



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

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

OFFICE USE ONLY

APPLICATION #: OPM-0533-19

OSHPD Preapproval of Manufacturer's Certification (OPM)

Type: ☐ New ☐ Renewal ☒ Update to Pre-CBC 2013 OPA Number: 2116-07

Manufacturer Information

Manufacturer: Thermo Fisher Scientific

Manufacturer's Technical Representative: Jan Öst

Mailing Address: Ratastie 2 | 01620 Vantaa | Finland

Telephone: +358 9 3291 0717

Email: jan.ost@thermofisher.com

Product Information

Product Name: TCAutomation™

Product Type: Laboratory automation system Ost

Product Model Number: Various Modules

General Description: TCAutomation is a modular system meant for automating the sample handling process in laboratories.

Modules automate specific pre- or post-analytical sample handling processes or connect different analyzers and other devices to the automation system. Modules can be combined as desired to obtain required degree of automation and throughput.

Applicant Information

Applicant Company Name: Thermo Fisher Scientific

Contact Person: Jan Öst

Mailing Address: Ratastie 2 | 01620 Vantaa | Finland

Telephone: +358 9 3291 0717

Email: jan.ost@thermofisher.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2019.

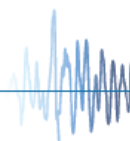
Signature of Applicant:

Date: 12.4.2019

Title: Sr. Program Manager,
Automation

Company Name: Thermo Fisher Scientific

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





OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

Registered Design Professional Preparing Engineering Recommendations

Company Name: CYS Structural Engineers, Inc.

Name: Dieter T. Siebald

California License Number: S4346

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

Telephone: 916-920-2020

Email: dieters@cyseng.com

OSHPD Special Seismic Certification Preapproval (OSP)

- ☐ Special Seismic Certification is preapproved under OSP-
(Separate application for OSP is required)
- ☐ Special Seismic Certification is not preapproved

Certification Method(s)

- ☐ Testing in accordance with: ☐ ICC-ES AC156 ☐ FM 1950-16
- ☐ Other* (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): _____

List of Attachments Supporting the Manufacturer's Certification

- ☐ Test Report ☒ Drawings ☒ Calculations ☐ Manufacturer's Catalog
- ☐ Other(s) (Please Specify): _____

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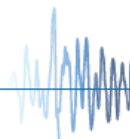
Signature: Haeseong Lim Date: May 22, 2020

Print Name: Haeseong Lim

Title: Senior Structural Engineer

Condition of Approval (if applicable): _____

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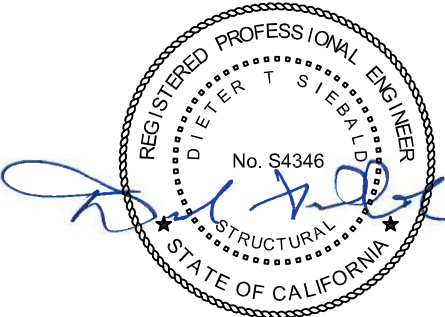
NOTES:

1. THESE DRAWINGS ARE PREPARED FOR THERMO FISHER SCIENTIFIC, VANTAA, FINLAND.
2. THE CONTRACTOR & INSPECTOR OF RECORD SHALL OBTAIN A COPY OF THIS PRE-APPROVAL FROM THE OFFICE OF STATEWIDE HEALTH PLANNING & DEVELOPMENT (OSHDP) PRE-APPROVAL PROGRAMS WEBSITE.
3. THIS PRE-APPROVAL COVERS THE SUPPORTS & ATTACHMENTS OF THE EQUIPMENT TO THE SUPPORTING STRUCTURE. THE EQUIPMENT, SUPPORT BRACKETS & ATTACHMENT HARDWARE ARE SUPPLIED BY THE MANUFACTURER. THE EXPANSION ANCHORS, THRU-BOLTS & STRUT PLATES SHOWN IN THIS OPM SHALL BE SUPPLIED & INSTALLED BY THE CONTRACTOR.

FRAME TYPE	PRODUCT NAME	PRODUCT NUMBER	FRAME TYPE	PRODUCT NAME	PRODUCT NUMBER
A-1	RACK ENTRY	952018	F	PARALLEL BYPASS FOR KONELAB PRIME 60	952133
	RACK EXIT	952019		PARALLEL BYPASS FOR ADVIA CENTAUR XP	952246
	COMBINED RACK ENTRY AND EXIT	952020		PARALLEL BYPASS FOR VITROS 5.1 FS AT	952131
	ES FLEX	952202		PARALLEL BYPASS FOR BECKMAN UniCel DxI800	952135
	ROBOTIC INTERFACE MODULE FOR SYMEX HST	952054		PARALLEL BYPASS FOR OLYMPUS AU680 DTS	952241
A-2	ROBOTIC INTERFACE MODULE FOR MODULAR	952053		PARALLEL BYPASS FOR TOSOH AIA-1800/2000 LA	952242
	TCA 400 INTERFACE FOR COBAS 8000	952232		PARALLEL BYPASS FOR TOSOH G8	952296
	TCA 800 INTERFACE FOR COBAS 8000	952233		PARALLEL BYPASS FOR IL ACL TOP 700/750 LAS	952245
	TCA INTERFACE FOR COBAS CONNECTION MODULE CCM	952309		PARALLEL BYPASS FOR DIASORIN LIAISON XL	952278
	CRA INTERFACE	952326		PARALLEL BYPASS FOR BioMajesty JCA-BM6010/C	952308
A-3	CENTRIFUGE MODULE WITH CENTRIFUGE ON TROLLEY	952040 & 952229	G	ROBOTIC INTERFACE FOR STAGO STA-R	952055
B	ALIQUOTER WITH LABELLER	952050	H	CONVEYOR 600MM (H1)	952021
C	ENTRY	952015		CONVEYOR 900MM (H1)	952030
	EXIT	952016		CONVEYOR 1200MM (H1)	952022
	BUFFER	952013		CONVEYOR 1500MM (H1)	952023
C-2	BULK INTERFACE MODULE	952341		CONVEYOR 1800MM (H1)	952024
D-1	DECAPPER FLEX	952039		CONVEYOR 2100MM (H1)	952031
D-2	RECAPPER 110 VAC 60HZ	952136		CONVEYOR 2400MM (H1)	952025
	RECAPPER 230 VAC 50HZ	952036		U-TURN (H2)	952226
	RECAPPER 230 VAC 60HZ	952336		L-TURN (H3)	952027
E	PERPENDICULAR BYPASS FOR ADVIA 1650/1800/2400	952091		INTERNAL U-TURN (H4)	952046
	PERPENDICULAR BYPASS FOR KONELAB PRIME 60	952132		T-TURN (H5)	952244
	PERPENDICULAR BYPASS FOR VITROS 5.1 FS AT	952043		Z-TURN, LEFT (H6)	952049
	PERPENDICULAR BYPASS FOR TCA COLD STORAGE LOADER	952292		Z-TURN, RIGHT (H6)	952048
	PARALLEL BYPASS FOR ADVIA CENTAUR CLASSIC	952089	I	ARCHITECT i2000SR INTERFACE	952234
F	PARALLEL BYPASS FOR ADVIA 1650/1800/2400	952090		ARCHITECT c8000 INTERFACE	952235
	PARALLEL BYPASS FOR ABBOTT ARCHITECT i2000	952092		PHADIA IMMUNOCAP 1000 INTERFACE	952243
	PARALLEL BYPASS FOR SMS/IMMULITE 2000/2500	952093			

NOTE:

NOT ALL PRODUCTS LISTED ABOVE ARE SHOWN IN THE SYSTEM CONFIGURATION LAYOUT EXAMPLES ON PAGES 4-10



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							By: DTS
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2495 NATOMAS PARK DRIVE, SUITE 650
SACRAMENTO, CA 95833

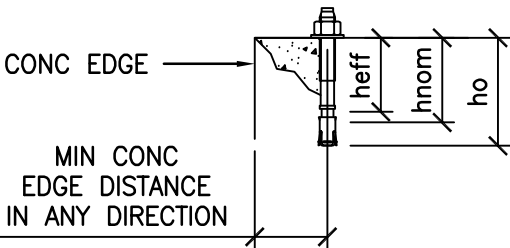
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GENERAL NOTES:

1. THIS OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION (OPM) IS BASED ON THE CBC 2019. THE DEMAND (DESIGN FORCES) FOR USE W/ THIS OPM SHALL BE BASED ON THE CBC 2019.
2. IT IS THE RESPONSIBILITY OF THE SEOR FOR A SITE SPECIFIC PROJECT TO VERIFY:
- A. THE ADEQUACY OF THE NEW OR EXISTING STRUCTURE TO RESIST THE FORCES & WT SPECIFIED FOR EA EQUIP IN ADDITION TO ALL OTHER LOADS. PROVIDE & DESIGN SUPPLEMENTARY MEMBERS AS REQ.
 - B. THAT THE FLR ANCHORS ARE LOCATED AT AN ADEQUATE DISTANCE FROM ANY SLAB EDGES OR OPGS.
 - C. THAT THE FLR ANCHORS ARE LOCATED AT AN ADEQUATE DISTANCE FROM ANY NEW OR EXISTING ANCHORS. THE SPCG SHOWN IN THE TEST TORQUE TABLE BLW IS THE REQ MIN SPCG OF THE GIVEN DIA ANCHORS. THE REQ SPCG FROM ANCHORS OF OTHER DIAMETERS & EMBEDMENTS MAY VARY & SHALL BE EVALUATED BY THE SEOR.
 - D. THAT THE INSTALLATION IS IN CONFORMANCE W/ THE CBC 2019 & W/ THE DETAILS SHOWN IN THIS PRE-APPROVAL.
 - E. THAT THE ACTUAL EQUIP'S WT, CENTER OF GRAVITY (CG) LOCATION, ANCHOR LOCATIONS, ANCHOR DETAILS, & THE MATERIAL & GAGE OF THE EQUIP WHERE ATTACHMENTS ARE MADE, AGREE W/ THE INFO SHOWN ON THE PRE-APPROVAL DOCUMENTS.
 - F. THAT THE PROJECT SPECIFIC VALUES OF S_{DS} & z/h RESULT IN SEISMIC FORCES THAT DO NOT EXCEED THE VALUES IN THE DESIGN CRITERIA.
3. EXPANSION ANCHORS INSTALLED IN NWC OR SLWC SHALL BE CARBON STL HILTI KB-TZ EXPANSION ANCHORS AS NOTED COMPLYING W/ ESR-1917 REVISED MARCH 2019.
- A. INSTALLATION: INSTALL THE EXPANSION ANCHORS IN ACCORDANCE W/ THE REQUIREMENTS GIVEN IN THE ICC EVALUATION REPORT FOR THE SPECIFIC ANCHOR & THE PARAMETERS GIVEN IN THE TABLE BLW.
 - B. JOB TESTING: FOR VERIFYING SATISFACTORY INSTALLATION WORKMANSHIP, PERFORM JOBSITE TESTING IN ACCORDANCE W/ THE TEST LOAD TABLE PROVIDED IN THIS DOCUMENT. TORQUE TEST 50% OF THE INSTALLED ANCHORS. ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE SPECIAL INSPECTOR & REPORT OF TEST RESULTS SHALL BE SUBMITTED TO OSHPD. IF ANY ANCHOR FAILS THE TEST, TEST ALL ANCHORS. THE TEST SHALL BE PERFORMED 24 HOURS OR MORE AFTER INSTALLATION. TESTING MAY BE DONE PRIOR TO EQUIP INSTALLATION, HOWEVER NUT SHALL BE RETORQUED TO INSTALLATION TORQUE AFTER EQUIP INSTALL. ALSO REFER TO CBC 1910A.5 "TESTS FOR POST-INSTALLED ANCHORS IN CONCRETE". REPORT OF TEST RESULTS SHALL BE SUBMITTED TO OSHPD. TESTING SHALL BE PERFORMED BY AN APPROVED TESTING AGENCY EMPLOYED BY THE FACILITY OWNER. TEST REPORTS SHALL BE SUBMITTED TO THE IOR, OWNER & THE ARCHITECT OR ENGINEER IN RESPONSIBLE CHARGE. (CAC 7-149)
 - C. FAILURE/ACCEPTANCE CRITERIA: THE FOLLOWING CRITERIA APPLY FOR THE ACCEPTANCE OF INSTALLED ANCHORS:
 - TORQUE WRENCH METHOD: THE APPLICABLE TEST TORQUE MUST BE REACHED WITHIN THE FOLLOWING LIMITS:
WEDGE TYPE: ONE-HALF ($\frac{1}{2}$) TURN OF THE NUT.
 - D. AVOID DAMAGING (E) STL REINF IN CONC SLAB WHEN INSTALLING CONC EXPANSION ANCHORS.
 - E. PROVIDE FOR FULL THRD ENGAGEMENT OF NUT & WASHER.
 - F. EXPANSION ANCHOR TABLE

CONDITION OF ANCHORAGE	ANCHOR DIA & TYPE (INCH)	INSTALLATION EMBED (INCH) h_{nom}	EFFECTIVE EMBED (INCH) h_{ef}	HOLE DEPTH (INCH) h_o	MIN CONC THK (INCH) h	MIN CONC EDGE DISTANCE (INCH)	MIN ANCHOR SPCG (INCH)	TEST TORQUE (FT-LBS)
CASE 1 STRUT R'S	$\frac{3}{8}$ KB-TZ	$1\frac{3}{16}$	$1\frac{1}{2}$	2	$\frac{3}{4}$	6	3	25
CASE 2, 3	$\frac{1}{2}$ KB-TZ	$2\frac{3}{8}$	2	$2\frac{5}{8}$	$\frac{3}{4}$, 4	10	3	40

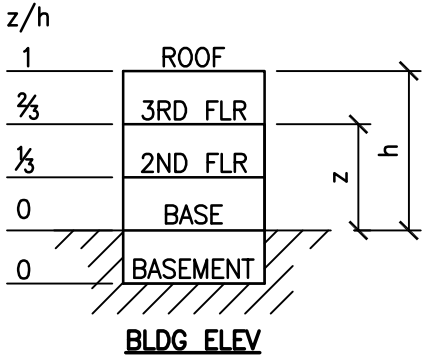


4. THREE (3) CASES OF ATTACHMENT ARE SPECIFIED & PRESENTED IN THIS PRE-APPROVAL:

CASE 1: ATTACHMENT DETAILS LOCATED AT UPPER FLRS ABV THE BASE OF A BLDG. THE FLRS ARE ASSUMED TO BE BUILT OF A MIN $\frac{3}{4}$ " SLWC TOPPING OVER 3" DEEP MIN 20 GA MTL DECK ($f'_c = 3000$ PSI, MIN). ANCHORS SHALL BE ASTM A36 STL THRD ROD THRU CONC FILL & MTL DECK.

CASE 2: ATTACHMENT DETAILS LOCATED AT UPPER FLRS ABV THE BASE OF A BLDG. THE FLRS ARE ASSUMED TO BE BUILT OF A MIN $\frac{3}{4}$ " SLWC TOPPING OVER 3" DEEP MIN 20 GA MTL DECK ($f'_c = 3000$ PSI, MIN). ANCHORS SHALL BE CARBON STL & INTO CONC FILL.

CASE 3: ATTACHMENT DETAILS LOCATED AT OR BLW THE BASE OF A BLDG. THE FLRS ARE ASSUMED TO BE BUILT OF A MIN 4" NWC SLAB ($f'_c = 3000$ PSI, MIN). ANCHORS SHALL BE CARBON STL.



5. BOLTS THRU CONC FILL OVER MTL DECK:
- A. THRU-BOLTS SHALL BE TORQUED BY $\frac{3}{4}$ TURN OF THE NUT AFTER SNUG TIGHT CONDITION IS ACHIEVED, UNO. THE SNUG TIGHT CONDITION IS DEFINED AS THE TIGHTNESS REQ TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
 - B. THRU-BOLT HOLES SHALL BE $\frac{1}{16}$ " LARGER THAN BOLT SIZE (HOLE SIZE = BOLT SIZE + $\frac{1}{16}$ ").
 - C. THRU-BOLTS IN CONC SHALL RECEIVE SPECIAL INSPECTION & TESTING IN ACCORDANCE W/ REQUIREMENTS FOR POST-INSTALLED ANCHORS. THRU-BOLTS W/ STL TO STL CONN IN TENSION DO NOT REQUIRE TESTING.
6. AN ADDNL WT OF 124# DUE TO ANY FRAME "H" ATTACHED AT EA SIDE OF ANY FRAME "A" TO "G" SHALL BE ADDED TO THE OP WT SHOWN ON FRAME ELEVS "A" TO "G".
7. DUE TO NUMEROUS SYSTEM CONFIGURATIONS, MOST TYP CONFIGURATIONS SHOWN ON THE FOLLOWING PAGES, THERMO FISHER SHALL SUBMIT THE SYSTEM CONFIGURATIONS FOR EA SITE SPECIFIC PROJECT TO THE SEOR & INSPECTOR OF RECORD. ANY FRAME TYPE, FRAME TYPE MODULE OR EQUIP THAT IS NOT LISTED OR SHOWN IN THIS PRE-APPROVAL SHALL NOT BE ALLOWED AS PART OF THIS PRE-APPROVAL.
8. ALL EQUIP COMPONENTS SHOWN IN THIS OPM HAVE THEIR SEISMIC SUPPORTS & ATTACHMENTS DESIGNED AS INDIVIDUAL MODULES. IF A COMPONENT IS SHOWN WITH GRAY LINES, IT IS NOT PART OF THIS OPM AND SEISMIC ANCHORAGE MAY REQUIRE TO BE DESIGNED BY OTHERS. NOTE THAT CONNECTING COMPONENTS SHOWN IN THIS OPM SHALL NOT BE USED AS SUPPORT FOR THE COMPONENTS THAT ARE NOT PART OF THIS OPM.



SHEET TITLE: GENERAL NOTES

ThermoFisher
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TCAutomation SYSTEM



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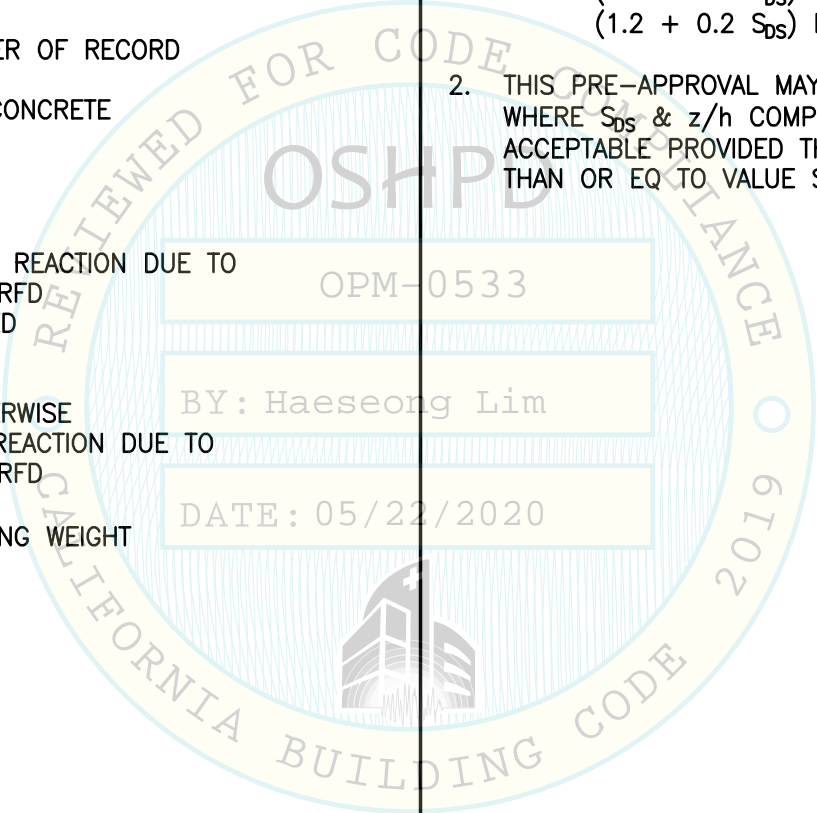
ABBREVIATIONS:

⊙	AT
AB	ANCHOR BOLT
ABV	ABOVE
ADJ	ADJACENT
AISC	AMERICAN INSTITUTE FOR STEEL CONSTRUCTION
ALT	ALTERNATE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
BLDG	BUILDING
BLW	BELOW
BOTT	BOTTOM
BYD	BEYOND
CBC	CALIFORNIA BUILDING CODE
CG	CENTER OF GRAVITY
Ⓢ	CENTERLINE
CONC	CONCRETE
CONN	CONNECTION
COORD	COORDINATE
DBL	DOUBLE
DIM	DIMENSION
DTL	DETAIL
DIA (⌀)	DIAMETER
(E)	EXISTING CONDITION
EA	EACH
EE	EACH END
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
EXTR	EXTERIOR
f'c	MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE
FLR	FLOOR
FT (')	FOOT/FEET
Fp	HORIZONTAL SEISMIC FORCE PER ASCE 7-16 SEISMIC FORCE REQUIREMENTS
Fv	VERTICAL SEISMIC FORCE PER ASCE 7-16 SEISMIC FORCE REQUIREMENTS
Fy	SPECIFIED YIELD STRENGTH OF REINFORCING, PS OF STEEL, KSI
GA	GAUGE
HSS	HOLLOW STRUCTURAL SECTION
ICC	INTERNATIONAL CODE COUNCIL
IN (")	INCH
INFO	INFORMATION
KG	KILOGRAM
KSI	KIPS PER SQUARE INCH
LBS	POUNDS
LRFD	LOAD AND RESISTANCE FACTOR DESIGN

MFR	MANUFACTURER
MAX	MAXIMUM
MIN	MINIMUM
mm	MILLIMETER
MTL	METAL
NO. (#)	NUMBER OR POUNDS
NWC	NORMAL WEIGHT CONCRETE
OP	OPERATING
OPG	OPENING
OPM	OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATION
OSHPD	OFFICE OF STATEWIDE HEALTH PLANNING & DEVELOPMENT
PERP	PERPENDICULAR
PG	PAGE
Ⓢ	PLATE
PSI	POUNDS PER SQUARE INCH
REINF	REINFORCING/REINFORCEMENT
REQ	REQUIRED
SEOR	STRUCTURAL ENGINEER OF RECORD
SIM	SIMILAR
SLWC	SAND-LIGHTWEIGHT CONCRETE
SPCG	SPACING
SS	STAINLESS STEEL
STL	STEEL
THK	THICK/THICKNESS
Tu	ANCHORAGE TENSION REACTION DUE TO SEISMIC FORCE AT LRFD
THRD	THREAD OR THREADED
T&B	TOP & BOTTOM
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
Vu	ANCHORAGE SHEAR REACTION DUE TO SEISMIC FORCE AT LRFD
W/	WITH
Wp	COMPONENT OPERATING WEIGHT
WT	WEIGHT

DESIGN CRITERIA:

1. SUPPORT & ATTACHMENT DESIGN IS PER 2019 CBC AT LRFD LEVEL FORCES.
- OTHER MECHANICAL OR ELECTRICAL COMPONENTS PER TABLE 13.6-1 OF ASCE 7-16:
- $a_p = 1.0$ $R_p = 1.5$ $I_p = 1.5$ $\Omega_0 = 1.5$ (FOR CONC ANCHORS ONLY)
- W_p AS NOTED ON DRAWINGS INCLUDING NOTE 6 ON PG 2
- UPPER FLRS ABV THE BASE OF BLDG
- CASE 1: $S_{DS} \leq 1.50$ $F_p = 1.20 W_p$ $z/h \leq 0.50$
- CASE 2: $S_{DS} < 0.70$ $F_p = 0.56 W_p$ $z/h \leq 0.50$
- FLRS AT OR BLW THE BASE OF BLDG
- CASE 3: $S_{DS} \leq 2.0$ $F_p = 0.90 W_p$ $z/h = 0$
- LOAD COMBINATIONS
- ($0.9 - 0.2 S_{DS}$) D - $\Omega_0 F_p$ (FOR MAX TENSION)
- ($1.2 + 0.2 S_{DS}$) D + $\Omega_0 F_p$ (FOR MAX COMPRESSION)
2. THIS PRE-APPROVAL MAY BE USED ONLY AT GEOGRAPHICAL LOCATIONS IN THE STATE OF CALIFORNIA WHERE S_{DS} & z/h COMPLY W/ VALUES SHOWN ABOVE. OTHER COMBINATIONS OF S_{DS} & z/h ARE ACCEPTABLE PROVIDED THAT SEOR DEMONSTRATES THAT THE CORRESPONDING F_p VALUE IS LESS THAN OR EQ TO VALUE SHOWN ABV.



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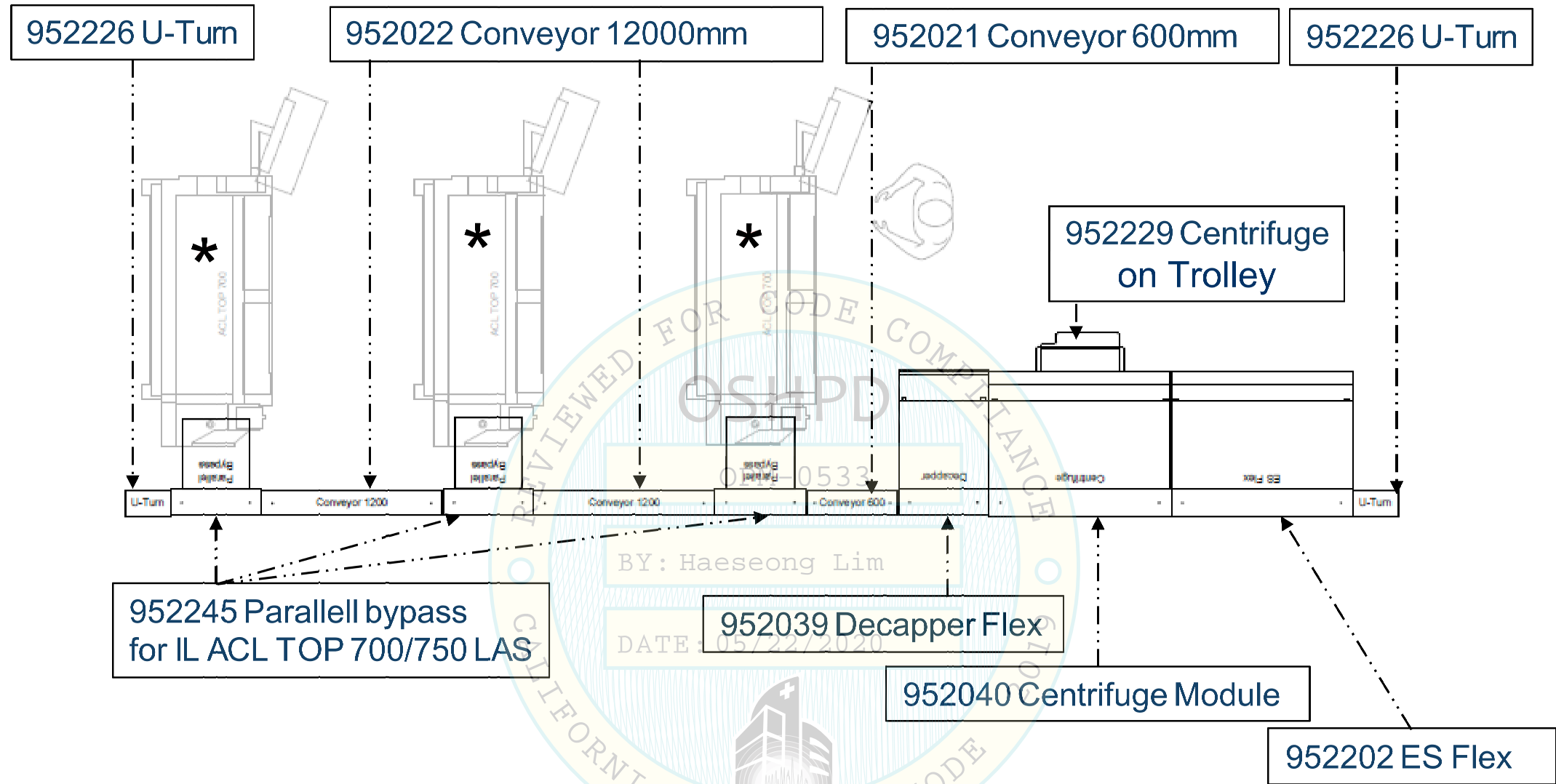
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Layout example 1



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SHEET TITLE: SYSTEM CONFIGURATION LAYOUT EXAMPLES				Rev	Description	Date	Job No: 18149
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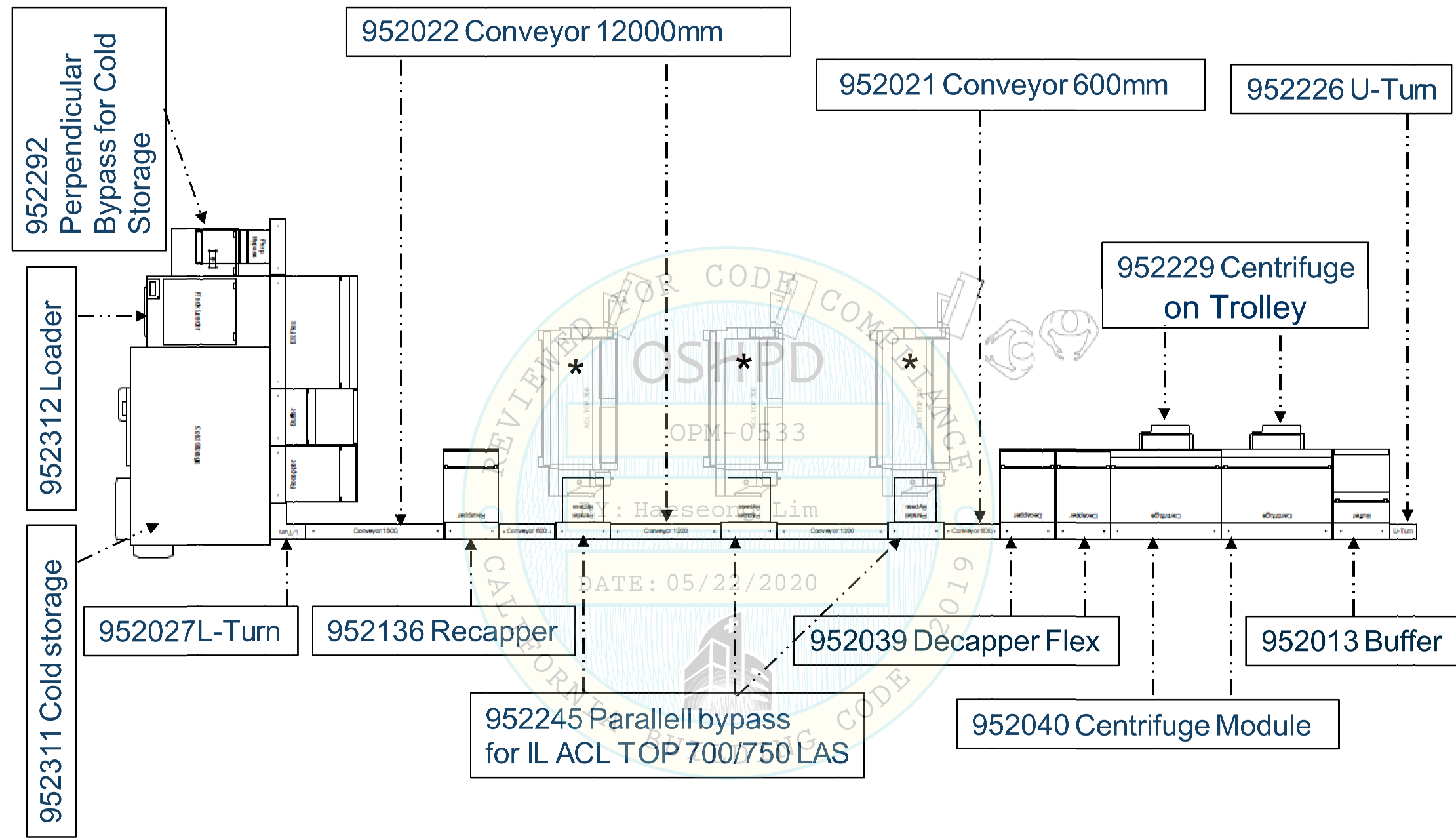
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Layout example 2

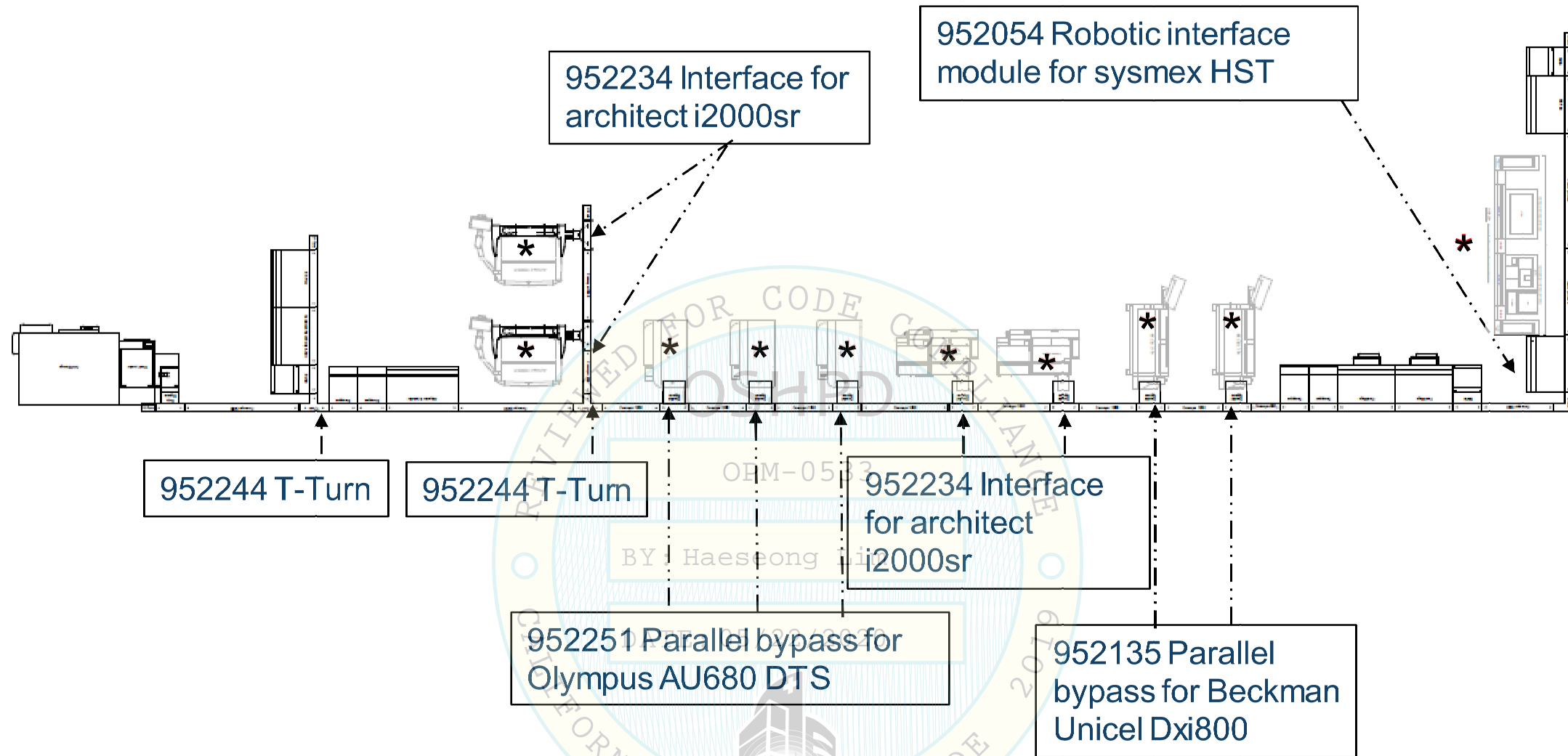


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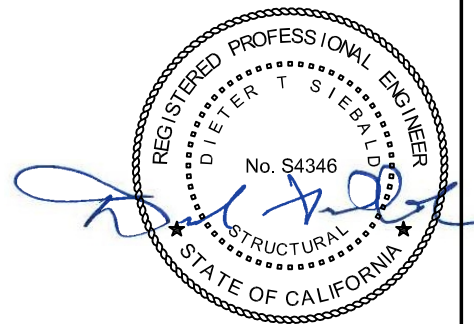


SHEET TITLE: SYSTEM CONFIGURATION LAYOUT EXAMPLES				Rev	Description	Date	Job No: 18149
 <div>TCAutomation SYSTEM</div>				 <div>CYS STRUCTURAL ENGINEERS, INC. 2495 NATOMAS PARK DRIVE, SUITE 650 SACRAMENTO, CA 95833 TEL (916) 920-2020 www.cyseng.com</div>			Date: 5/21/2020
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Layout example 3



