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

OFFICE USE ONLY

APPLICATION #: OPM-0654

HCAI Preapproval of Manufacturer's Certification (OPM)

Type: [X] New [ ] Renewal/Update

Manufacturer Information

Manufacturer: Skytron LLC

Manufacturer's Technical Representative: BOB VREELAND

Mailing Address: 5085 Corporate Exchange Blvd SE, Grand Rapids, MI 49512

Telephone: (616) 656-1189 Email: bvreeland@skytron.com

Product Information

Product Name: Skytron Freedom Series booms with optional Skytron lights

Product Type: Hospital Ceiling Mounted Booms

Product Model Number: F110, F120, F130, F10L, F20H, F200, F212, F221, F222, F310, F320, F330, F340, F350, F410, F420, F440

General Description: Skytron's Freedom Series ceiling mounted booms are mounted from a single point of attachment. May include optional surgical, procedure or examination lights. Multiple booms at different elevations are used for equipment, monitors and lights.

Applicant Information

Applicant Company Name: ISAT SEISMIC BRACING

Contact Person: KRIS CLEMENTE

Mailing Address: 1020 CREWS RD STE Q, MATTHEWS, ND 28105

Telephone: (757) 817-1893 Email: kclemente@isatsb.com

Title: ENGINEER

Registered Design Professonal Preparing Engineering Recommendations

Company Name: ISAT SEISMIC BRACING

Name: Anthony Rubalcava California License Number: S4710

Mailing Address: 14848 Northam Street, La Mirada, CA 90638

Telephone: (714) 356-3286 Email: arubalcava@isatsb.com

HCAI 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): 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, 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 HCAI prior to testing.

☒ Analysis

☐ Experience Data

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

HCAI Approval

Date: 2/18/2022

Name: William Staehlin Title: Senior Structural Engineer

Condition of Approval (if applicable):

TOTAL SUPPORT

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Submittal Documents

HCAI OPM-0654

SUPPORT AND ATTACHMENT OPM CONSTRUCTION DRAWINGS FOR SKYTRON FREEDOM SERIES BOOMS WITH OPTIONAL SKYTRON LIGHTS

REGISTERED PROFESSIONAL ENGINEER
DEEP M. SHAH
S 5867
STRUCTURAL
STATE OF CALIFORNIA

02/01/2022

SKYTRON, LLC

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

FILE NO.: NC32527.200690 ***"Empowered by Experience"*** REV 1

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OPM DRAWING INDEX

INDEX

HCAI OPM-0654

MANUFACTURE: SKYTRON
EQUIPMENT TYPE: CEILING MOUNTED BOOM AND SURGICAL LIGHTS (NON-MOTORIZED)

GENERAL NOTES:

1. THIS HCAI PREAPPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2019. THE DESIGN FORCES FOR USE WITH THIS OPM SHALL BE BASED ON THE CBC 2019 AND ASCE 7-16.
2. SEISMIC CRITERIA USED: $S_{DS} = 2.5$ $I_P = 1.5$ ap = 1.0 Rp = 1.5 (OTHER MECHANICAL AND ELECTRICAL COMPONENTS) z/h ≤ 1.0 FpH = 3.00 AND FpV = 0.50.
3. SUPPORT AND ATTACHMENT FORCES ARE DETERMINED USING ASCE 7-16 CHAPTER 13 "SEISMIC DESIGN REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS". AN OVERSTRENGTH FACTOR Ω_0 = 2.0 IS USED FOR CONCRETE MATERIALS PER ASCE 7-16 TABLE 13.6-1. LOADS SHOWN ARE STRENGTH DESIGN LOADS PER CBC 2019.
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 70 KSI TENSILE STRENGTH, ALL THREAD ROD ASTM A193 GR. B7, NUTS ASTM A194 GR.2H, WASHERS ASTM F436. ALL THREAD ROD SUPPLIED BY SKYTRON ARE ASTM A193 GR.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 TZ2 (ESR-4266) 5/8" DIAMETER x 4 3/4" MIN. HOLE DEPTH (4" EFFECTIVE EMBEDMENT) AND 40 FT-LBS INSTALLATION TORQUE; 12" MINIMUM EDGE DISTANCE. ANCHOR SPACING IS SHOWN ON THE OPM DRAWINGS.
8. FREEDOM SURGICAL LIGHTS THAT ARE PART OF THIS OPM ARE ATTACHED TO THE FREEDOM BOOMS AND HUB.

