



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT FACILITIES DEVELOPMENT DIVISION

Registered Design Professional Preparing Engineering Recommendations

Company Name: ISAT Seismic Bracing

Name: William V Joerger California License Number: S4545

Mailing Address: 1020 Crews Rd, Matthews NC 28105

Telephone: 510-714-0216 Email: wvjoerger@isatsb.com

OSHPD Special Seismic Certification Preapproval (OSP)

Special Seismic Certification is preapproved under OSP-
(Separate application for OSP is required)

Special Seismic Certification is no preapproved

Certification Method(s)

Testing in accordance with: ICC-ES AC156 FM 1950-10

Other* (Please Specify): _____

Equipment is considered to be rugged. OPM is for anchorage to concrete slabs.

*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.

BY: Jeffrey Y. Kikumoto

DATE: 08/21/2015

Analysis

Experience Data

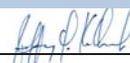
Combination of Testing, Analysis, and/or Experience Data (Please Specify): _____

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:  Date: 08-21-2015

Print Name: Jeffrey Kikumoto

Title: SSE

Condition of Approval (if applicable): _____

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





INTERNATIONAL SEISMIC APPLICATION TECHNOLOGY

A Division of Tomarco Contractor Specialties

Submittal Documents

OPM-0256-13

OSHPD OPM-0256-13

BY: Jeffrey Y. Kikumoto

SUPPORT AND ATTACHMENT OPM CONSTRUCTION DRAWINGS SKYTRON ERGON 3 BOOMS

SKYTRON, LLC

ISAT
1020 Crews Road Suite Q
Matthews, N.C. 28105
704-841-4080



FILE NO.: CLT-0515-070

"Empowered by Experience"

REV 1

OSHPD OPM-0256-13 DWG - i

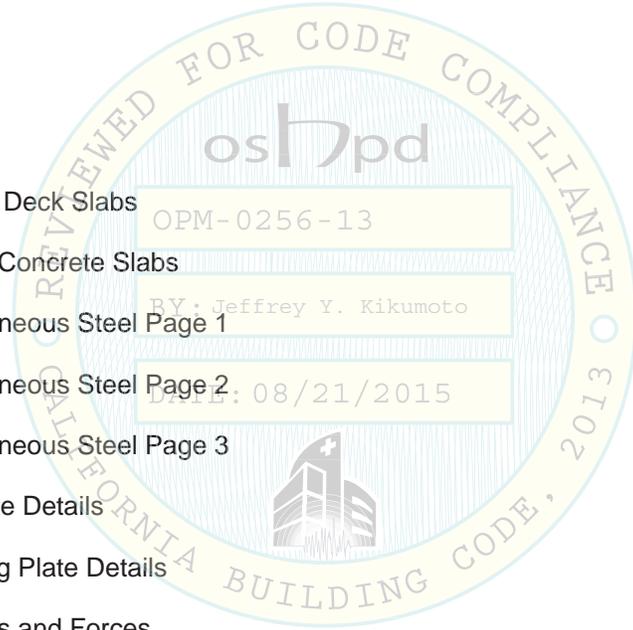


OSHPD OPM-0256-13

CALCULATION INDEX

INDEX

Cover Page	p i
Index Page	p ii
General Notes	p 1
Attachment Notes	p 2
Skytron Ergon 3 at Metal Deck Slabs	p 3
Skytron Ergon 3 at Solid Concrete Slabs	p 4
Skytron Ergon 3 Miscellaneous Steel Page 1	p 5
Skytron Ergon 3 Miscellaneous Steel Page 2	p 6
Skytron Ergon 3 Miscellaneous Steel Page 3	p 7
Skytron Ergon 3 Top Plate Details	p 8
Skytron Ergon 3 Mounting Plate Details	p 9
Skytron Ergon 3 Moments and Forces	p 10



OSHPD OPM-0256-13

MANUFACTURE: SKYTRON

EQUIPMENT TYPE: CEILING MOUNTED BOOM

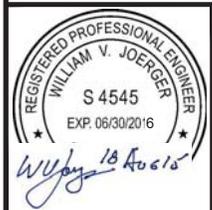
GENERAL NOTES:

1. THIS OSHPD PREAPPROVAL 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.
2. SEISMIC CRITERIA USED: $S_{DS} = 2.5$ $I_p = 1.5$ $a_p = 2.5$ $R_p = 2.5$ $z/h \leq 1.0$ $F_pH = 4.50$ AND $F_pV = 0.50$.
3. SUPPORT AND ATTACHMENT FORCES ARE DETERMINED USING ASCE 7-10 CHAPTER 13 "SEISMIC DESIGN REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS". AN OVERSTRENGTH FACTOR $\Omega_0 = 2.5$ IS USED FOR CONCRETE MATERIALS PER ASCE 7-10 SUPPLEMENT 1 TABLE 13.6-1. LOADS SHOWN ARE STRENGTH DESIGN LOADS PER CBC 2013 SECTION 1909A.
4. THIS PREAPPROVAL COVERS ONLY THE SUPPORTS AND ATTACHMENTS OF THE EQUIPMENT TO THE STRUCTURE.
5. STEEL MATERIALS: ANGLES AND PLATE ASTM A36, ROUND HSS ASTM A500 GRADE B (FY = 42 KSI), RECTANGULAR HSS ASTM A500 GRADE B (FY = 46 KSI), WELDING ELECTRODES E70XX. ALL THREAD ROD ASTM A36, NUTS ASTM A563, WASHERS ASTM F436. BOLTS SUPPLIED BY SKYTRON ARE ASTM A193 B7.
6. CONCRETE SLABS:
 - a. FOR ELEVATED SOLID CONCRETE SLABS: 6" THICKNESS OF NORMAL WEIGHT CONCRETE WITH 4000 PSI MINIMUM STRENGTH.
 - b. METAL DECK: 3" DEEP COMPOSITE STEEL DECK, 20 GAGE MINIMUM, 4 1/2 INCH MINIMUM BOTTOM FLUTE WIDTH AND FLUTE SPACING IS 12", WITH 3 1/4 INCH SAND LIGHT WEIGHT CONCRETE CONCRETE COVER AT 4000 PSI MINIMUM STRENGTH.
7. POST-INSTALLED CONCRETE ANCHORS: HILTI KWIK BOLT TZ (ESR-1917) 5/8" DIAMETER x 4 3/4" MIN. HOLE DEPTH (4" EFFECTIVE EMBEDMENT) AND 65 FT-LBS INSTALLATION TORQUE.