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SHEET TITLE: SYSTEM CONFIGURATION LAYOUT EXAMPLES

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SCIENTIFIC

TCAutomation SYSTEM



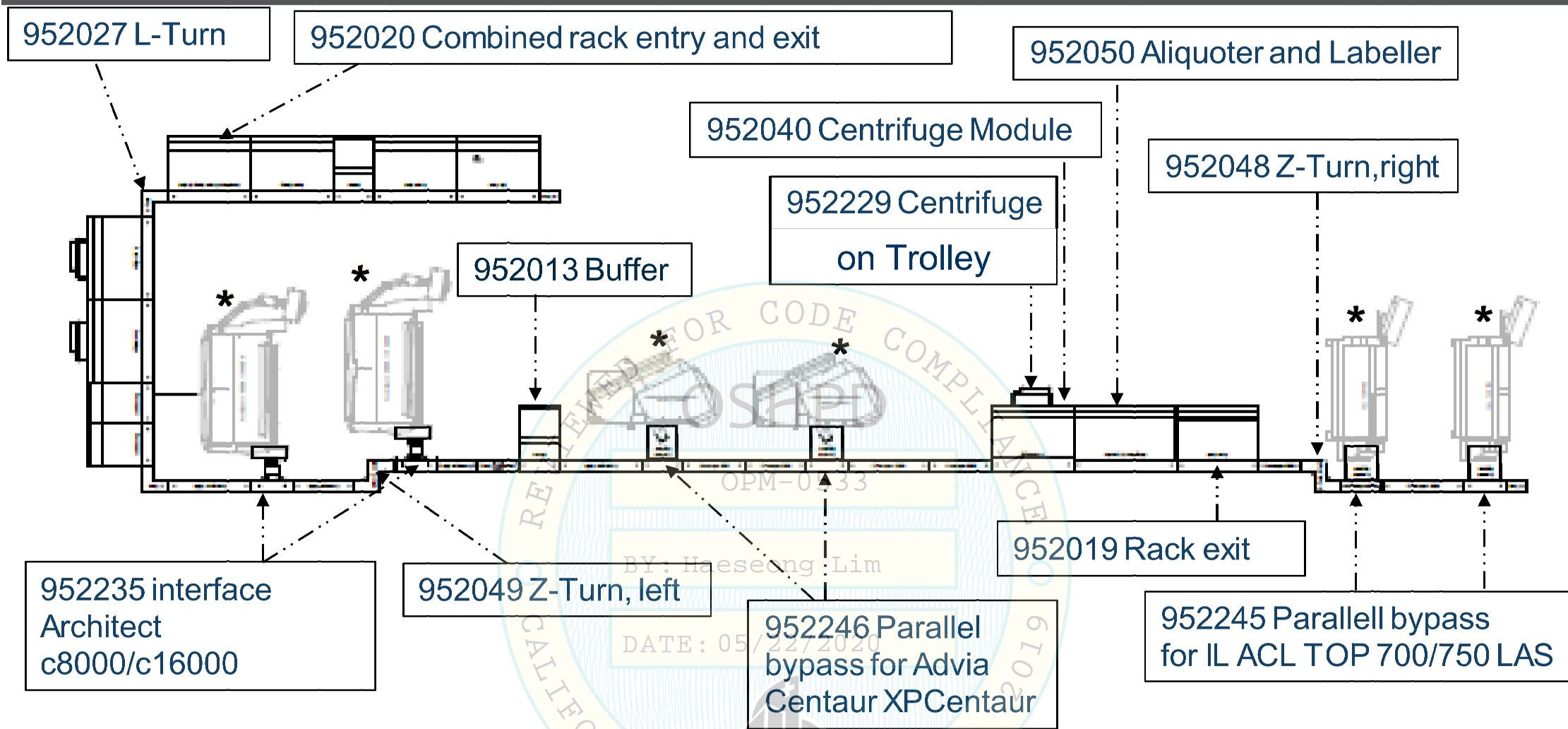
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Layout example 4



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SHEET TITLE: SYSTEM CONFIGURATION LAYOUT EXAMPLES



TCAutomation SYSTEM



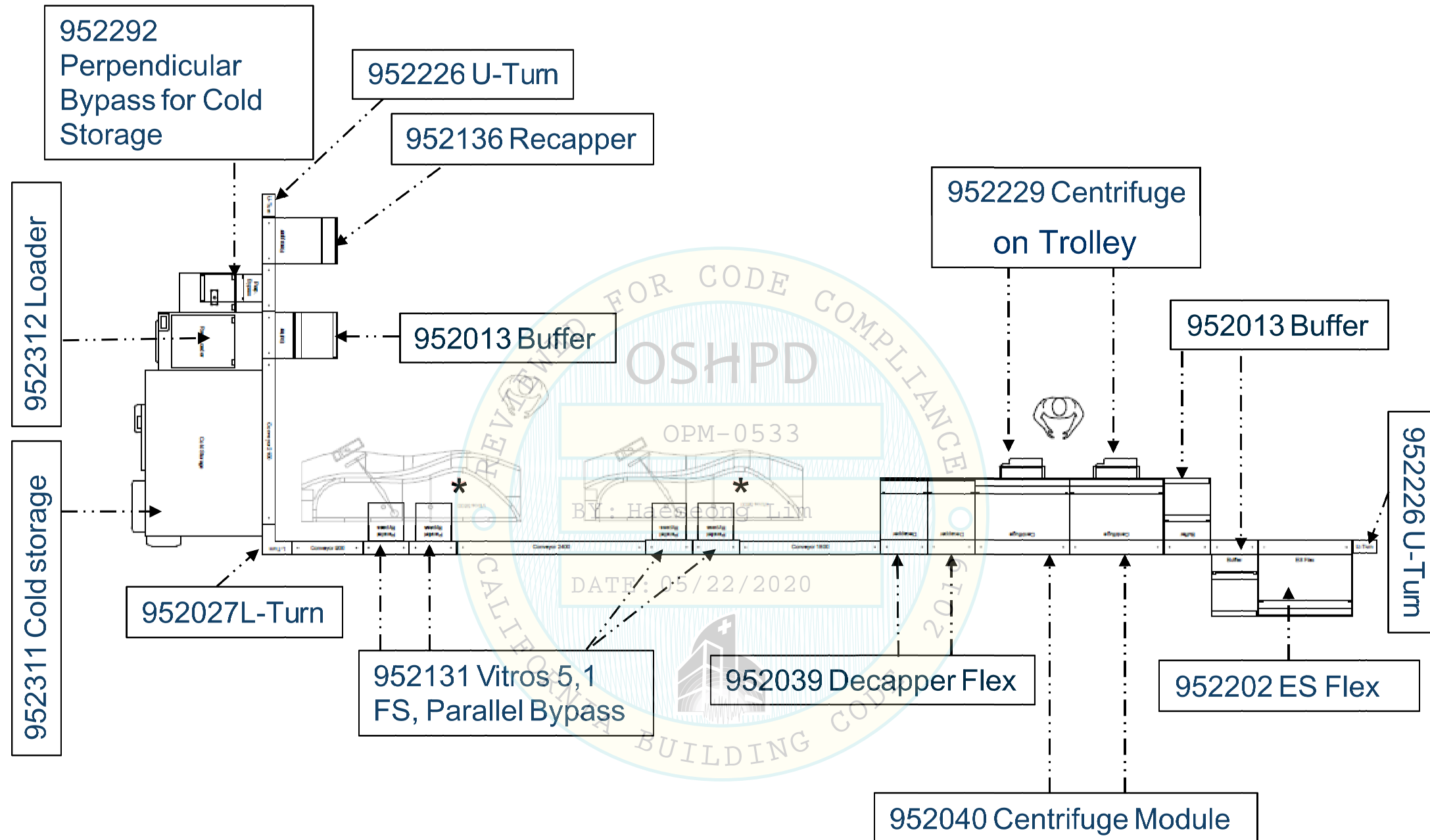
CYS STRUCTURAL ENGINEERS, INC.

2495 NATOMAS PARK DRIVE, SUITE 650
SACRAMENTO, CA 95833

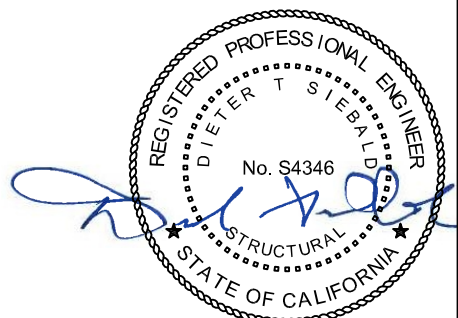
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			Date:	5/21/2020
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			Page:	7 of 39

Layout example 5



* ALL UNITS SHOWN W/ AN ASTERISK ARE NOT PART OF THIS THERMOFISHER OFFERING & NOT A PART OF THIS OPM



SHEET TITLE: SYSTEM CONFIGURATION LAYOUT EXAMPLES				Rev	Description	Date	Job No: 18149
<div><div>ThermoFisher</div><div>SCIENTIFIC</div></div> <div>TCAutomation SYSTEM</div>							Date: 5/21/2020
							By: DTS
							Page: 8 of 39

CYS STRUCTURAL ENGINEERS, INC.

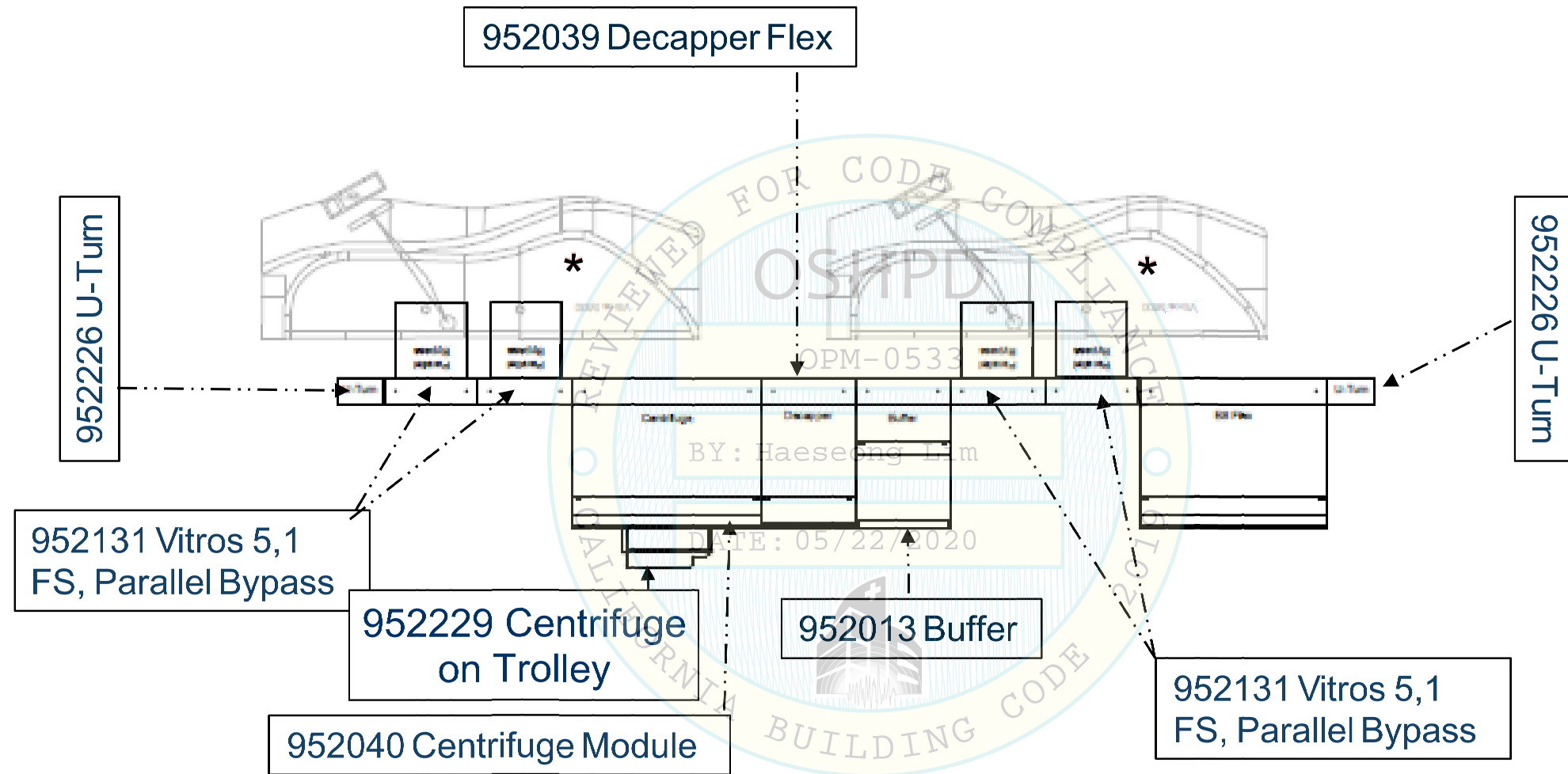
2495 NATOMAS PARK DRIVE, SUITE 650

SACRAMENTO, CA 95833

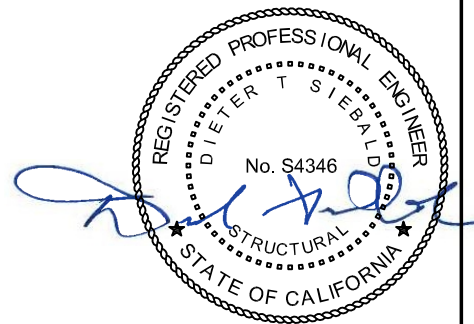
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Layout example 6



* ALL UNITS SHOWN W/ AN ASTERISK ARE NOT PART OF THIS THERMOFISHER OFFERING & NOT A PART OF THIS OPM



SHEET TITLE: SYSTEM CONFIGURATION LAYOUT EXAMPLES

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



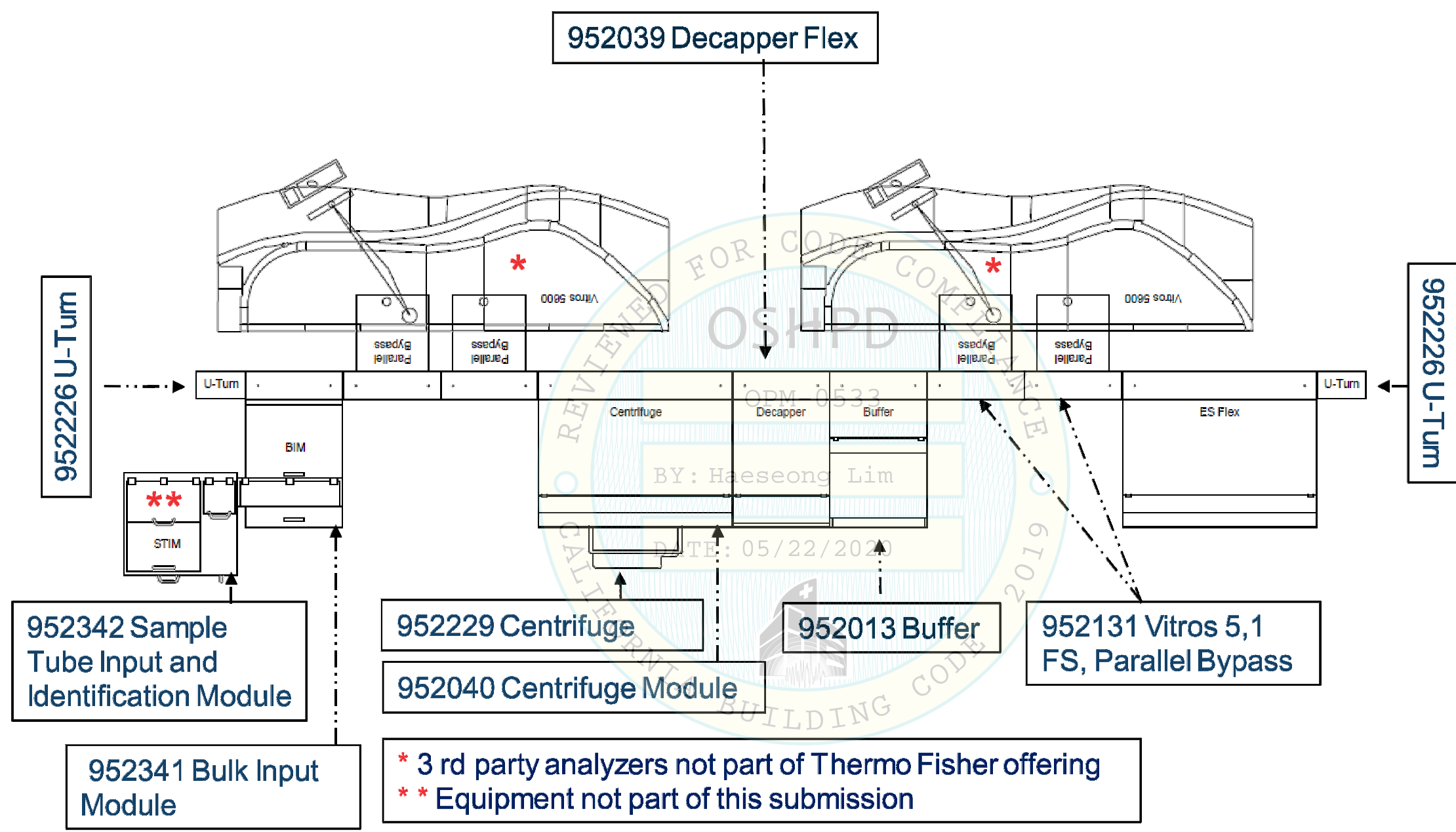
CYS STRUCTURAL ENGINEERS, INC.

2495 NATOMAS PARK DRIVE, SUITE 650
SACRAMENTO, CA 95833

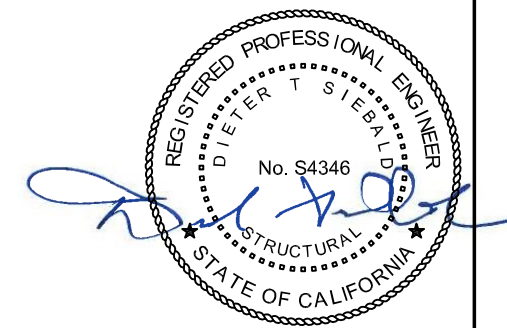
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			Date:	5/21/2020
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			Page:	9 of 39

Layout example



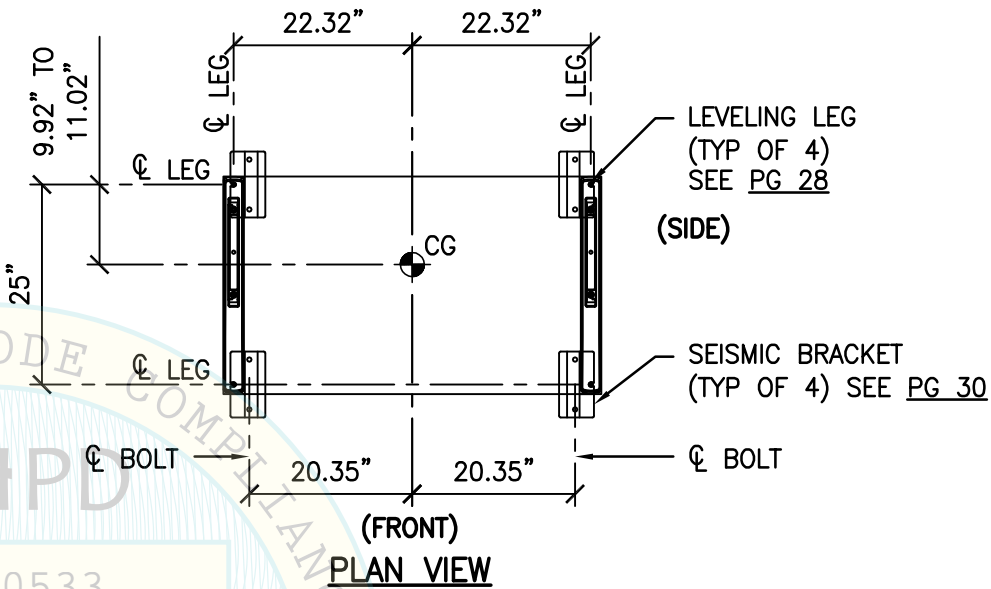
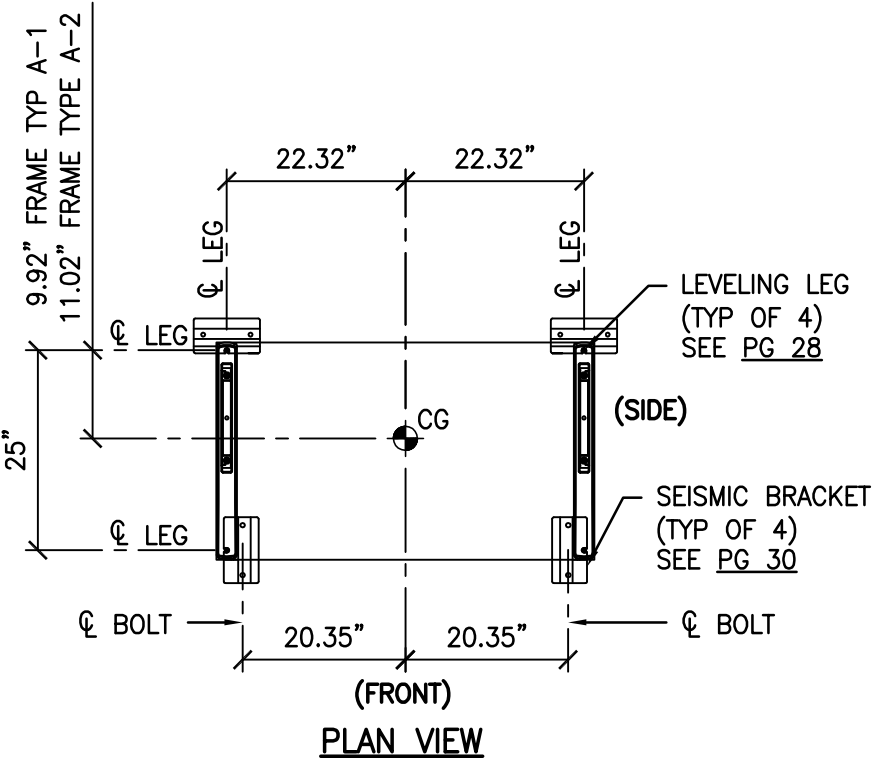
* ALL UNITS SHOWN W/ AN ASTERISK ARE NOT PART OF THIS THERMOFISHER OFFERING & NOT A PART OF THIS OPM



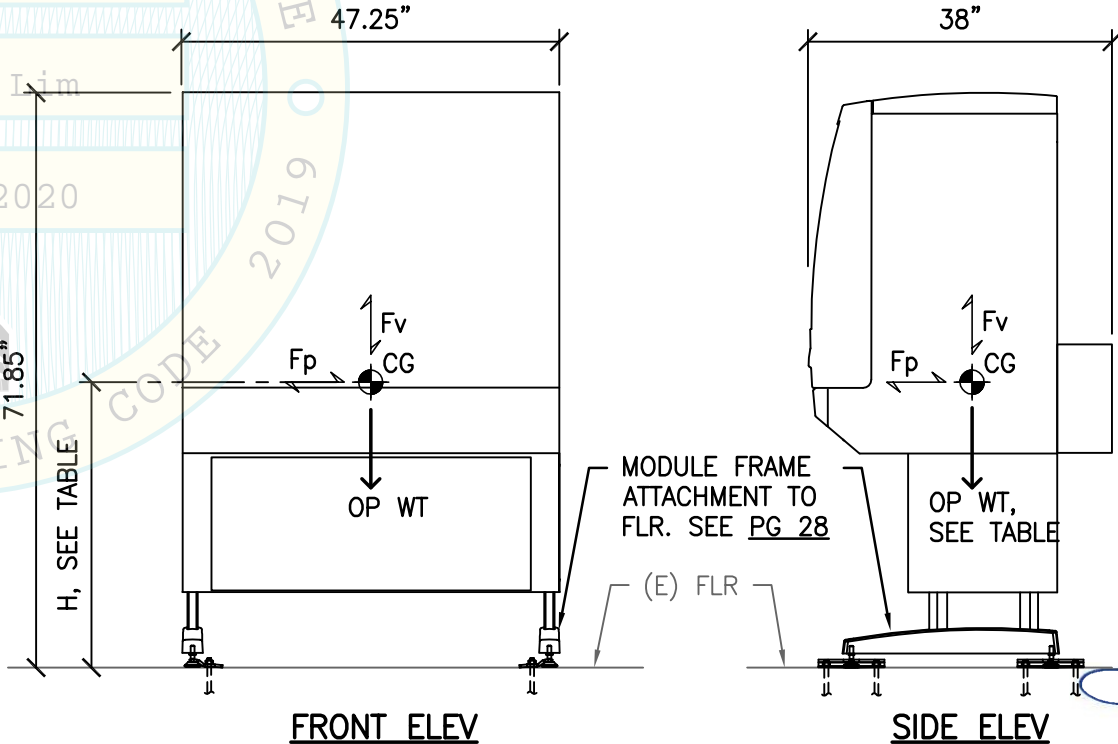
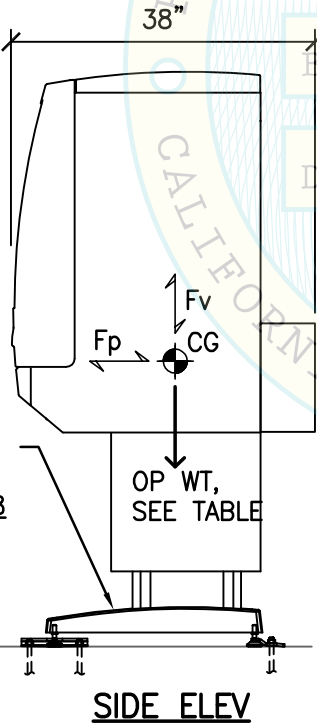
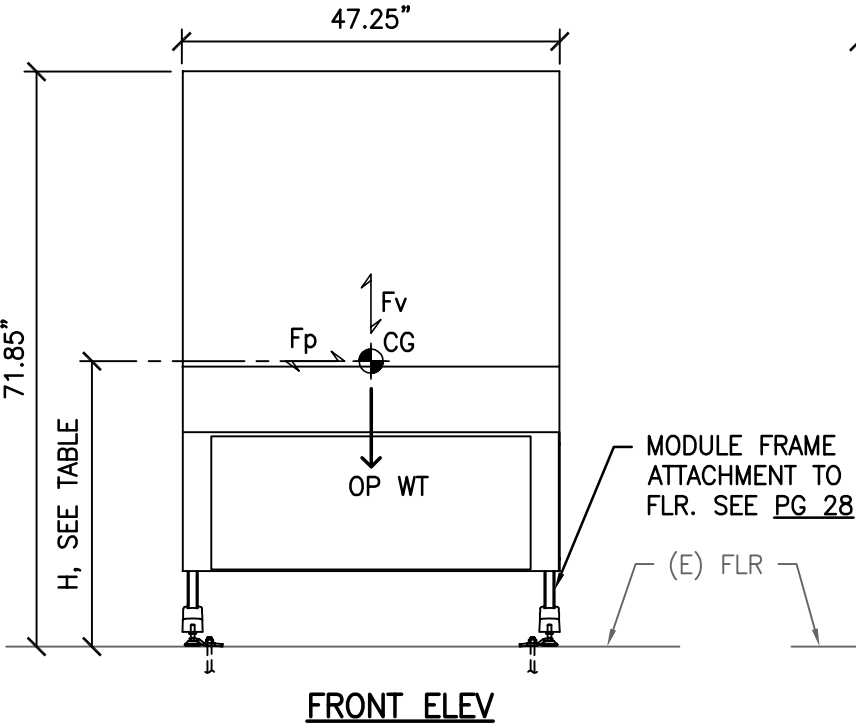
SHEET TITLE: SYSTEM CONFIGURATION LAYOUT EXAMPLES				Rev	Description	Date	Job No: 18149
<div><div>ThermoFisher</div><div>SCIENTIFIC</div></div> <div>TCAutomation SYSTEM</div>				<div><div></div><div>CYS STRUCTURAL ENGINEERS, INC.</div><div>2495 NATOMAS PARK DRIVE, SUITE 650</div><div>SACRAMENTO, CA 95833</div><div>TEL (916) 920-2020</div><div>www.cyseng.com</div></div>			Date: 5/21/2020
							By: DTS
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FRAME TYPE A-1 & A-2

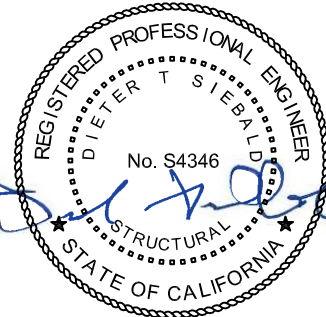
- NOTES:
- 1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
 - 2. FOR FRAME TYPE "A-3" CENTRIFUGE MODULE, SEE PG 12.
 - 3. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.



CG OP WT & LOCATION FOR FRAME TYPE "A"		
FRAME TYPE	OP WT, LBS	H, IN
A-1	761	35.43
A-2	838	34.25



ALT REAR BRACKET CONFIGURATION



SHEET TITLE: FRAME TYPE "A"



TCAutomation SYSTEM



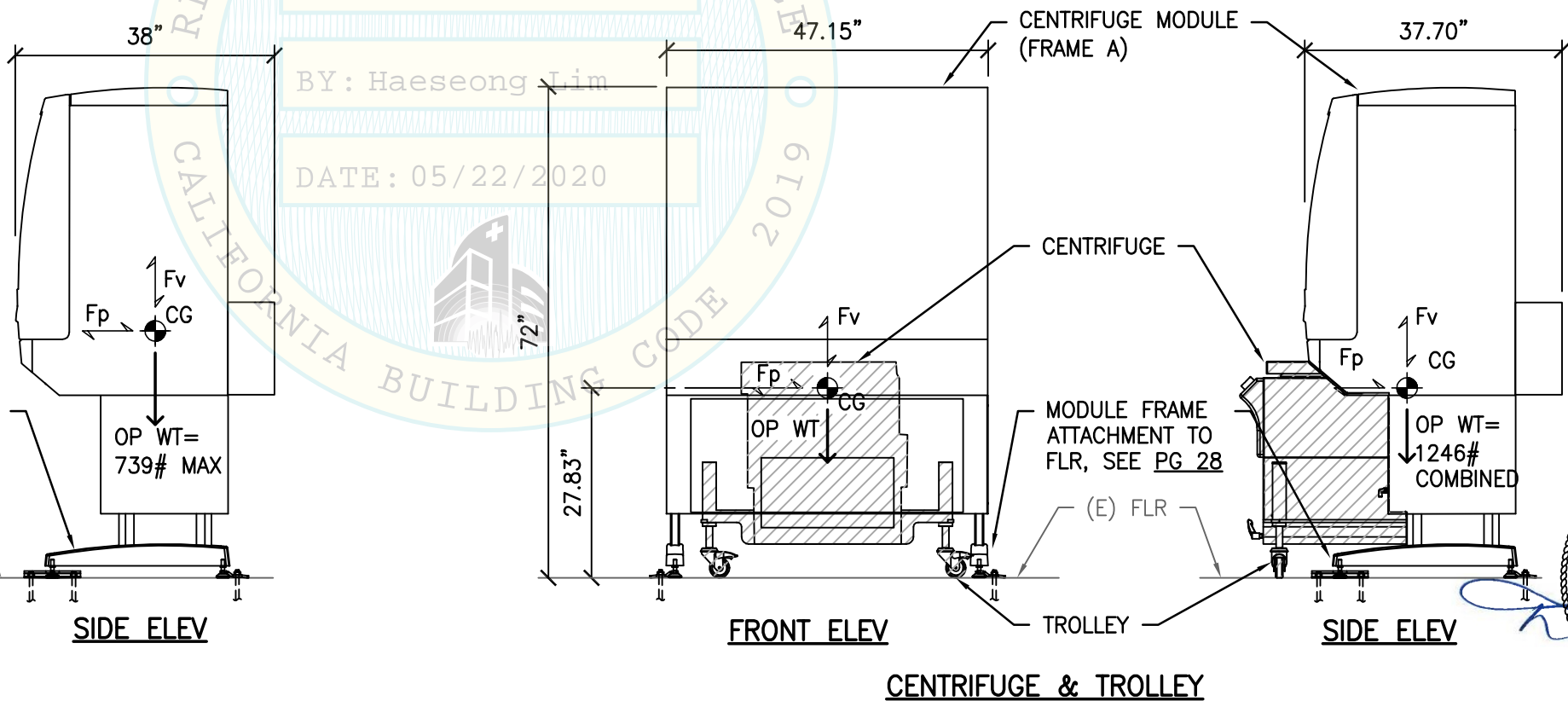
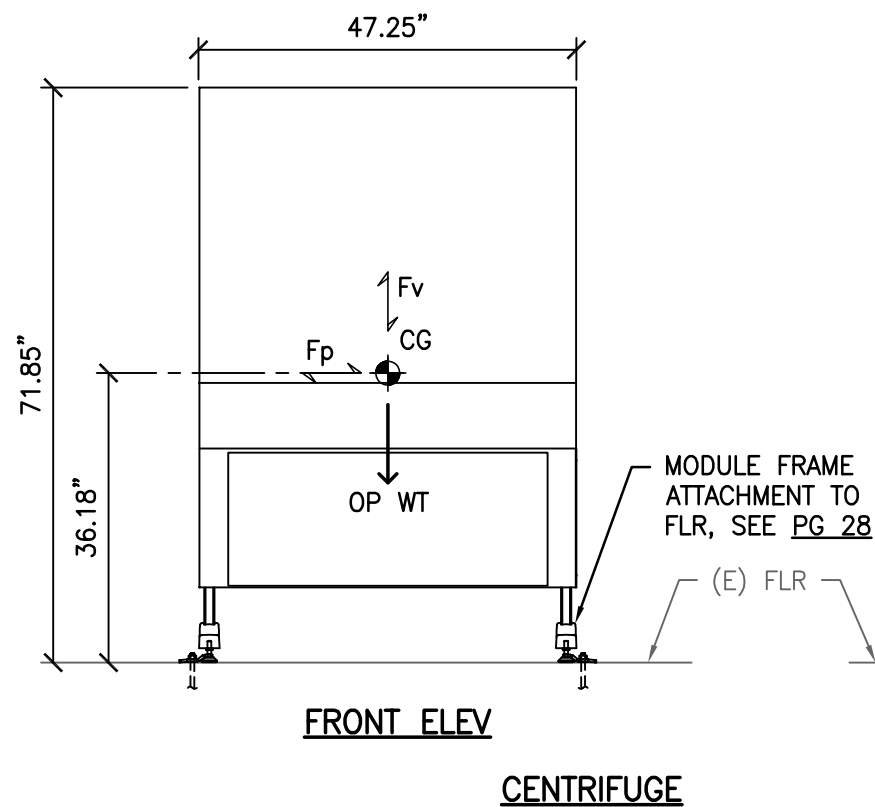
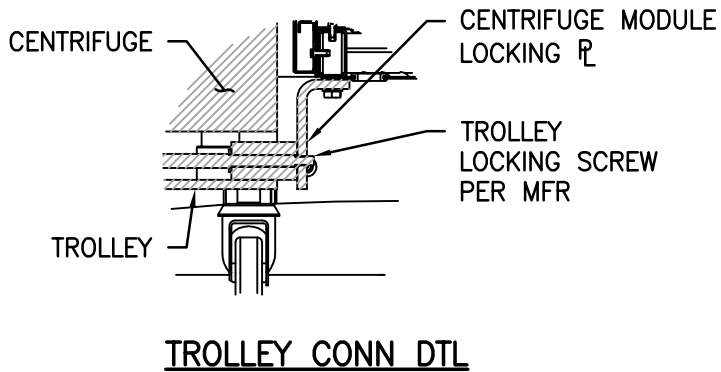
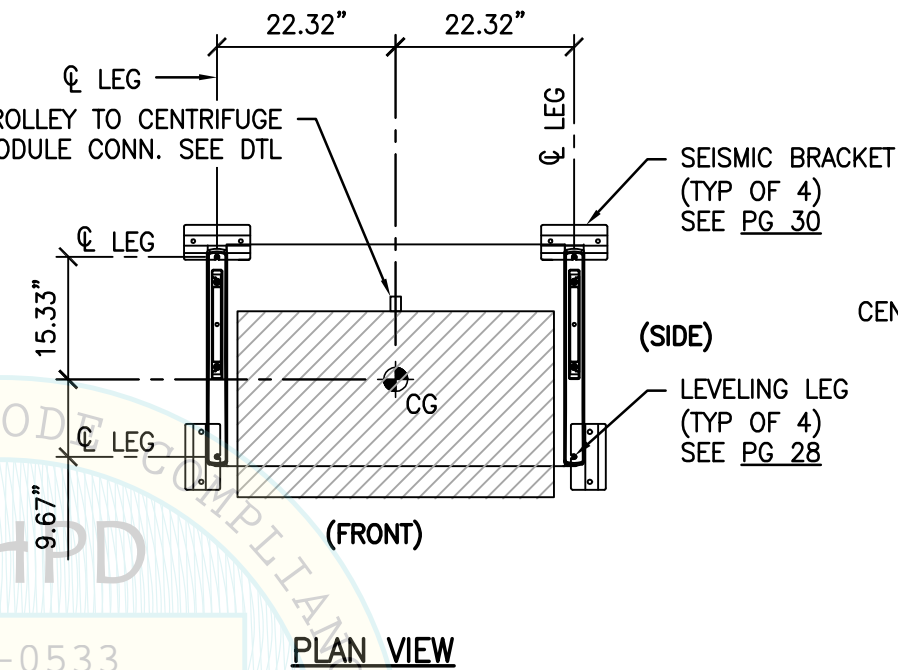
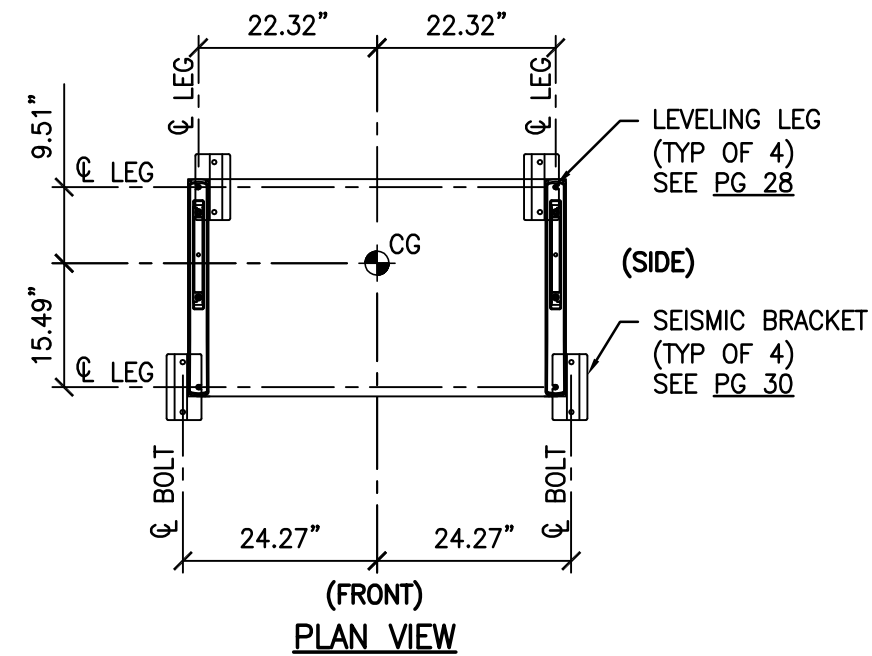
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FRAME TYPE A-3

- NOTES:
1. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.

2. FOR ALT BRACKET CONFIGURATIONS NOT SHOWN, SEE PG 11.



SHEET TITLE: FRAME TYPE "A" - CENTRIFUGE MODULE & CENTRIFUGE MODULE & TROLLEY



TCAutomation SYSTEM



CYS STRUCTURAL ENGINEERS, INC.