OPM-0654 SKYTRON FREEDOM SERIES GENERAL NOTES

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DRAWN BY: KJC	**DATE:** 12/06/2021
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SCALE N.T.S.	**PAGE** GEN NOTES

HCAI OPM-0654

MANUFACTURE: SKYTRON

EQUIPMENT TYPE: CEILING MOUNTED BOOM AND SURGICAL LIGHTS (NON-MOTORIZED)

ATTACHMENT NOTES:

1. THIS HCAI 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. BRACE ARM INCLINATION MAY VARY FROM 30° TO 45° FROM HORIZONTAL.
3. PERIODIC SPECIAL INSPECTION PER CBC 2019 SECTION 1705 AND TABLE 1705.3 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 2019 CALIFONIA BUILDING CODE SECTION 1910A.5 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 AGENGY. THE SEOR SHALL POVIDE 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 Ω_o PER ACI 318-14 WHERE REQUIRED FOR ATTACHMENT TO CONCRETE.
6. EXCERCISE DUE CARE WHEN DRILLING POST-INSTALLED ANCHORS TO AVOID DAMAGING CONCRETE REINFORCEMENT OR TENDONS.
7. PROVIDE FULL THREAD ENGAGEMENT OF NUT AND WASHER.

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 EXISITNG STRUCTURE IS ADEQUATE FOR THE IMPOSED DEAD, LATERAL AND TENSION FORCES SHOWN IN ADDTION TO ALL OTHER LOADS.
5. VERIFY THAT THE INSTALLATION IS IN CONFORMANCE WITH CBC 2019 AND WITH DETAILS IN THIS OPM 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 (Eh AND Ev) THAT DO NOT EXCEED THE VALUES SHOWN IN THESE DETAILS.

OPM-0654 SKYTRON FREEDOM SERIES ATTACHMENT NOTES

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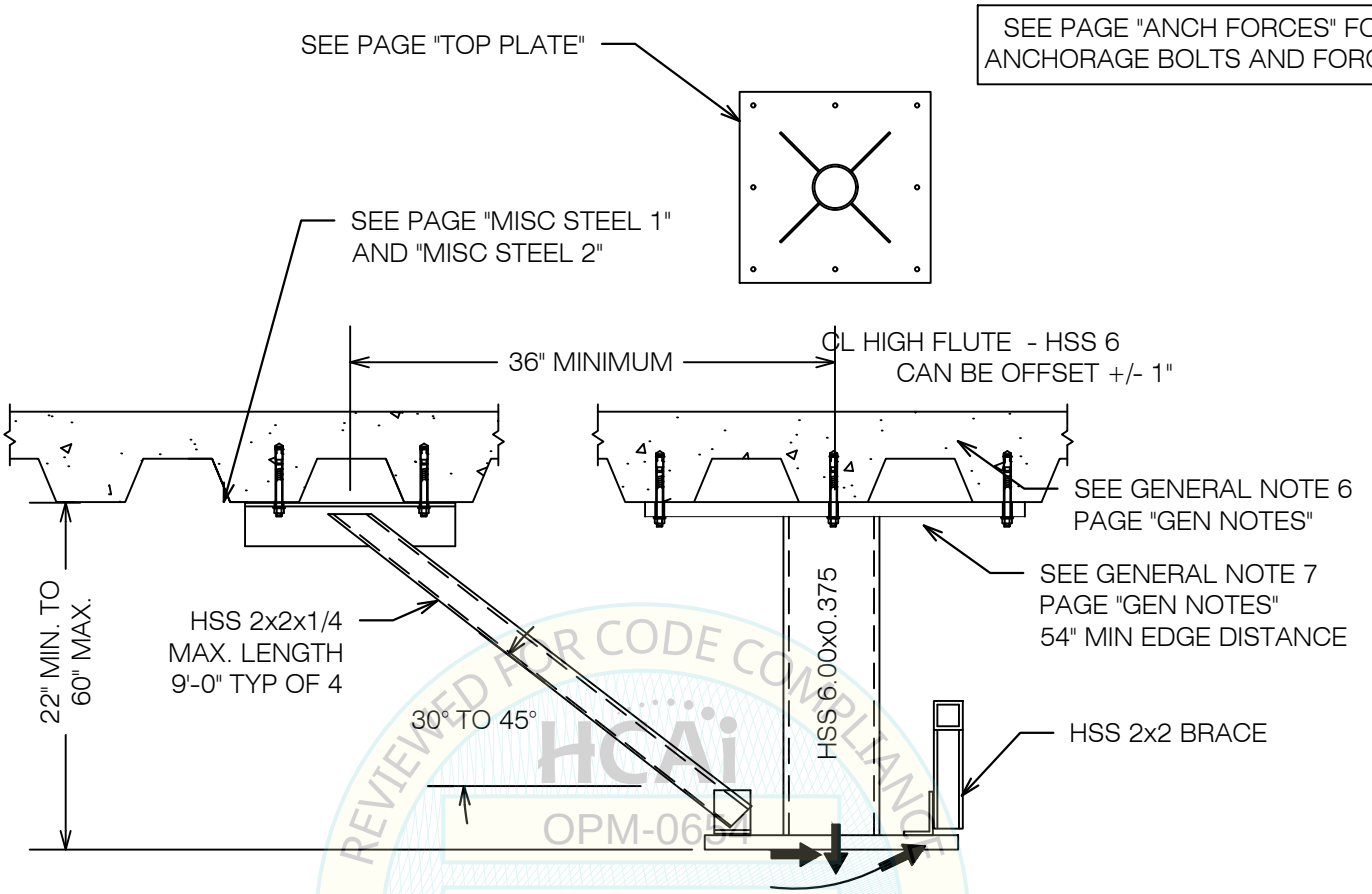
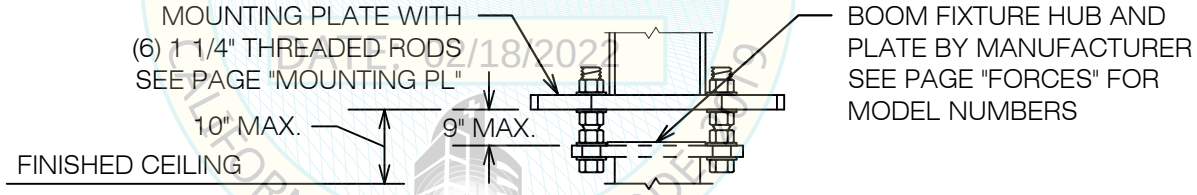
SEE PAGE "ANCH FORCES" FOR ANCHORAGE BOLTS AND FORCES



