

WATERSIDE OUTDOOR
ALUMINUM LOUVERED PERGOLA MASTER PLAN

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DESIGN CRITERIA:
INTERNATIONAL BUILDING CODE (2015 & 2018)
FLORIDA BUILDING CODE SEVENTH EDITION (2020)
ASCE 7-16 LOAD COMBINATIONS

1. DEAD LOADS

1.1. SYSTEM DEAD LOAD..... 3 PSF
2. LIVE LOADS

2.1. SYSTEM LIVE LOAD..... 20 PSF
3. SNOW LOAD

3.1. GROUND SNOW LOAD..... 0-20 PSF

3.2. SNOW EXPOSURE FACTOR..... 1.0

3.3. SNOW LOAD IMPORTANCE FACTOR.... 1.0

3.4. THERMAL FACTOR..... 1.1

3.5. SNOW DRIFT..... PER CODE
4. WIND LOADS

4.1. METHODOLOGY..... OPEN STRUCTURE

4.2. ULTIMATE WIND SPEED..... 110-160 MPH (ASD)

4.3. WIND EXPOSURE FACTOR..... B & C

4.4. DIRECTIONALITY/OTHER FACTORS.... $K_d=0.85, G=0.85,$

4.5. MEAN ROOF HEIGHT..... UP TO 9 FEET

4.6. SYSTEM MOUNTING HEIGHT..... 0 FEET (AT GRADE)
5. SEISMIC LOADS..... DOES NOT GOVERN

LOUVERS SHALL BE SPACED SUCH THAT THEY ALLOW 50% SYSTEM POROSITY WHEN FULLY OPENED. SYSTEM NOT DESIGNED TO HANDLE CONCENTRATED LOADS FROM HUMAN ACTIVITY.

SYSTEM DESIGN LIMITS

THIS SYSTEM IS DESIGNED FOR A MAXIMUM PRESSURE OF:
±50 PSF ASD LATERAL LOAD COMBINATION*
±60 PSF ASD UPLIFT/GRAVITY LOAD COMBINATION*
@ **50% LOUVERED ROOF POROSITY**

***LOAD COMBINATIONS TO CONSIDER ALL CODE-REQUIRED LOADING CONDITIONS INCLUDING BUT NOT LIMITED TO WIND, SEISMIC & SNOW DRIFT LOADS**

THIS SYSTEM IS DESIGNED AS AN OPEN STRUCTURE. WALLED OR SCREENED ENCLOSURES ARE BEYOND THE SCOPE OF THIS DOCUMENT AND REQUIRE ADDITIONAL ENGINEERING REVIEW.

DESIGN NOTES

ALLOWABLE DESIGN PRESSURES UTILIZED IN THIS DOCUMENT HAVE BEEN CALCULATED PER THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (2018) & ASCE 7-16 USING ALLOWABLE STRESS DESIGN METHODOLOGY WITH THE CRITERIA AS OUTLINED HEREIN. THE CONTRACTOR SHALL CONTACT THE AUTHORITY HAVING JURISDICTION TO ENSURE APPROPRIATE CRITERIA TO BE USED BEFORE CONSTRUCTION BEGINS. THE SYSTEM HAS NOT BEEN DESIGNED TO WITHSTAND CONCENTRATED LOADS FROM HUMAN ACTIVITY.