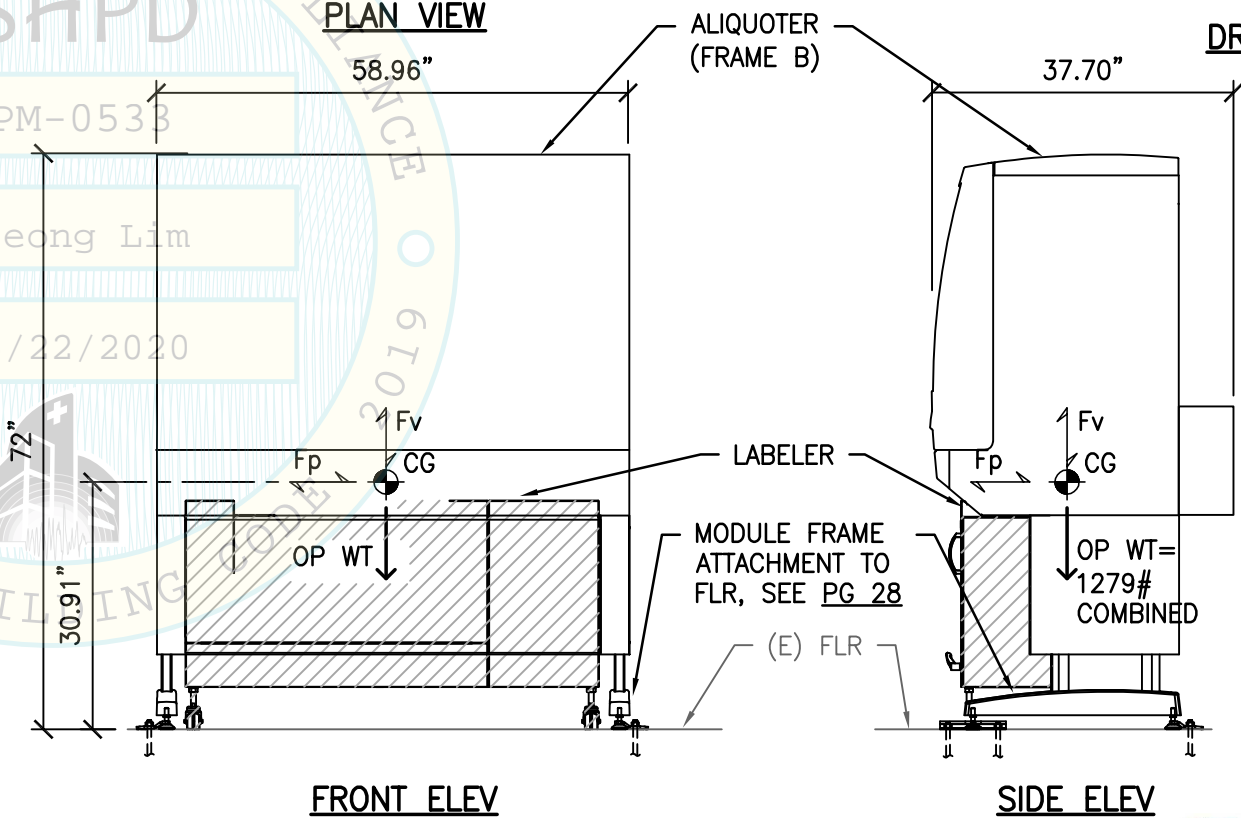
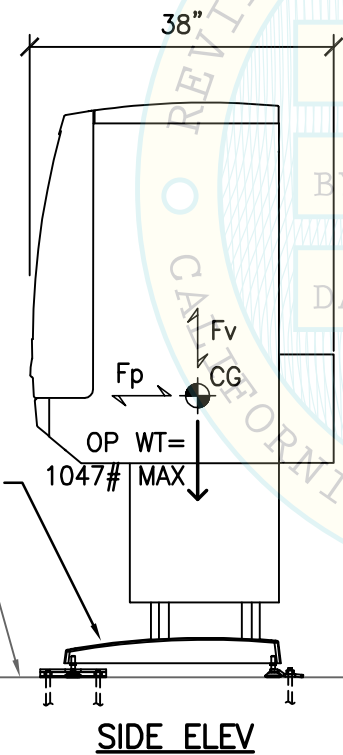
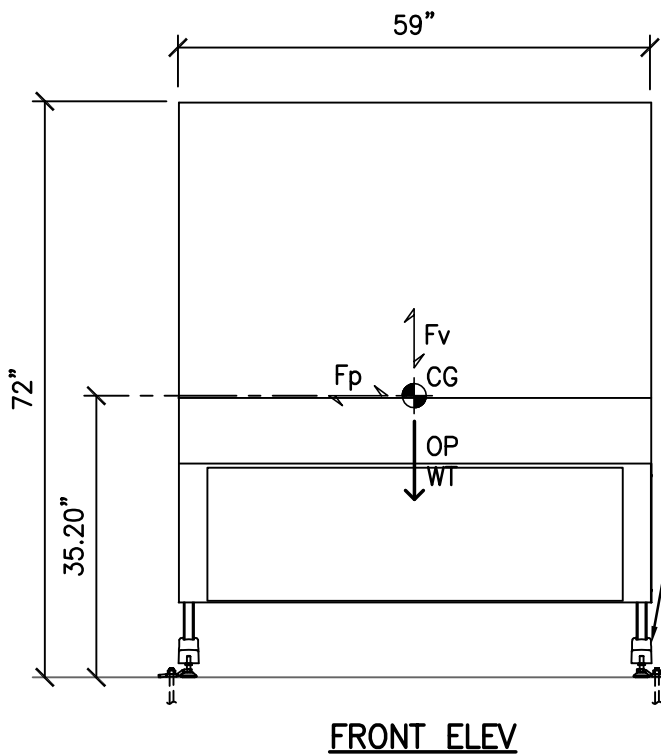
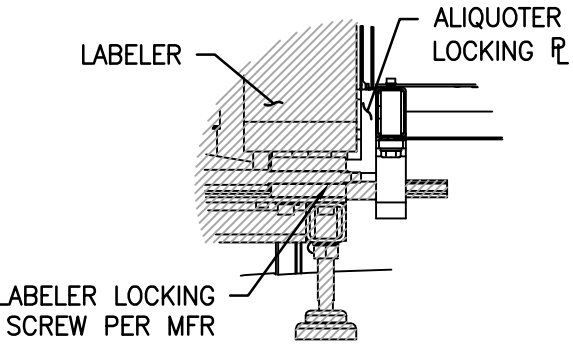
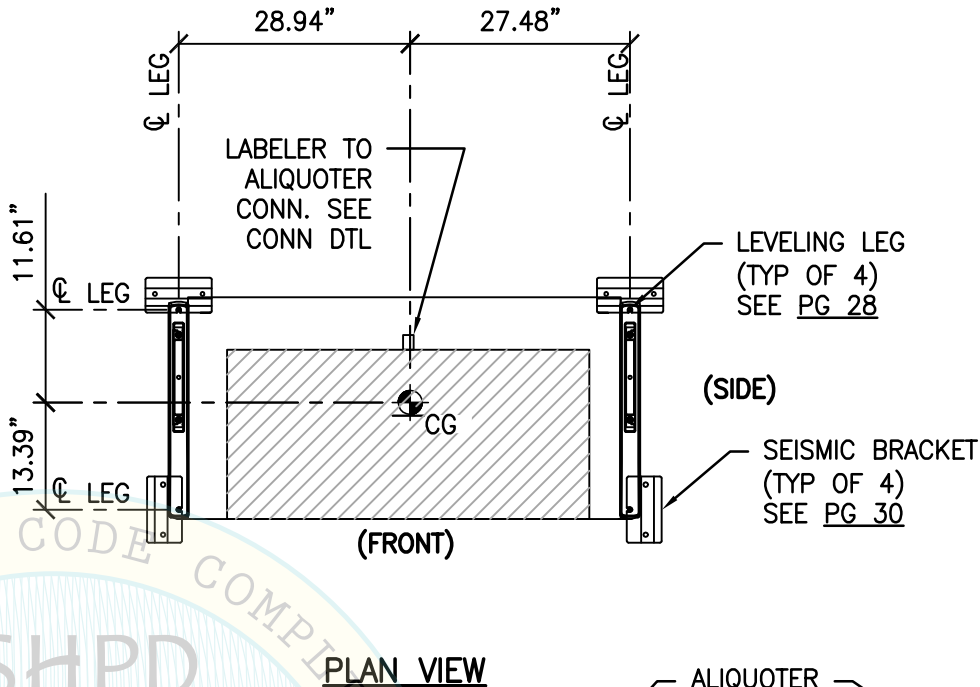
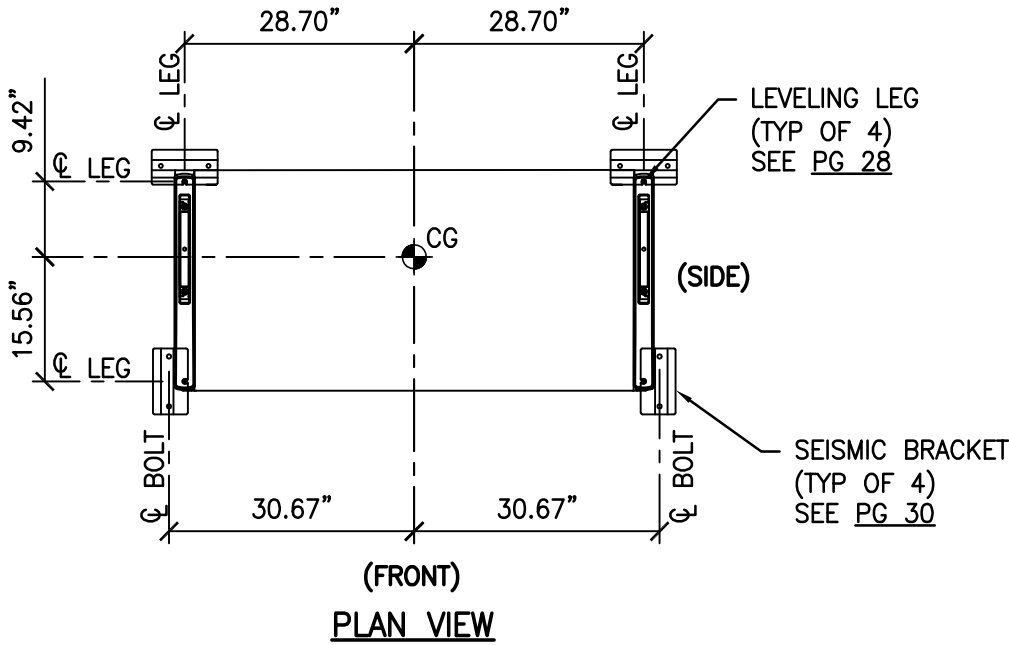
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FRAME TYPE B

- NOTES:
- 1. ALIQUOTER W/ LABELER CANNOT BE INSTALLED NEXT TO ANOTHER ALIQUOTER W/ LABELER DUE TO LABELER LIMITATIONS.
 - 2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.



DRAWER CONN DTL



SHEET TITLE: FRAME TYPE "B" - ALIQUOTER OR ALIQUOTER W/ LABELER

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



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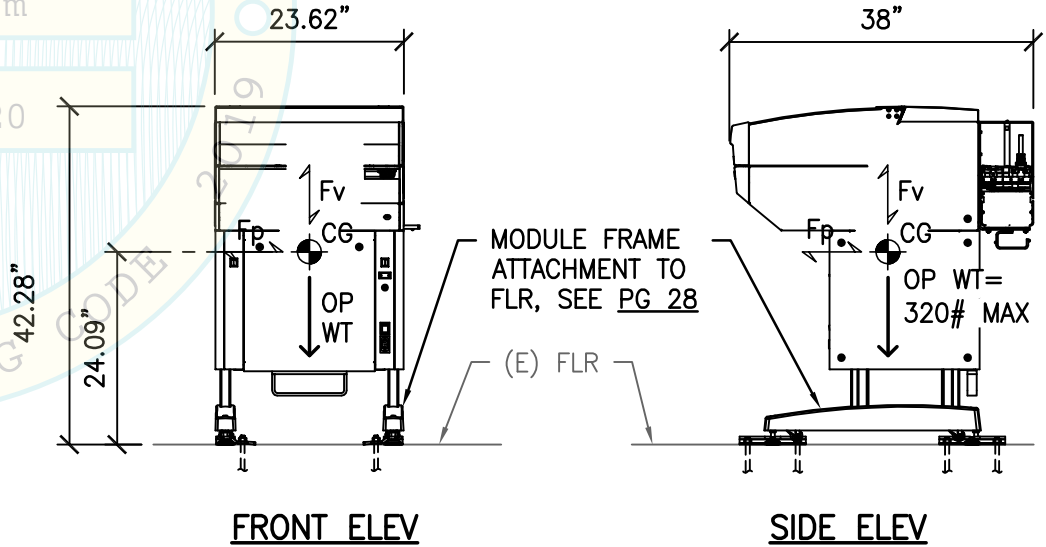
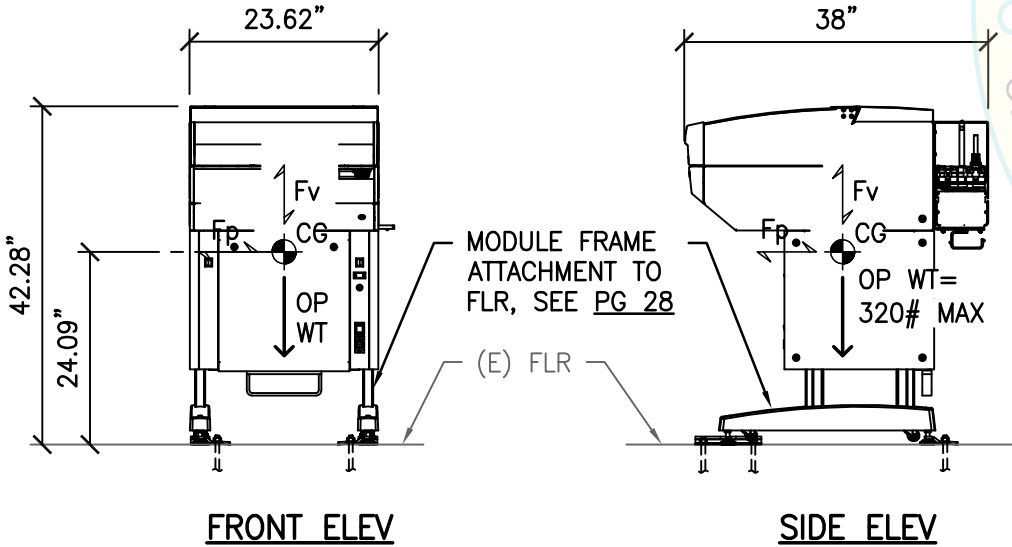
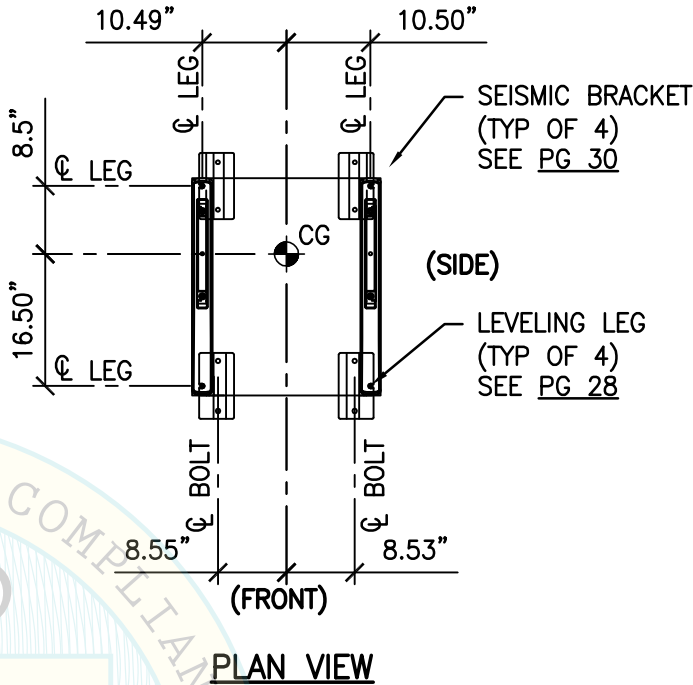
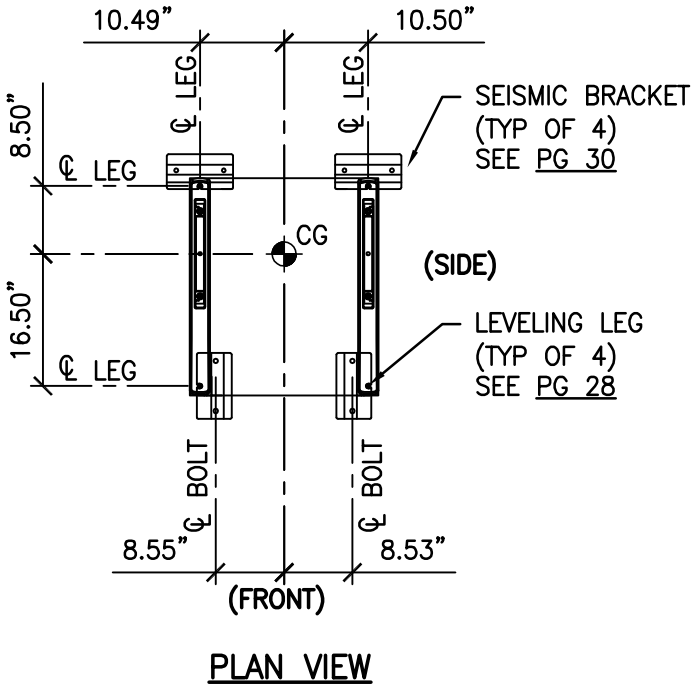
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			Date:	5/21/2020
			By:	DTS
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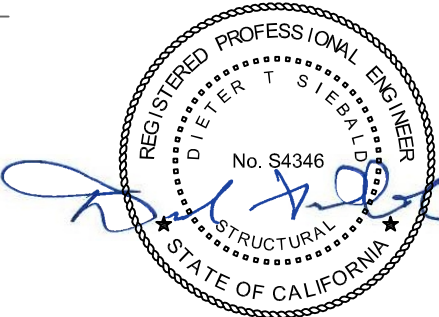
FRAME TYPE C

- NOTES:
1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.

2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.



ALT REAR BRACKET CONFIGURATION



SHEET TITLE: FRAME TYPE "C"



TCAutomation SYSTEM



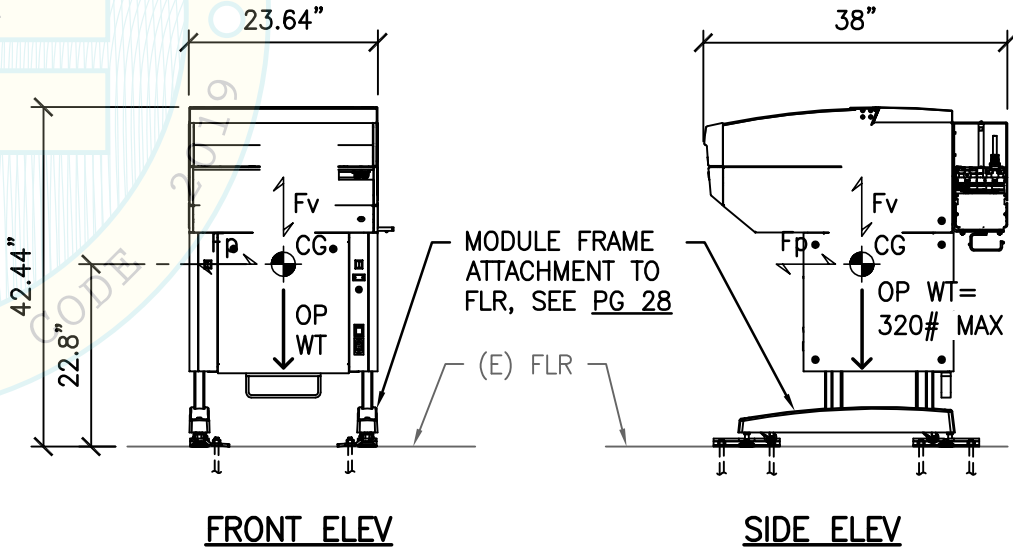
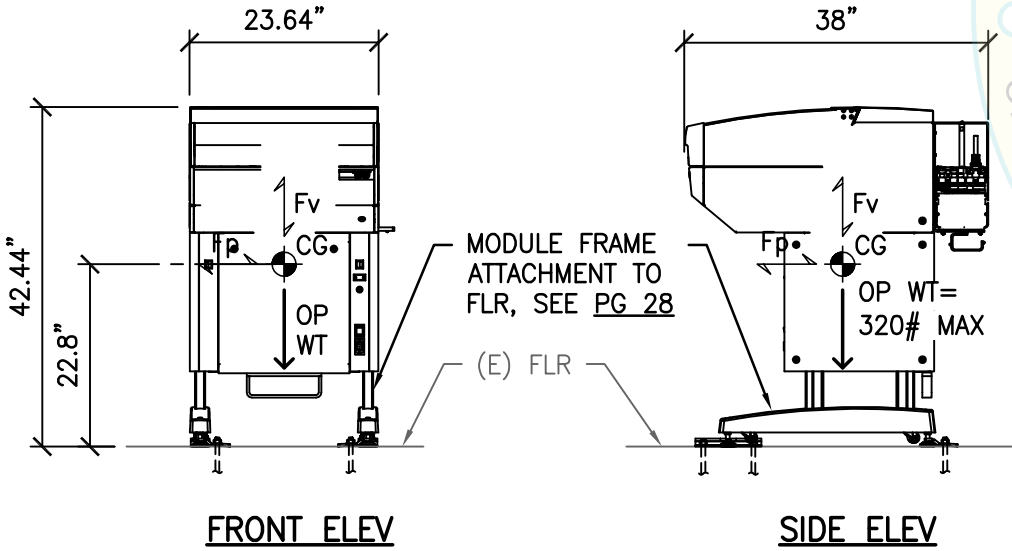
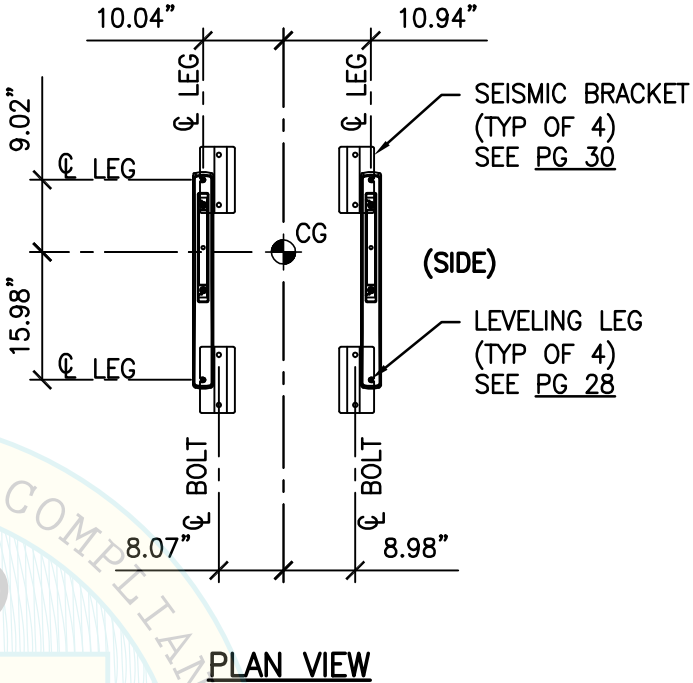
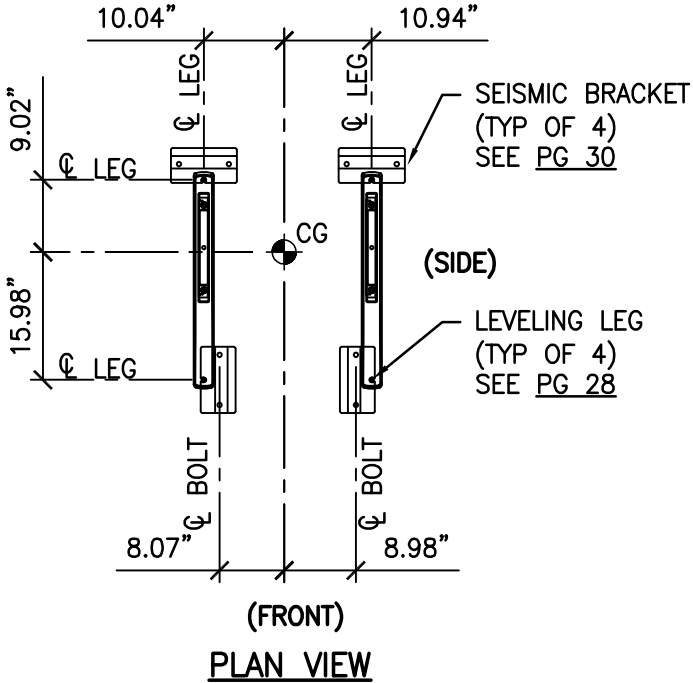
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FRAME TYPE C-2

- NOTES:
1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.

2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.



ALT REAR BRACKET CONFIGURATION



SHEET TITLE: FRAME TYPE "C"



TCAutomation SYSTEM



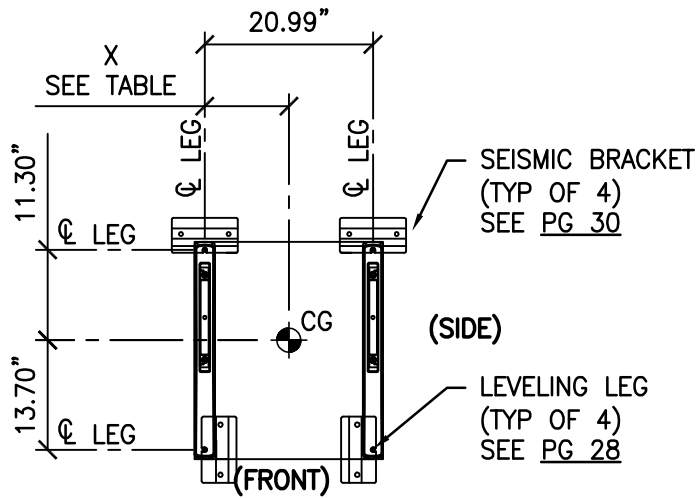
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			By:	DTS
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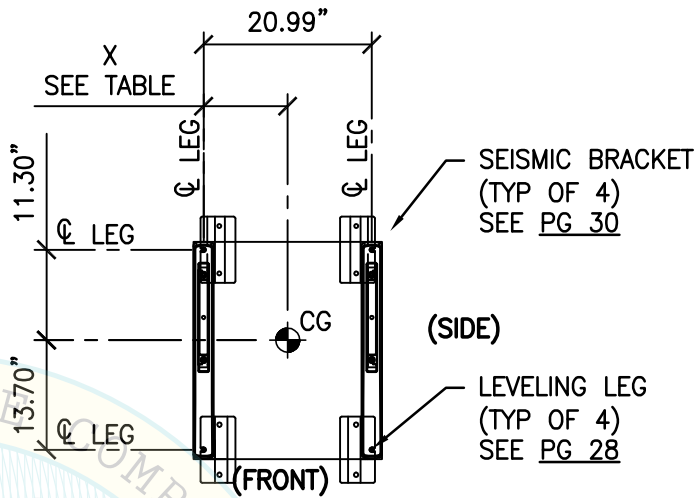
FRAME TYPE D

- NOTES:**
- 1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
 - 2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.

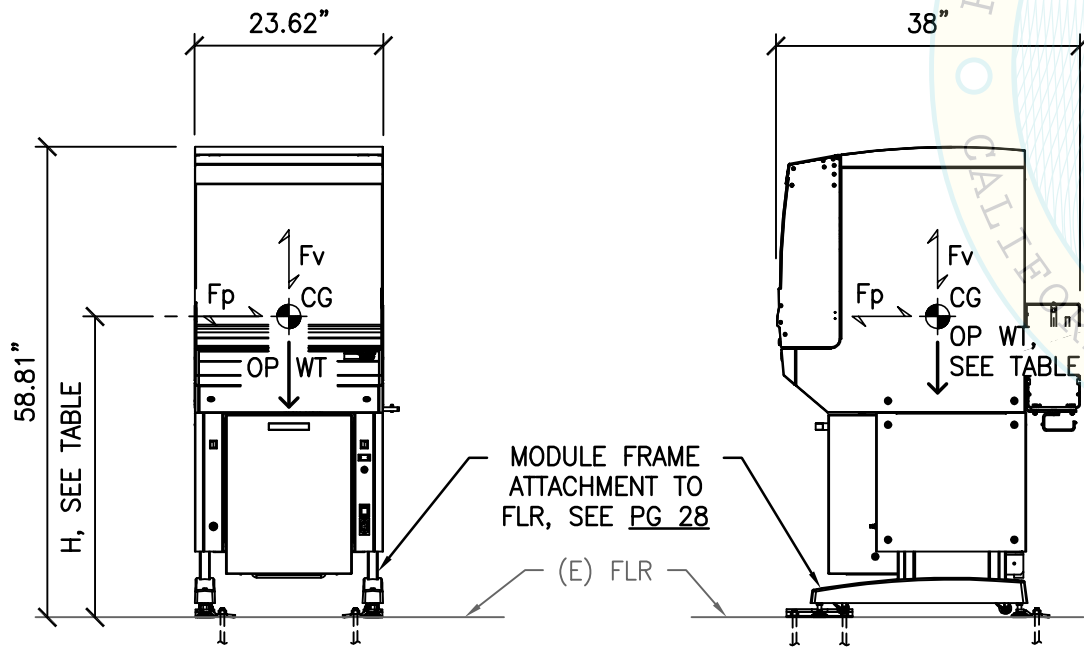
CG OP WT & LOCATION FOR FRAME TYPE "D"			
FRAME TYPE	OP WT, LBS	H, IN	X, IN
D-1	485	28.66	10.49
D-Z	650	32.13	10.94



PLAN VIEW

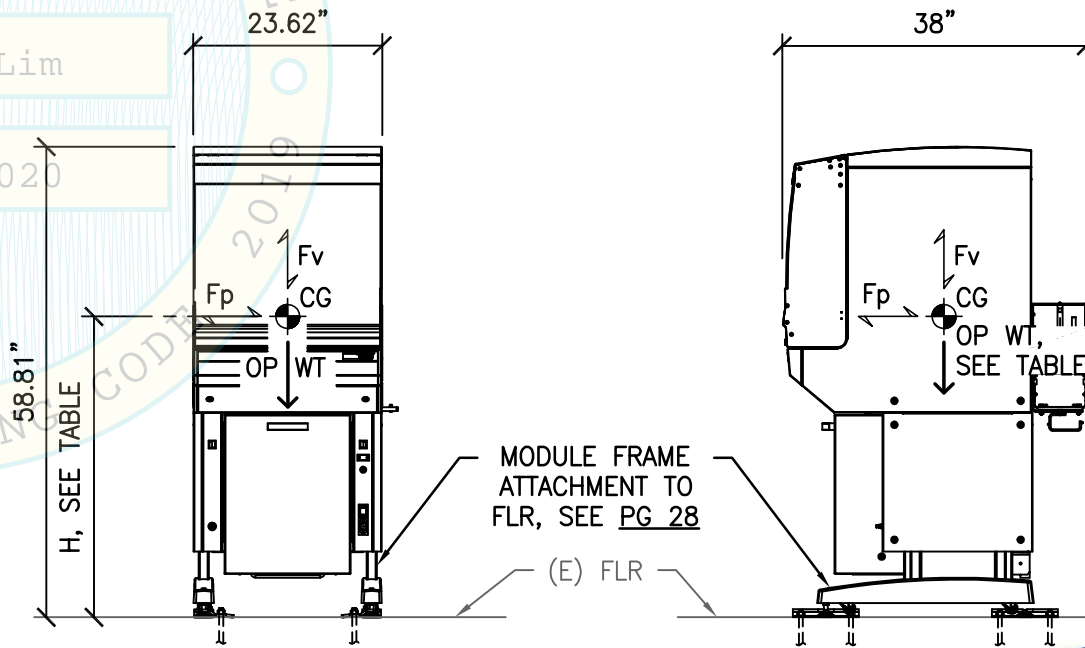


PLAN VIEW



FRONT ELEV

SIDE ELEV



FRONT ELEV

SIDE ELEV

ALT REAR BRACKET CONFIGURATION



SHEET TITLE: FRAME TYPE "D"



TCAutomation SYSTEM

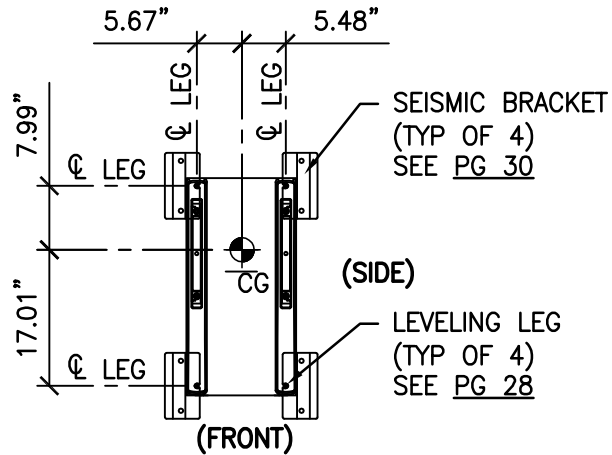


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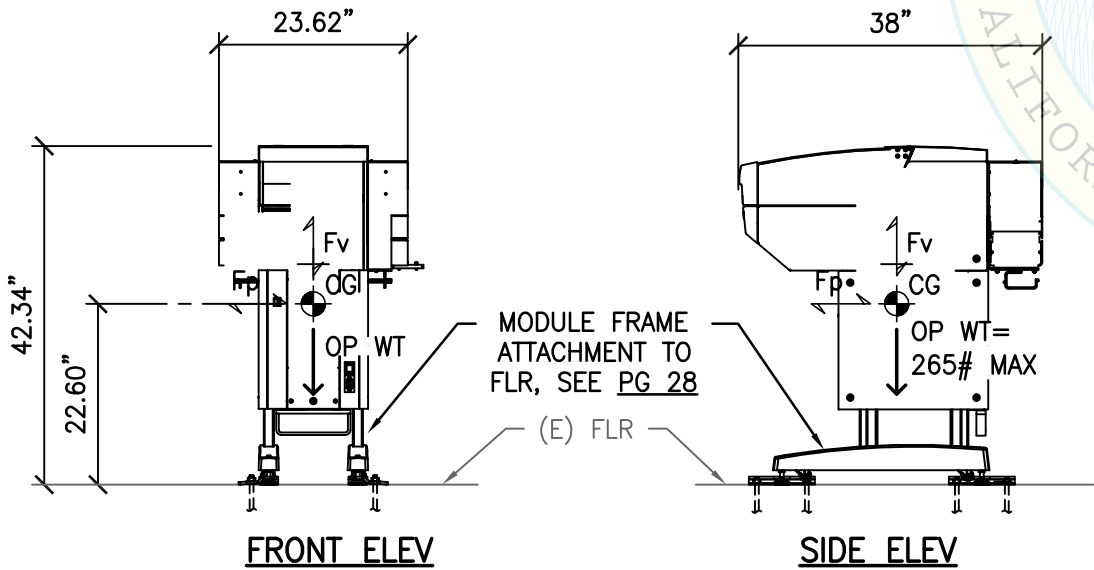
Rev	Description	Date	Job No:	18149
			Date:	5/21/2020
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FRAME TYPE E

- NOTES:
- 1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
 - 2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
 - 3. ALL BYPASS MODULES DO NOT INCLUDE THE UNITS SHOWN W/ AN ASTERISK ON PGS 4 – 10.

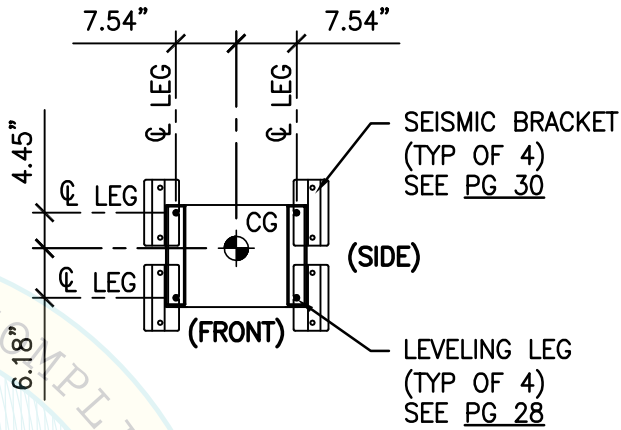


PLAN VIEW

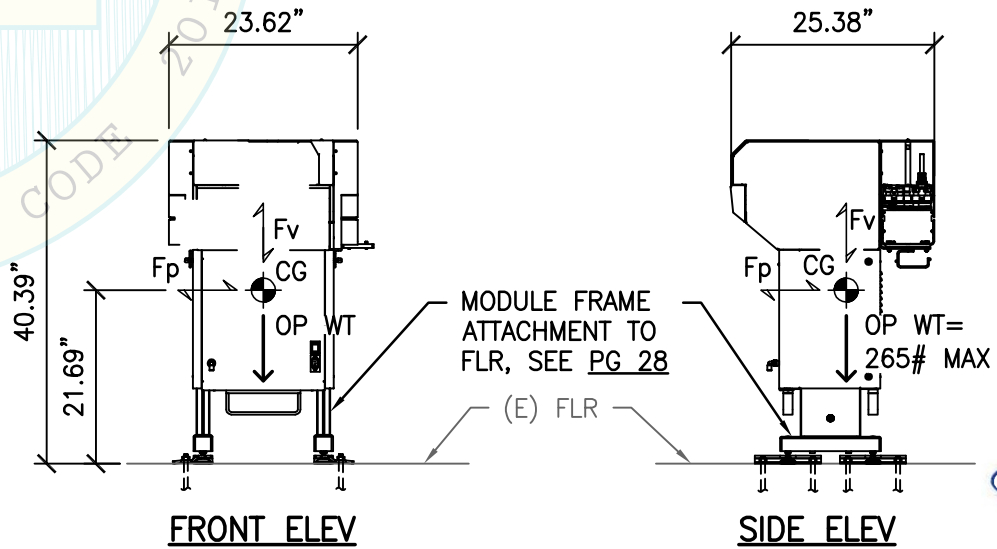


FRAME TYPE F

- NOTES:
- 1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
 - 2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
 - 3. ALL BYPASS MODULES DO NOT INCLUDE THE UNITS SHOWN W/ AN ASTERISK ON PGS 4 – 10.