RESPONSIBILITIES OF THE STRUCTURAL ENGINEER OF RECORD

1. CONFIRM THE MATERIAL PROPERTIES AND THICKNESS OF THE CONCRETE SLAB TO WHICH THE EQUIPMENT IS ATTACHED MEETS THE REQUIREMENTS OF THIS OPM.
2. PROVIDE A PLAN FOR INSPECTION OF SUPPORTS AND ATTACHMENTS AND VERIFY ITS IMPLEMENTATION.
3. CONFIRM THE SPECIFIED MINIMUM CONCRETE EDGE DISTANCES ARE MAINTAINED BASED ON THE ACTUAL EQUIPMENT LOCATION. VERIFY THAT EXISTING OR NEW ANCHORS ARE AN ADEQUATE DISTANCE FROM THIS UNIT'S ATTACHMENT.
4. VERIFY THAT THE EXISTING STRUCTURE IS ADEQUATE FOR THE IMPOSED DEAD, LATERAL AND TENSION FORCES SHOWN IN ADDITION TO ALL OTHER LOADS.
5. VERIFY THAT THE INSTALLATION IS IN CONFORMANCE WITH CBC 2013 AND WITH THE OPM-0256-13 DETAILS INCLUDING MATERIALS AND DIMENSIONS OF THE SUPPORT WHERE THE ATTACHMENTS ARE MADE AGREE WITH THE INFORMATION SHOWN.
6. VERIFY THAT THE PROJECT SPECIFIC S_{DS} AND z/h VALUES RESULT IN SEISMIC FORCES (E_h AND E_v) DO NOT EXCEED THE VALUES SHOWN IN THESE DETAILS.

OPM-0256-13 SKYTRON ERGON 3 GENERAL NOTES

 ISAT A Division of Tomarco Contractor Specialties International Seismic Application Technology 1020 Crews Road, Suite Q, Matthews, NC 28105 704-841-4080 www.isatsb.com		
 <i>WVJ 18 Aug 15</i>	DRAWN BY: WVJ DATE: 08/10/15	
	REVISED BY: WVJ DATE: 08/18/15 REV NO: 1	
	<table border="1"> <tr> <td>SCALE N.T.S.</td> <td>PAGE GEN NOTES</td> </tr> </table>	SCALE N.T.S.
SCALE N.T.S.	PAGE GEN NOTES	

OSHPD OPM-0256-13 DWG - 1

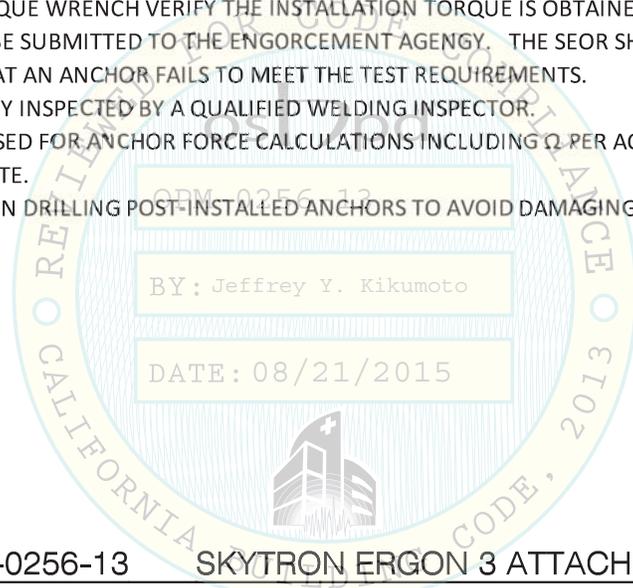
OSHPD OPM-0256-13

MANUFACTURE: SKYTRON

EQUIPMENT TYPE: CEILING MOUNTED BOOM

ATTACHMENT NOTES:

1. THIS OSHPD PREAPPROVAL 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.
2. BRACE ARM INCLINATION MAY VARY FROM 30° TO 45° FROM HORIZONTAL.
3. PERIODIC SPECIAL INSPECTION PER CBC 2013 SECTION 1705A AND TABLE 1705A.3 INCLUDING VERIFICATION OF ANCHOR TYPE, ANCHOR DIMENSIONS, CONCRETE TYPE, CONCRETE COMPRESSIVE STRENGTH, ANCHOR SPACING, EDGE DISTANCES, CONCRETE MEMBER THICKNESS, TIGHTENING TORQUE, HOLE DIMENSIONS, ANCHOR EMBEDMENT AND ADHERENCE TO THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. IN ADDITION, FOLLOW THE PROVISIONS OF THE 2013 CALIFORNIA BUILDING CODE SECTION 1913A.7.2 BY CONFIRMING THE INSTALLATION TORQUE SPECIFIED BY THE MANUFACTURER. TESTING IS NOT TO OCCUR UNTIL A MINIMUM OF 24 HOURS HAS ELAPSED AFTER THE INSTALLATION OF THE SUBJECT ANCHORS. TESTING SHALL BE DONE IN THE PRESENCE OF THE SPECIAL INSPECTOR. TEST 50% OF THE ANCHORS FOR EACH PIECE OF EQUIPMENT. USING A CALIBRATED TORQUE WRENCH VERIFY THE INSTALLATION TORQUE IS OBTAINED WITHIN 1/2 TURN OF THE NUT. REPORT OF TEST RESULTS ARE TO BE SUBMITTED TO THE ENFORCEMENT AGENCY. THE SEOR SHALL PROVIDE REMEDIAL ANCHORAGE DETAILS IN THE EVENT THAT AN ANCHOR FAILS TO MEET THE TEST REQUIREMENTS.
4. WELDS ARE TO BE VISUALLY INSPECTED BY A QUALIFIED WELDING INSPECTOR.
5. STRENGTH DESIGN WAS USED FOR ANCHOR FORCE CALCULATIONS INCLUDING ϕ PER ACI 318-11 WHERE REQUIRED FOR ATTACHMENT TO CONCRETE.
6. EXERCISE DUE CARE WHEN DRILLING POST-INSTALLED ANCHORS TO AVOID DAMAGING CONCRETE REINFORCEMENT OR TENDONS.