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-0654 SKYTRON FREEDSOM SERIES AT METAL DECK SLAB

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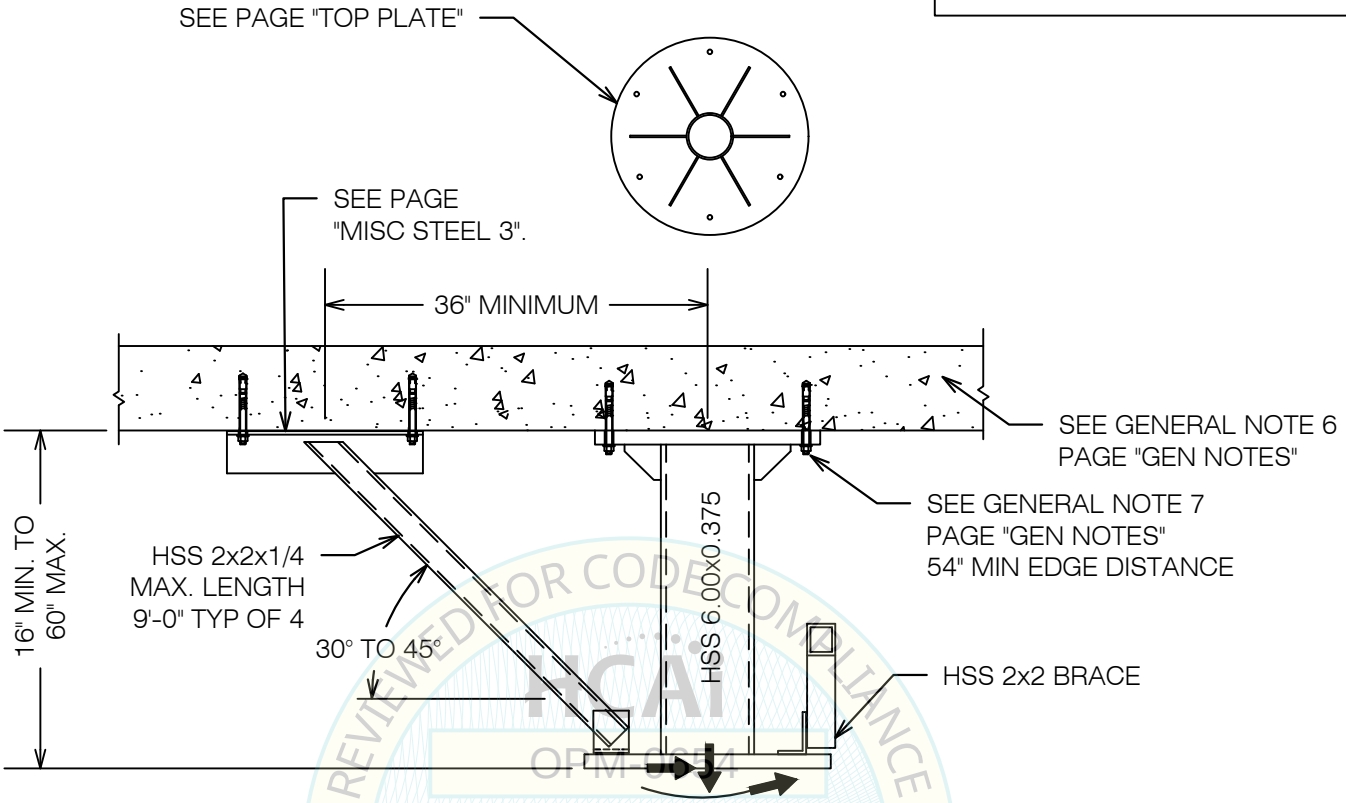
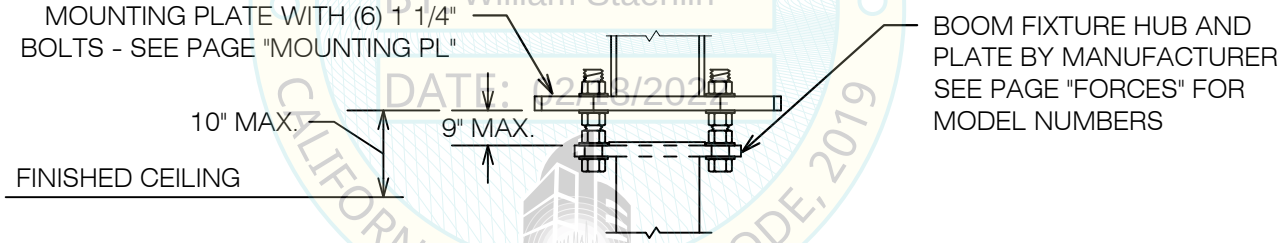
SCALE N.T.S.	**PAGE** METAL DECK