PLAN VIEW



SHEET TITLE: FRAME TYPE "E" & FRAME TYPE "F"



TCAutomation SYSTEM

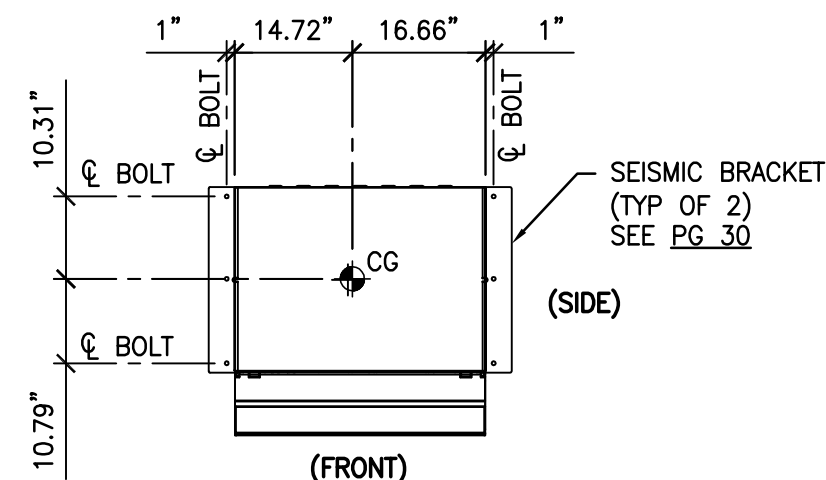


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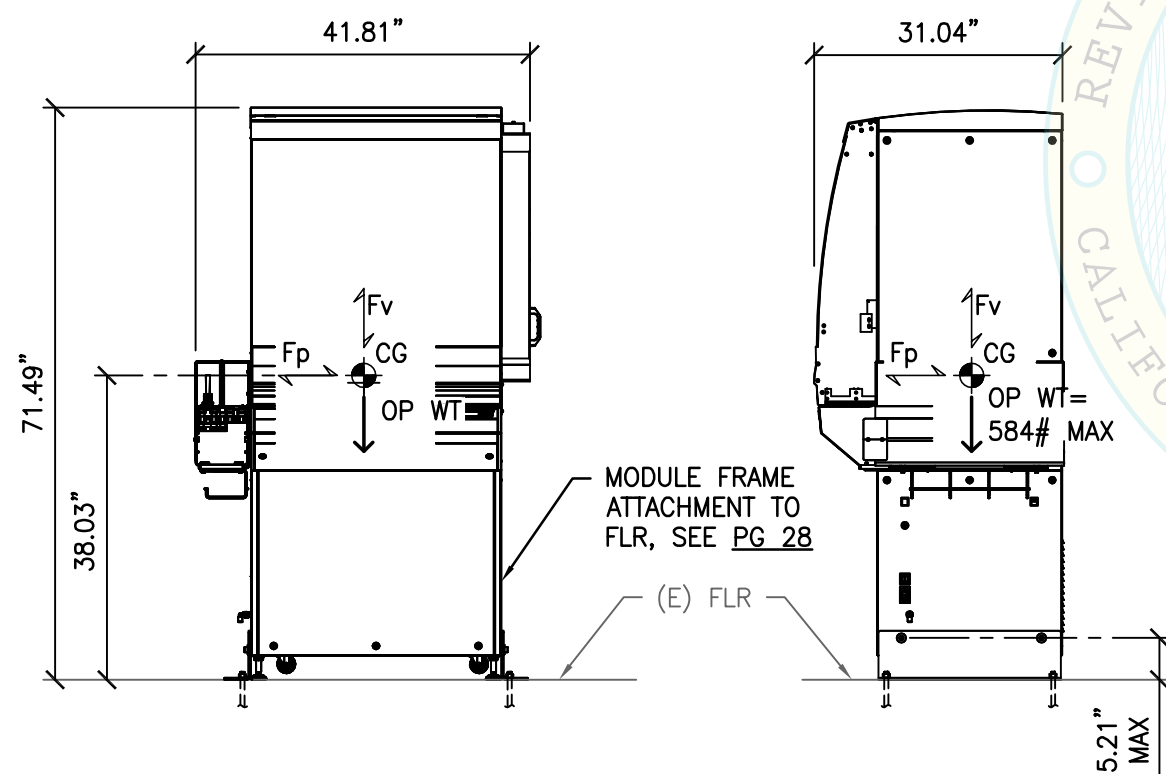
Rev	Description	Date	Job No:	18149
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			By:	DTS
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FRAME TYPE G

1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
3. LEVELING LEGS NOT RESTRAINT BY SEISMIC BRACKETS.



PLAN VIEW

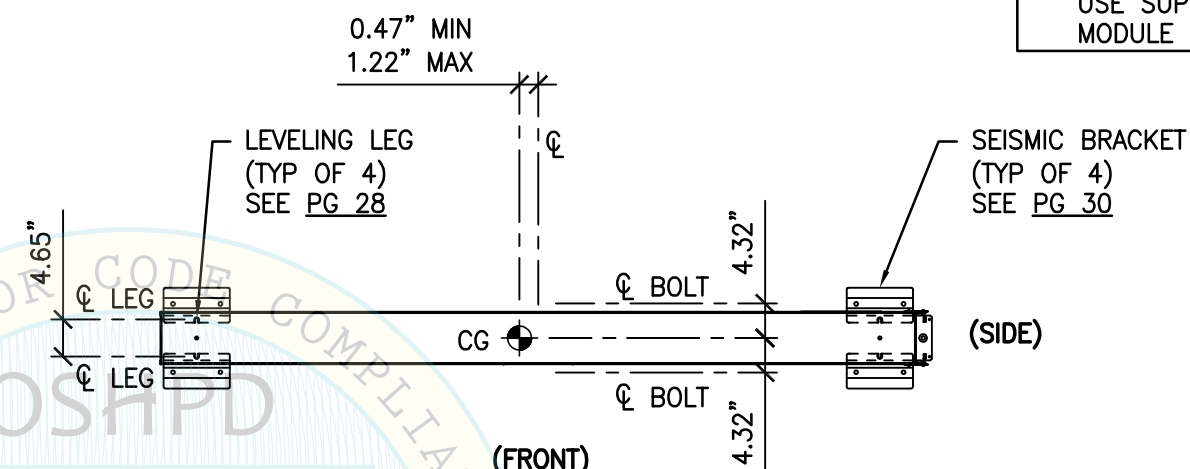


FRONT ELEV

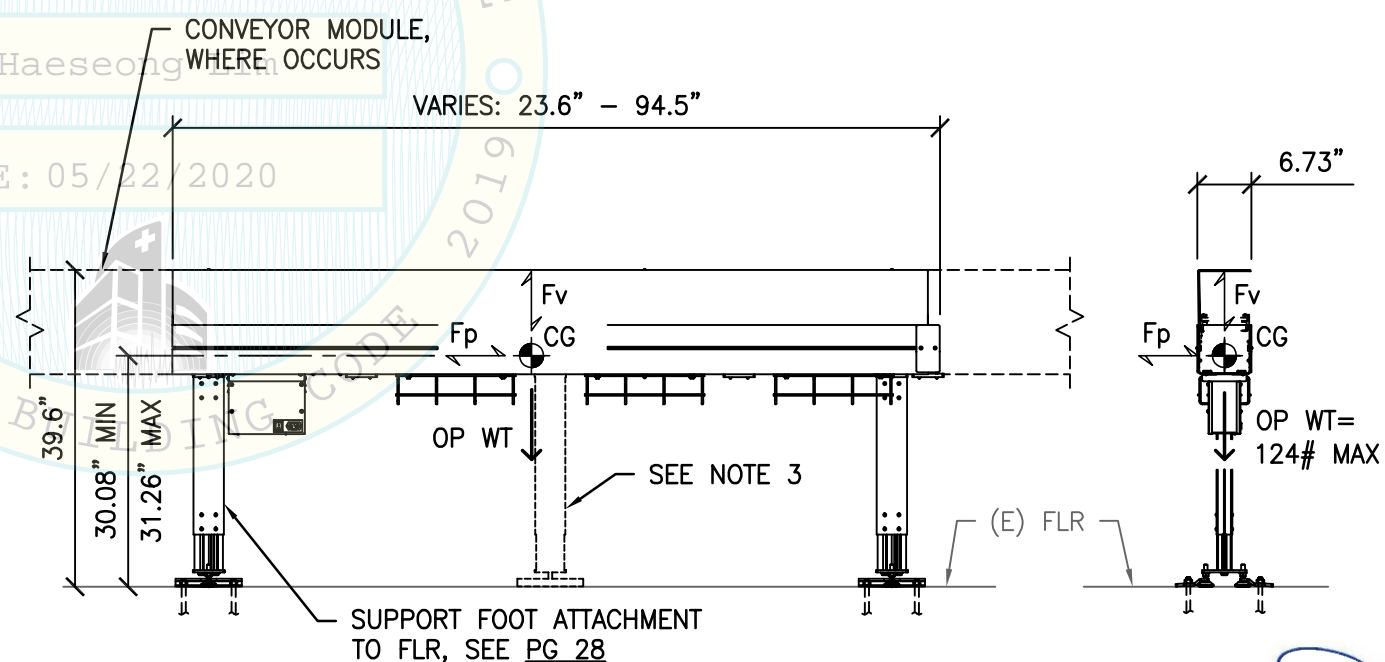
SIDE ELEV

FRAME TYPE H-1 - STRAIGHT CONVEYORS

1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
3. THE SUPPORT FOOT IN THE MIDDLE IS NOT MANDATORY BUT RECOMMENDED TO BE USED WITH THE LONGEST CONVEYORS 2100 & 2400.
4. SUPPORT FOOT SHALL OCCUR OCCUR AT ALL CONVEYOR-TO-CONVEYOR CONNS. DO NOT USE SUPPORT FOOT AT CONVEYOR TO MODULE CONNS.



(FRONT)
PLAN VIEW



FRONT ELEV

SIDE ELEV

STRAIGHT CONVEYORS

SHEET TITLE: FRAME TYPE "G" & FRAME TYPE "H-1"



TCAutomation SYSTEM

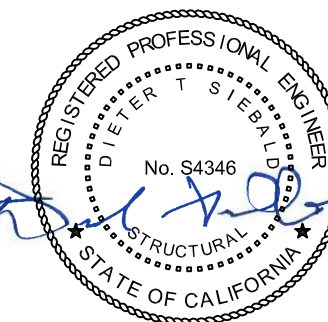


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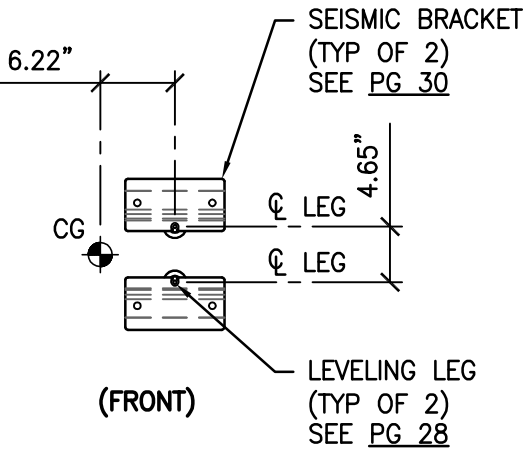
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			By: DTS
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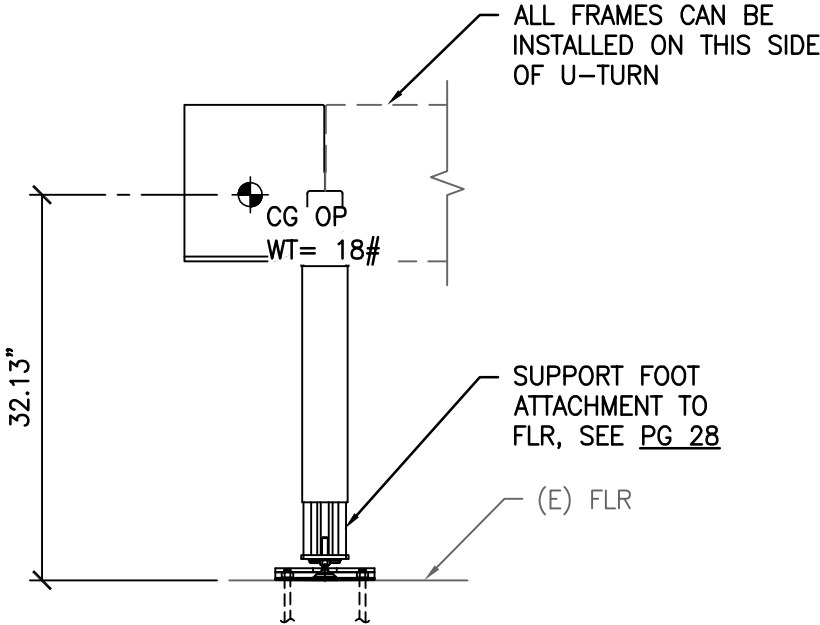


L:\Jobs\18149 Thermo Fisher - OPA OPM Renewal\STRU\S1_TCAutomation_11X17.dwg Time:May21,2020-04:19pm Login:camachom Dimscale:1 LTScale:6

FRAME TYPE H-2 - U-TURN CONVEYOR



PLAN VIEW AT BASE



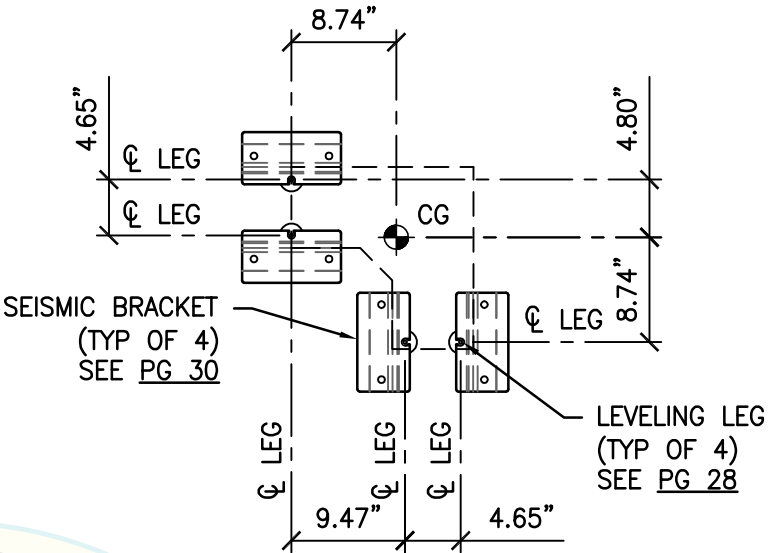
SIDE ELEV

U-TURN CONVEYOR

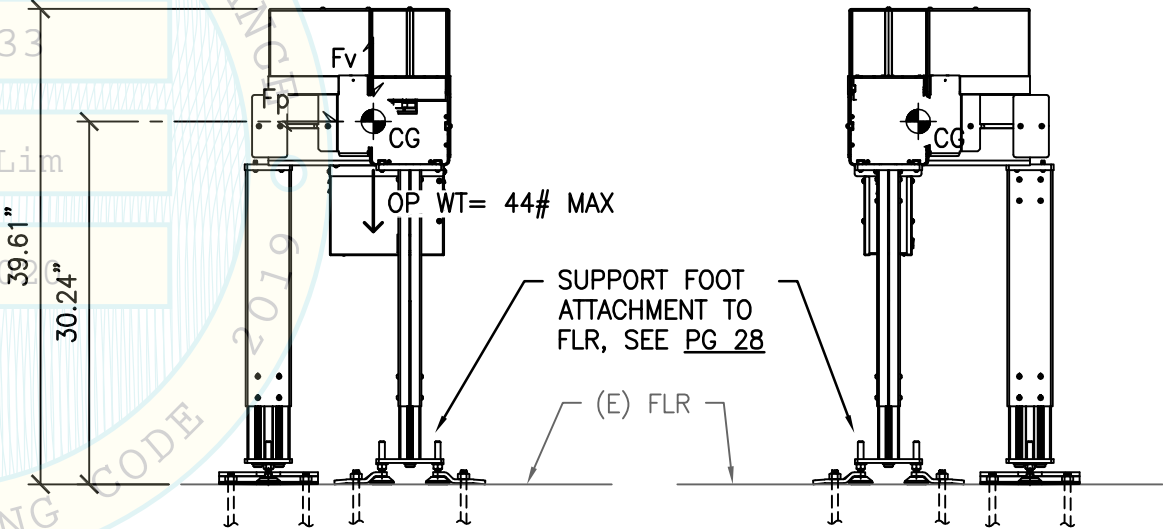
NOTES:

1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
2. SUPPORT FOOT SHALL OCCUR AT ALL CONVEYOR-TO-CONVEYOR CONNS. DO NOT USE SUPPORT FOOT AT CONVEYOR TO MODULE CONNS.

FRAME TYPE H-3 - L-TURN CONVEYOR



PLAN VIEW



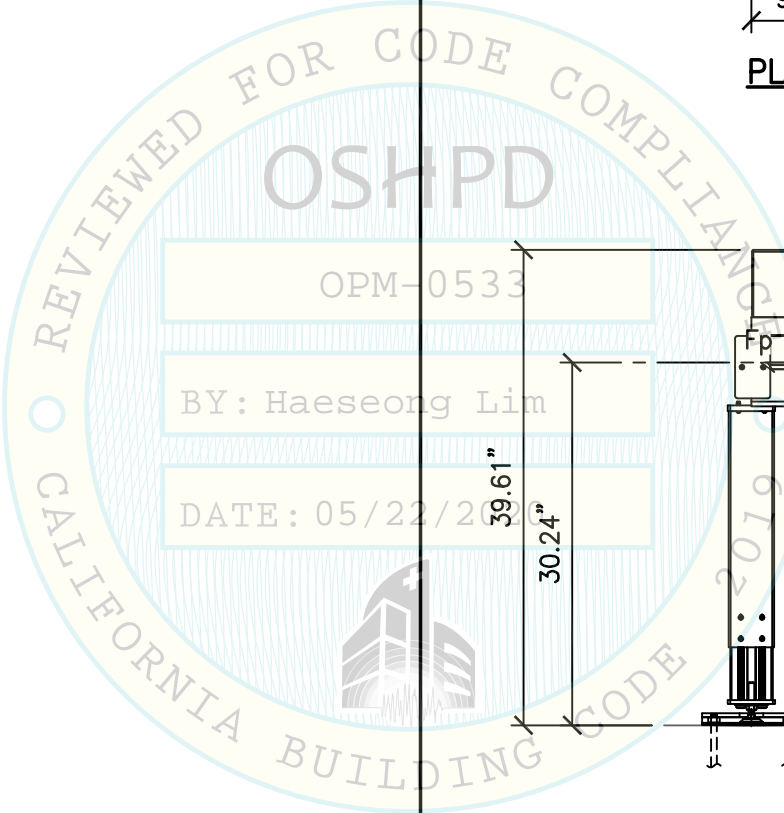
FRONT ELEV

SIDE ELEV

L-TURN CONVEYOR

NOTES:

1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
3. SUPPORT FOOT SHALL OCCUR AT ALL CONVEYOR-TO-CONVEYOR CONNS. DO NOT USE SUPPORT FOOT AT CONVEYOR TO MODULE CONNS.



SHEET TITLE: FRAME TYPE "H-2" & "H-3"

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



CYS STRUCTURAL ENGINEERS, INC.

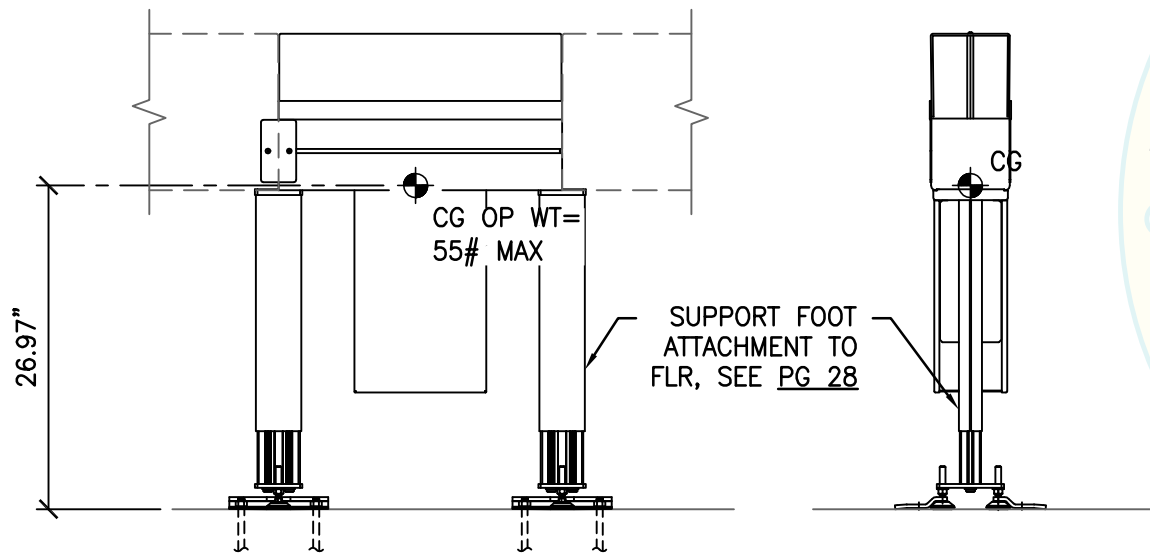
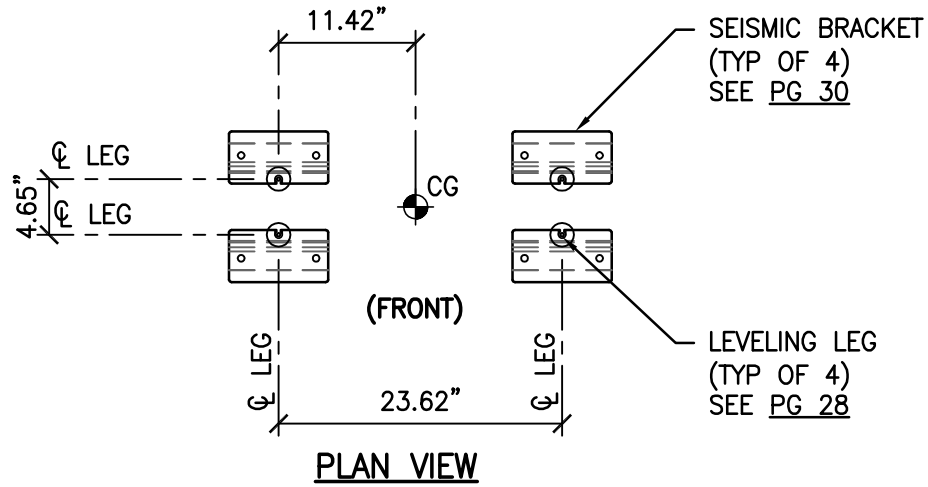
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L:\Jobs\18149 Thermo Fisher - OPA OPM Renewal\STRU\S1_TCAutomation_11X17.dwg Time:May21,2020-04:19pm Login:camachom Dimstyle:1 LTScale:6

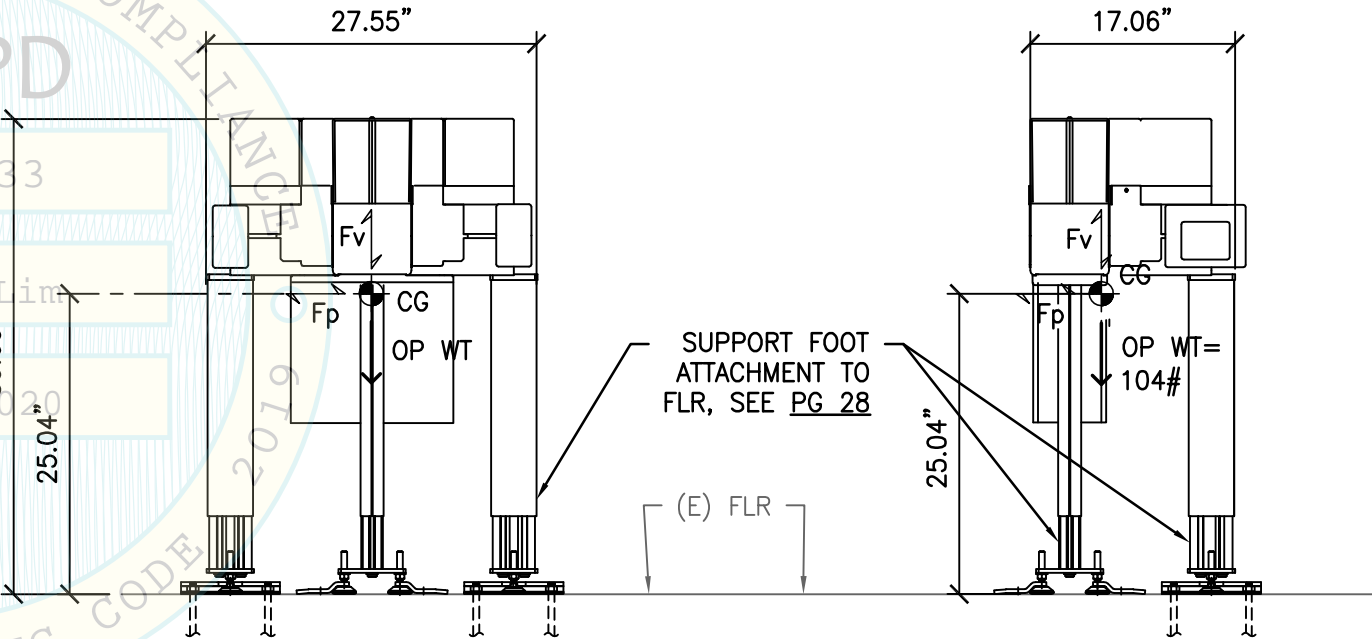
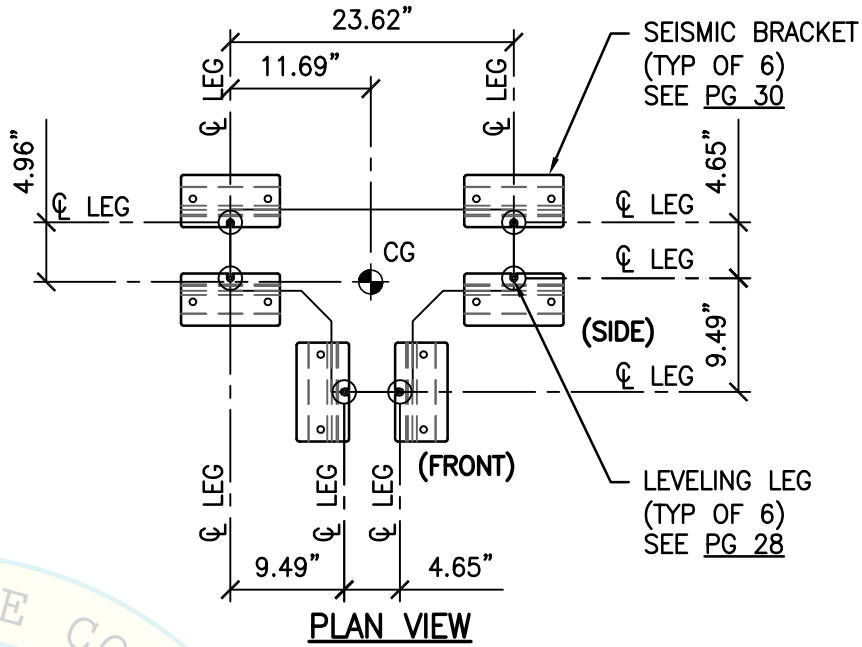
FRAME TYPE H-4 - INTERNAL U-TURN CONVEYOR



FRONT ELEV
INTERNAL U-TURN CONVEYOR
SIDE ELEV

- NOTES:**
1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
 2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
 3. SUPPORT FOOT SHALL OCCUR OCCUR AT ALL CONVEYOR-TO-CONVEYOR CONNS. DO NOT USE SUPPORT FOOT AT CONVEYOR TO MODULE CONNS.

FRAME TYPE H-5 T-TURN CONVEYOR



FRONT ELEV
T-TURN CONVEYOR
SIDE ELEV

- NOTES:**
1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
 2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
 3. SUPPORT FOOT SHALL OCCUR OCCUR AT ALL CONVEYOR-TO-CONVEYOR CONNS. DO NOT USE SUPPORT FOOT AT CONVEYOR TO MODULE CONNS.

SHEET TITLE: FRAME TYPE "H-4" & "H-5"

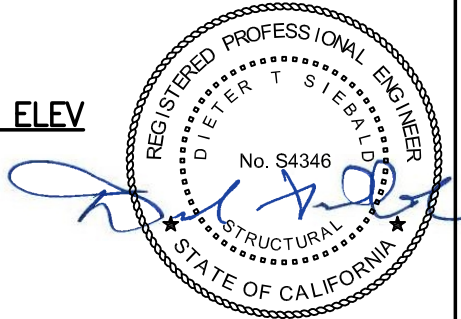
ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



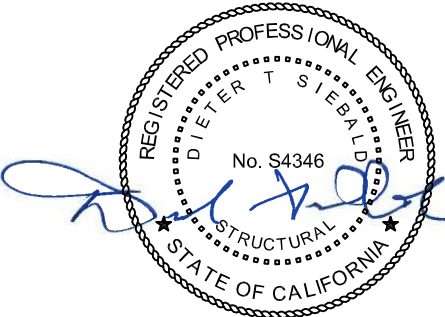
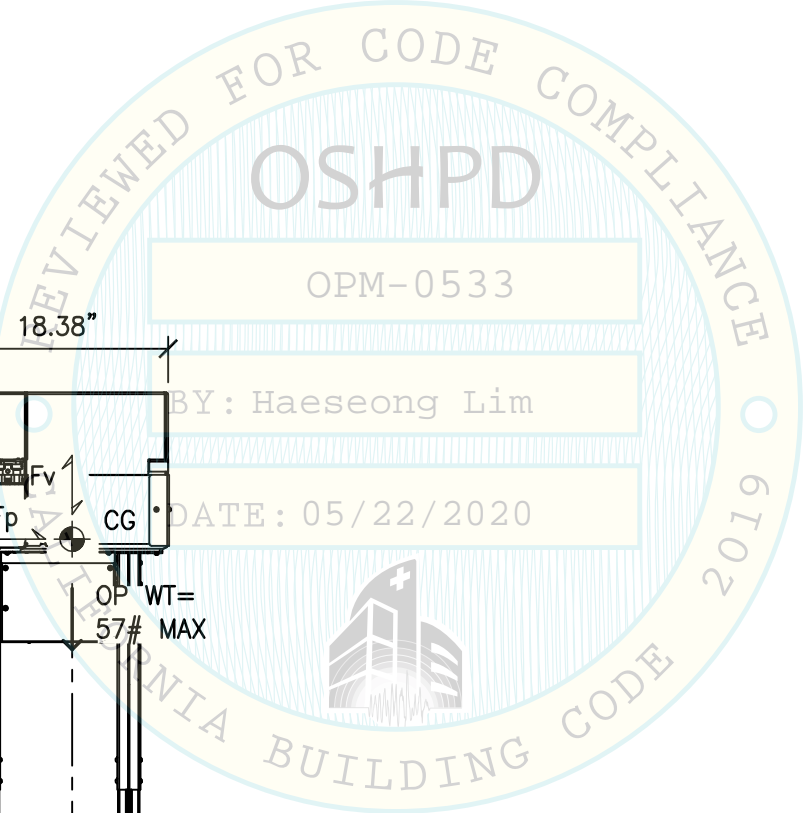
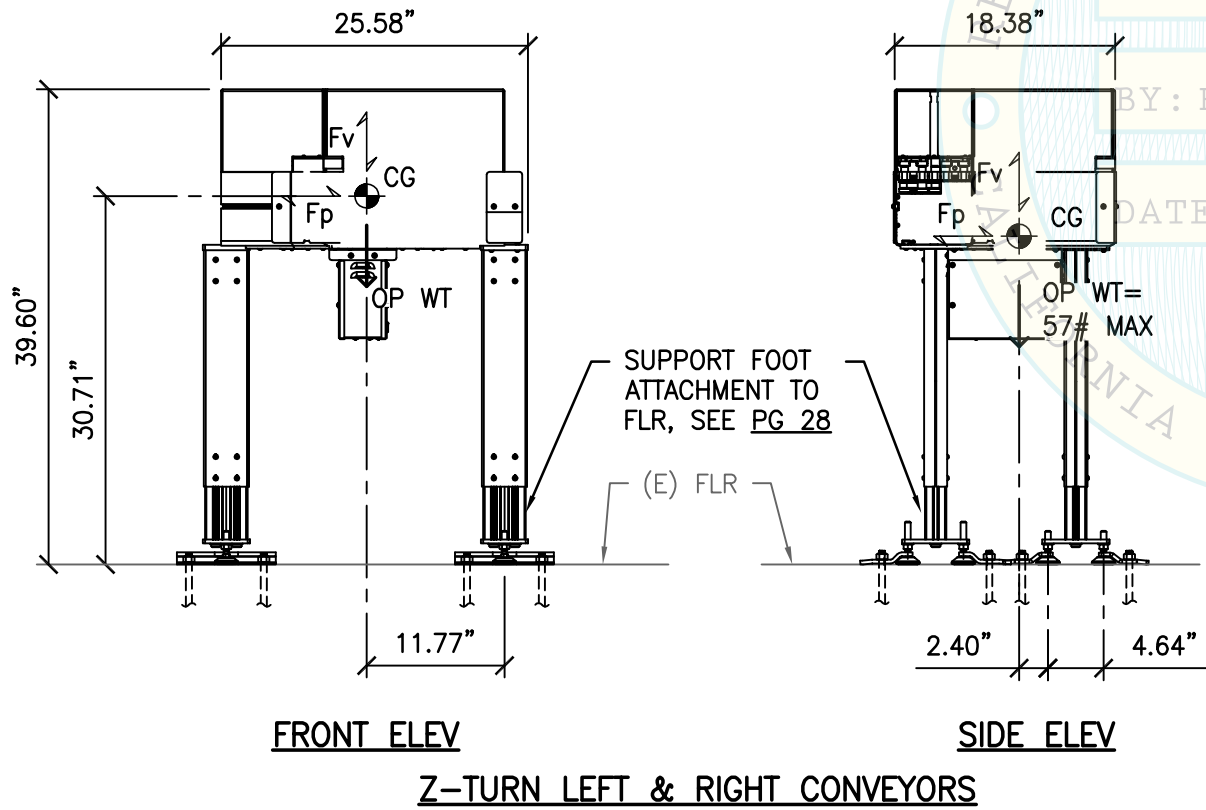
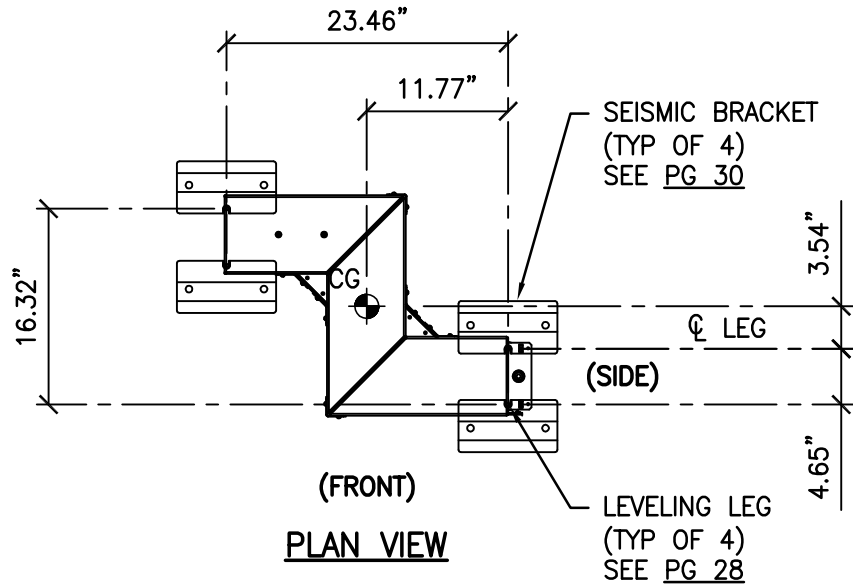
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FRAME TYPE H-6 – Z-TURN LEFT & RIGHT CONVEYORS

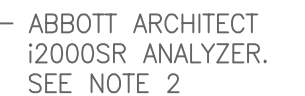
- NOTES:**
- 1. SEE PG 1 FOR PRODUCTS QUALIFIED BY FRAME TYPE(S) NOTED ON THIS SHEET.
 - 2. ALL FRAMES CAN BE INSTALLED AT ES OF THIS EQUIP.
 - 3. SUPPORT FOOT SHALL OCCUR OCCUR AT ALL CONVEYOR-TO-CONVEYOR CONNS. DO NOT USE SUPPORT FOOT AT CONVEYOR TO MODULE CONNS.



SHEET TITLE: FRAME TYPE "H-6"				Rev	Description	Date	Job No: 18149
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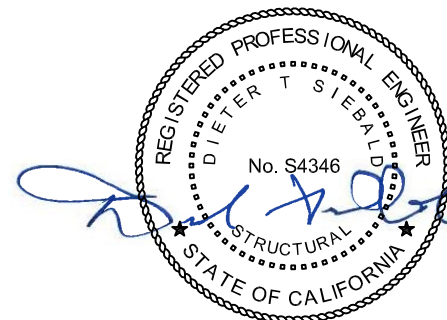
1. INTERFACE MODULE & CONVEYOR MODULES BY THERMOFISHER SCIENTIFIC SUPPORTS & ATTACHMENTS FOR THE INTERFACE HAVE BEEN DESIGNED TO SUPPORT THE INTERFACE'S SELF-WEIGHT & DOES NOT INCLUDE THE WT OF ANY ATTACHED COMPONENTS.
2. ABBOTT ANALYZER NOT IN THE SCOPE OF THIS OPM. SEISMIC ATTACHMENTS & SUPPORTS ARE REQ & SHALL BE DESIGNED BY OTHERS.