OPM-0256-13 SKYTRON ERGON 3 ATTACHMENT NOTES

 <p>A Division of Tomarco Contractor Specialties International Seismic Application Technology 1020 Crews Road, Suite Q, Matthews, NC 28105 704-841-4080 www.isatsb.com</p>		
	DRAWN BY: WVJ DATE: 08/10/15	
	REVISED BY: WVJ DATE: 08/18/15 REV NO: 1	
	<table border="1"> <tr> <td>SCALE N.T.S.</td> <td>PAGE ATTACH NOTES</td> </tr> </table>	SCALE N.T.S.
SCALE N.T.S.	PAGE ATTACH NOTES	

OSHPD OPM-0256-13 DWG - 2

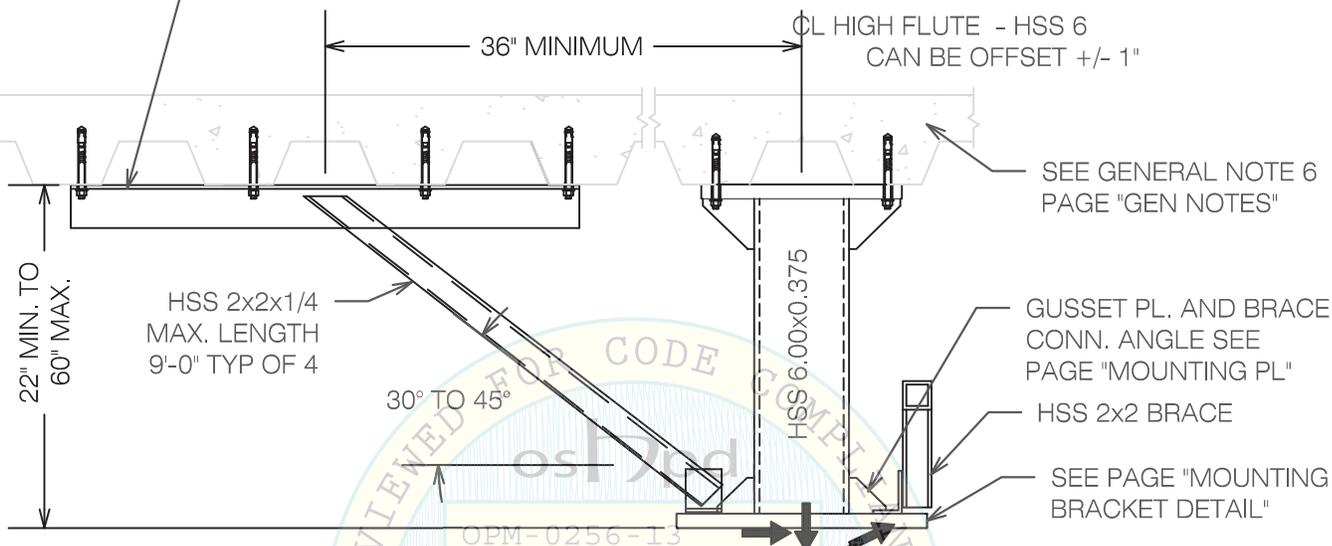
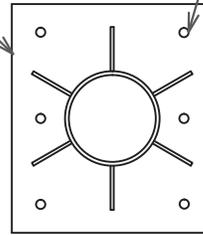
TOP MOUNTING PLATE FOR METAL DECK CONCRETE SLABS BY INSTALLATION CONTRACTOR SEE PAGE "TOP PLATE"

(2) L3x3x1/4 TOP BRACKET SEE PAGE "MISC STEEL 1" AND FLAT PLATE SEE PAGE "MISC STEEL 2"

POST-INSTALLED ANCHORS SEE GEN. NOTE 7 ON PAGE "GEN NOTES"

(6) HILTI KWIK BOLT TZ AT TOP PL
 $T_u = 828 \text{ LBS.}$ $V_u = 1643 \text{ LBS.}$

AT EACH OF (4) BRACES USE HILTI KWIK BOLT TZ WITH $T_u = 2217 \text{ LBS.}$ $V_u = 214 \text{ LBS.}$ SEE PAGES "MISC STEEL 1" AND "MISC STEEL 2"



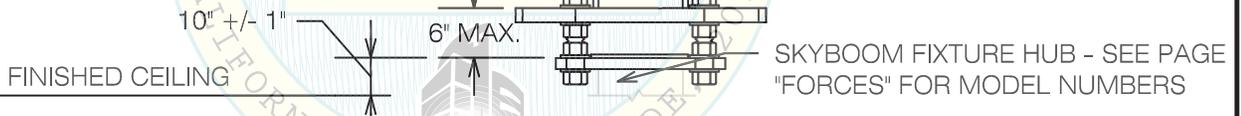
SECTION VIEW AT BRACE AND VERTICAL SUPPORT CONNECTION

BY: Jeffrey Y. Kikumoto

SEE PAGE "MOUNTING PL"

DATE: 08/21/2015

(6) 1 1/4" DIA. RODS SEE PAGE "MOUNTING PL"



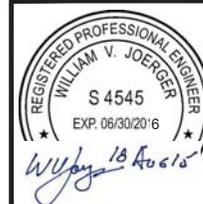
SECTION VIEW AT FIXTURE TO MOUNTING PLATE CONNECTION

INSTALLER IS TO PROVIDE ALL MATERIALS ABOVE THE SKYTRON MOUNTING PLATE

OPM-0256-13 SKYTRON ERGON 3 AT METAL DECK SLAB



A Division of Tomarco Contractor Specialties
International Seismic Application Technology
 1020 Crews Road, Suite Q, Matthews, NC 28105
 704-841-4080 www.isatsb.com



DRAWN BY: WVJ
DATE: 08/10/15
REVISED BY: WVJ
DATE: 08/18/15
REV NO: 1

SCALE N.T.S. **PAGE** METAL DECK

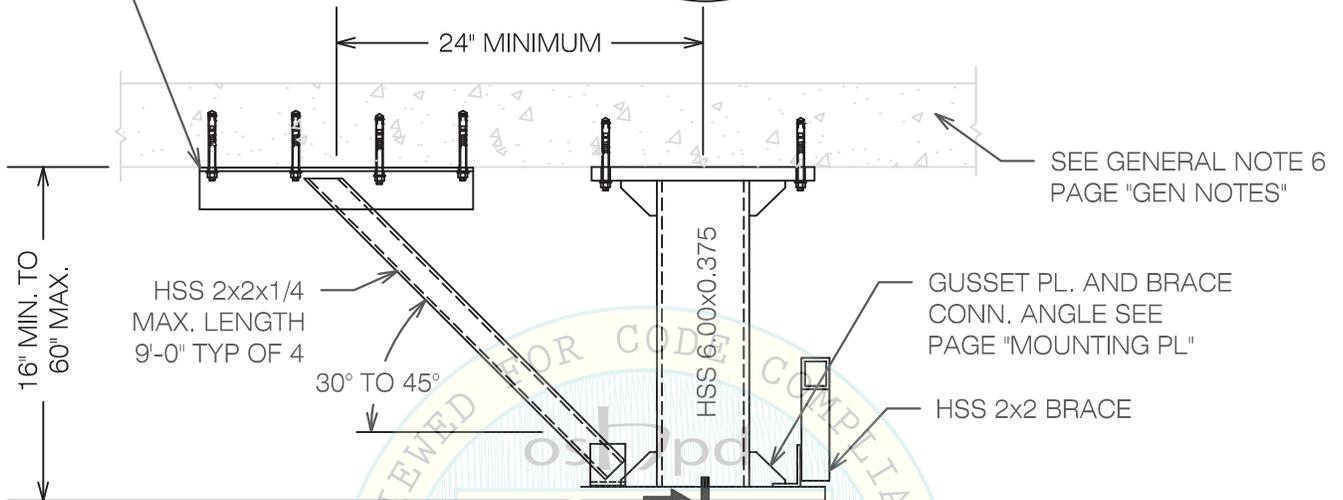
TOP MOUNTING PLATE FOR SOLID CONCRETE SLABS BY INSTALLATION CONTRACTOR SEE PAGE "TOP PLATE"

(2) L3x3x1/4 NO. OF ANCHORS DEPENDS ON MODEL NUMBER, SEE PAGE "MISC STEEL 3".