GENERAL NOTES

1. THIS SYSTEM HAS BEEN DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FLORIDA BUILDING CODE 7TH EDITION (2020). ALSO APPLICABLE FOR THE FBC 6TH EDITION (2017), IBC/IRC (2015 & 2018), AS WELL AS CURRENT VERSIONS OF THE MN, NC, NJ, NY, OH, SC, & VA BUILDING CODES AS APPLICABLE. CODE ENFORCED COMPLIES WITH STATE OF SEAL AND IF MULTIPLE VERSIONS ARE LISTED THEN MOST STRINGENT APPLIES. CONTRACTOR SHALL INVESTIGATE AND CONFORM TO ALL LOCAL BUILDING CODE AMENDMENTS WHICH MAY APPLY AND GOVERN. DESIGN SHALL UTILIZE ASD DESIGN METHOD USING ASCE 7-16 OR ASCE 7-10 CODES FOR SITE SPECIFIC APPLICATIONS AS APPLICABLE. DESIGN CRITERIA OR SPANS BEYOND STATED HEREIN MAY REQUIRE ADDITIONAL SITE SPECIFIC SEALED ENGINEERING.
2. NO 33-1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS SYSTEM. WIND LOAD DURATION FACTOR $C_d=1.6$ HAS BEEN USED FOR WOOD ANCHOR DESIGN.
3. PRODUCT APPROVED FOR USE IN SEISMIC DESIGN CATEGORY A-C PER REQUIREMENTS OF ASCE 7 AND CALIFORNIA BUILDING CODE 2019. FOR SEISMIC DESIGN CATEGORY D-F AND ANY CONCRETE CONNECTIONS, ADDITIONAL REVIEW BY THIRD-PARTY ENGINEERS IS REQUIRED FOR THE VALIDITY OF THE DESIGN.
4. THE ARCHITECT/ENGINEER OF RECORD FOR THE PROJECT SUPERSTRUCTURE WITH WHICH THIS DESIGN IS USED SHALL BE RESPONSIBLE FOR THE INTEGRITY OF ALL SUPPORTING SURFACES TO THIS DESIGN WHICH SHALL BE COORDINATED BY THE PERMITTING CONTRACTOR.
5. THE CONTRACTOR SHALL CONSIDER POSSIBLE IMPOSING LOADS ON ROOF, INCLUDING BUT NOT LIMITED TO ANY SNOW, WIND, OR CONCENTRATED LOADS WHICH MAY JUSTIFY GREATER DESIGN CRITERIA. THIS ADDITIONAL ROOF LOAD CRITERIA SHALL BE PROPERLY ANALYZED BY A LICENSED ENGINEER OR REGISTERED ARCHITECT BEFORE USE WITH THE INFORMATION HEREIN.

MATERIALS

6. ALL ALUMINUM SHALL BE 6063-T6 ALLOY AND TEMPER UNLESS NOTED OTHERWISE.
7. WOOD HOST STRUCTURE & ALL WOOD MEMBERS SHALL BE "#2 SOUTHERN YELLOW PINE" $G=0.55$ OR GREATER DENSITY WHERE APPLICABLE.
8. ALL CONCRETE AND EPOXY TO REACH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI IN 7 DAYS.
9. CONCRETE MIXTURES SHALL BE DESIGNED TO REACH A COMPRESSIVE STRENGTH OF 3,000 PSI IN 28 DAYS. ALL MIXING, TRANSPORTING, PLACING, & CURING OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI 318. NO ADMIXTURES ARE TO BE USED WITHOUT THE WRITTEN APPROVAL OF THE ABOVE-SIGNED ENGINEER. CONCRETE SHALL BE TYPE 1 PORTLAND CEMENT MEETING THE REQUIREMENTS OF ASTM C150, AGGREGATES TO MEET ASTM C33. POTABLE WATER SHALL BE USED.
10. CONCRETE FOOTERS ARE TO INCLUDE STEEL REINFORCEMENT AS LISTED IN THE FOOTER DESIGN NOTES OR EQUIVALENT STEEL FIBER REINFORCEMENT AT THE DISCRETION OF THE GENERAL CONTRACTOR.

NON-STRUCTURAL ELEMENTS:

11. THE INSTALLATION OF ANY ACCESSORIES THAT DO NOT AFFECT THE STRUCTURAL INTEGRITY OF THE STRUCTURE ARE OUTSIDE THE SCOPE OF THIS CERTIFICATION AND NOT REQUIRED TO BE CERTIFIED UNDER THIS STRUCTURAL DRAWING. THEY MAY BE INSTALLED WITHIN LIMITATIONS STATED HEREIN AND AS DESIRED PER MFR. SPECIFICATIONS. DETAILS PROVIDED HEREIN ARE FOR REFERENCE ONLY
12. LOUVER SYSTEM HINGES AND OPERABILITY ARE OUTSIDE THE SCOPE OF THIS CERTIFICATION.