CONTROL BOX
SUPPORTER FROM
CONVEYOR MODULE
INTERFACE MODULE.
SEE NOTE 1



FRONT ELEV

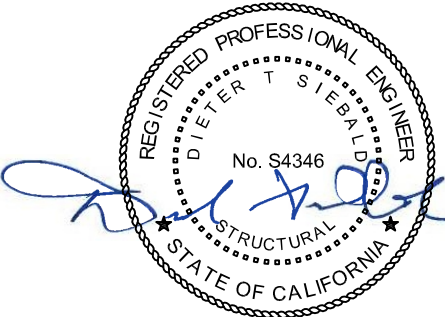
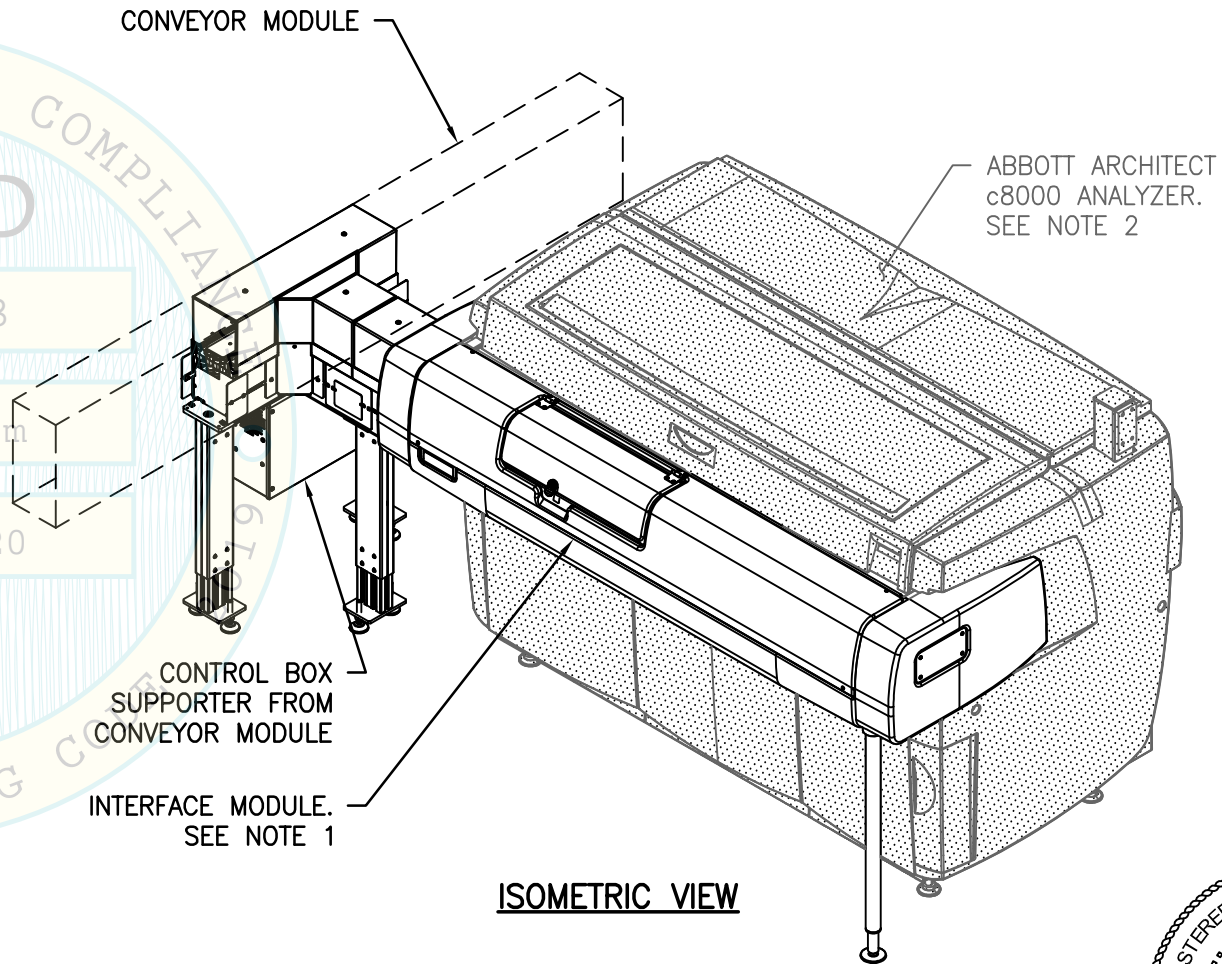
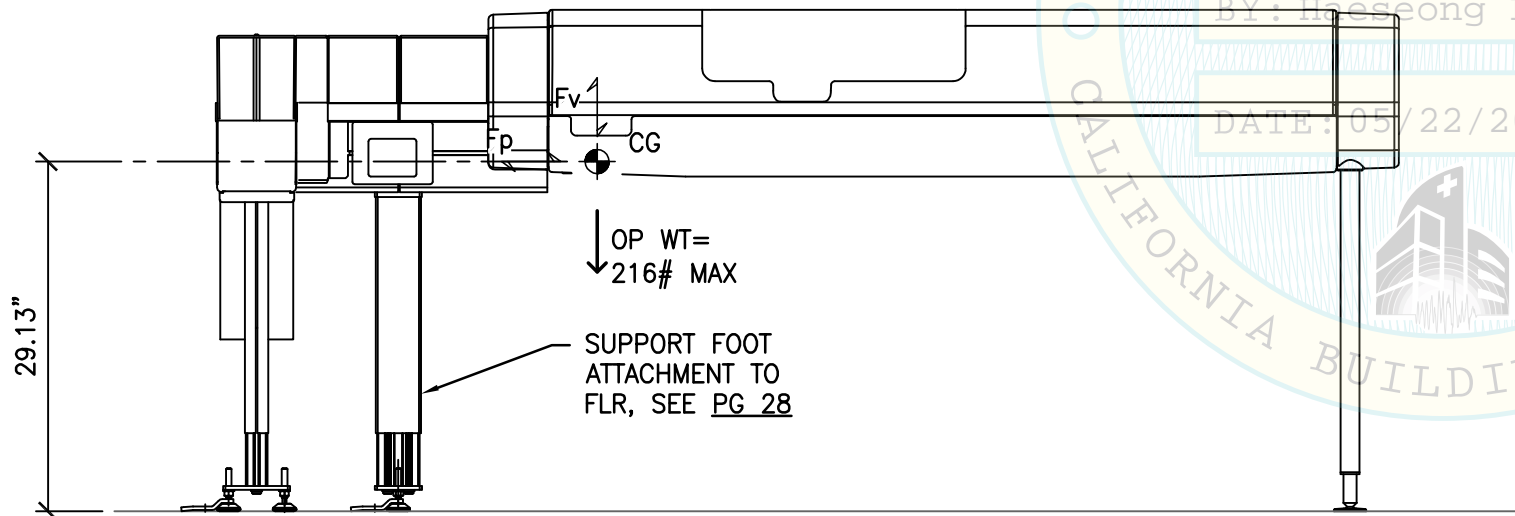
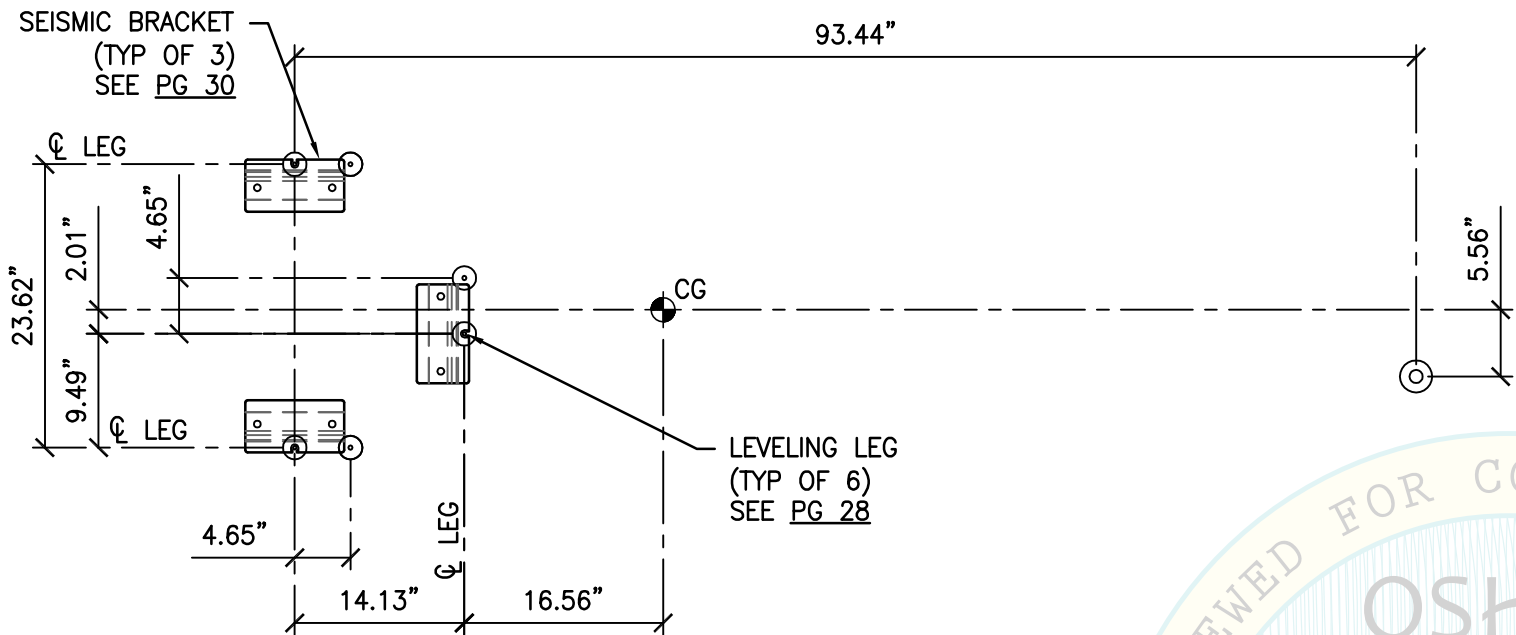


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- NOTES:
- 1. INTERFACE MODULE & CONVEYOR MODULES BY THERMOFISHER SCIENTIFIC SUPPORTS & ATTACHMENTS FOR THE INTERFACE HAVE BEEN DESIGNED TO SUPPORT THE INTERFACE'S SELF-WEIGHT & DOES NOT INCLUDE THE WT OF ANY ATTACHED COMPONENTS.
 - 2. ABBOTT ANALYZER NOT IN THE SCOPE OF THIS OPM. SEISMIC ATTACHMENTS & SUPPORTS ARE REQ & SHALL BE DESIGNED BY OTHERS.



SHEET TITLE: FRAME TYPE "I" - INTERFACE FOR ABBOTT ARCHITECT c8000 ANALYZER



TCAutomation SYSTEM

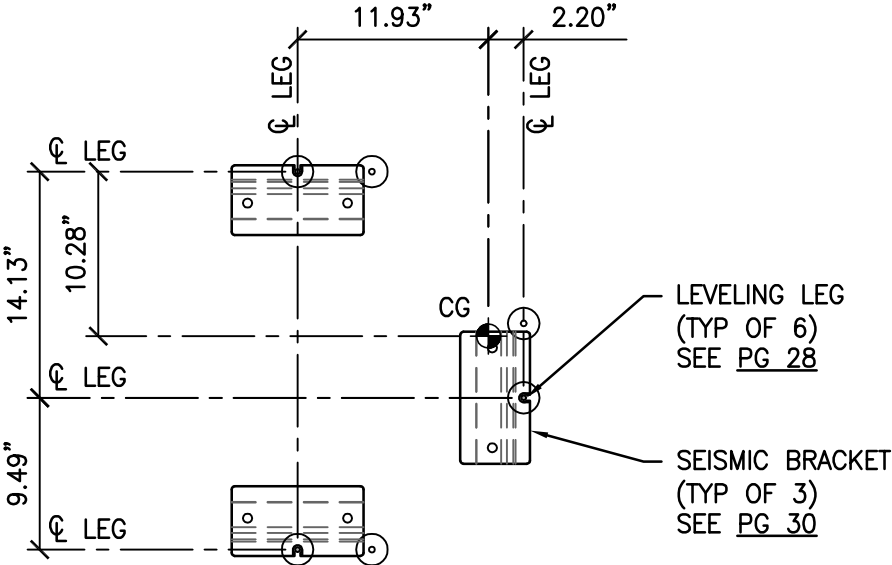


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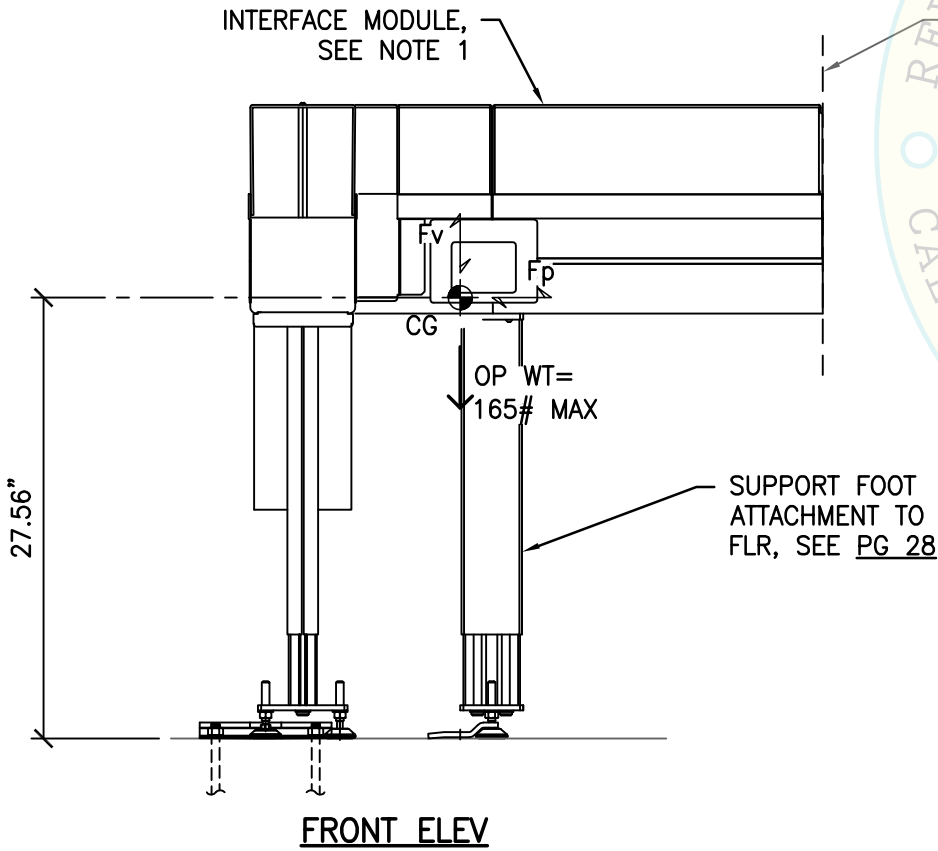
Rev	Description	Date	Job No:	18149
			Date:	5/21/2020
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FRAME TYPE I – INTERFACE FOR PHADIA IMMUNOCAP 1000

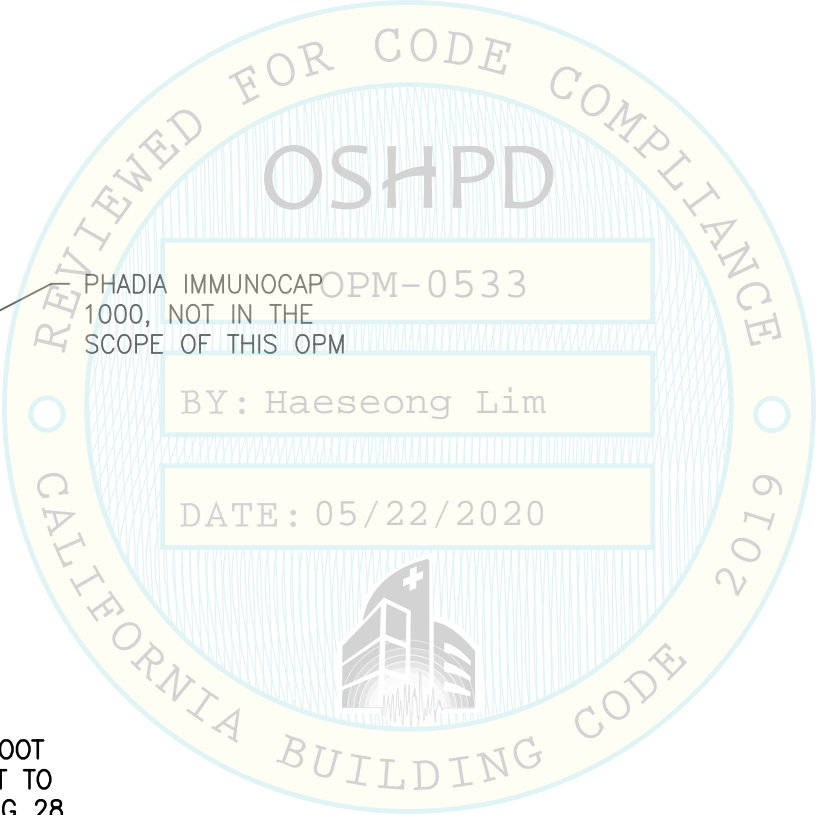
NOTE:
1. INTERFACE MODULE & CONVEYOR MODULES BY THERMOFISHER SCIENTIFIC SUPPORTS & ATTACHMENTS FOR THE INTERFACE HAVE BEEN DESIGNED TO SUPPORT THE INTERFACE'S SELF-WEIGHT & DOES NOT INCLUDE THE WT OF ANY ATTACHED COMPONENTS.



PLAN VIEW AT BASE



FRONT ELEV



SHEET TITLE: FRAME TYPE "I" - INTERFACE FOR PHADIA IMMUNOCAP 1000



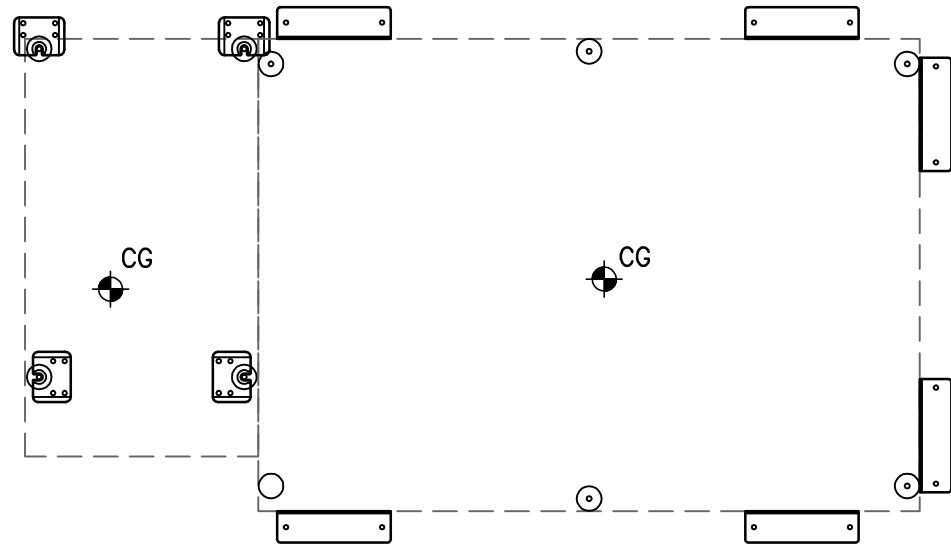
TCAutomation SYSTEM



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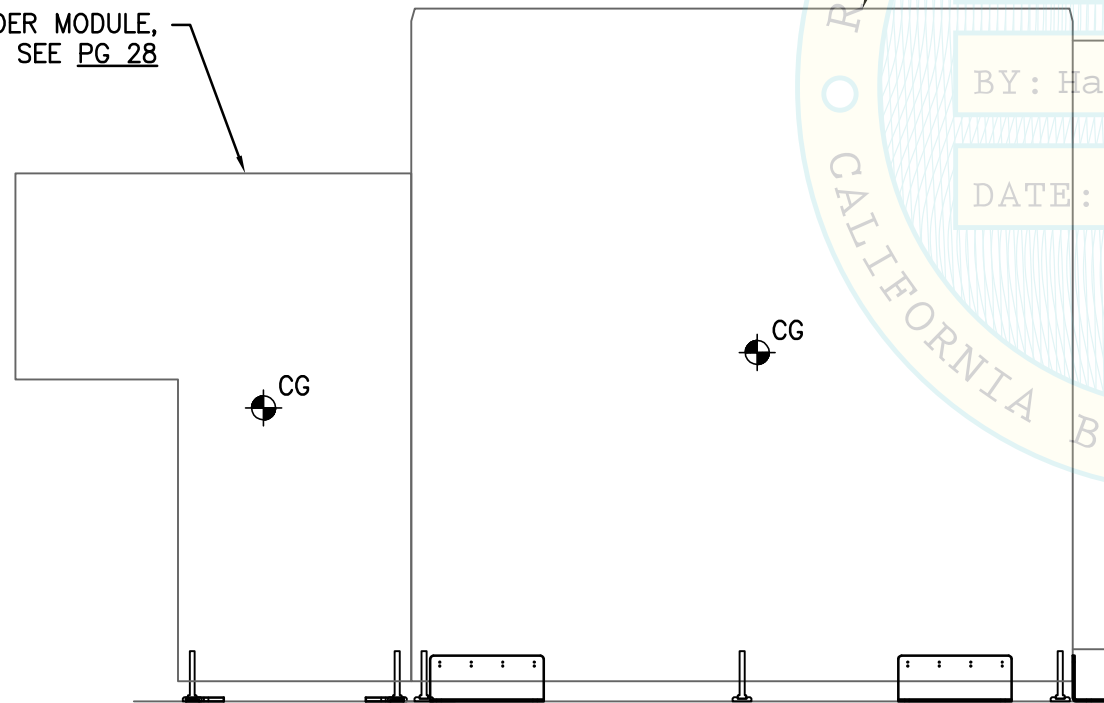
Rev	Description	Date	Job No:	18149
			Date:	5/21/2020
			By:	DTS
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L:\Jobs\18149 Thermo Fisher - OPA OPM Renewal\STRU\51_TCAutomation_11X17.dwg Time:May21,2020-04:19pm Login:camachom DimScale:1 LScale:6

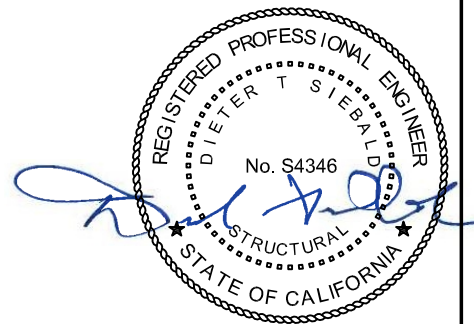
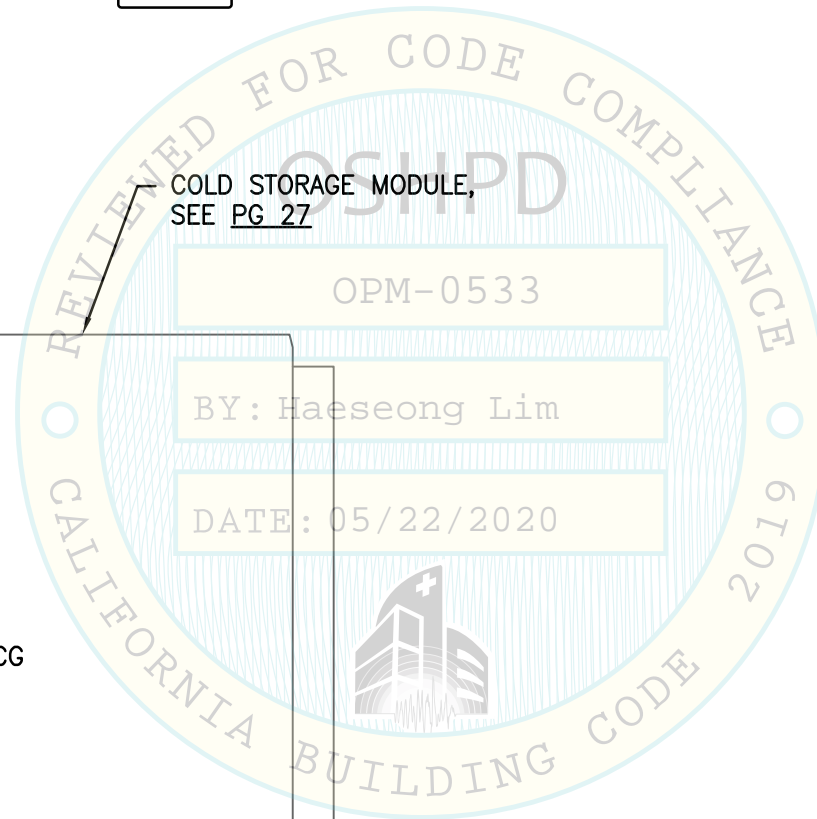


PLAN VIEW
AT BASE

LOADER MODULE,
SEE PG 28



FRONT ELEV



SHEET TITLE: LOADER MODULE & COLD STORAGE MODULE
CONFIGURATION

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



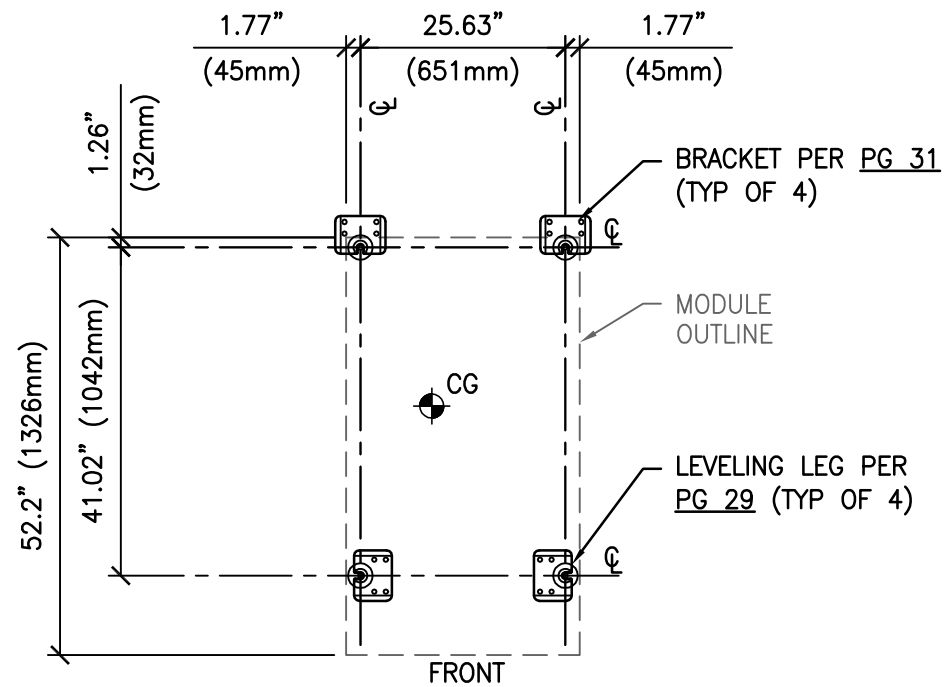
CYS STRUCTURAL ENGINEERS, INC.

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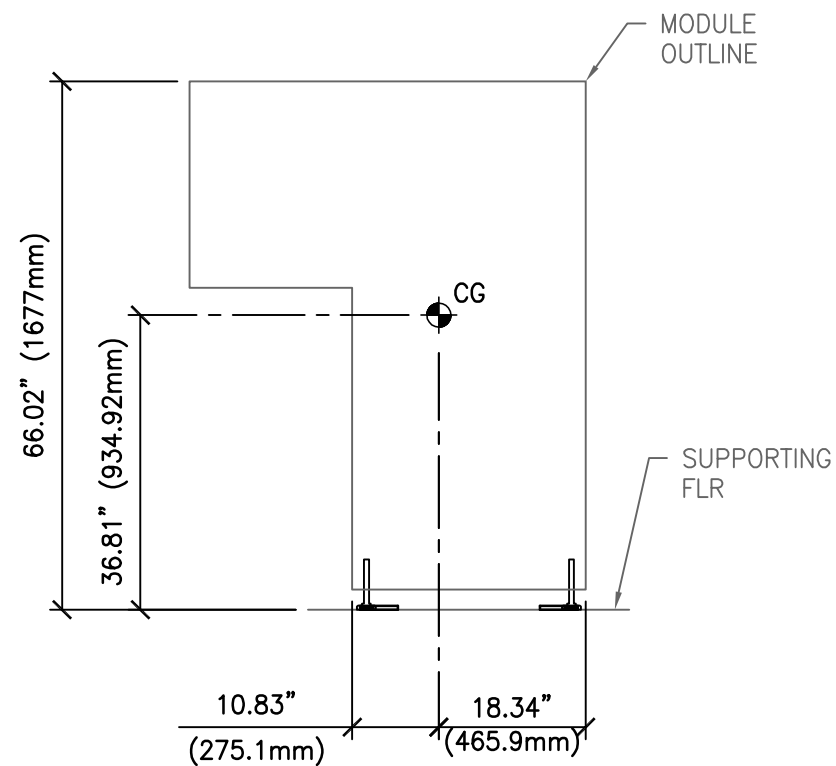
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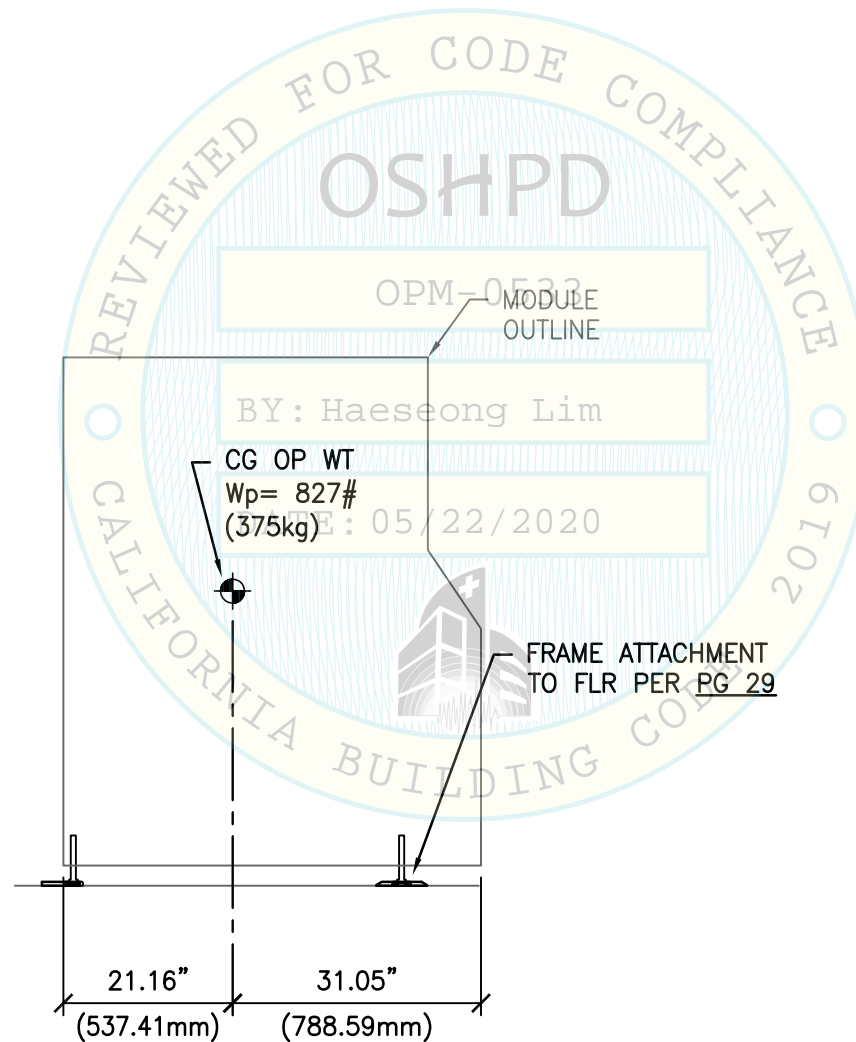
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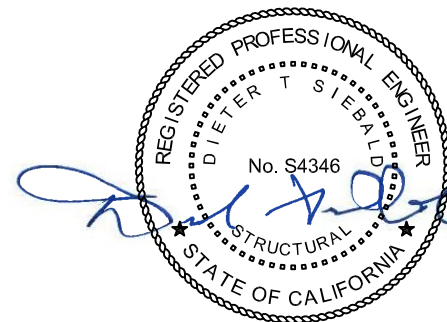
PLAN VIEW
AT BASE



FRONT ELEV



RIGHT SIDE ELEV



SHEET TITLE: LOADER MODULE
PLAN VIEW & ELEVATIONS

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



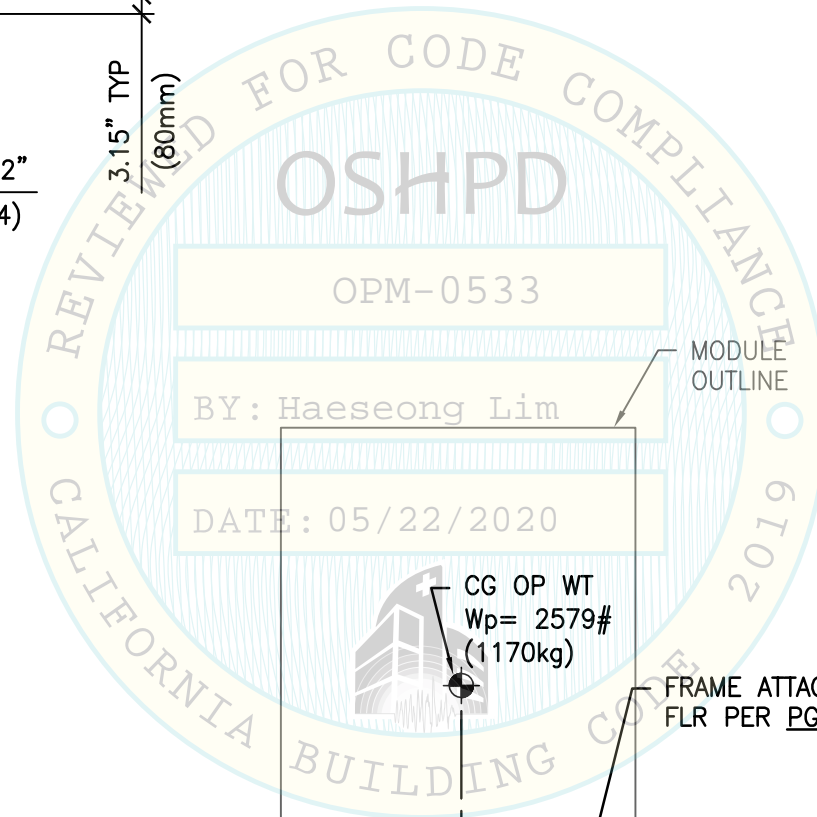
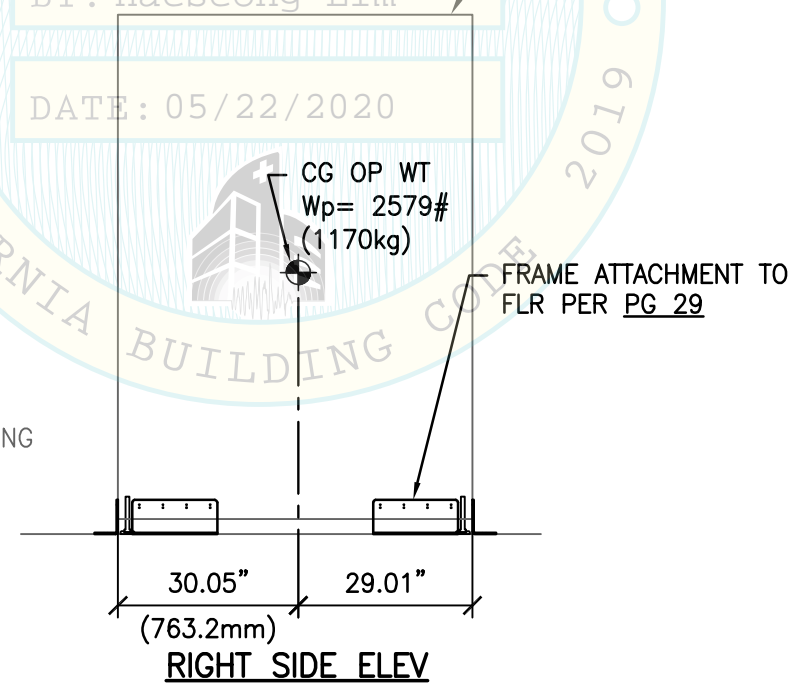
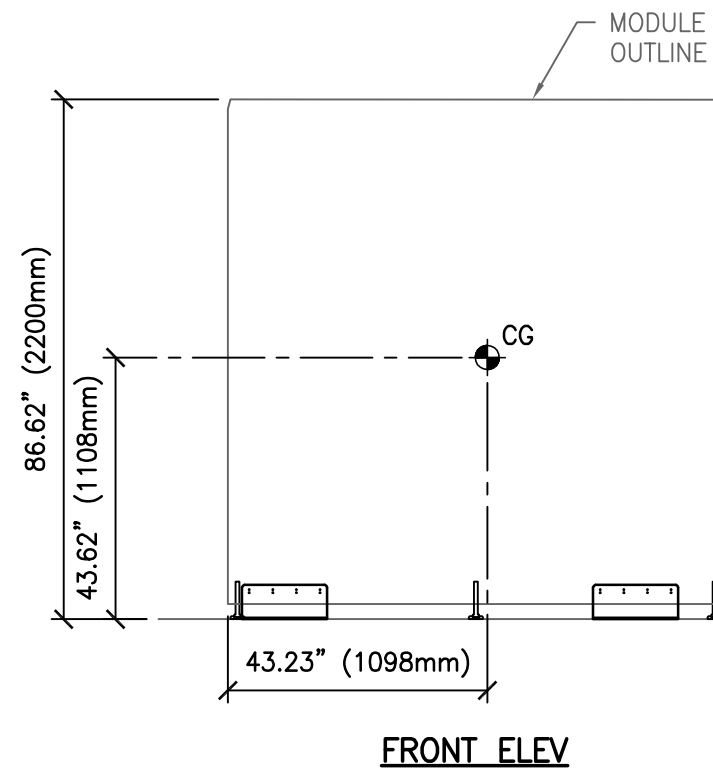
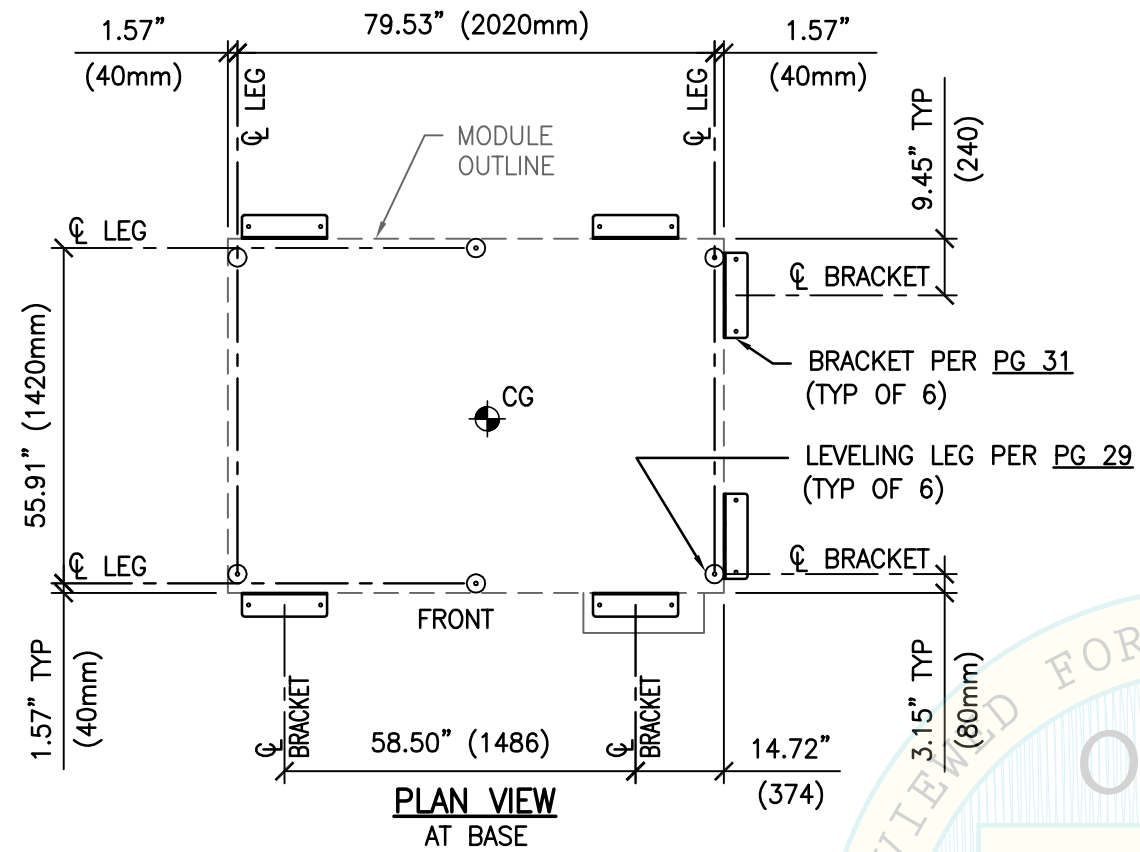
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L:\Jobs\18\18149 Thermo Fisher - OPA OPM Renewal\STRU\S1_TCAutomation_11X17.dwg Time:May21,2020-04:19pm Login:camachom DimScale:1 LScale:6