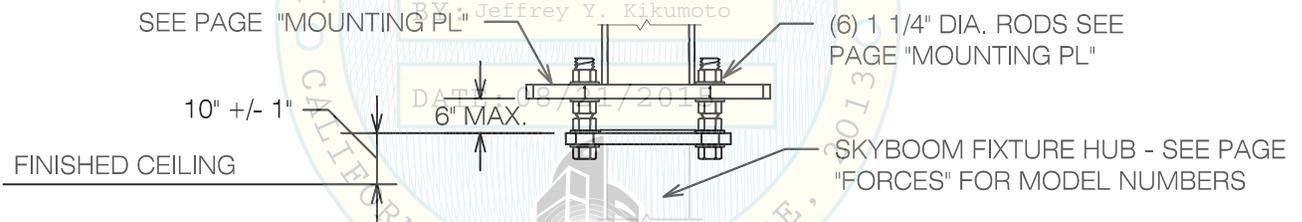
POST-INSTALLED ANCHORS SEE GENERAL NOTE 7 ON PAGE "GEN NOTES"

(6) HILTI KWIK BOLT TZ AT TOP PLATE $T_u = 828$ LBS. $V_u = 1643$ LBS.

AT EACH OF (4) BRACES USE HILTI KWIK BOLT TZ $T_u = 2217$ LBS. $V_u = 214$ LBS. NUMBER OF ANCHORS DEPENDS ON MODEL NUMBER - SEE PAGE "MISC STEEL 3"



SECTION VIEW AT BRACE AND VERTICAL SUPPORT CONNECTION

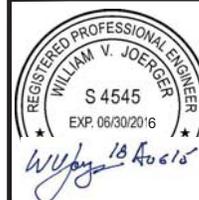


SECTION VIEW AT FIXTURE TO MOUNTING PLATE CONNECTION
INSTALLER IS TO PROVIDE ALL MATERIALS ABOVE THE SKYTRON MOUNTING PLATE

OPM-0256-13 SKYTRON ERGON 3 AT SOLID CONCRETE SLAB

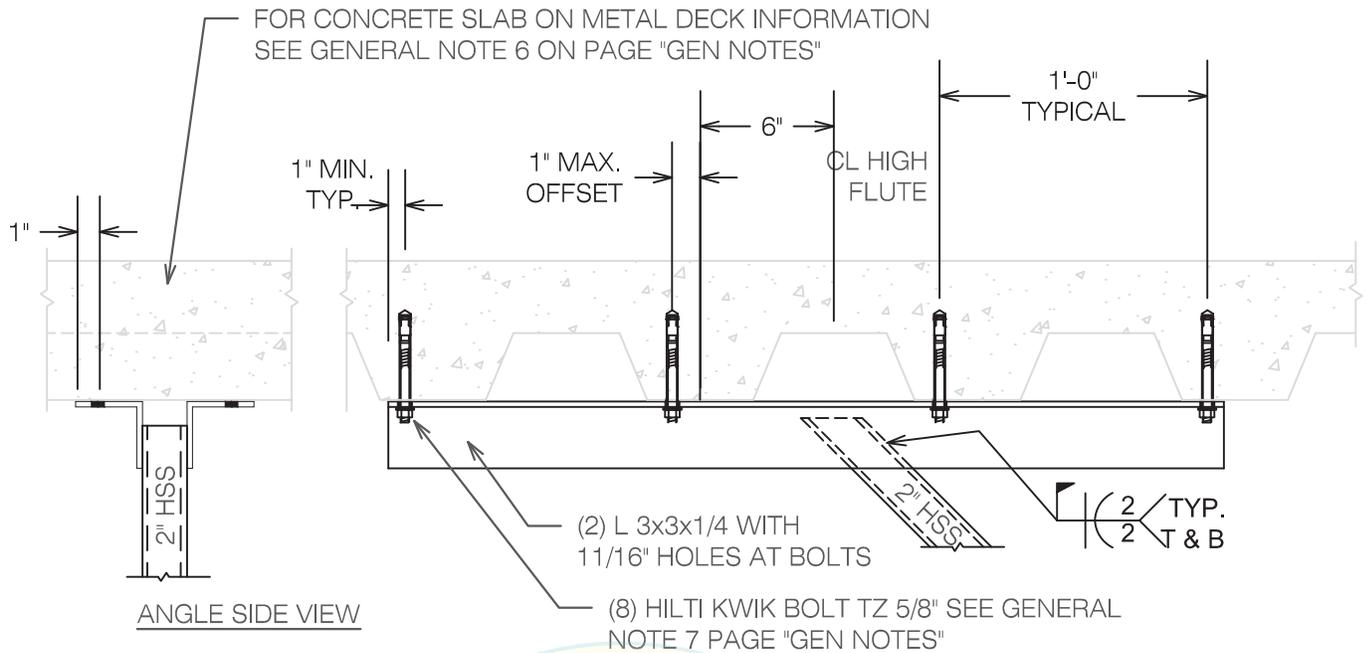


**A Division of Tomarco Contractor Specialties
International Seismic Application Technology**
1020 Crews Road, Suite Q, Matthews, NC 28105
704-841-4080 www.isatsb.com