SEE PAGE "ANCH FORCES" FOR ANCHORAGE BOLTS AND FORCES



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 HUB PLATE

OPM-0654 SKYTRON FREEDOM SERIES AT SOLID CONCRETE SLAB

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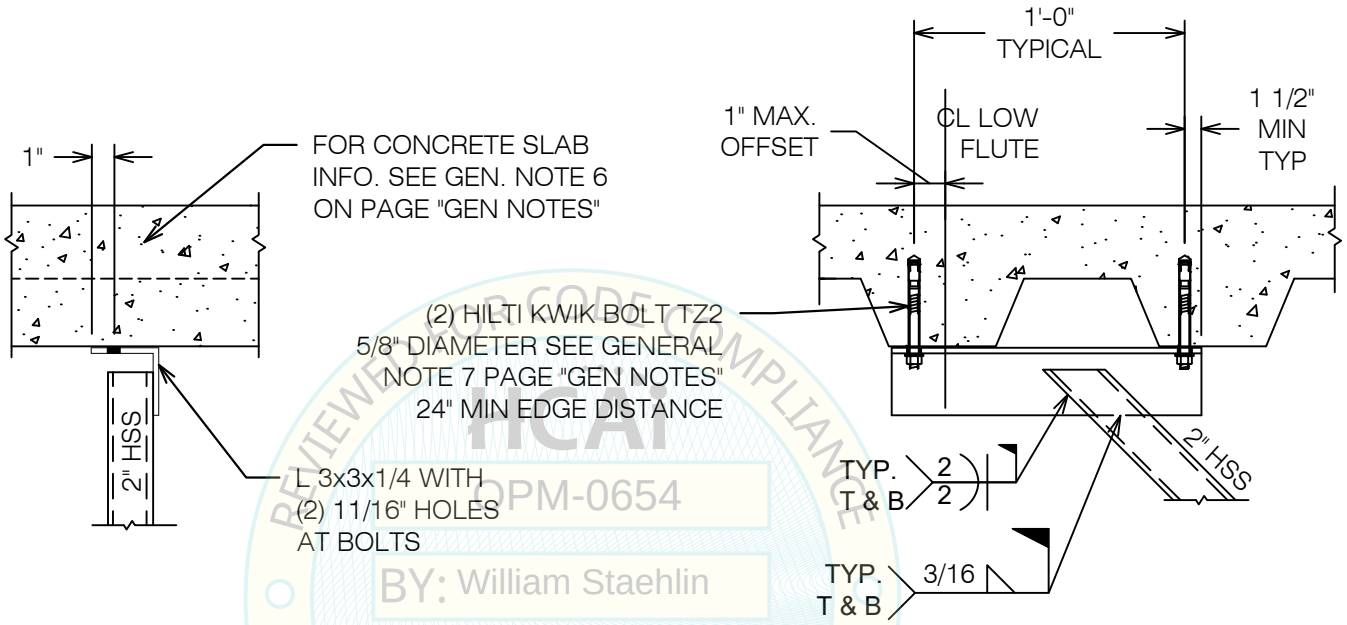
SCALE N.T.S.	**PAGE** SOLID SLAB