INSTALLATION & CONSTRUCTION

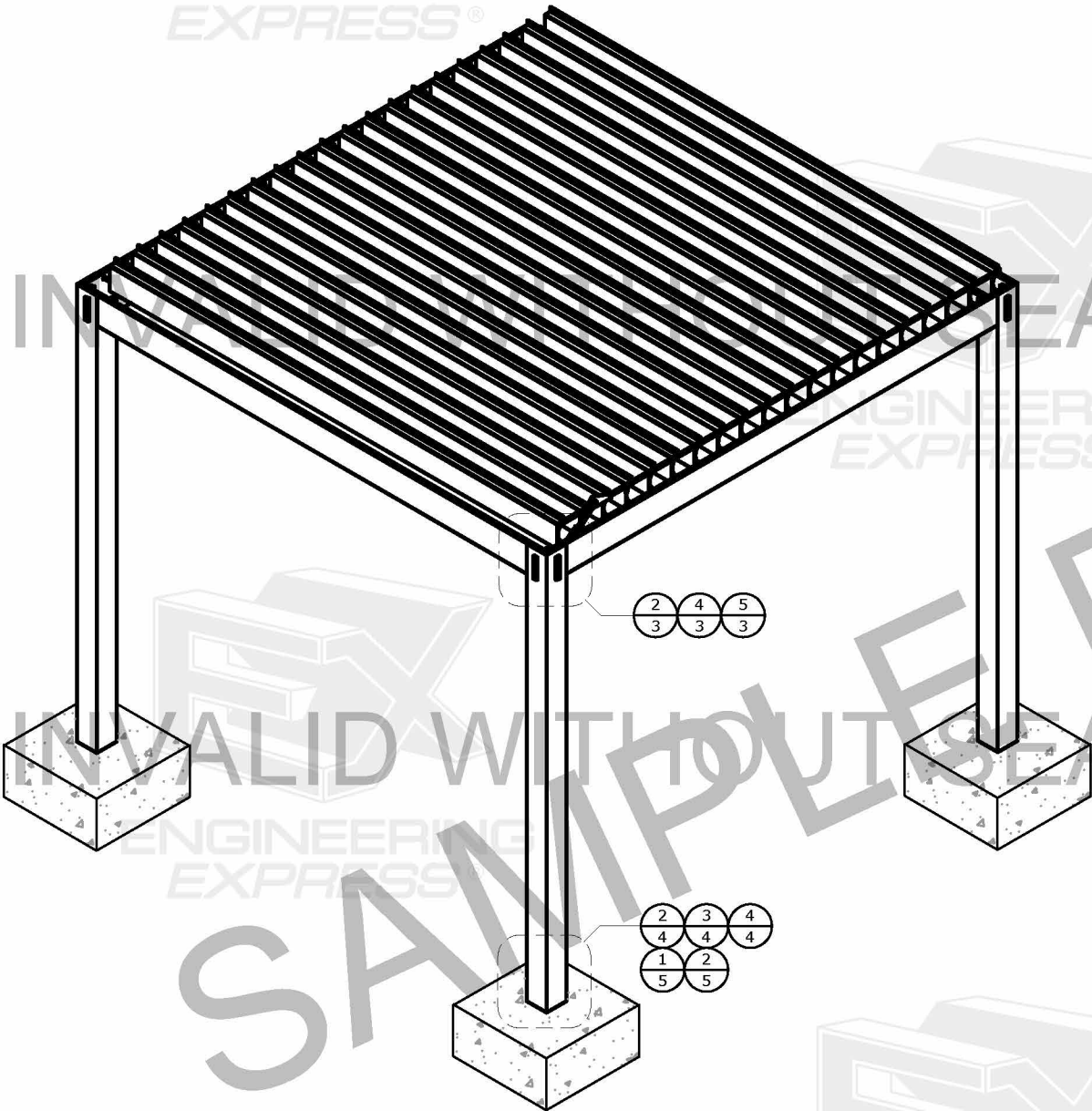
13. ALL FOOTINGS ARE TO BE INSTALLED BELOW ANY CODE REQUIRED FROST LINE. GENERAL CONTRACTOR IS RESPONSIBLE FOR ADHERENCE TO LOCAL FROST LEVEL CODE REQUIREMENTS
14. SURROUNDING SOIL TO BE WELL COMPACTED BY MECHANICAL MEANS TO 90% OPTIMUM DENSITY, BE FREE OF MUCK AND ORGANICS, AND ACHIEVE 2000 PSF MIN BEARING PRESSURE AND LATERAL BEARING PRESSURE BELOW NATURAL GRADE OF 150 PSF. SOIL SHALL BE CLASSIFIED OR VERIFIED BY OTHERS PRIOR TO CONSTRUCTION AS SAND CLASS OR BETTER. SHOULD OTHER CONDITIONS OR MATERIALS BE ENCOUNTERED THE ENGINEER OF RECORD MUST BE NOTIFIED.
15. THE CONTRACTOR IS RESPONSIBLE TO INSULATE ALL MEMBERS FROM DISSIMILAR MATERIALS TO PREVENT ELECTROLYSIS.