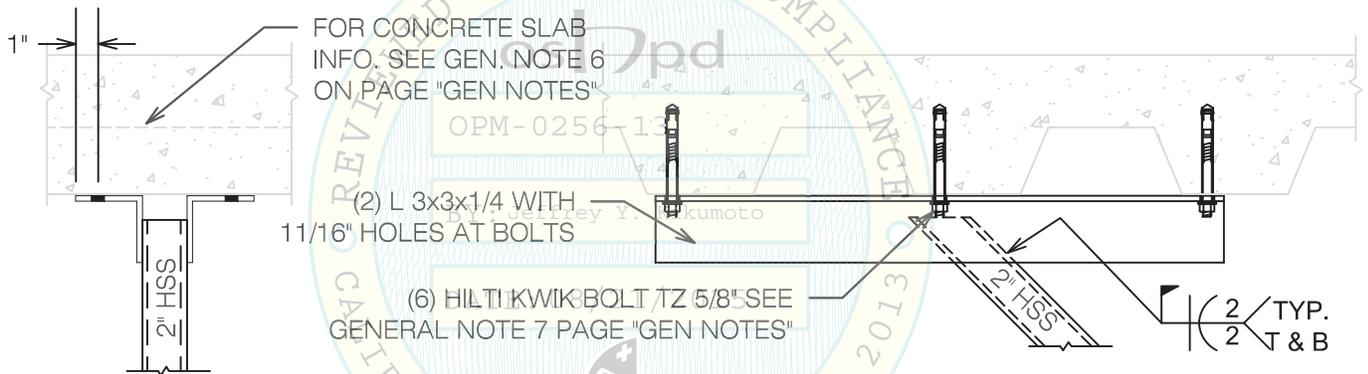


DRAWN BY: WVJ
DATE: 08/10/15
REVISED BY: WVJ
DATE: 08/18/15
REV NO: 1

SCALE: N.T.S. **PAGE:** SOLID SLAB



DETAIL A FOR MODELS 330 SERIES, 320 SERIES, 310 SERIES AND 300 SERIES BRACE CONNECTION



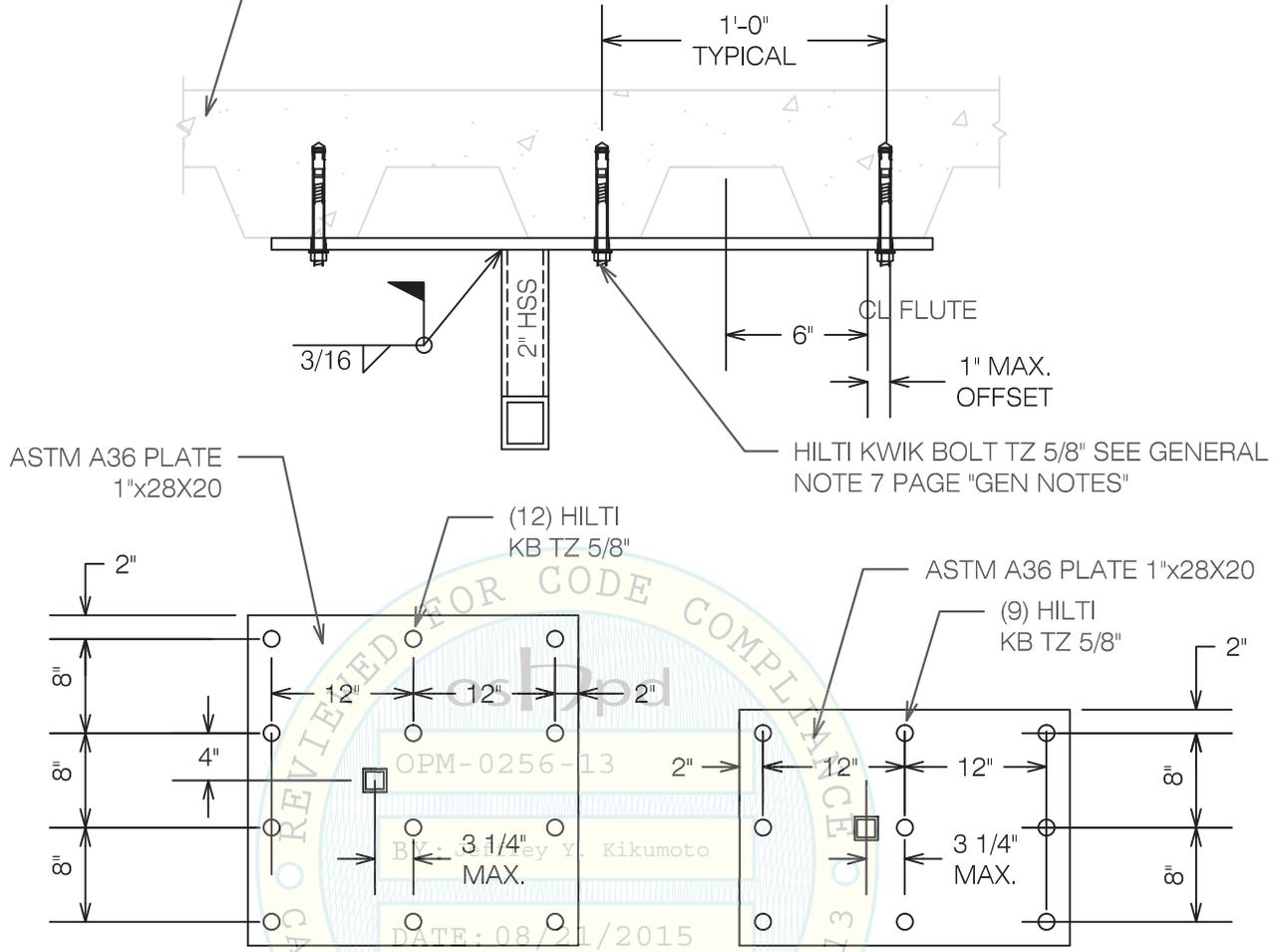
DETAIL B FOR MODELS 200 SERIES, 120 SERIES, 110 SERIES AND 100 SERIES BRACE CONNECTION

**OPM-0256-13 SKYTRON ERGON 3 MISCELLANEOUS STEEL FOR METAL DECK SLABS
BRACE CONNECTION PERPENDICULAR TO METAL DECK FLUTES**

 A Division of Tomarco Contractor Specialties International Seismic Application Technology 1020 Crews Road, Suite Q, Matthews, NC 28105 704-841-4080 www.isatsb.com	
 <i>WVJ 18 Aug 15</i>	DRAWN BY: WVJ DATE: 08/10/15
	REVISED BY: WVJ DATE: 08/18/15 REV NO: 1
SCALE: N.T.S.	PAGE: MISC. STEEL 1

OSHPD OPM-0256-13 DWG - 5

FOR CONCRETE SLAB ON METAL DECK INFORMATION
SEE GENERAL NOTE 6 ON PAGE "GEN NOTES"