OPM-0654 SKYTRON FREEDOM SERIES MISC. STEEL FOR
METAL DECK SLABS BRACE CONNECTION PERPENDICULAR TO METAL DECK FLUTES

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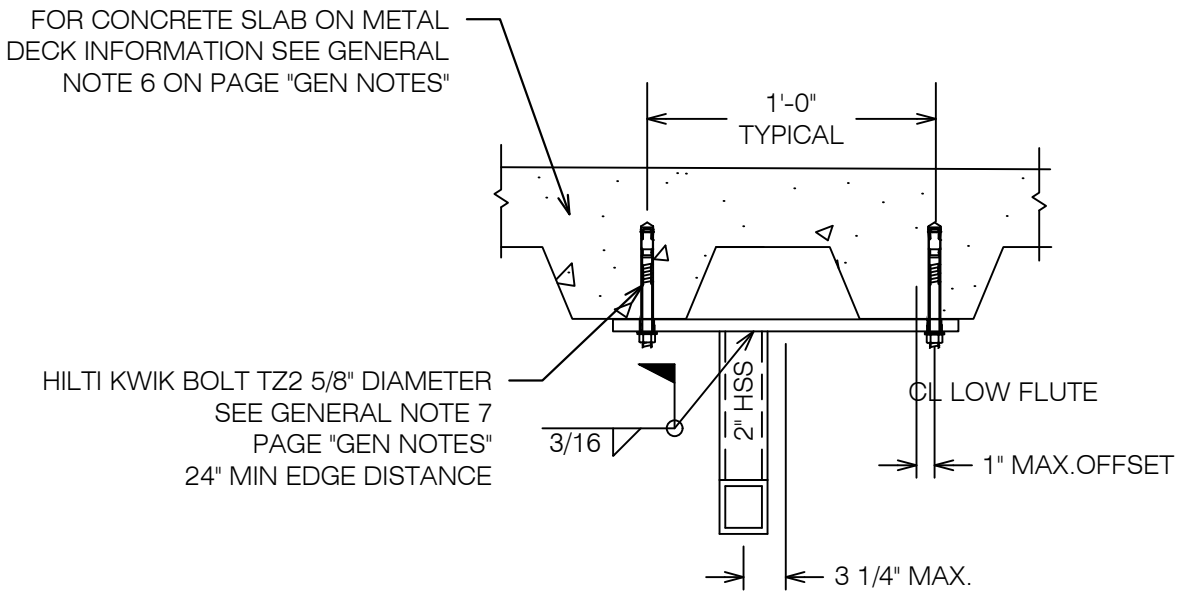
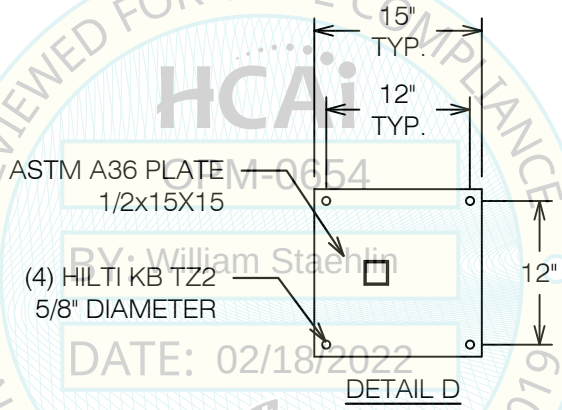
SCALE N.T.S.	**PAGE** MISC. STEEL 1





OPM-0654 SKYTRON FREEDOM SERIES MISC. STEEL FOR METAL DECK SLABS
BRACE CONNECTION PARALLEL TO METAL DECK FLUTES

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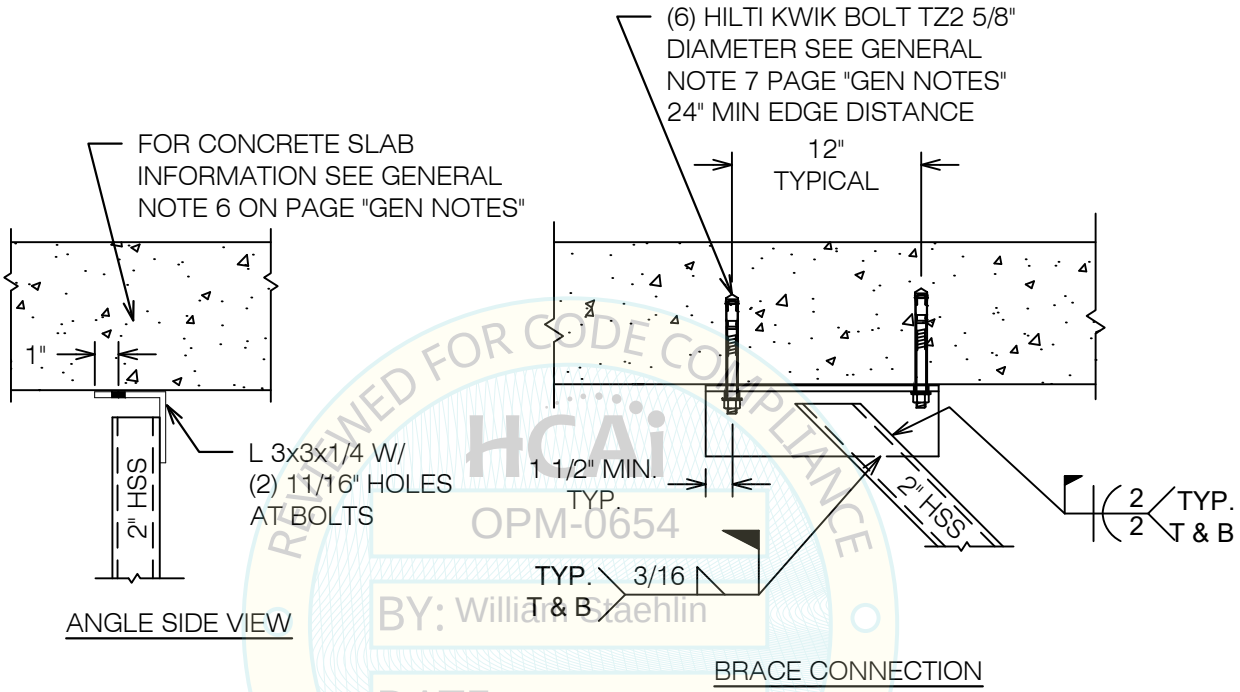
SCALE N.T.S.	**PAGE** MISC. STEEL 2