FASTENERS & ANCHORS

16. ALL FASTENERS TO BE #14 SAE GRADE 2 WITH APPROPRIATE CORROSION RESISTANT OR STAINLESS STEEL 304 UNLESS NOTED OTHERWISE. FASTENERS SHALL BE CADMIUM-PLATED OR OTHERWISE CORROSION-RESISTANT MATERIAL AND SHALL COMPLY WITH "SPECIFICATIONS FOR ALUMINUM STRUCTURES" BY THE ALUMINUM ASSOCIATION, INC., & ANY APPLICABLE FEDERAL, STATE, AND/OR LOCAL CODES.
17. FOR ALUMINUM MEMBERS ALL ANCHORS SHALL BE SPACED WITH $2 \times$ DIAMETER END DISTANCE AND $2.5 \times$ DIAMETER MIN. SPACING TO ADJACENT ANCHORS, UNLESS NOTED OTHERWISE.
18. ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE AS NOTED HEREIN. MINIMUM EMBEDMENT AND EDGE DISTANCE EXCLUDES STUCCO, FOAM, BRICK, AND OTHER WALL FINISHES.
19. ALL CONCRETE ANCHORS SHALL BE INSTALLED TO NON-CRACKED CONCRETE ONLY.

OTHER

20. THE SYSTEM DETAILED HEREIN IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SPECIFIC SITE. FOR SITE CONDITIONS DIFFERENT FROM THE CONDITIONS DETAILED HEREIN, A LICENSED ENGINEER OR REGISTERED ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS FOR USE IN CONJUNCTION WITH THIS DOCUMENT.
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22. ENGINEER SEAL AFFIXED HERETO VALIDATES STRUCTURAL DESIGN AS SHOWN ONLY. USE OF THIS SPECIFICATION BY CONTRACTOR, et. al. INDEMNIFIES & SAVES HARMLESS THIS ENGINEER FOR ALL COST & DAMAGES INCLUDING LEGAL FEES & APPELLATE FEES RESULTING FROM MATERIAL FABRICATION, SYSTEM ERECTION, & CONSTRUCTION PRACTICES BEYOND THAT WHICH IS CALLED FOR BY LOCAL, STATE, & FEDERAL CODES & FROM DEVIATIONS OF THIS PLAN.
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LOUVERED ROOF PERGOLA - MASTER PLAN
FLORIDA BUILDING CODE 7TH ED (2020)
INTERNATIONAL BUILDING CODE (2018)

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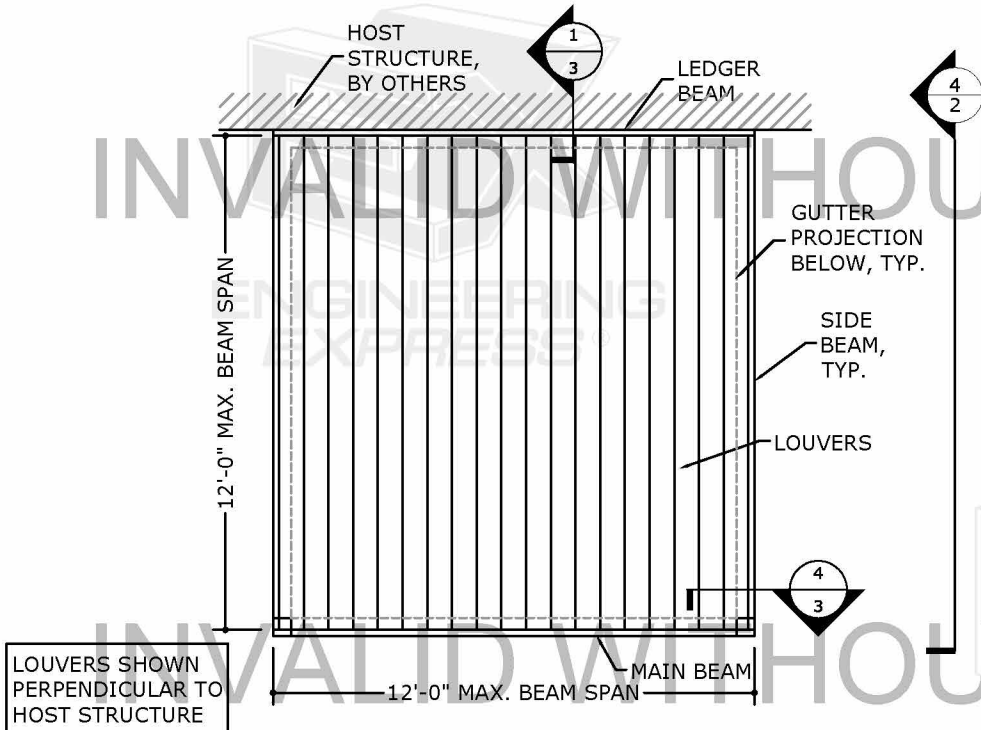
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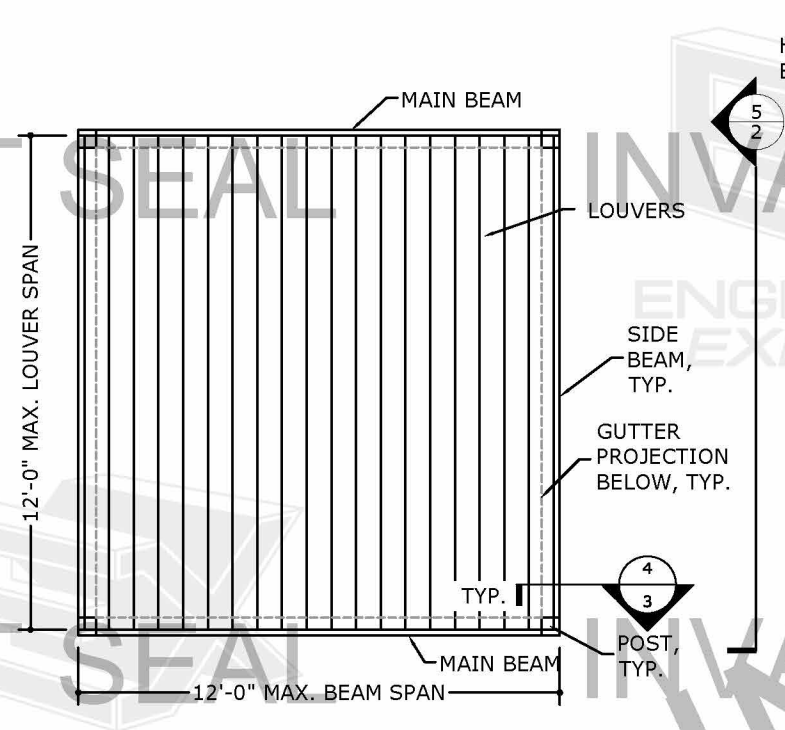
PERGOLA LAYOUT & LOUVER CONFIGURATIONS