SHEET TITLE: COLD STORAGE
PLAN VIEW & ELEVATIONS

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



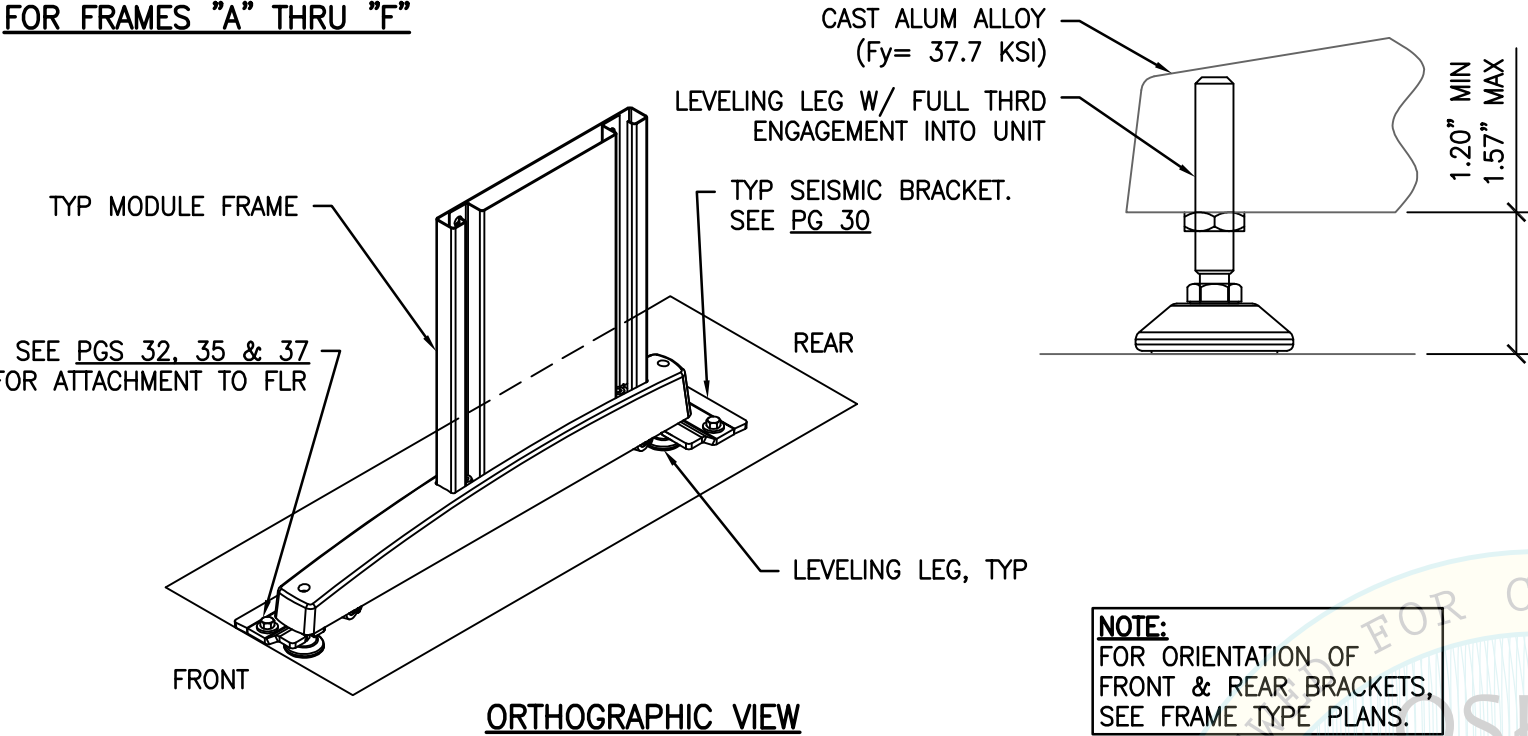
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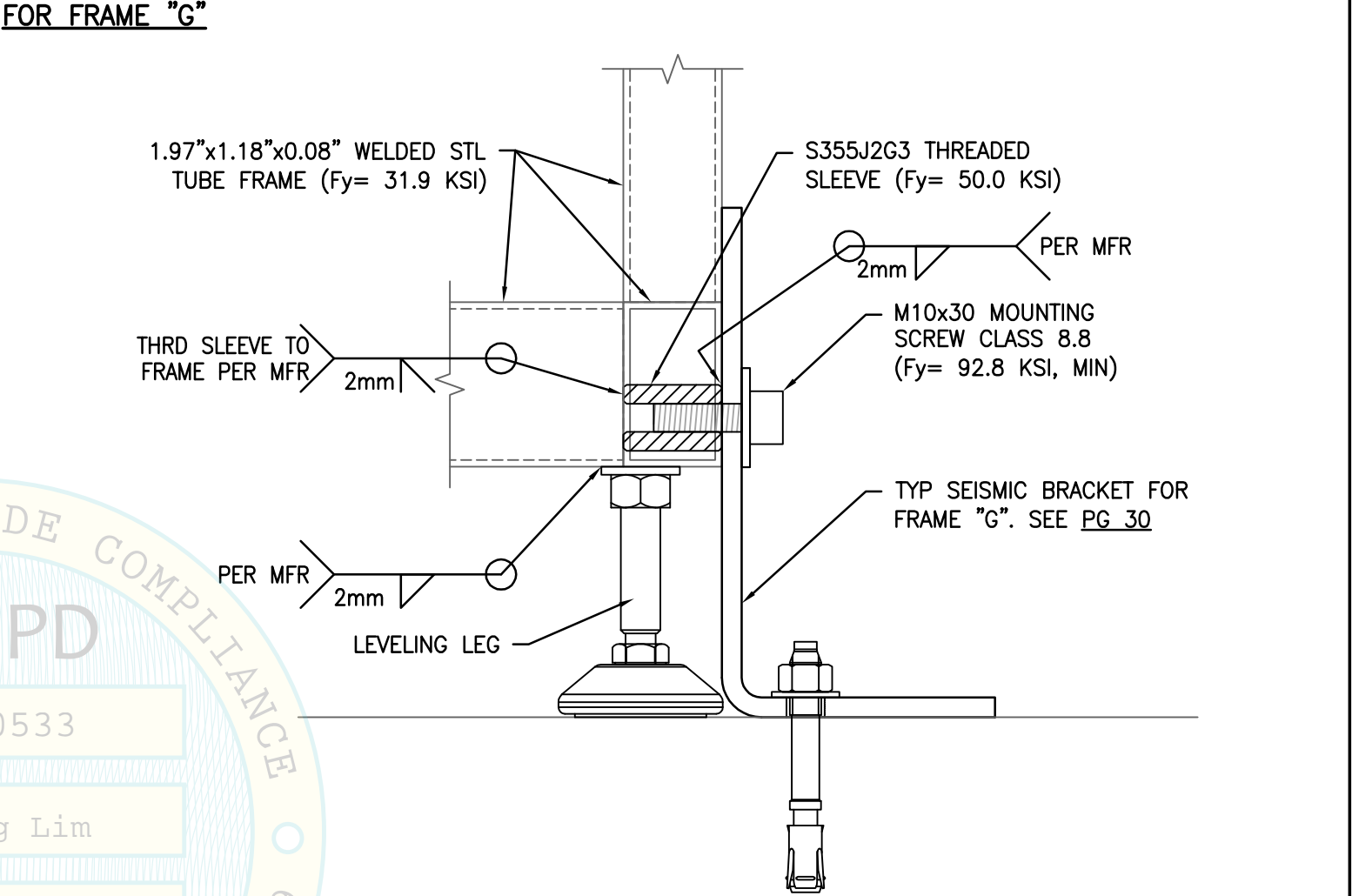
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			Date:	5/21/2020
			By:	DTS
			Page:	27 of 39

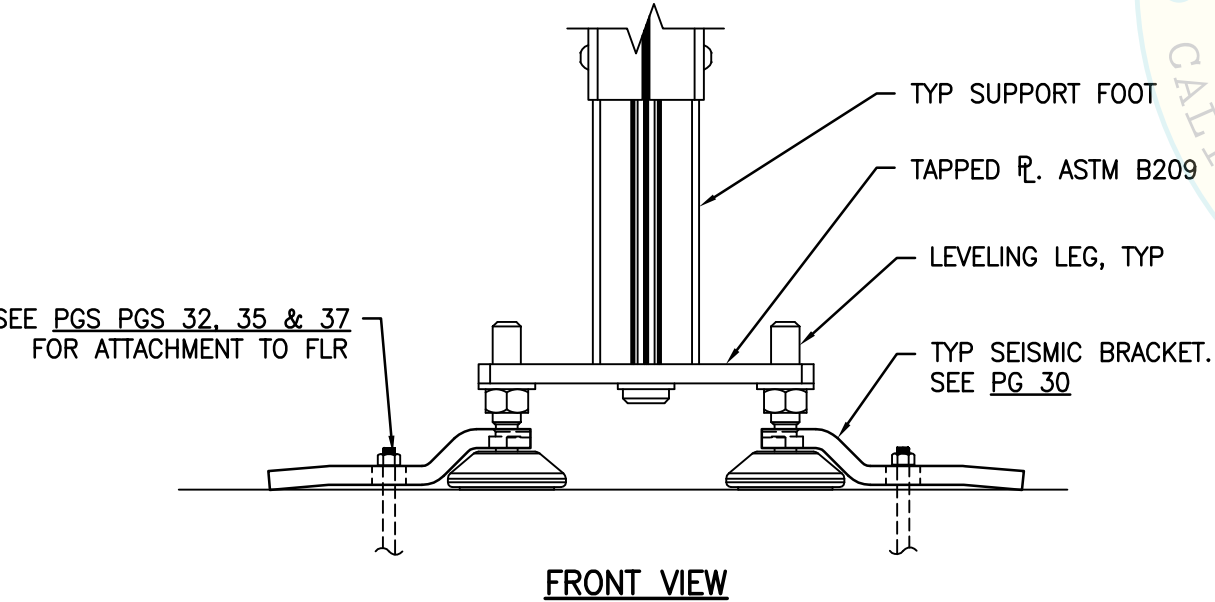
TYP MODULE FRAME ATTACHMENT TO FLR
FOR FRAMES "A" THRU "F"



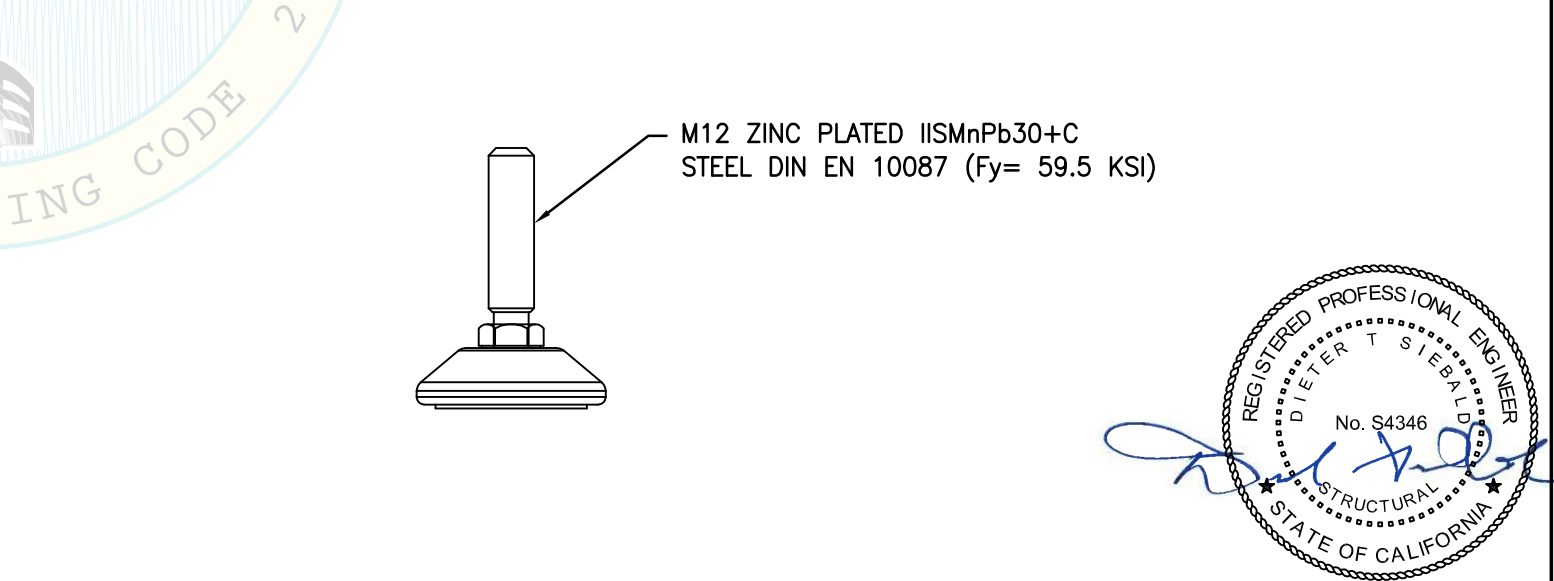
TYP MODULE FRAME ATTACHMENT TO FLR
FOR FRAME "G"



TYP CONVEYOR ATTACHMENT TO FLR
FOR FRAMES "H-1" THRU "H-6"



TYP LEVELING LEG



SHEET TITLE: TYPICAL MODULE FRAME ATTACHMENT TO FLOOR DETAILS &
TYPICAL LEVELING LEG DETAILS



TCAutomation SYSTEM



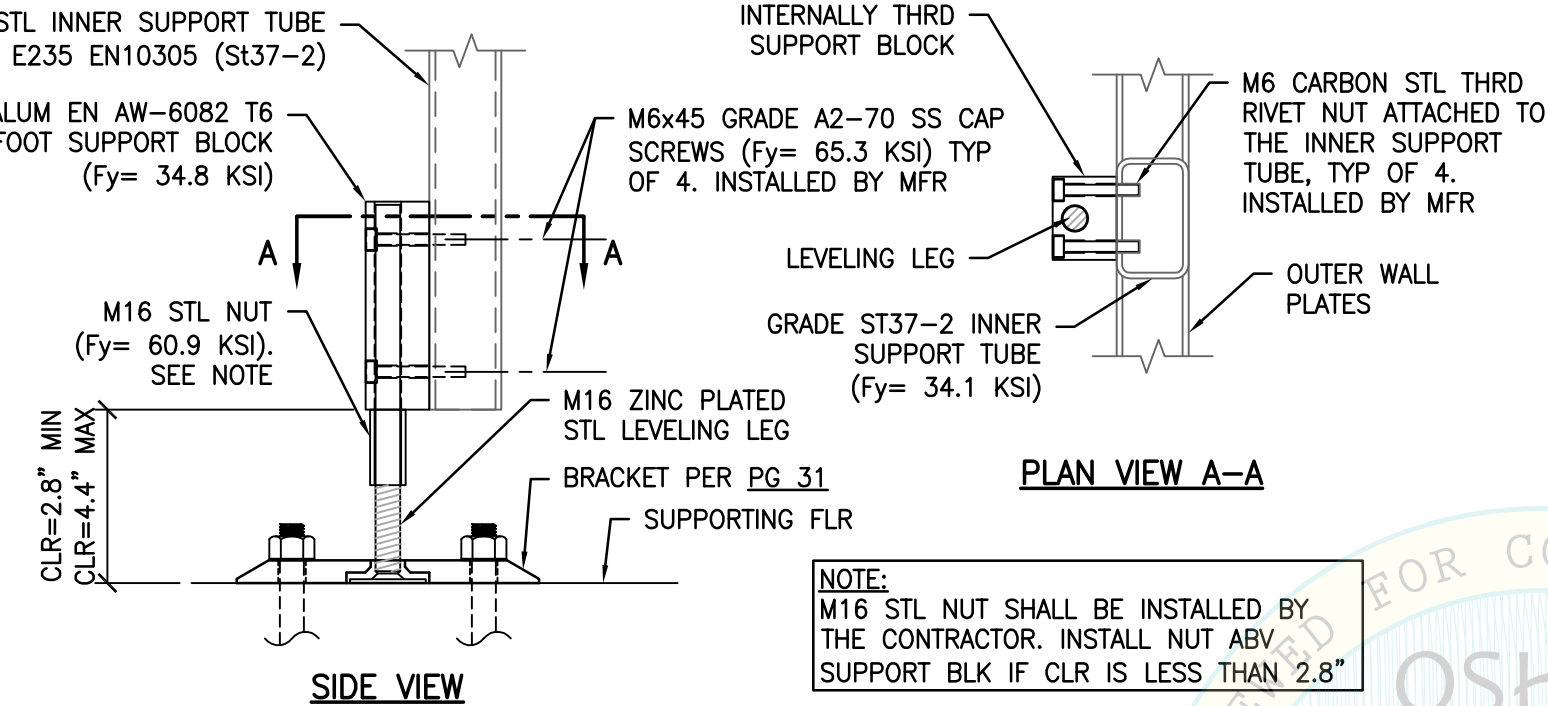
CYS STRUCTURAL ENGINEERS, INC.

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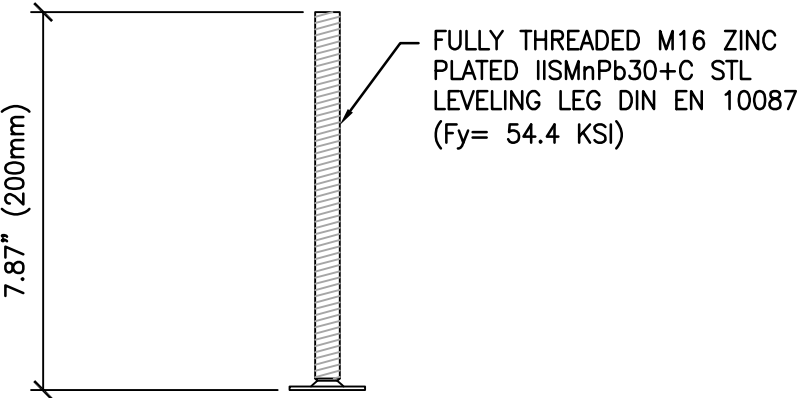
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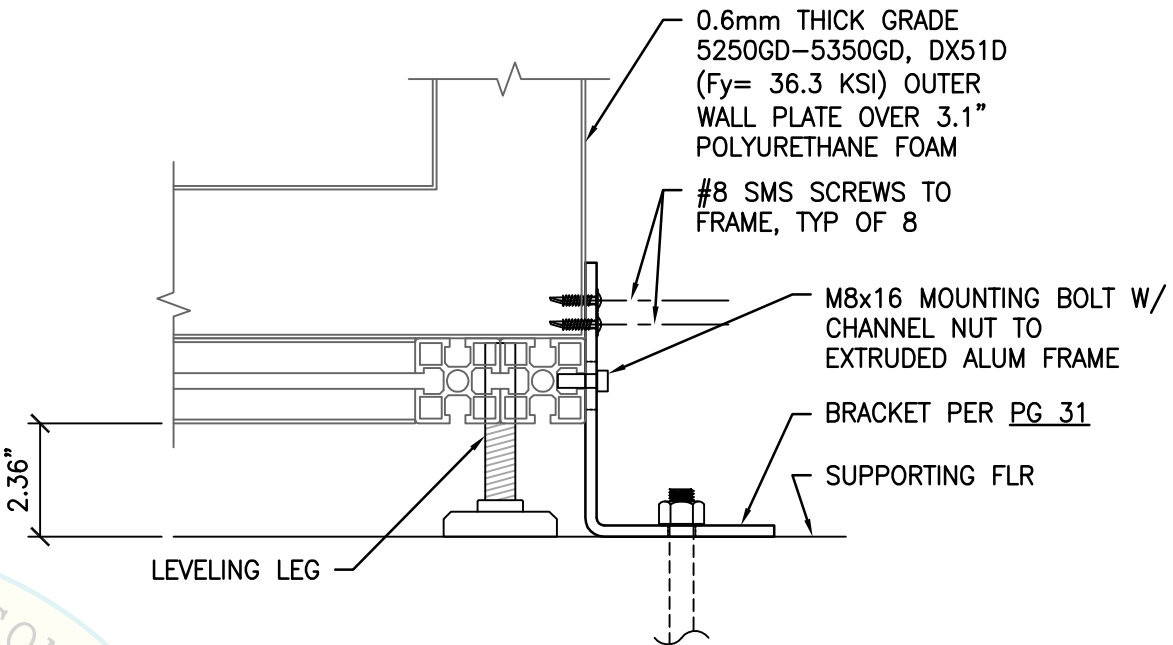
LOADER MODULE FRAME ATTACHMENT TO FLOOR



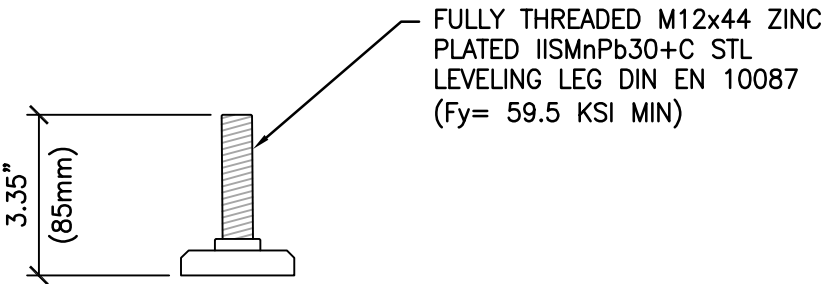
LOADER MODULE LEVELING LEG DETAIL:



COLD STORAGE MODULE FRAME ATTACHMENT



COLD STORAGE LEVELING LEG DETAIL:



SHEET TITLE: TYPICAL MODULE FRAME ATTACHMENT TO FLOOR DETAILS &
 TYPICAL LEVELING LEG DETAILS



TCAutomation SYSTEM



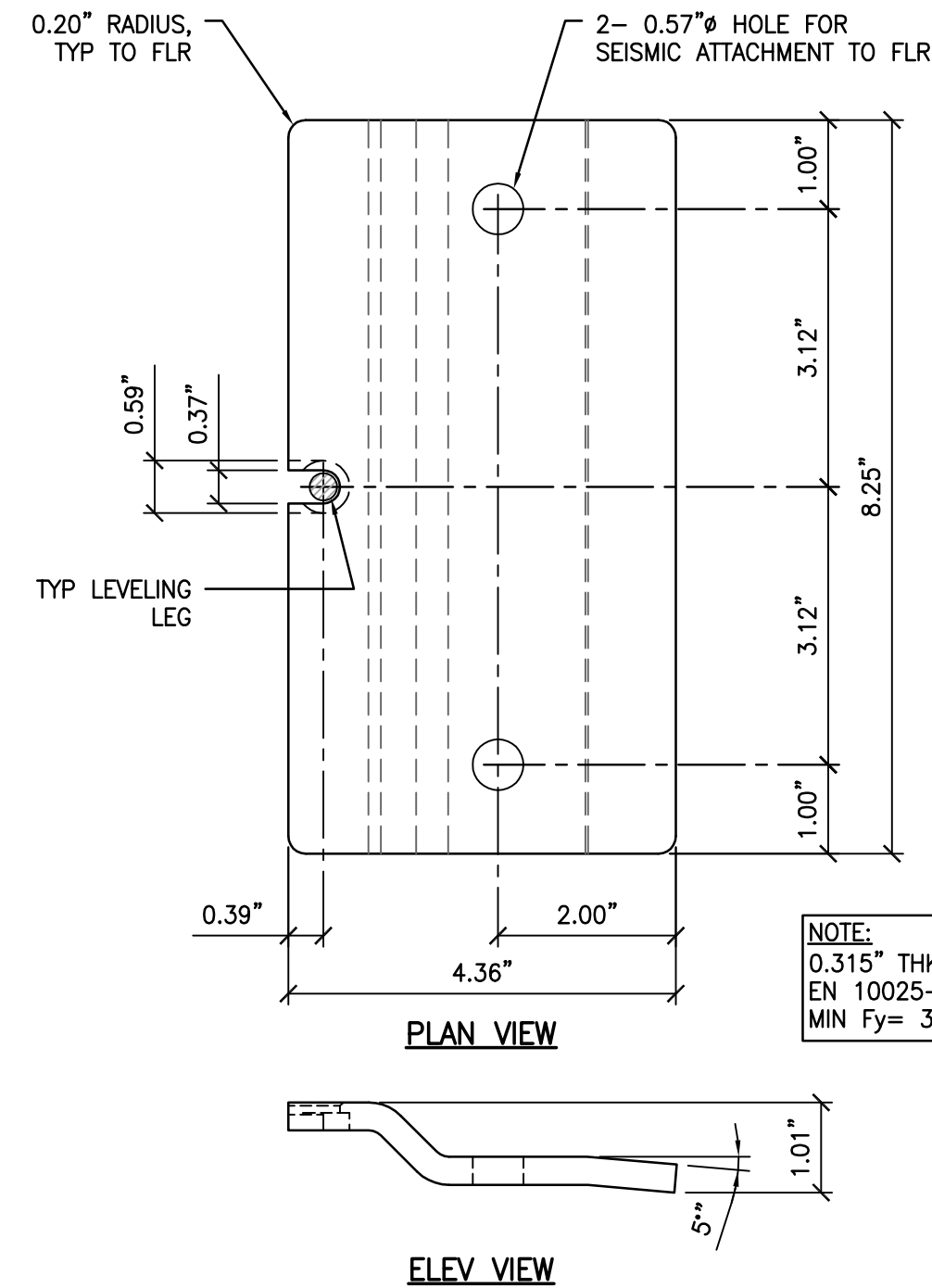
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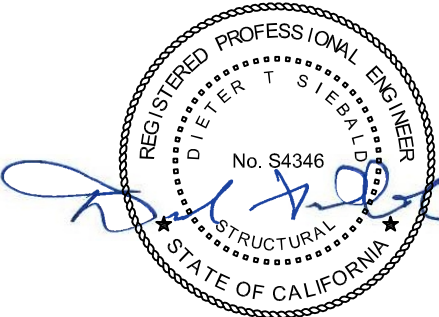
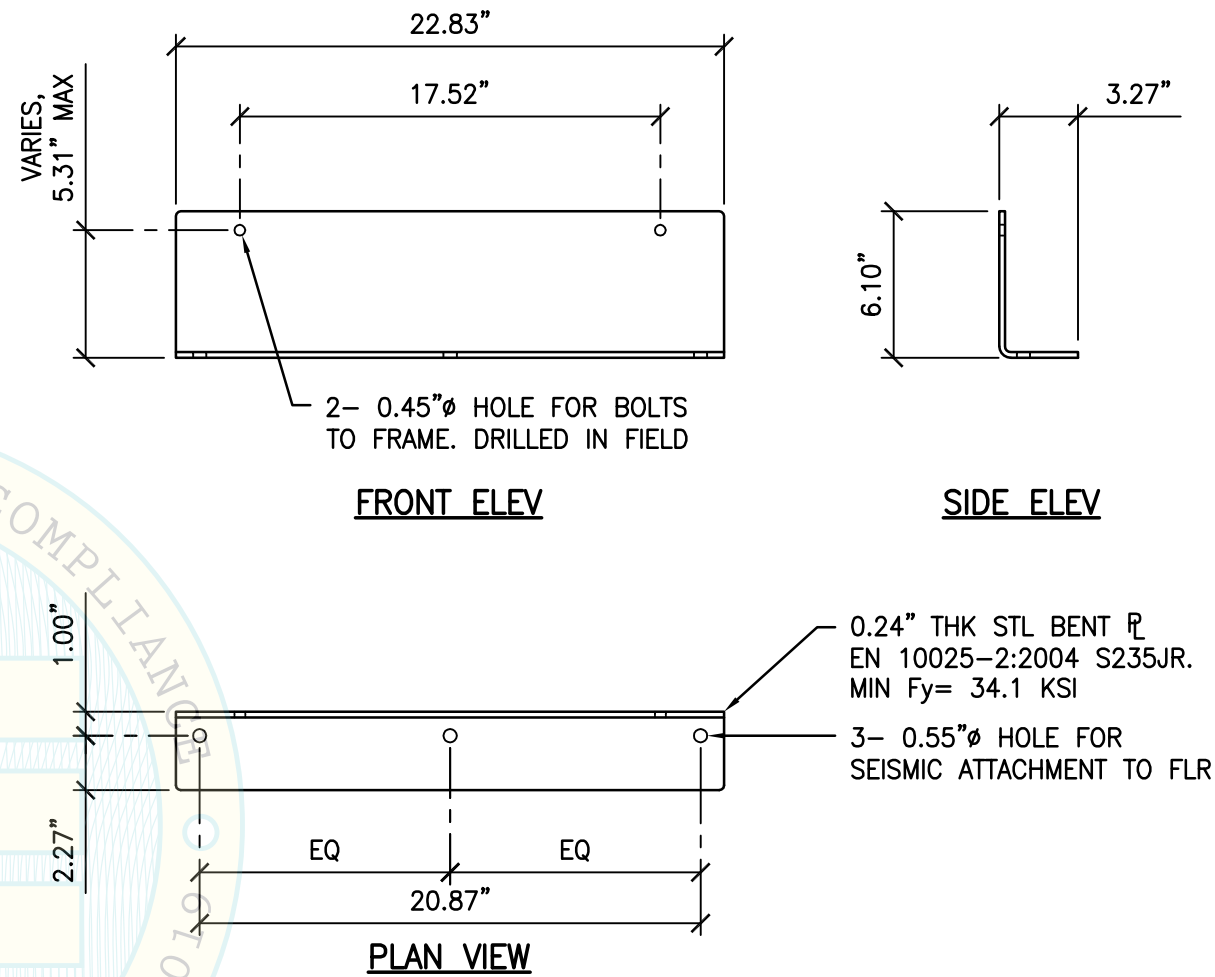
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TYP BRACKET DETAIL FOR FRAME TYPES A THRU F



TYP SEISMIC BRACKET DETAIL FOR FRAME TYPE G



SHEET TITLE: TYPICAL SEISMIC BRACKET DETAILS



TCAutomation SYSTEM



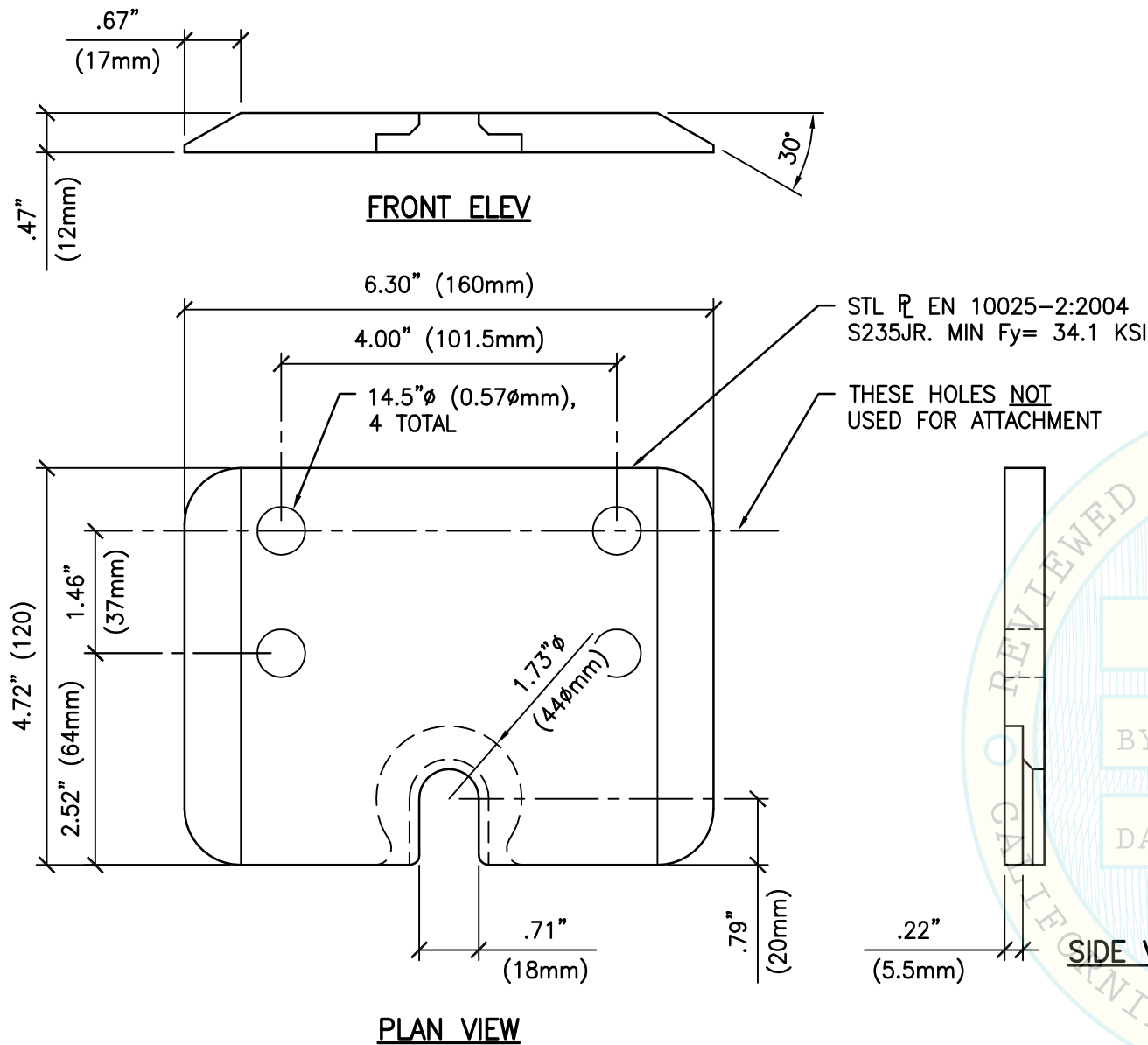
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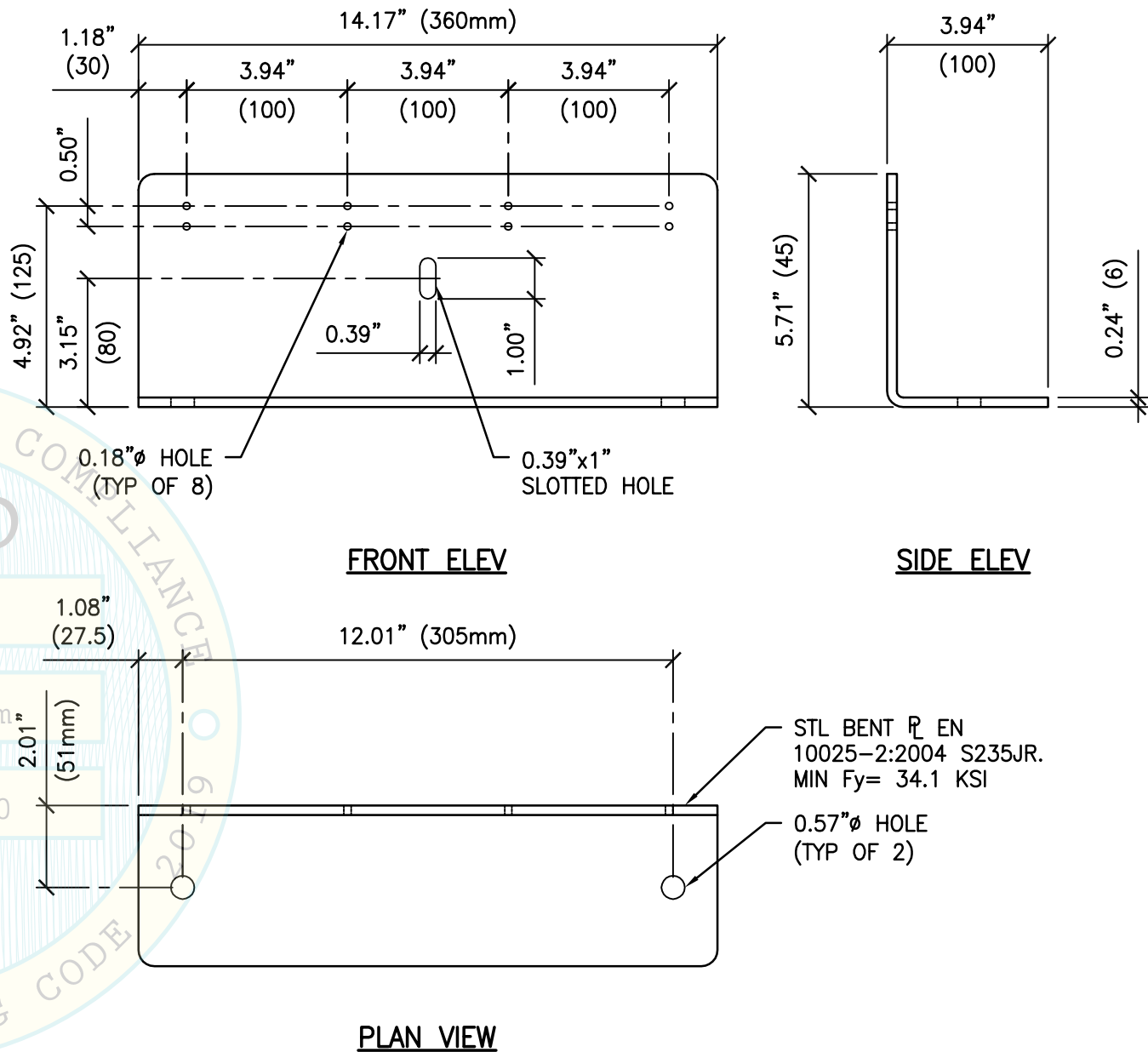
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LOADER MODULE BRACKET