OPM-0654 SKYTRON FREEDOM SERIES MISC. STEEL FOR SOLID SLABS

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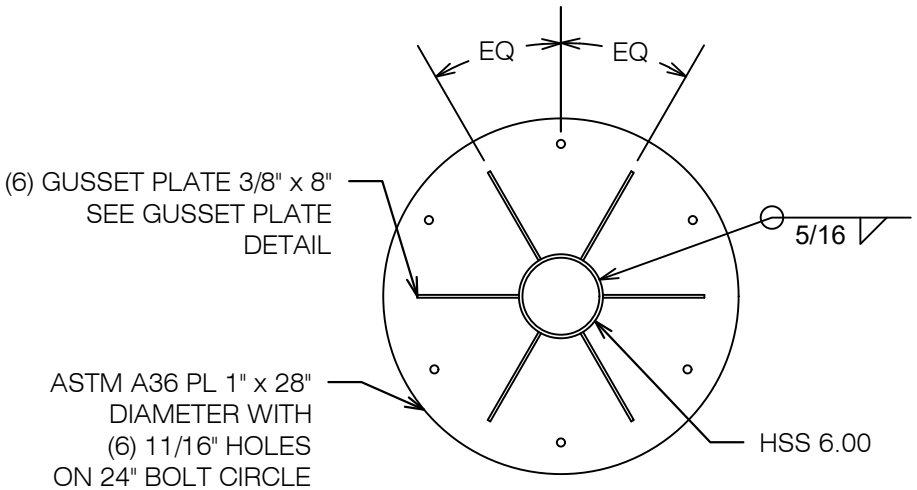
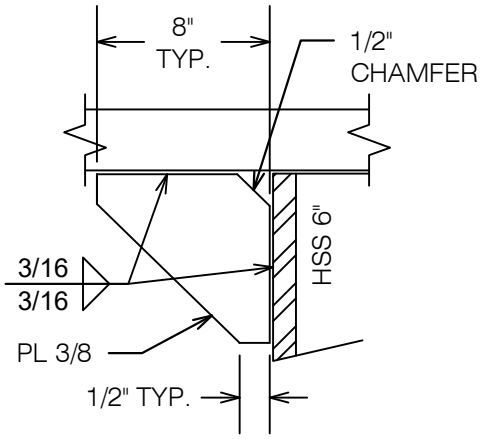
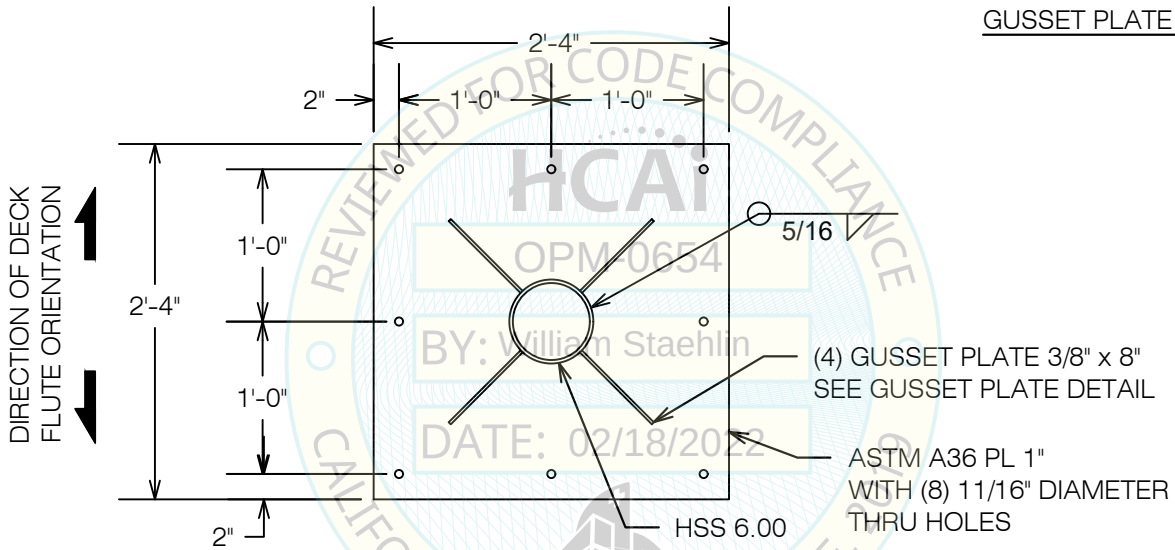
HCAI OPM-0654 CONST DWG - 7