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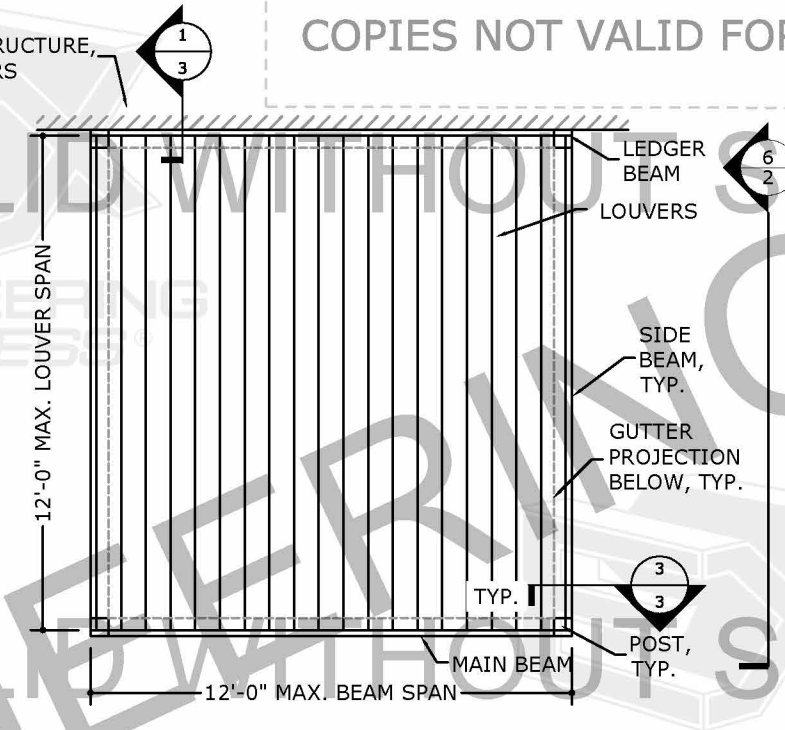
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2 N.T.S. PLAN