COLD STORAGE MODULE BRACKET



SHEET TITLE: TYPICAL SEISMIC BRACKET DETAILS



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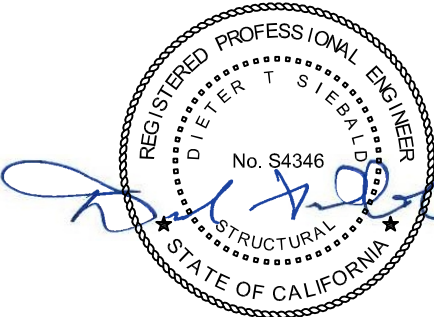
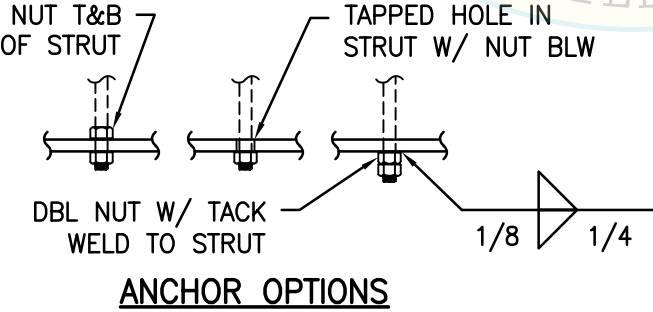
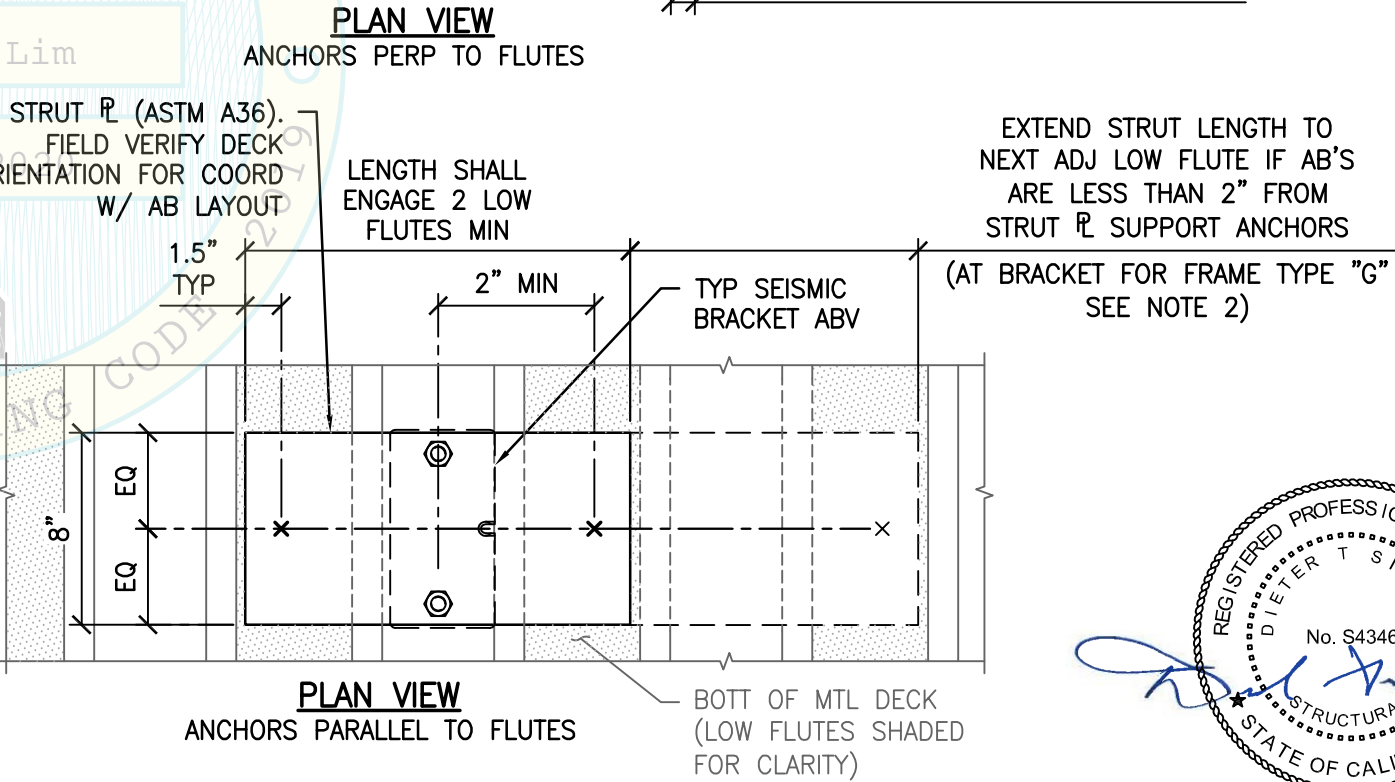
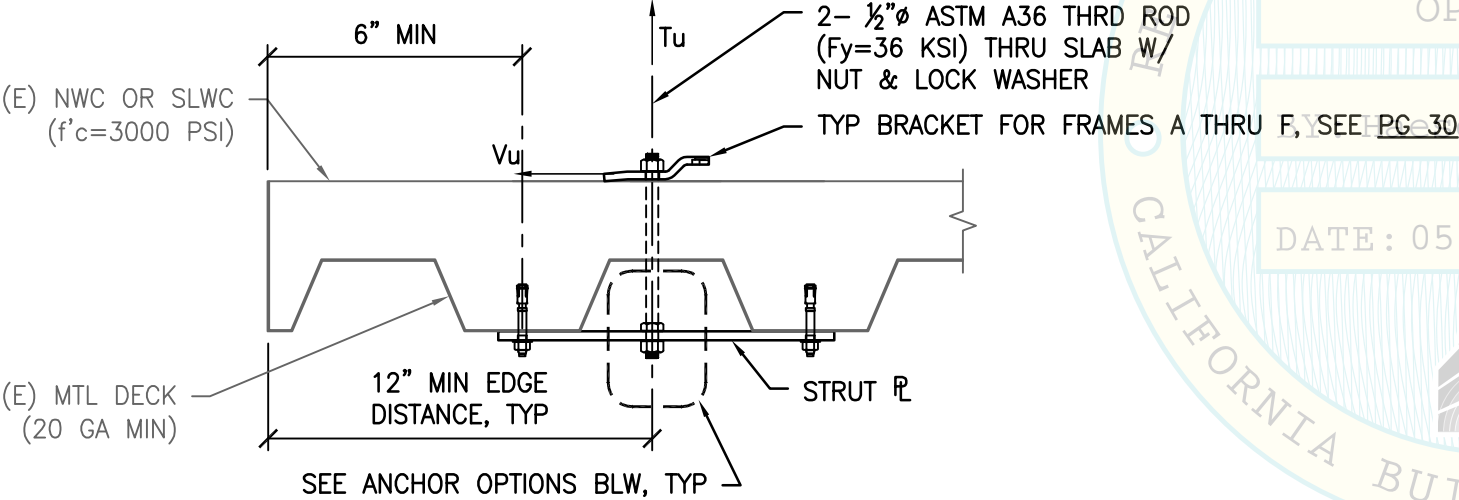
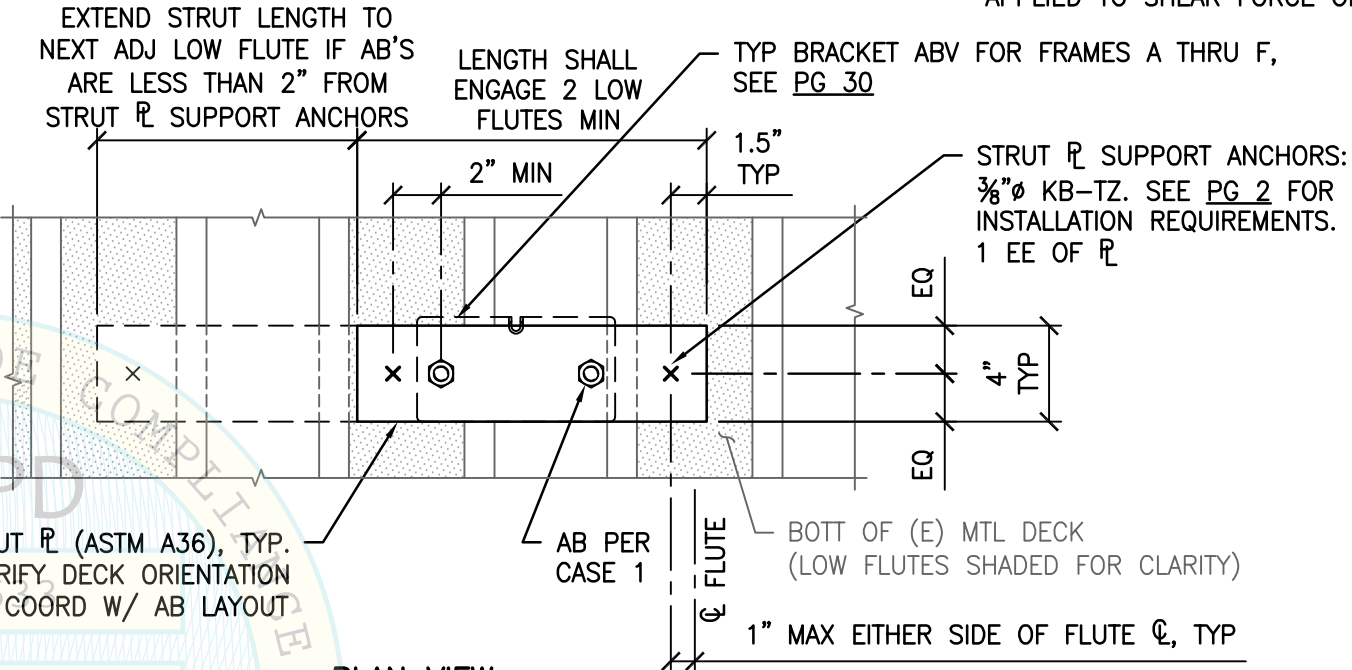
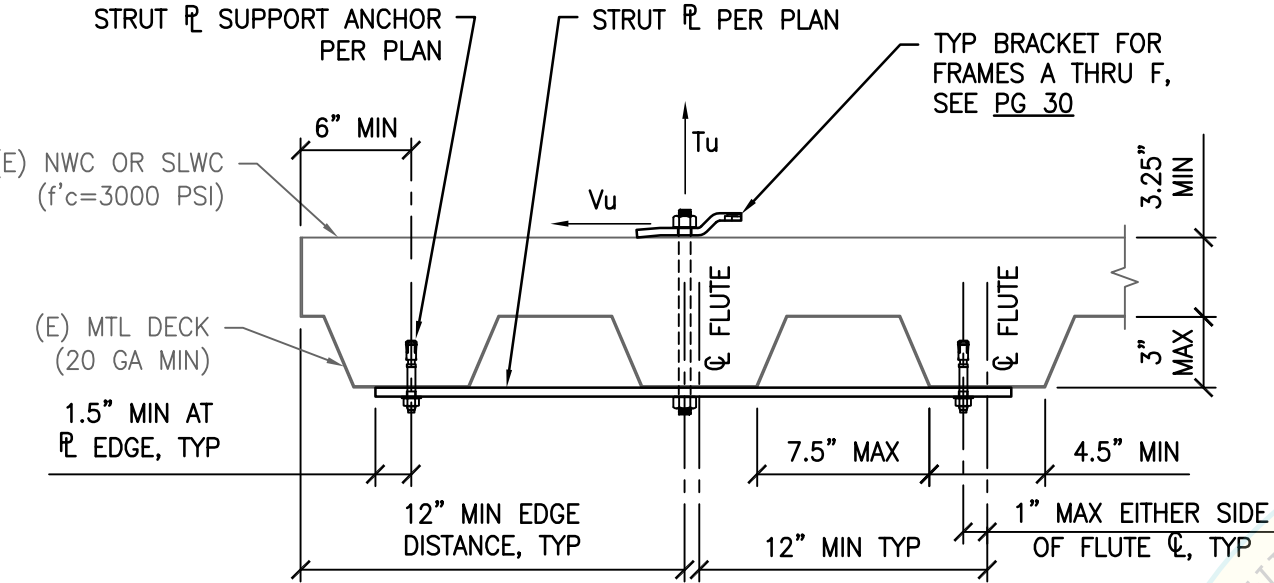
Rev	Description	Date	Job No:	18149
			Date:	5/21/2020
			By:	DTS
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CASE 1: BRACKET ATTACHMENT DTL FOR FRAMES A THRU F

	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)	
	Tu	Vu
CASE 1 $S_{Ds} \leq 1.50$ & $z/h \leq 0.50$	1026#	1032#

($\Omega_o = 1.5$) OVERSTRENGTH FACTOR IS APPLIED TO SHEAR FORCE ONLY



SHEET TITLE: ATTACHMENT DETAILS THROUGH CONCRETE FILL OVER METAL DECK (CASE 1)

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



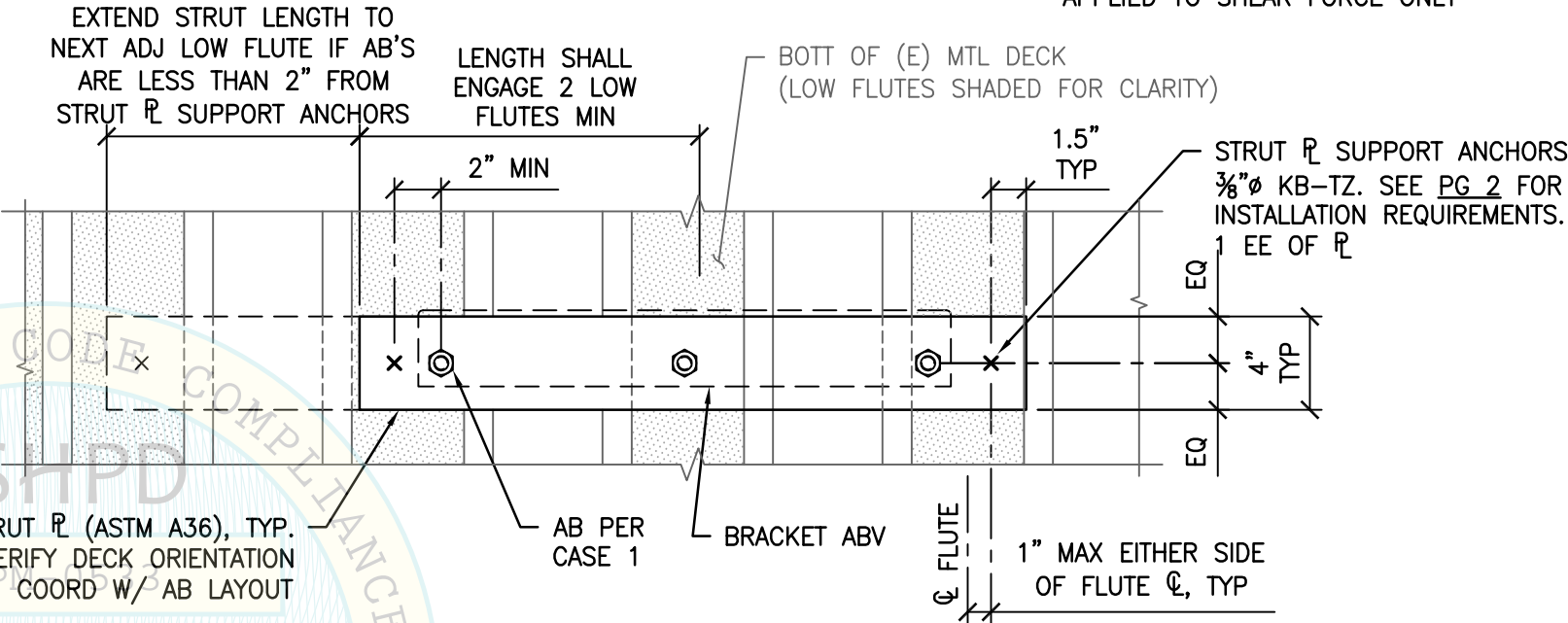
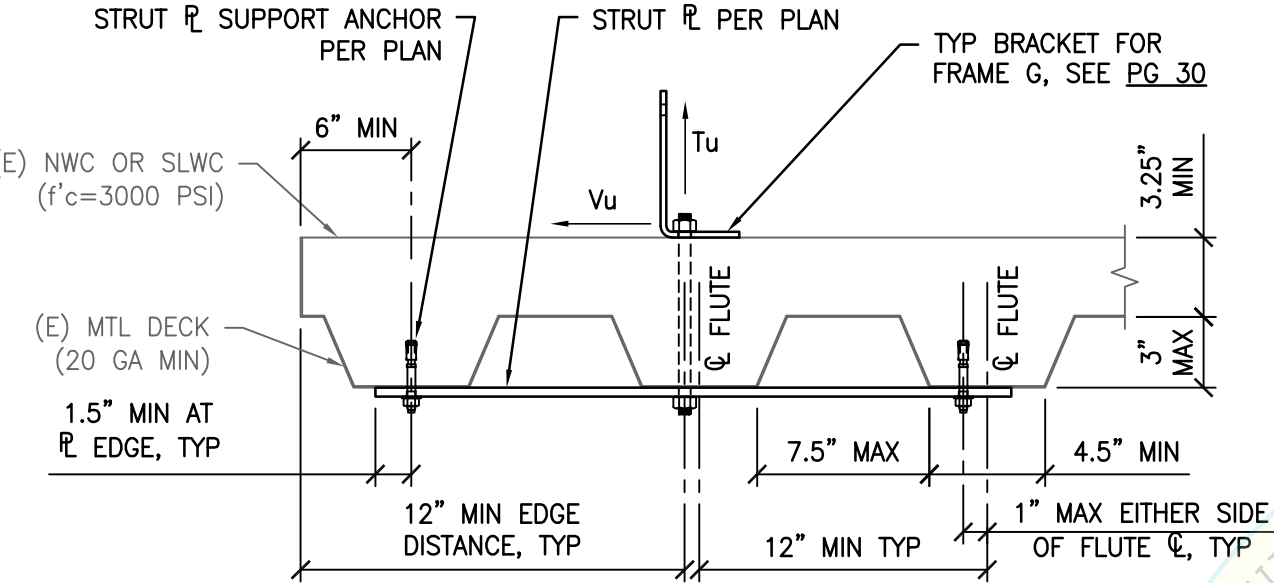
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CASE 1: BRACKET ATTACHMENT DTL FOR FRAME G

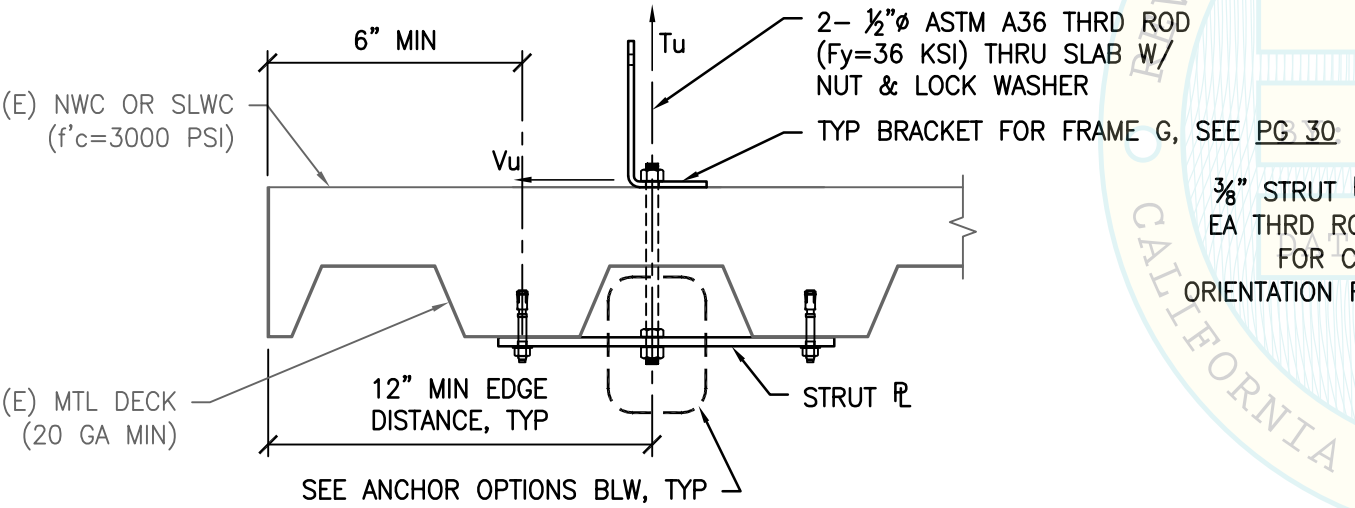
	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)	
	Tu	Vu
CASE 1 $S_{Ds} \leq 1.50$ & $z/h \leq 0.50$	834#	305#

($\Omega_o = 1.5$) OVERSTRENGTH FACTOR IS APPLIED TO SHEAR FORCE ONLY



PLAN VIEW

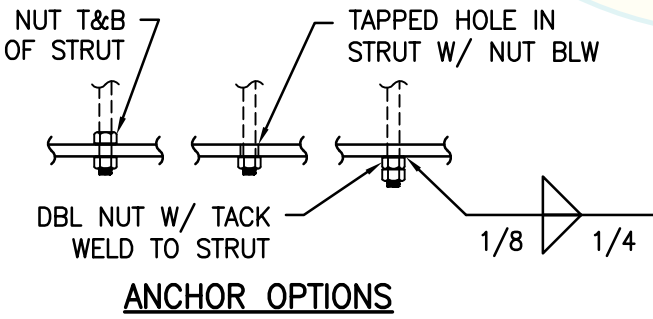
ANCHORS PERP TO FLUTES



$\frac{3}{8}$ " STRUT \perp (ASTM A36). PROVIDE AT EA THRD ROD (3- TOTAL, NOT SHOWN FOR CLARITY) FIELD VERIFY DECK ORIENTATION FOR COORD W/ AB LAYOUT

LENGTH SHALL ENGAGE 2 LOW FLUTES MIN

EXTEND STRUT LENGTH TO NEXT ADJ LOW FLUTE IF AB'S ARE LESS THAN 2" FROM STRUT \perp SUPPORT ANCHORS (AT BRACKET FOR FRAME TYPE "G" SEE NOTE 2)



PLAN VIEW

ANCHORS PARALLEL TO FLUTES

BOTT OF MTL DECK (LOW FLUTES SHADED FOR CLARITY)



SHEET TITLE: ATTACHMENT DETAILS THROUGH CONCRETE FILL OVER METAL DECK (CASE 1)



TCAutomation SYSTEM

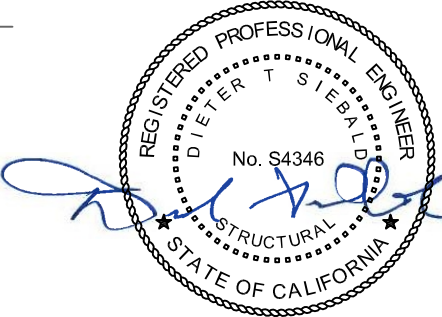
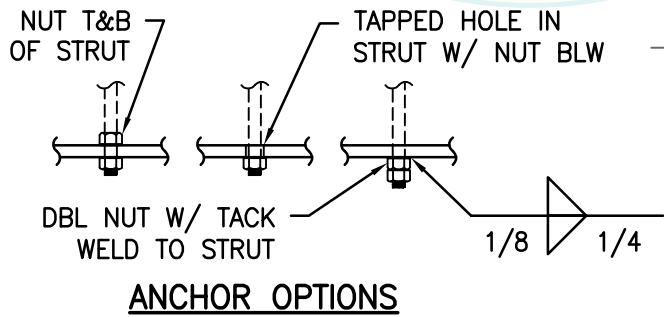
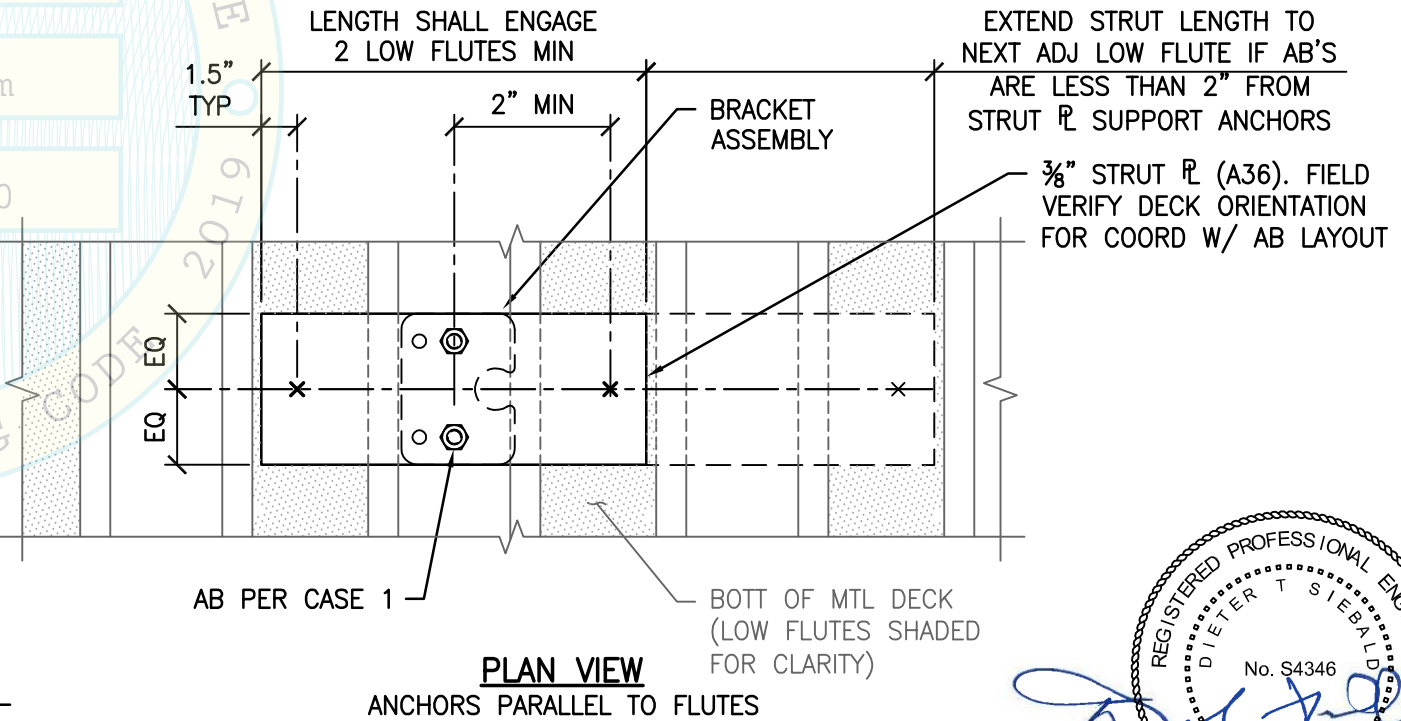
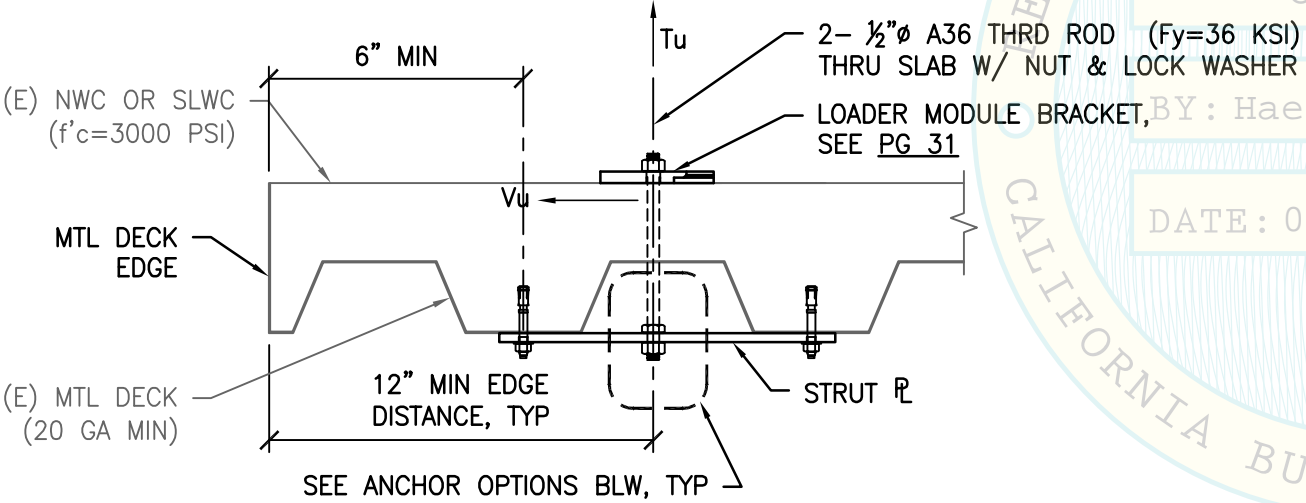
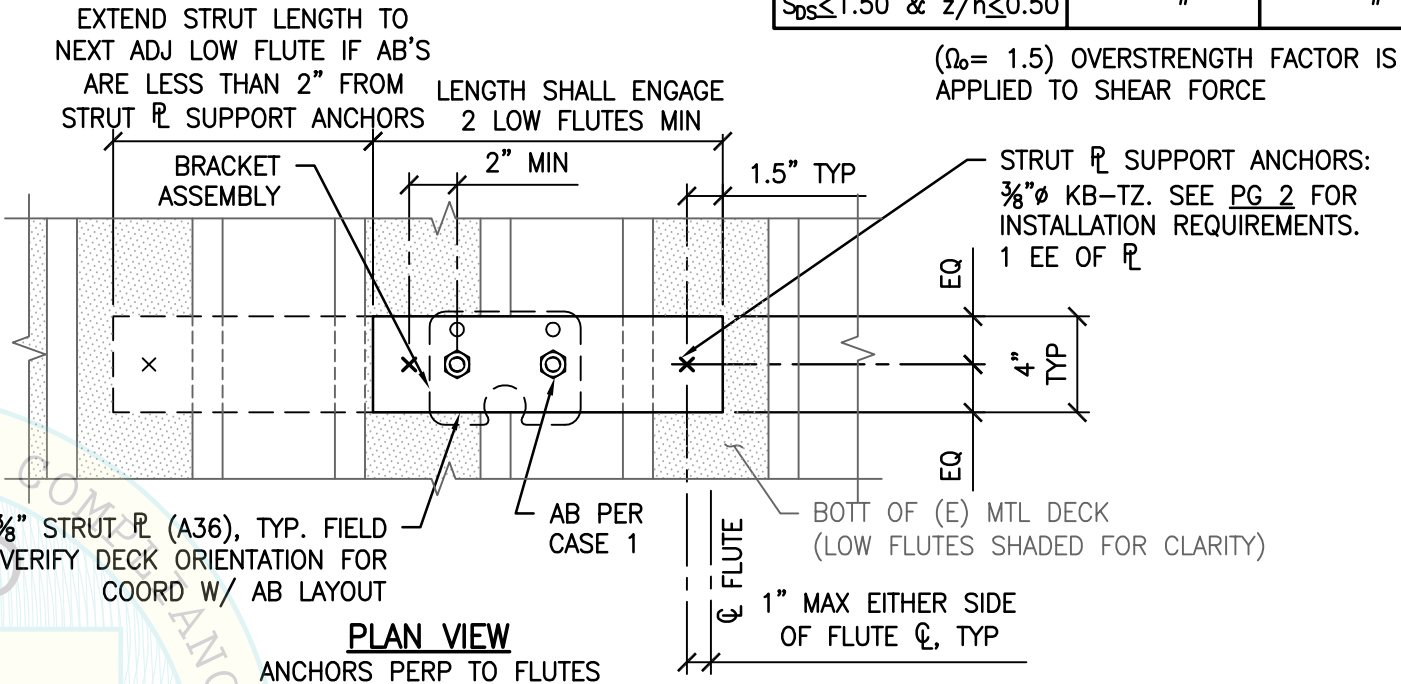
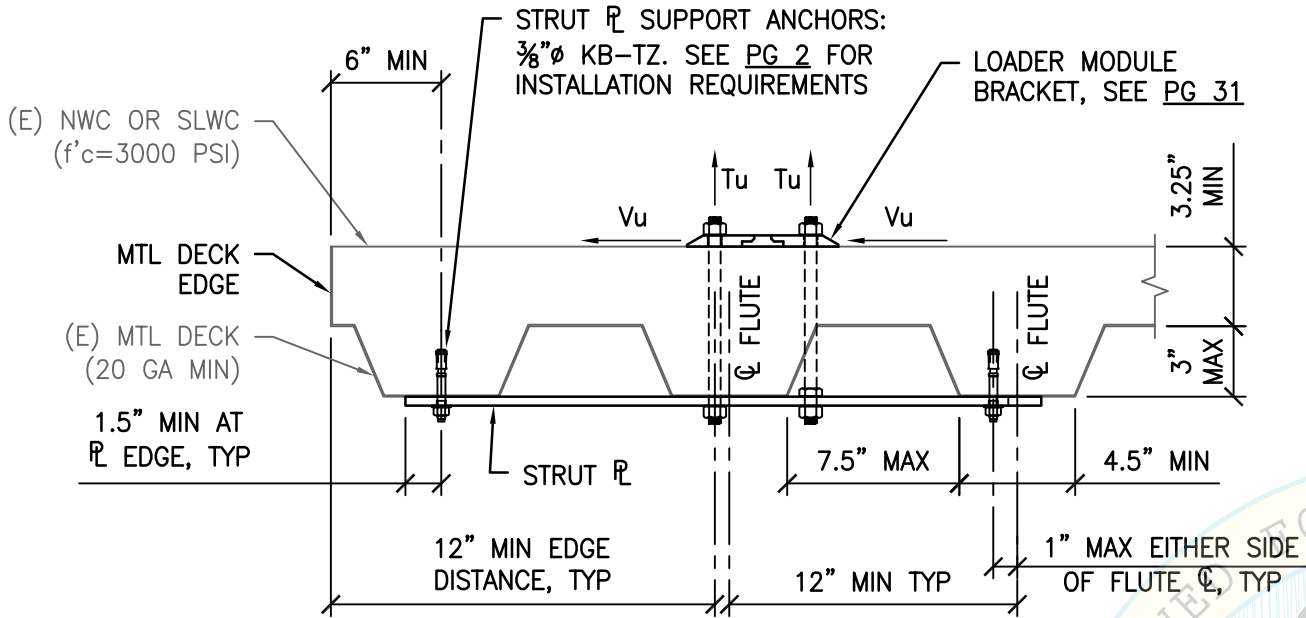


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CASE 1: BRACKET ATTACHMENT DTL FOR LOADER MODULE

MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)		
	Tu	Vu
CASE 1 $S_{Ds} \leq 1.50$ & $z/h \leq 0.50$	612#	528#



SHEET TITLE: LOADER MODULE ATTACHMENT DETAILS THROUGH CONCRETE FILL OVER METAL DECK (CASE 1)