DETAIL C FOR MODELS 330 SERIES, 320 SERIES,
310 SERIES AND 300 SERIES BRACE CONNECTION

DETAIL D FOR MODELS 200 SERIES, 120 SERIES,
110 SERIES AND 100 SERIES BRACE CONNECTION

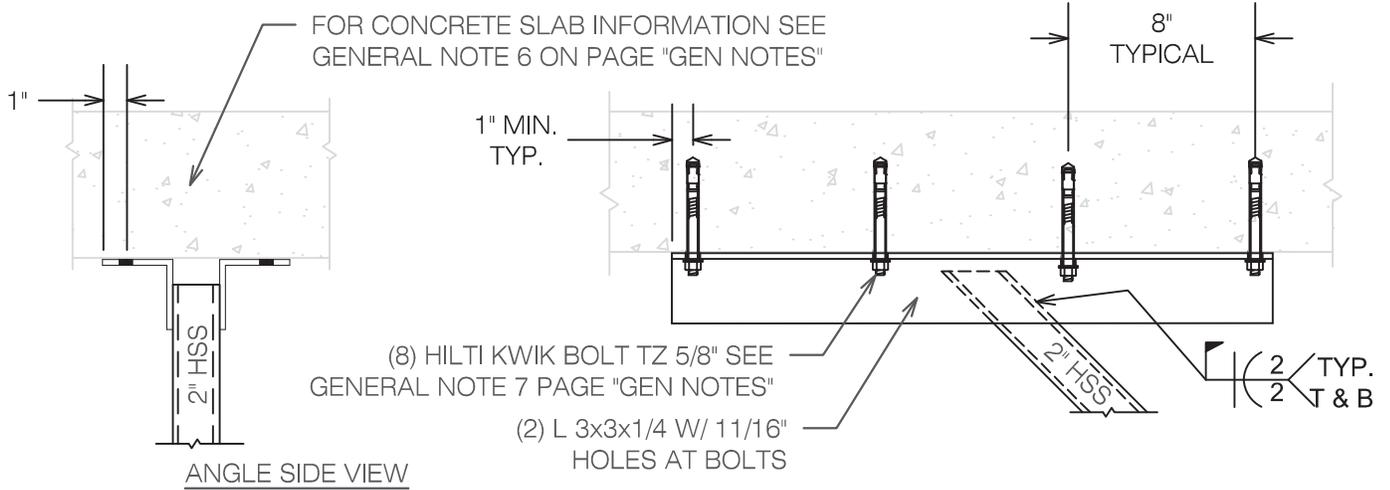
**OPM-0256-13 SKYTRON ERGON 3 MISCELLANEOUS STEEL FOR METAL DECK SLABS
BRACE CONNECTION PARALLEL TO METAL DECK FLUTES**



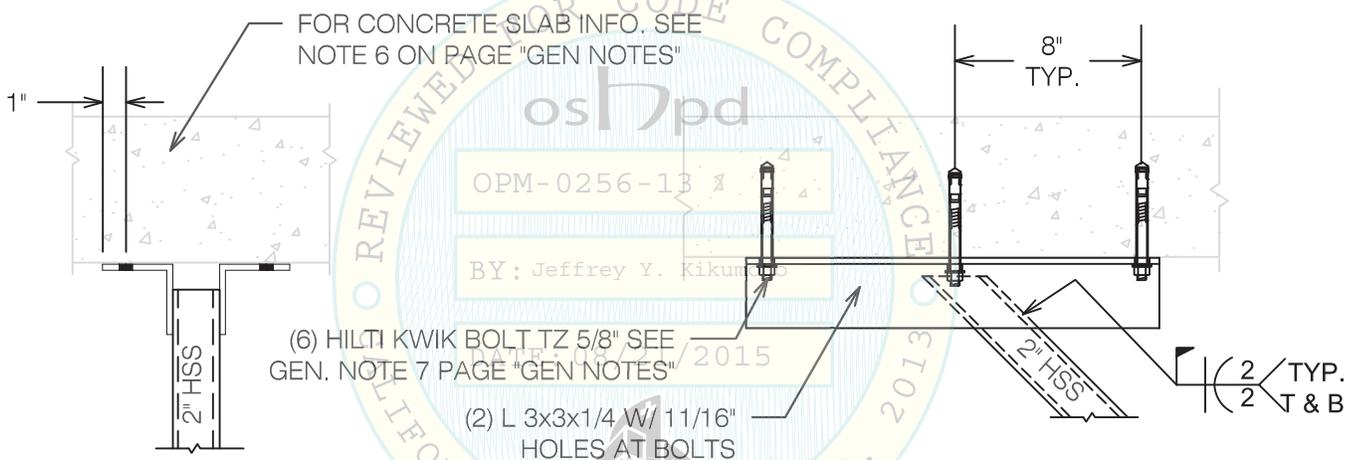
**A Division of Tomarco Contractor Specialties
International Seismic Application Technology**
1020 Crews Road, Suite Q, Matthews, NC 28105
704-841-4080 www.isatsb.com

 <i>WVJ 18 Aug 15</i>	DRAWN BY: WVJ DATE: 08/10/15	
	REVISED BY: WVJ DATE: 08/18/15 REV NO: 1	
	SCALE N.T.S.	PAGE MISC. STEEL 2

OSHPD OPM-0256-13 DWG - 6



DETAIL E FOR MODELS 330 SERIES, 320 SERIES, 310 SERIES AND 300 SERIES BRACE CONNECTION

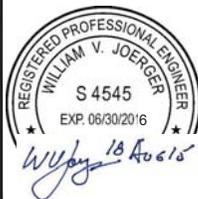


DETAIL F FOR MODELS 200 SERIES, 120 SERIES, 110 SERIES AND 100 SERIES BRACE CONNECTION

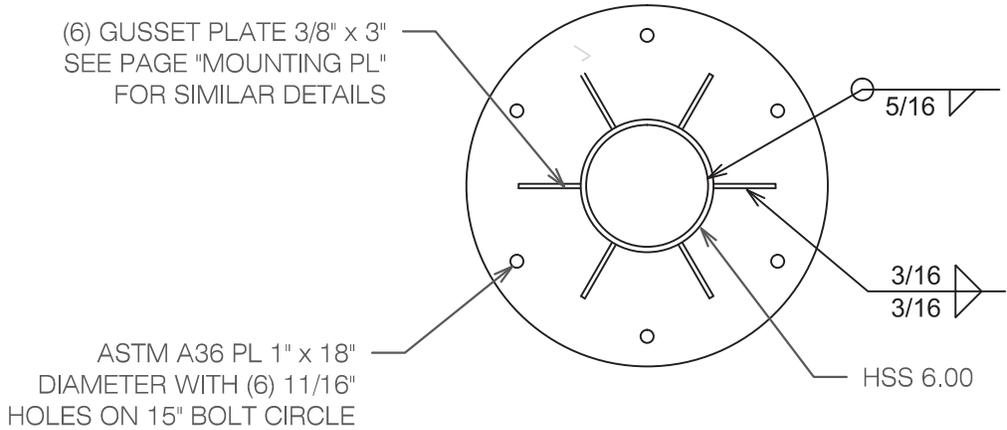
OPM-0256-13 SKYTRON ERGON 3 MISCELLANEOUS STEEL FOR SOLID SLABS