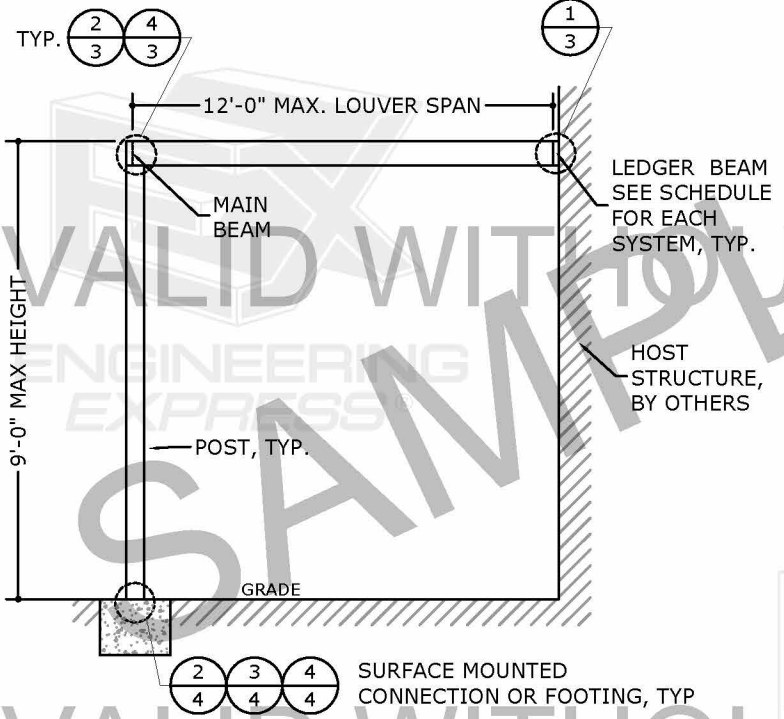


2 FREESTANDING (4 POSTS)
2 N.T.S. PLAN



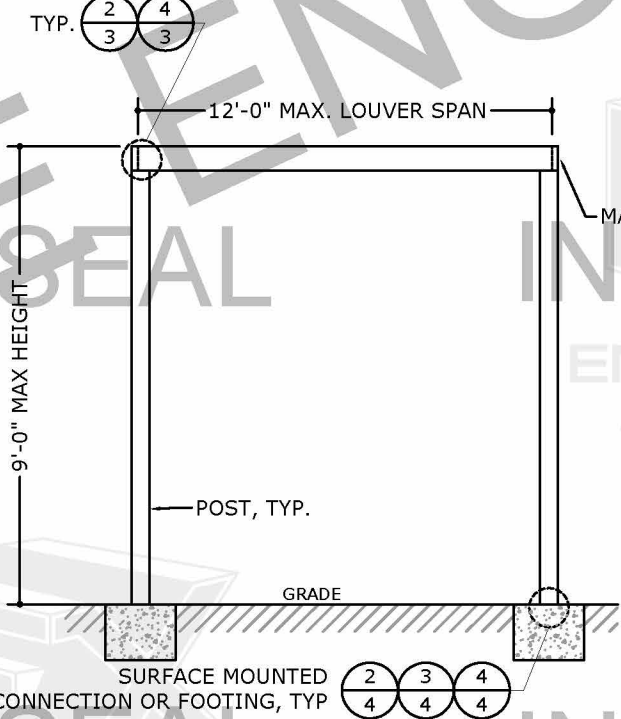
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2 N.T.S. PLAN

LOUVERS SHOWN PERPENDICULAR TO HOST STRUCTURE



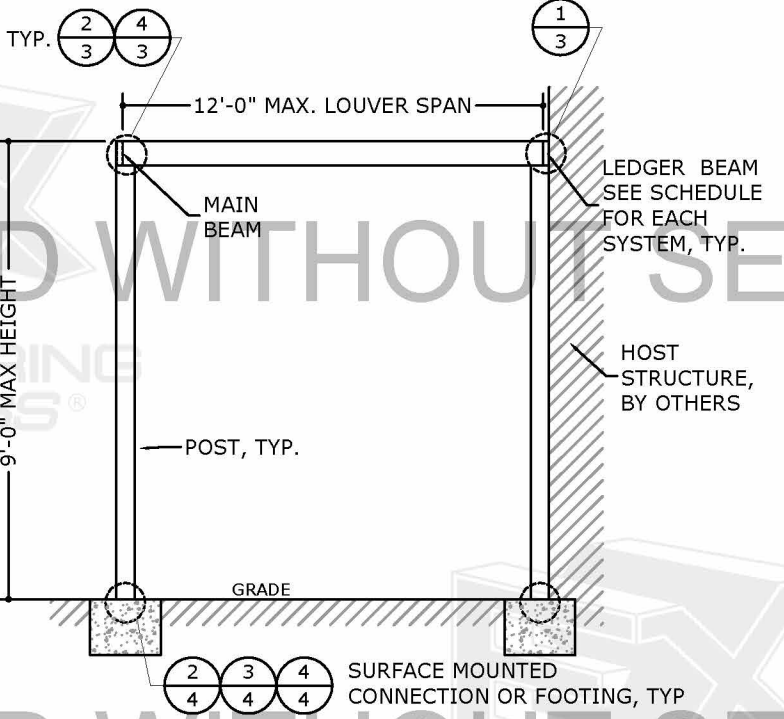
4 HOST ATTACHED (2 POSTS)
2 N.T.S. ELEVATION