TOP PLATE AT SOLID CONCRETE SLABS



GUSSET PLATE DETAIL



TOP PLATE AT METAL DECK SLABS

OPM-0654 SKYTRON FREEDOM SERIES TOP PLATE DETAILS

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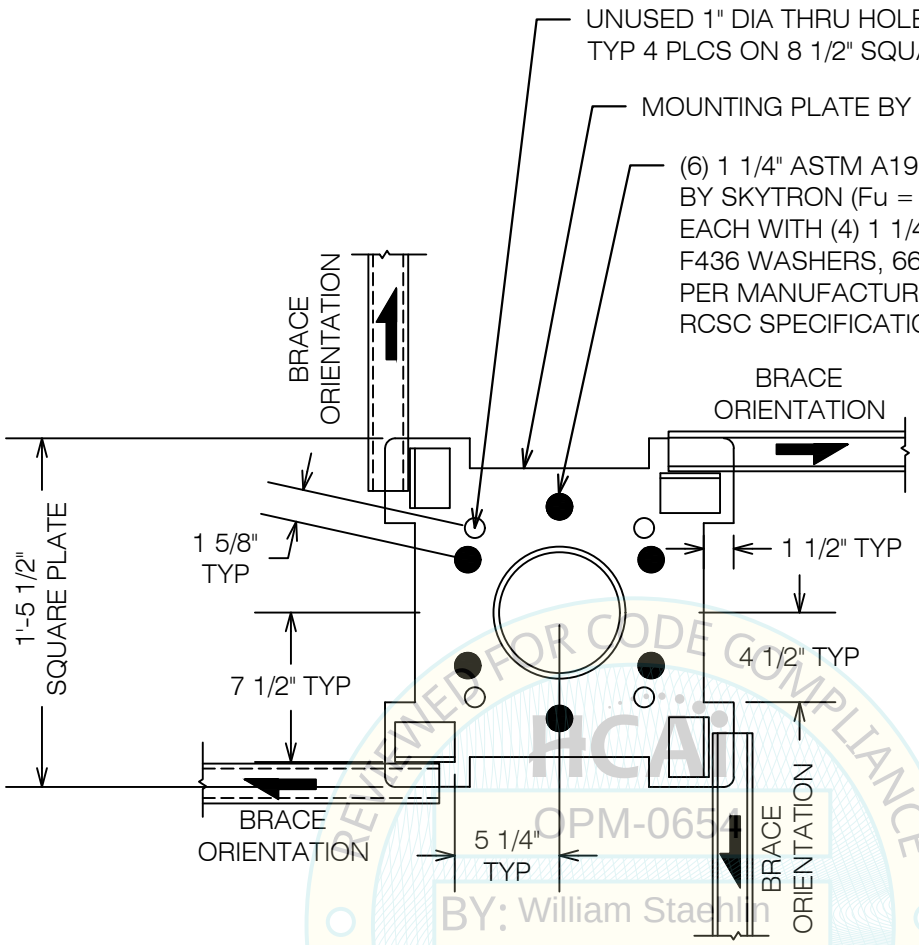
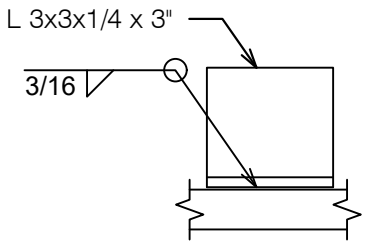
SCALE N.T.S.	**PAGE** TOP PLATE



MOUNTING PLATE PLAN



BRACE CONNECTION ANGLE (4 REQUIRED)