ThermoFisher
SCIENTIFIC

TCAutomation SYSTEM



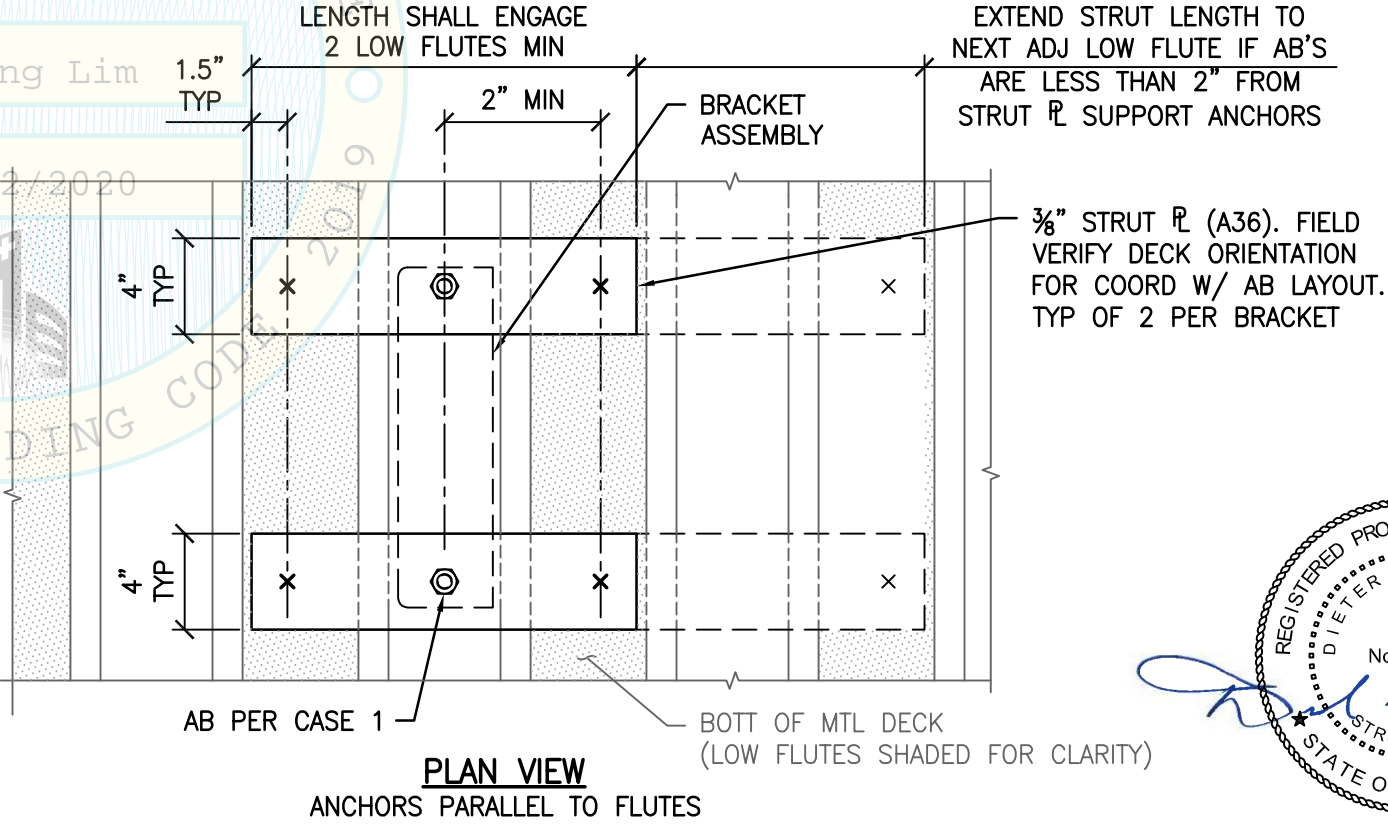
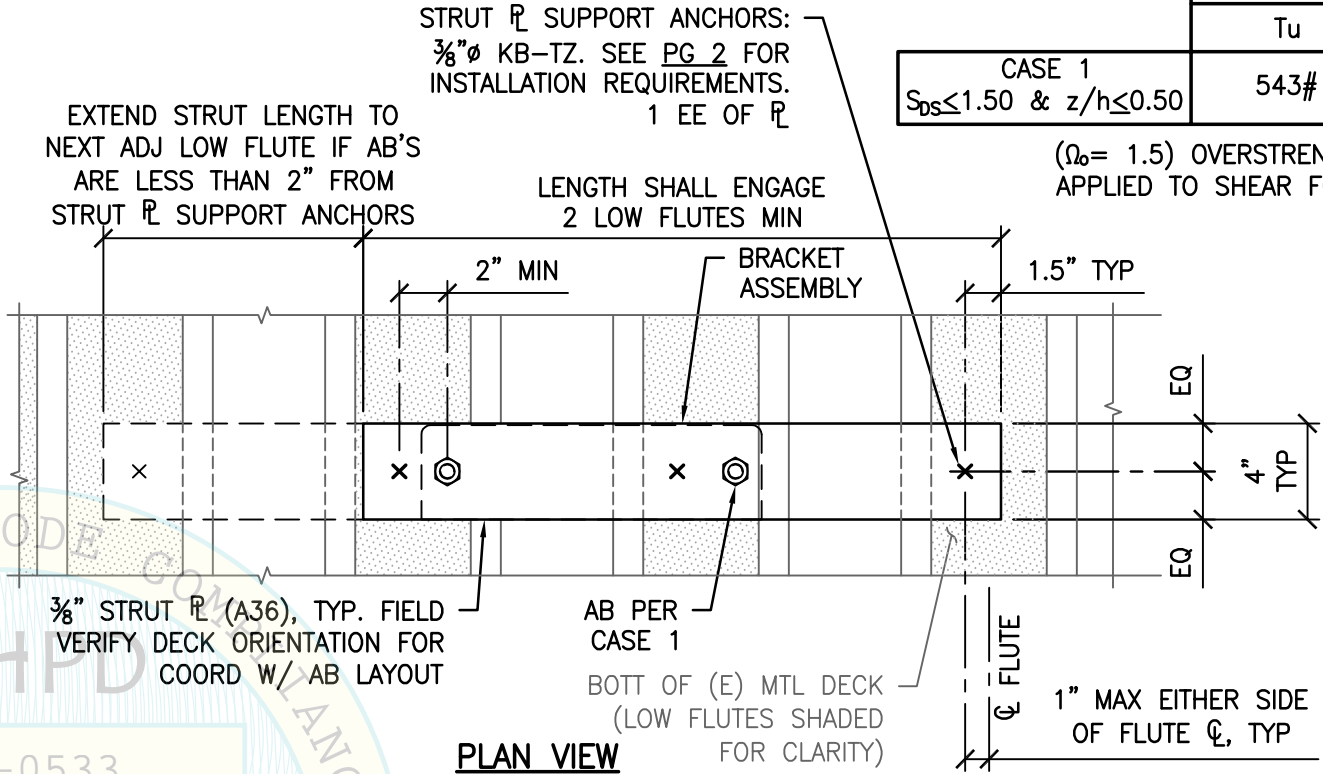
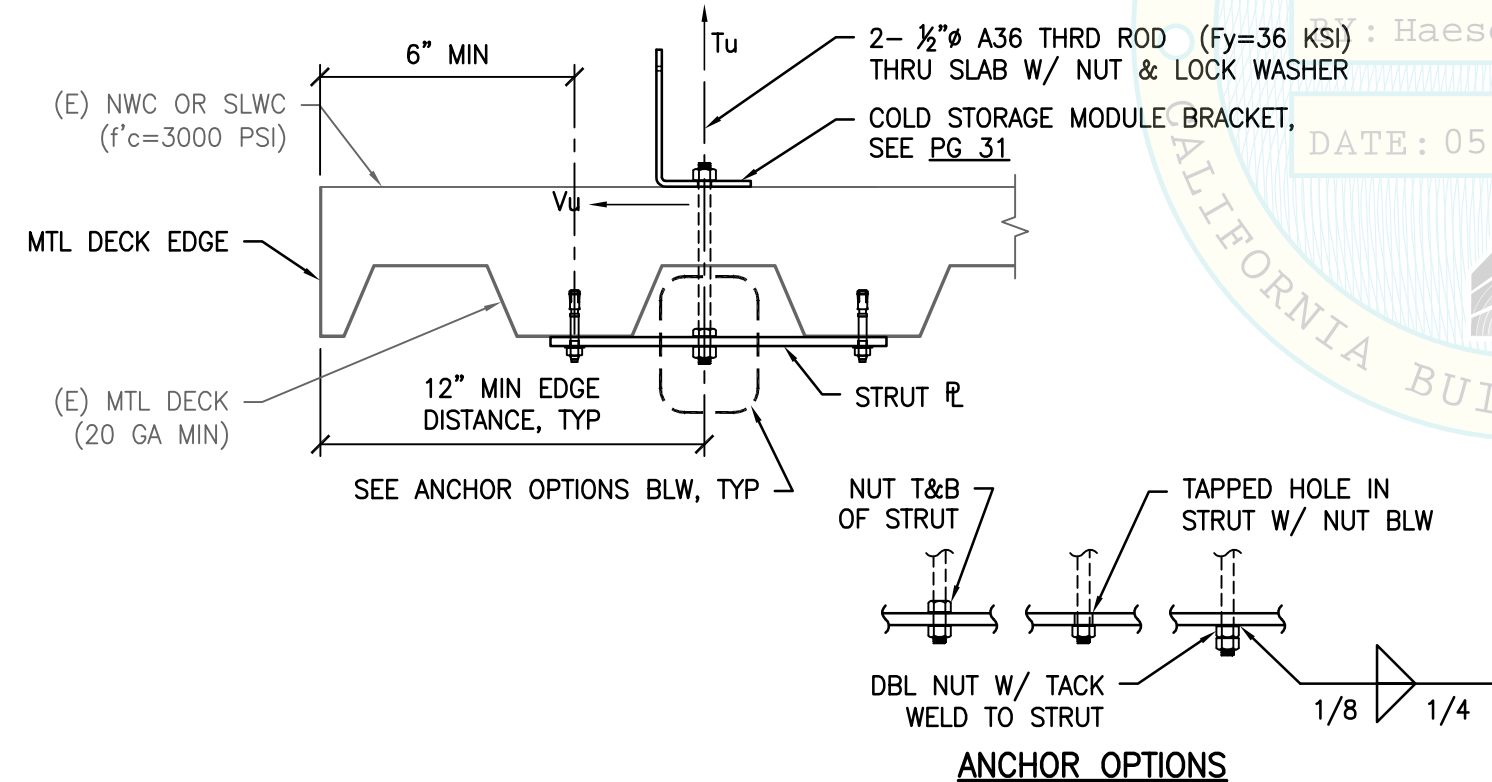
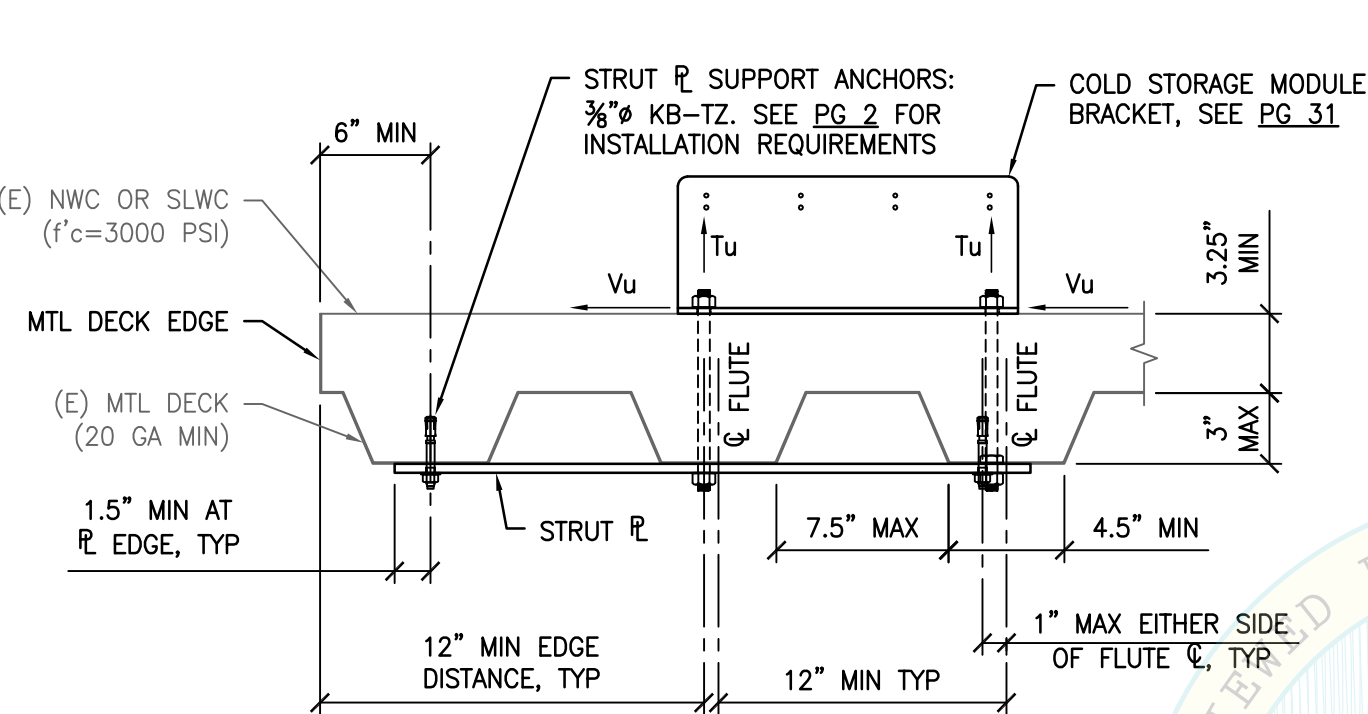
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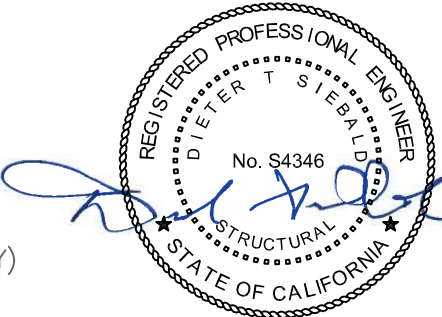
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CASE 1: BRACKET ATTACHMENT DTL FOR COLD STORAGE MODULE



	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)	
	T_u	V_u
CASE 1 $S_{ps} \leq 1.50$ & $z/h \leq 0.50$	543#	1221#

($\Omega_o = 1.5$) OVERSTRENGTH FACTOR IS APPLIED TO SHEAR FORCE



SHEET TITLE: COLD STORAGE MODULE ATTACHMENT DETAILS THROUGH CONCRETE FILL OVER METAL DECK (CASE 1)

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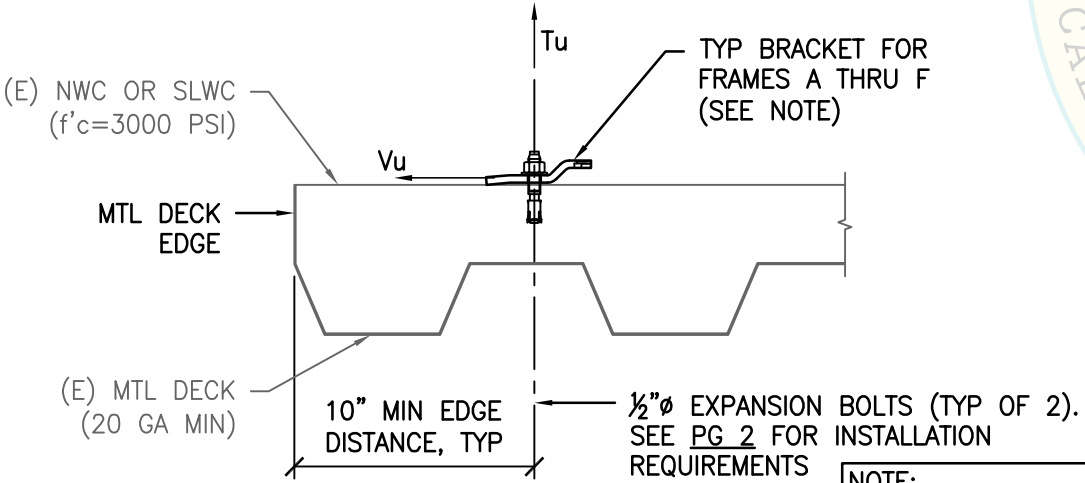
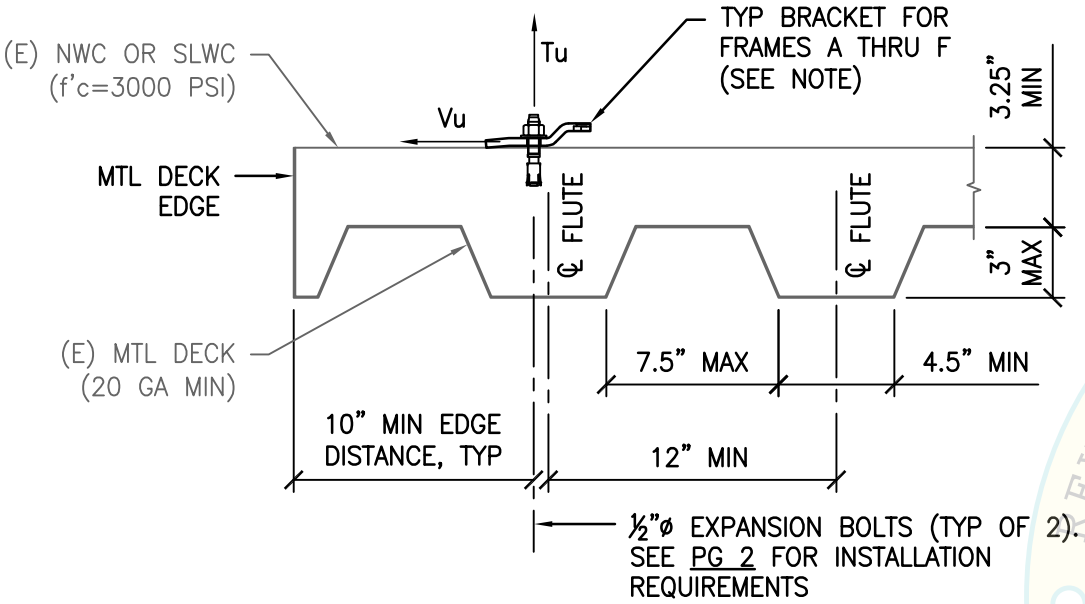
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CASE 2: BRACKET ATTACHMENT DTL FOR FRAMES A THRU F

CASE 2 $S_{Ds} \leq 0.7$ & $z/h \leq 0.50$	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)		
	FRAME TYPE	Tu	Vu
	A-F	606#	558#
	G	407#	71#

INCLUDES OVERSTRENGTH FACTOR ($\Omega_0=1.5$)



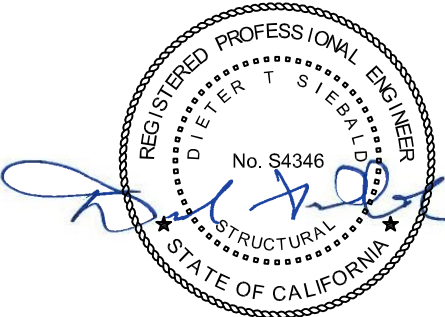
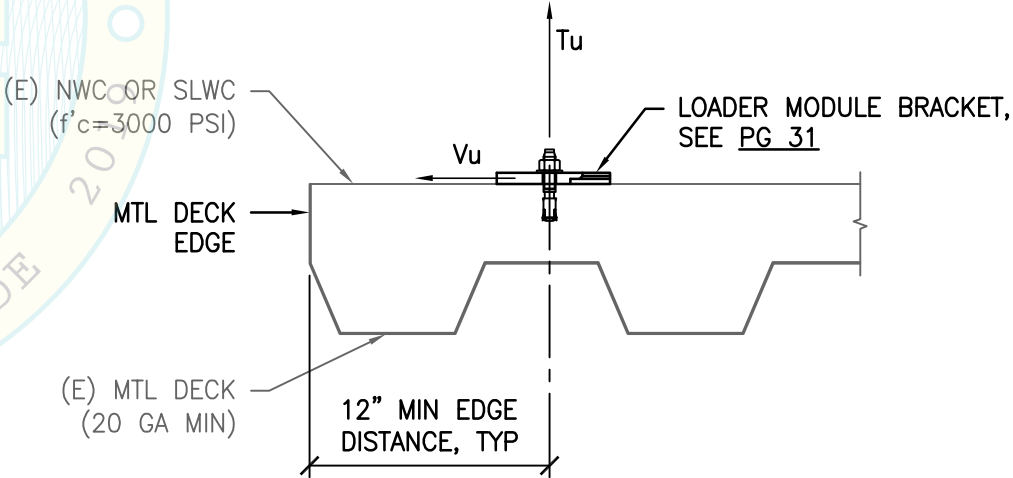
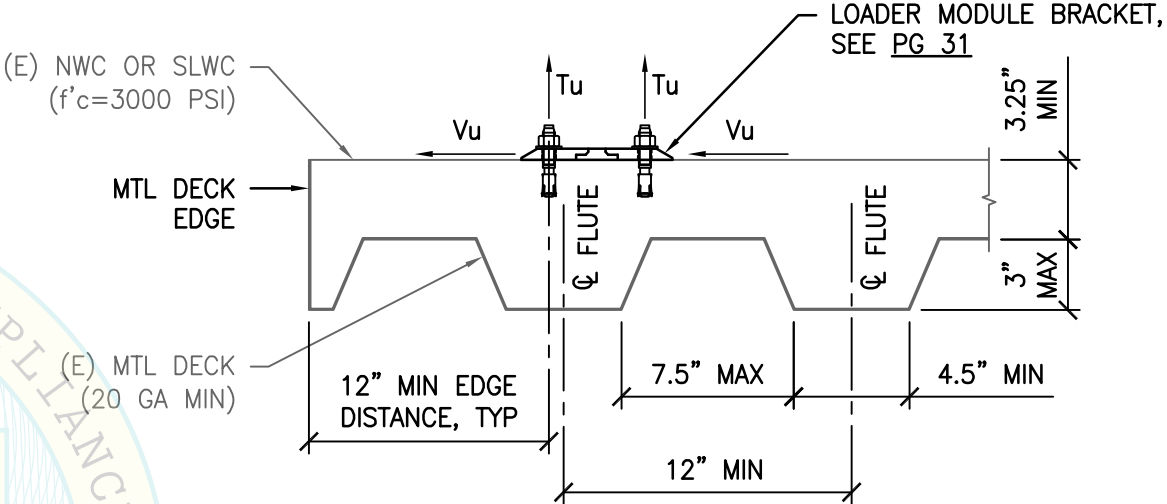
CONC FILL OVER MTL DECK

NOTE:
BRACKET ATTACHMENT FOR FRAME
TYPE "G" IS SIM. SEE TABLE ABV
FOR FORCES & PG 30 FOR BRACKET.

CASE 2: BRACKET ATTACHMENT DTL FOR LOADER MODULE

CASE 2 $S_{Ds} \leq 0.7$ & $z/h \leq 0.50$	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)	
	Tu	Vu
	520#	231#

INCLUDES OVERSTRENGTH FACTOR ($\Omega_0=1.5$)



SHEET TITLE: ATTACHMENT DETAILS TO
CONCRETE FILL OVER METAL DECK (CASE 2)



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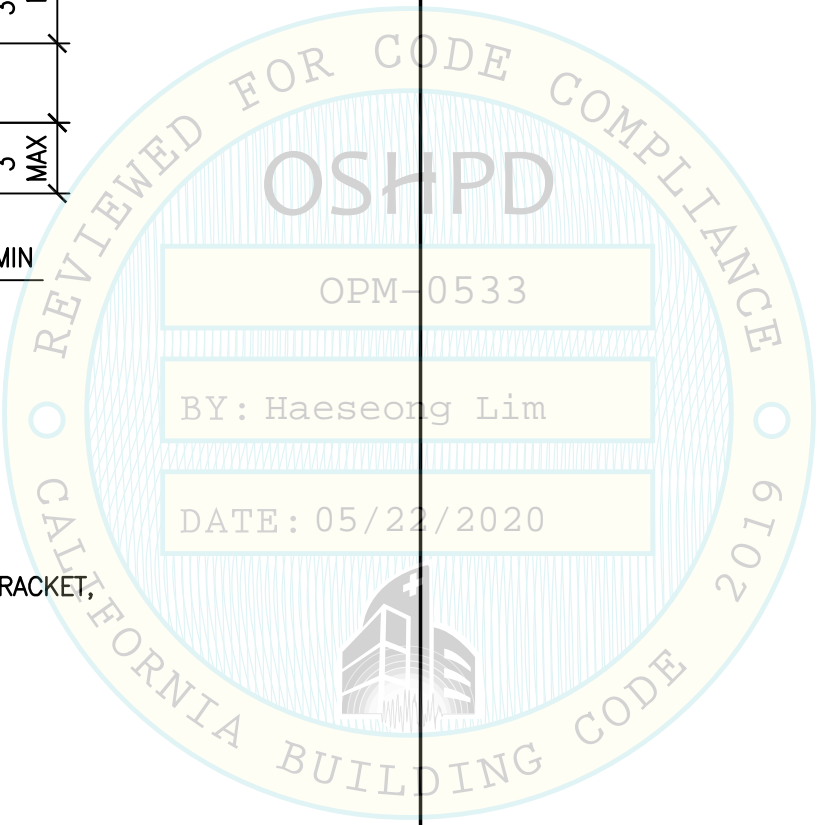
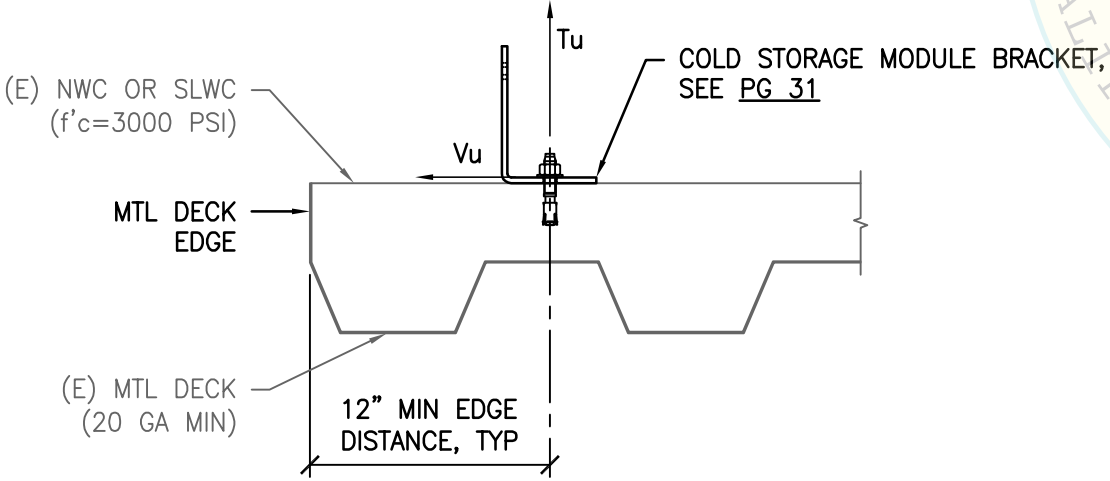
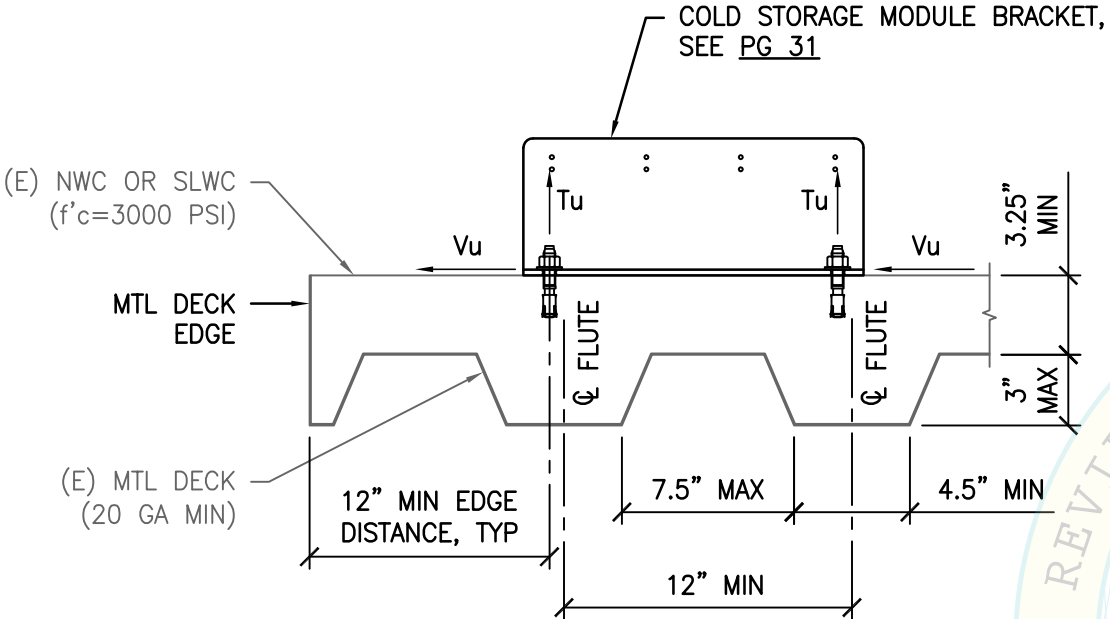
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CASE 2: BRACKET ATTACHMENT DTL FOR COLD STORAGE MODULE

	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)	
	Tu	Vu
CASE 2 $S_{Ds} \leq 0.80$ & $z/h \leq 0.50$	434#	652#

INCLUDES OVERSTRENGTH FACTOR ($\Omega_0=1.5$)



SHEET TITLE: ATTACHMENT DETAILS TO CONCRETE FILL OVER METAL DECK (CASE 2)				Rev	Description	Date	Job No: 18149
   <div>CYS STRUCTURAL ENGINEERS, INC. 2495 NATOMAS PARK DRIVE, SUITE 650 SACRAMENTO, CA 95833 TEL (916) 920-2020 www.cyseng.com</div>							Date: 5/21/2020
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CASE 3: BRACKET ATTACHMENT DTL FOR FRAMES A THRU F

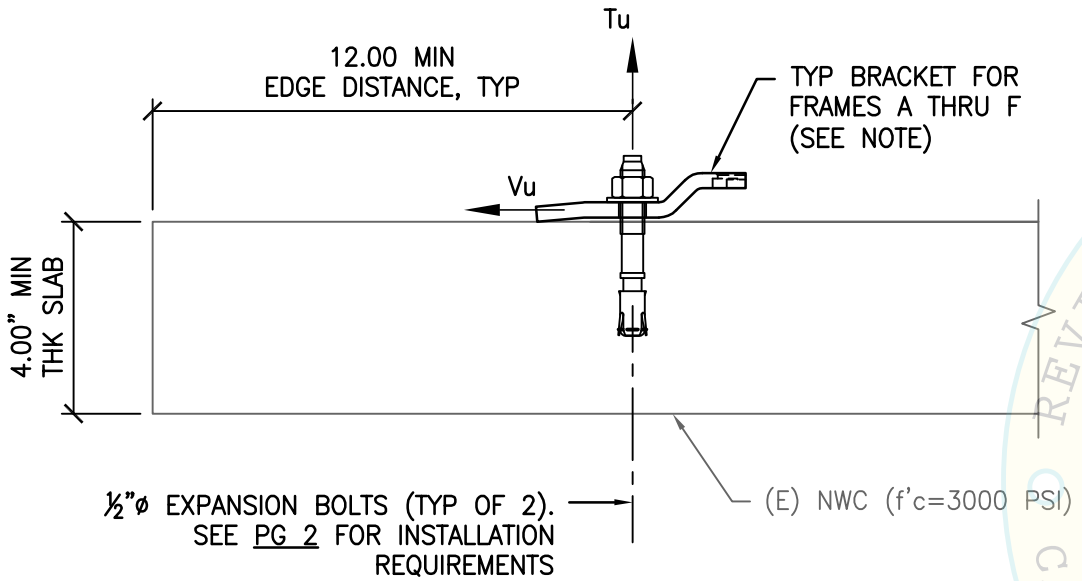
	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)		
	FRAME TYPE	Tu	Vu
	CASE 3 $S_{Ds} \leq 2.00$ & $z/h \leq 0$	A-F 1123#	691#
	G	636#	100#

INCLUDES OVERSTRENGTH FACTOR ($\Omega_0=1.5$)

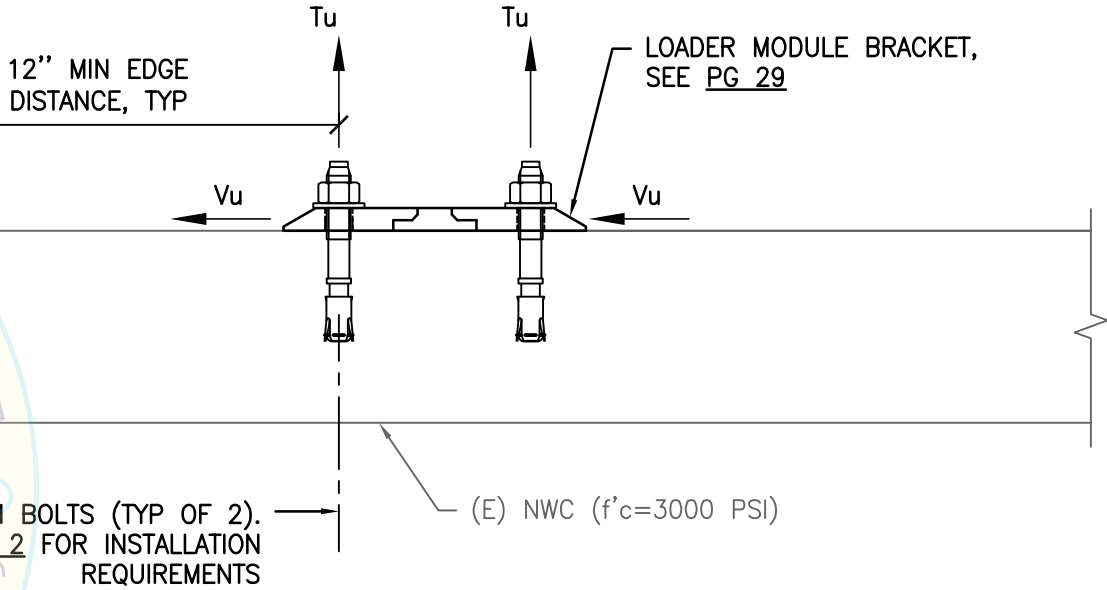
CASE 3: BRACKET ATTACHMENT DTL FOR LOADER MODULE

	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)	
	Tu	Vu
	CASE 3 $S_{Ds} \leq 2.00$ & $z/h \leq 0$	708# 396#

INCLUDES OVERSTRENGTH FACTOR ($\Omega_0=1.5$)



NOTE:
BRACKET ATTACHMENT FOR FRAME TYPE "G" IS SIM. SEE TABLE ABV FOR FORCES & PG 28 FOR BRACKET.



SHEET TITLE: ATTACHMENT DETAILS TO CONCRETE SLAB ON GRADE (CASE 3)

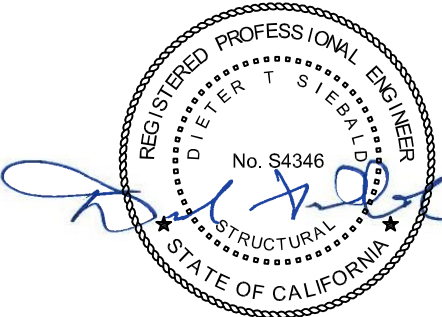


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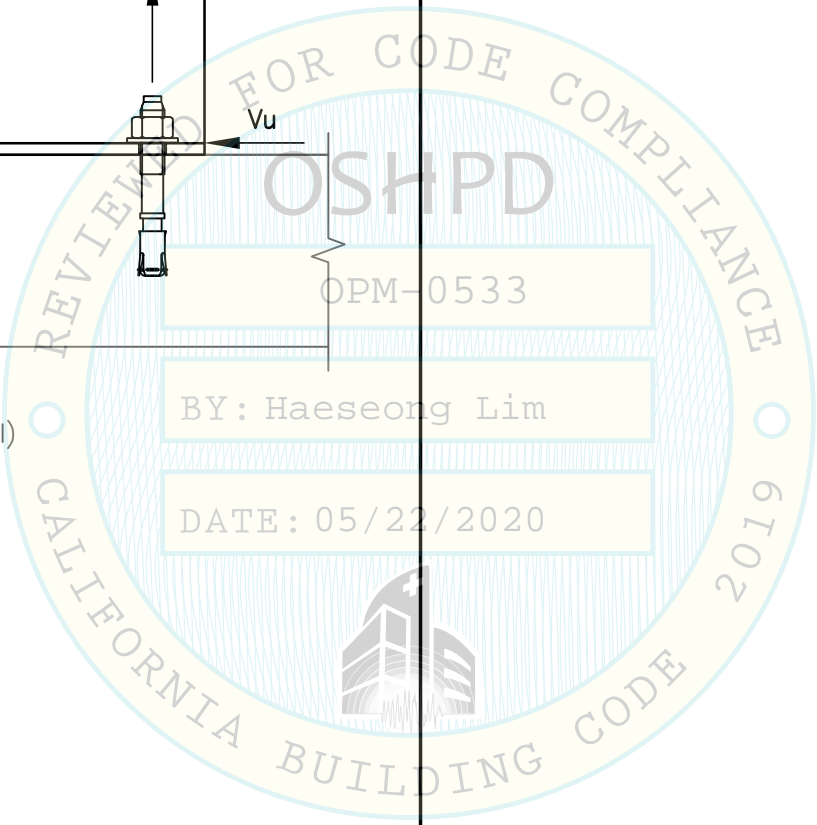
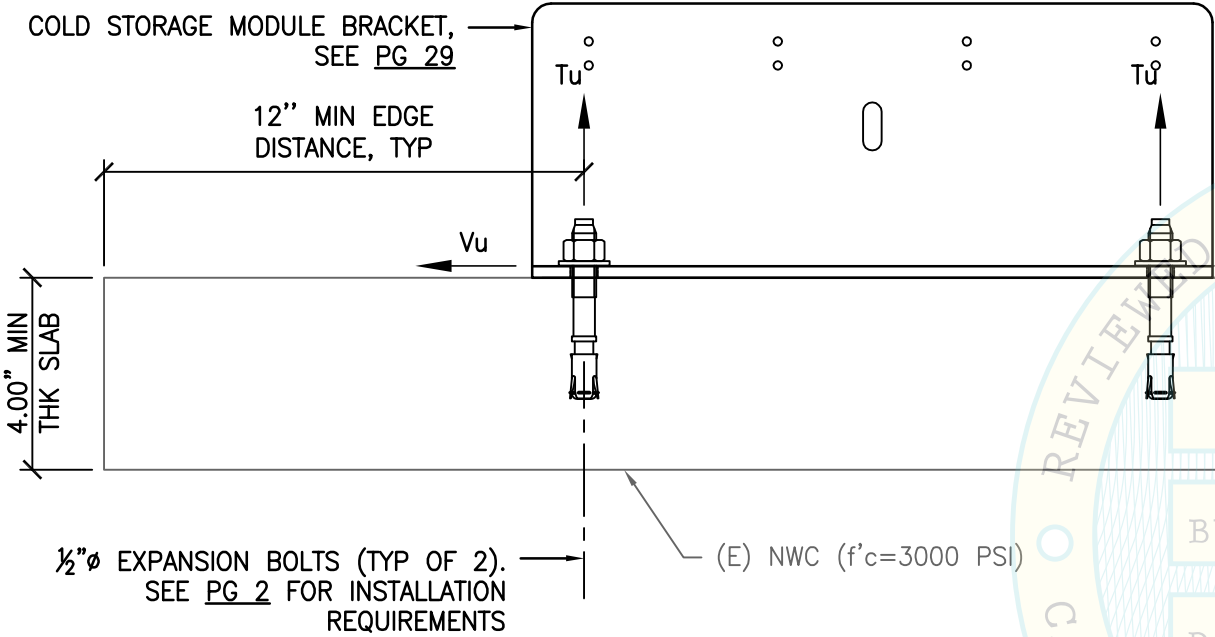


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CASE 3: BRACKET ATTACHMENT DTL FOR COLD STORAGE MODULE

CASE 3 $S_{DS} \leq 2.00$ & $z/h \leq 0$	MAX ANCHOR FORCES AT LRFD AT EA AB (LBS)	
	Tu	Vu
	610#	916#

INCLUDES OVERSTRENGTH FACTOR ($\Omega_0=1.5$)



SHEET TITLE: ATTACHMENT DETAILS TO CONCRETE SLAB ON GRADE (CASE 3)				Rev	Description	Date	Job No: 18149
<div>ThermoFisher SCIENTIFIC</div> <div>TCAutomation SYSTEM</div>							Date: 5/21/2020
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