LOUVERS MAY BE PARALLEL OR PERPENDICULAR TO HOST STRUCTURE



5 FREESTANDING (4 POSTS)
2 N.T.S. ELEVATION

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6 HOST ATTACHED (4 POSTS)
2 N.T.S. ELEVATION

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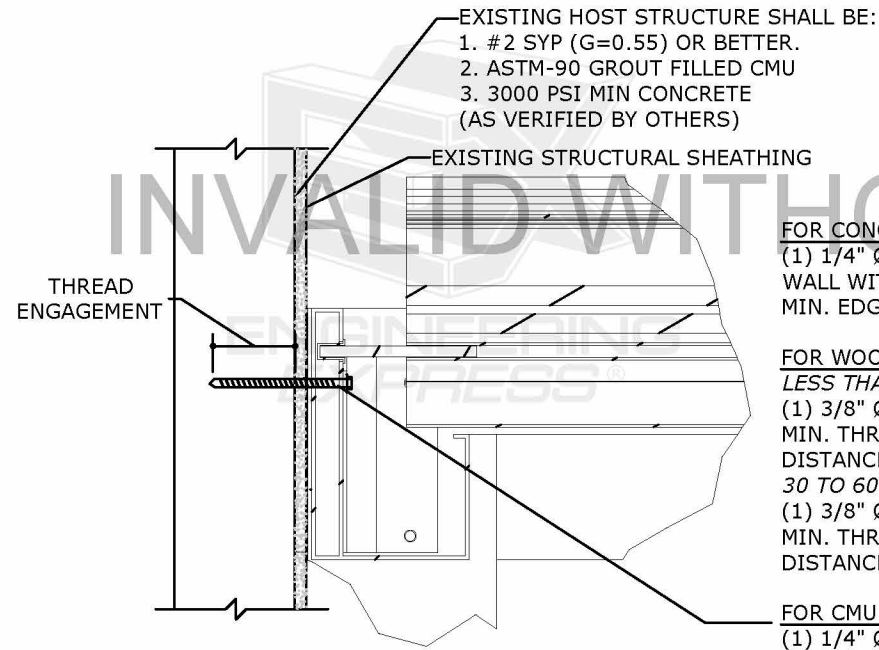
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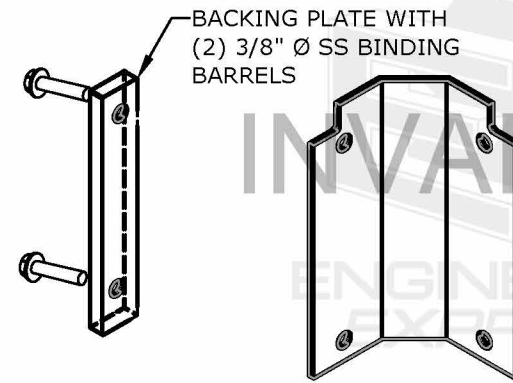


FOR CONCRETE ATTACHMENT:
(1) 1/4" Ø ITW STAINLESS STEEL TAPCON INTO WALL WITH 1 1/2" MIN. EMBEDMENT AND 2 1/2" MIN. EDGE DISTANCE @ 12" O.C. MAX

FOR WOOD ATTACHMENT:
LESS THAN 30 PSF VERTICAL LOAD:
(1) 3/8" Ø S.S. LAG SCREW INTO WALL WITH 3" MIN. THREAD PENETRATION AND 3/4" MIN. EDGE DISTANCE @ 12" O.C. MAX
30 TO 60 PSF VERTICAL LOAD:
(1) 3/8" Ø S.S. LAG SCREW INTO WALL WITH 3" MIN. THREAD PENETRATION AND 3/4" MIN. EDGE DISTANCE @ 6" O.C. MAX