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

OPM-0654 SKYTRON FREEDOM SERIES MOUNTING PLATE DETAILS

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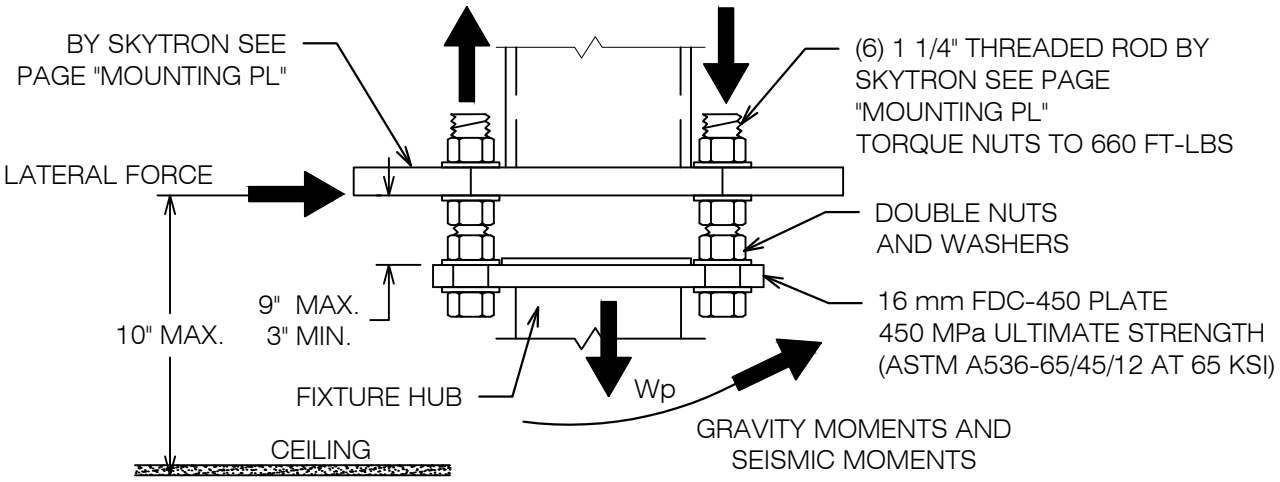

Model Number[5]	Weight at 1g (lbs.)	Seismic Design Forces at Ultimate Loads				
		Vertical Force (lbs.)	Lateral force (lbs.)	Mx (ft.-lbs.)	My (ft.-lbs.)	Mz (ft.-lbs.)
F130 SERIES	761	1,293	2,282	693	589	1,039
F200 SERIES	1050	1,785	3,150	761	766	1,352
F222 SERIES	1050	1,785	3,150	780	766	1,352
F350 SERIES	1454	2,473	4,363	1,159	1,221	2,155
F440 SERIES	1442	2,452	4,326	1,068	1,142	2,015
DESIGN CASE	**1500**	**2,500**	**4,500**	**1,250**	**1,250**	**2,200**

1. WEIGHTS AND MOMENTS ARE FACTORED LOADS USING STRENGTH DESIGN AND INCLUDE THE FOLLOWING FACTORS: DL = 1.2, FpV = 0.5 AND FpH = 3.0. MAXIMUM LOADING AFFECT IS USED FOR DESIGN.
2. Mz ARE MOMENTS ABOUT THE VERTICAL AXIS DUE TO VERTICAL SEISMIC ACCELERATION TIMES THE HORIZONTAL ECCENTRICITY.
3. Mx ARE MOMENTS ABOUT THE HORIZONTAL AXIS DUE TO HORIZONTAL SEISMIC ACCELERATION TIMES THE VERTICAL ECCENTRICITY.
4. My ARE MOMENTS ABOUT THE HORIZONTAL AXIS DUE TO VERTICAL SEISMIC ACCELERATION TIMES THE HORIZONTAL ECCENTRICITY.
5. THE MODELS LISTED ARE THE MAXIMUM OF EACH SERIES, SEE PAGE "ANCHOR FORCES" FOR ALL MODELS IN THIS OPM

OPM-0654 SKYTRON FREEDOM SERIES FORCES AND MOMENTS

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EQUIPMENT ATTACHMENT DATA AND ANCHORAGE FORCES [3]							
	Bolt Diameter at Mounting Plate [4]	Install Torque (ft-lbs)	All Concrete Anchorage [1]	Top Plate Max. [2]		Brace Anchoraqge [2]	
Model Series				Tension (lbs)	Shear (lbs)	Tension (lbs)	Shear (lbs)
F110 Low duty single	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F120 Low duty double	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F130 Low duty triple	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F10L Stackrotation unit Low Duty	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F20H Stackrotation unit Heavy Duty	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F200 Single Q1	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F212 Twin TL+Q1	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F221 Twin Q1+TL	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F222 Twin Q1+Q1	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F310 Heavy duty single	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F320 Heavy duty + Single Low duty	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F330 Heavy duty + Double Low duty	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F340 Heavy duty + Heavy tandem	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F350 Heavy duty+Heavy tandem+Low duty	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F410 Heavy duty double	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F420 Heavy duty double + Low duty	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771
F440 Heavy duty double + Heavy tandem	1-1/4"	660	Hilti KB TZ2 5/8"	2728	1442	1661	1771

1. SEE PAGE "GEN NOTE" GENERAL NOTE 7 HILTI KWIK BOLT TZ2 WITH 4" EFFECTIVE EMBEDMENT AND 40 FT-LBS INSTALLATION TORQUE PER ESR-4266.
2. INCLUDES AN OVERSTRENGTH FACTOR OF $\Omega_0 = 2.0$.
3. FORCES SHOWN ARE FOR EACH ANCHOR.
4. SEE PAGE "MOUNTING PL" FOR BOLT INFORMATION.

OPM-0654 SKYTRON FREEDOM SERIES WITH STELLAR XL SURGICAL LIGHTS EQUIPMENT MOUNTING AND ANCHOR FORCES

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