCE OVER THE "OPD" DETAILS CALLED OUT ON THIS SHEET.
2. FOR THE SCOPE OF THIS OPM, BRACING WIRES HAVE BEEN REPLACED BY THE GRIDLOK BRACING SYSTEM AND ARE NOT APPLICABLE FOR USE UNDER THIS OPM.



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**1 HANGER WIRE CONNECTION TO STRUCTURAL STEEL**

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**2 HANGER WIRE CONNECTION TO SAWN TIMBER**



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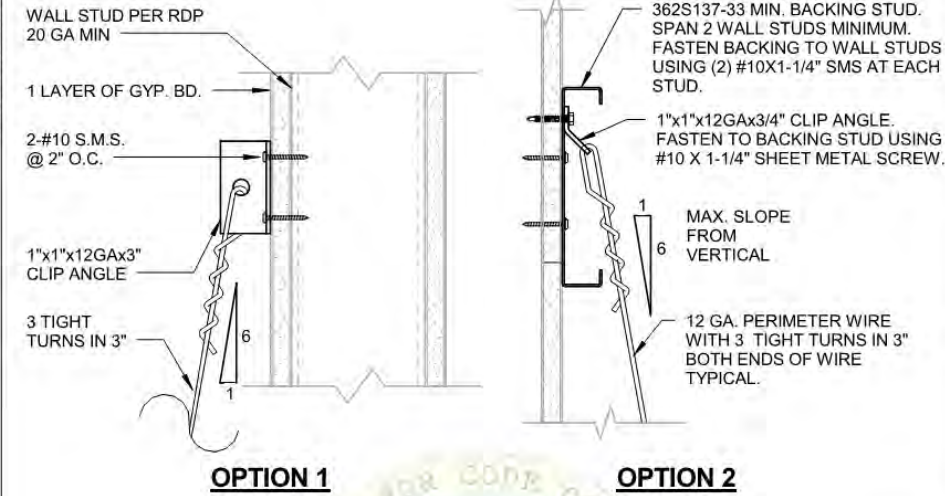
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**OPTION 1**

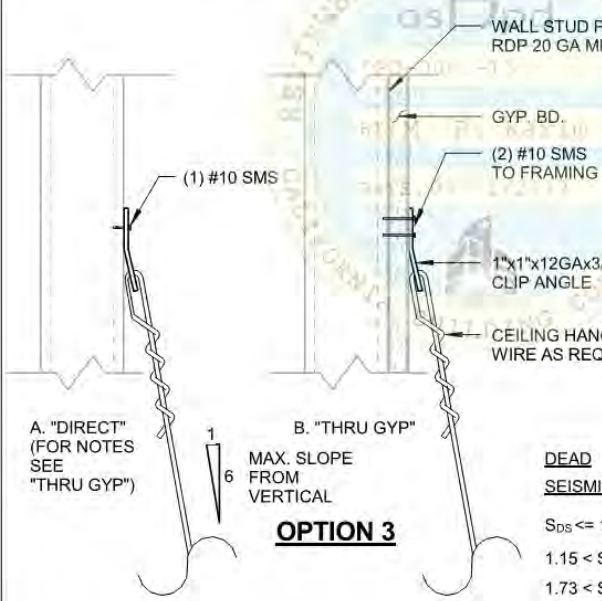
**OPTION 2**

**NOTES:**

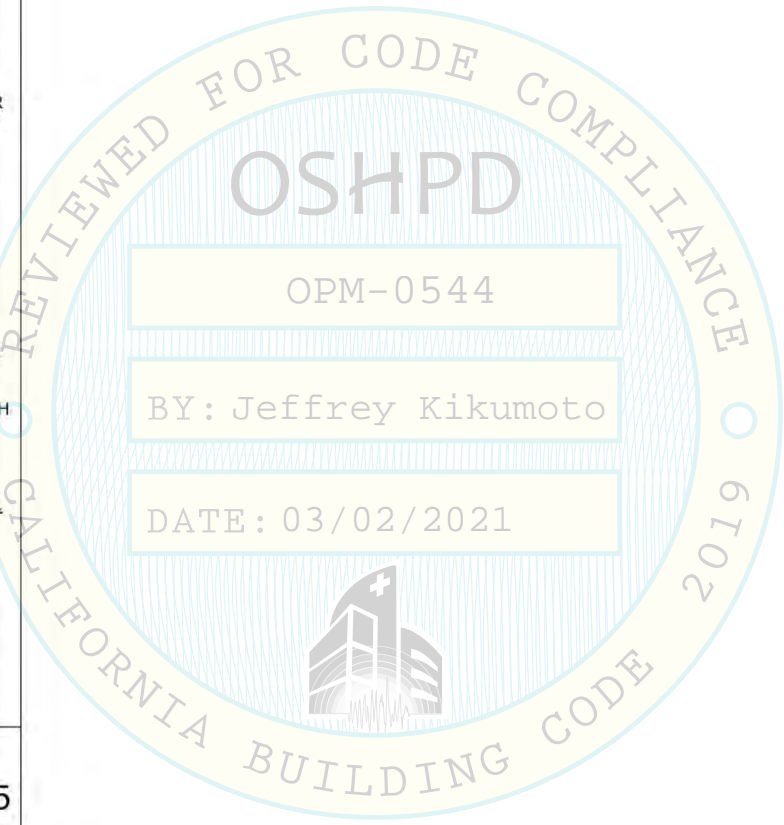
1. THIS IS APPLIED FOR PERIMETER WIRE ATTACHEMENT OR WHERE OBSTRUCTION PREVENTS ATTACHMENT TO STRUCTURE ABOVE
2. RDP SHALL DESIGN FRAMING WALL TO CARRY THE CEILING LOAD. SEE TABLE BELOW FOR LOADS. LOADS ASSUME A TRIBUTARY AREA OF 16 SQ FT AND ARE UNFACTORED.
3. WALLS SHALL BE DESIGNED FOR HANGER FORCES BELOW. AT FREE JOINT, HANGER WIRE SHALL HAVE A MINIMUM STRETCH LENGTH (CLR LENGTH BTWN TURNS) OF 12"

**HANGER FORCES**

	VERTICAL	HORIZONTAL
<b>DEAD</b>	64 LBS	11 LBS
<b>SEISMIC (0.14S<sub>DS</sub> Wp)</b>		
S <sub>DS</sub> <= 1.15	11 LBS	2 LBS
1.15 < S <sub>DS</sub> <= 1.73	16 LBS	3 LBS
1.73 < S <sub>DS</sub> <= 2.50	23 LBS	4 LBS



**OPTION 3**



**SHEET NOTES:**

1. NOTES AND DETAIL CALLOUTS IN SPECIFIC DETAILS TAKE PRECEDENCE OVER THE "OPD" DETAILS CALLED OUT ON THIS SHEET.
2. FOR THE SCOPE OF THIS OPM, BRACING WIRES HAVE BEEN REPLACED BY THE GRIDLOK BRACING SYSTEM AND ARE NOT APPLICABLE FOR USE UNDER THIS OPM.

Section Title: OSHPD STANDARD SUSPENDED CEILING DETAILS	OPD No:
Sheet Title: HANGER WIRE CONNECTION TO METAL STUD WALL	<b>CL4.25</b>

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**HANGER WIRE CONNECTION TO METAL STUD WALL**



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