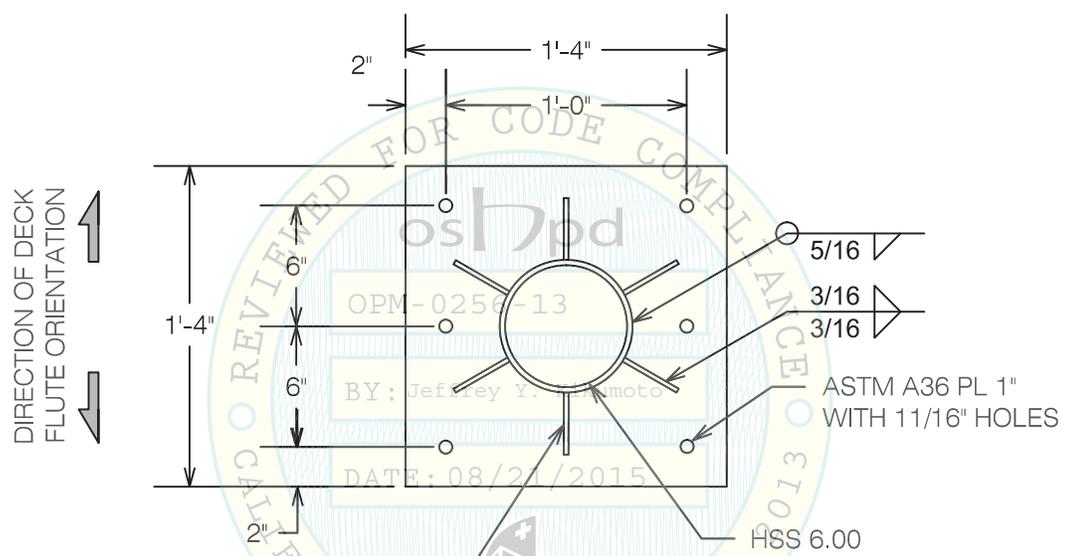
**A Division of Tomarco Contractor Specialties
International Seismic Application Technology**
1020 Crews Road, Suite Q, Matthews, NC 28105
704-841-4080 www.isatsb.com

	DRAWN BY: WVJ DATE: 08/10/15
	REVISED BY: WVJ DATE: 08/18/15 REV NO: 1
SCALE: N.T.S.	PAGE: MISC. STEEL 3

OSHPD OPM-0256-13 DWG - 7



TOP PLATE AT SOLID CONCRETE SLABS



(6) GUSSET PLATE 3/8" x 3" SEE PAGE "MOUNTING PL" FOR SIMILAR DETAILS

TOP PLATE AT METAL DECK SLABS

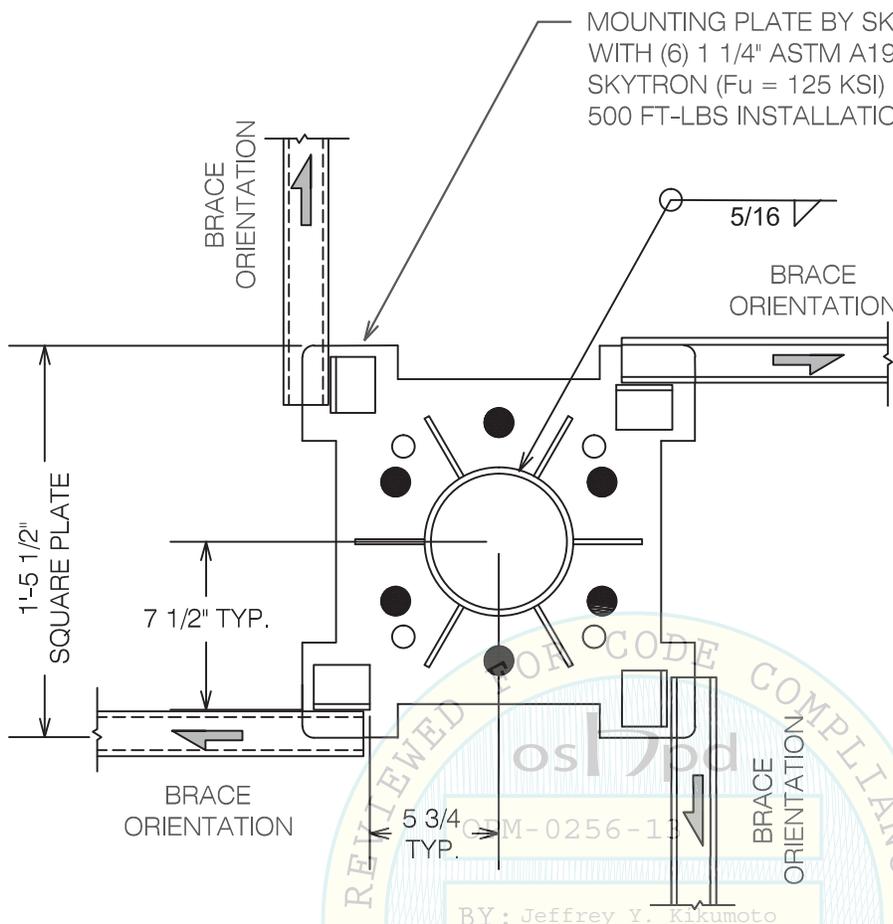
OPM-0256-13 SKYTRON ERGON 3 TOP PLATE DETAILS



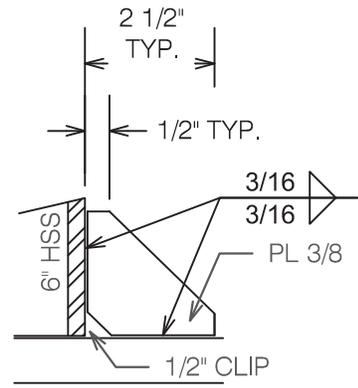
**A Division of Tomarco Contractor Specialties
International Seismic Application Technology**
1020 Crews Road, Suite Q, Matthews, NC 28105
704-841-4080 www.isatsb.com

 <i>WVJ 18 Aug 15</i>	DRAWN BY: WVJ DATE: 08/10/15	
	REVISED BY: WVJ DATE: 08/18/15 REV NO: 1	
	SCALE N.T.S.	PAGE TOP PLATE

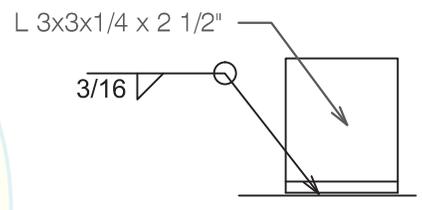
OSHPD OPM-0256-13 DWG - 8



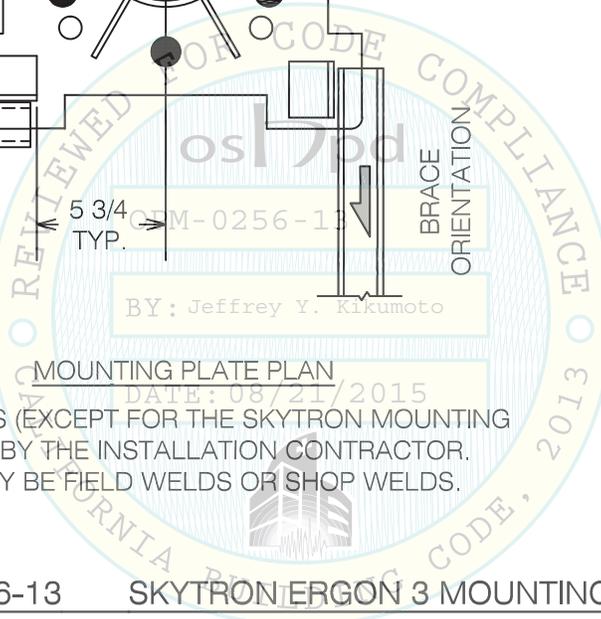
MOUNTING PLATE BY SKYTRON 1" ASTM A36 FY = 36 KSI WITH (6) 1 1/4" ASTM A193 B7 BOLTS PROVIDED BY SKYTRON (Fu = 125 KSI) ON A 10 5/8" BOLT CIRCLE 500 FT-LBS INSTALLATION TORQUE



GUSSET PLATE DETAIL (6 REQUIRED)



BRACE CONNECTION ANGLE (4 REQUIRED)



MOUNTING PLATE PLAN

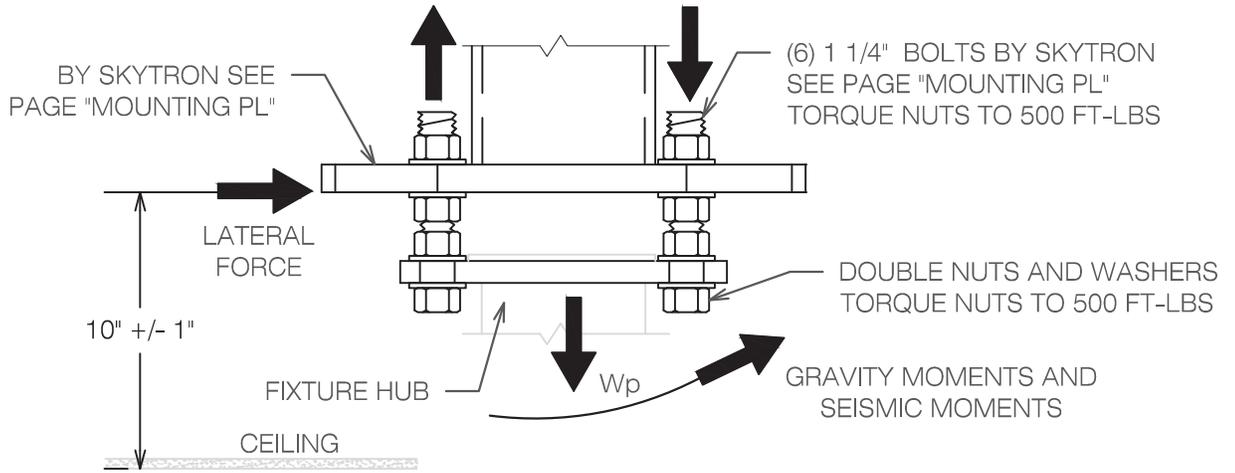
ALL MATERIALS (EXCEPT FOR THE SKYTRON MOUNTING PLATE) ARE BY THE INSTALLATION CONTRACTOR. WELDS MAY BE FIELD WELDS OR SHOP WELDS.

OPM-0256-13 SKYTRON ERGON 3 MOUNTING PLATE DETAILS



**A Division of Tomarco Contractor Specialties
International Seismic Application Technology**
1020 Crews Road, Suite Q, Matthews, NC 28105
704-841-4080 www.isatsb.com

 <i>WVJ 18 Aug 15</i>	DRAWN BY: WVJ	
	DATE: 08/10/15	
	REVISED BY: WVJ	
DATE: 08/18/15		
REV NO: 1		
SCALE N.T.S.	PAGE MOUNTING PL	



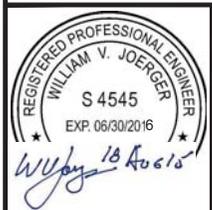
Model Number	Weight at 1g (lbs.)	Seismic Design Forces at Ultimate Loads			
		Vertical Force (lbs.)	Lateral force (lbs.)	Mx (ft.-lbs.)	My (ft.-lbs.)
100 SERIES	184	313	828	1,903	2,619
110 SERIES	494	840	2,223	4,477	9,250
120 SERIES	639	1,086	2,876	5,454	10,832
200 SERIES	518	881	2,331	3,067	8,348
300 SERIES	625	1,068	2,826	7,012	15,633
310 SERIES	839	1,426	3,776	6,137	18,691
320 SERIES	1006	1,710	4,527	9,557	21,815
330 SERIES	1168	1,986	5,256	12,059	29,319

1. WEIGHTS AND MOMENTS ARE FACTORED LOADS USING STRENGTH DESIGN AND INCLUDE THE FOLLOWING FACTORS: DL = 1.2, FpV = 0.5 AND FpH = 4.5.
2. Mx ARE MOMENTS IN THE HORIZONTAL AXIS DUE TO COMPONENT WEIGHT TIMES THE MAXIMUM HORIZONTAL ECCENTRICITY.
3. My ARE MOMENTS IN THE HORIZONTAL AXIS DUE TO COMPONENT WEIGHT PLUS VERTICAL SEISMIC ACCELERATION TIMES THE MAXIMUM VERTICAL ECCENTRICITY.

OPM-0256-13 SKYTRON ERGON 3 FORCES AND MOMENTS



**A Division of Tomarco Contractor Specialties
International Seismic Application Technology**
1020 Crews Road, Suite Q, Matthews, NC 28105
704-841-4080 www.isatsb.com

	DRAWN BY: WVJ	
	DATE: 08/10/15	
	REVISED BY: WVJ	
		DATE: 08/18/15
		REV NO: 1
SCALE N.T.S.	PAGE FORCES	

OSHPD OPM-0256-13 DWG - 10