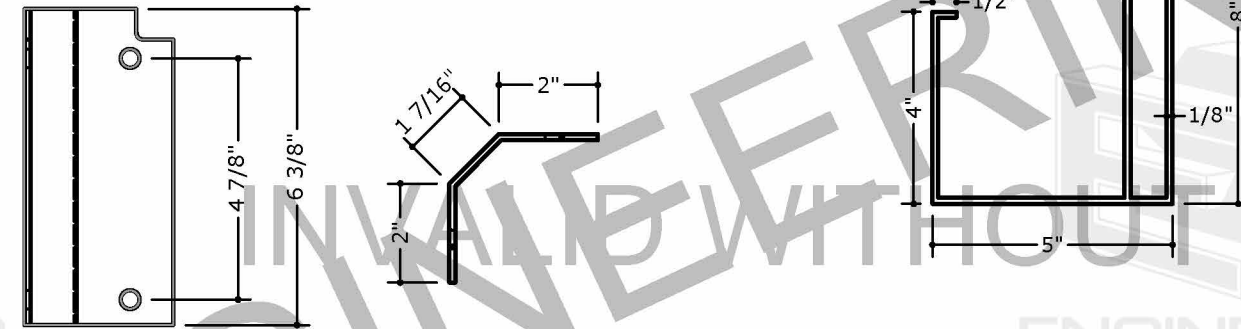
FOR CMU ATTACHMENT:
(1) 1/4" Ø S.S. HILTI KWIK-CON II+ INTO GROUT-FILLED CMU WITH 1 3/4" MIN. EMBEDMENT AND 3" MIN. EDGE DISTANCE @ 12" O.C. W/
(1) ANCHOR MAX PER CMU CELL

1 LEDGER CONNECTION TO HOST
3 SCALE: N.T.S. DETAIL VIEW

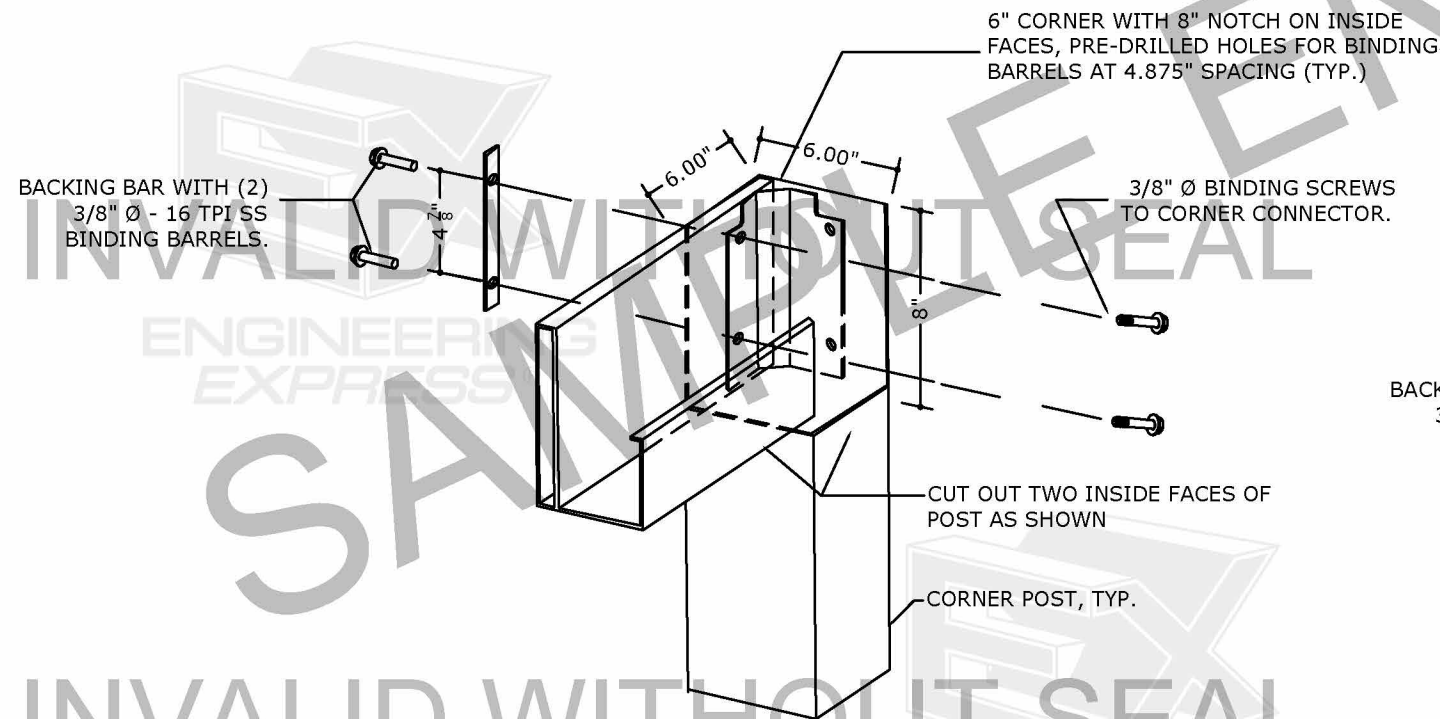


2 CORNER CONNECTOR BRACKET
3 SCALE: N.T.S. DETAIL VIEW

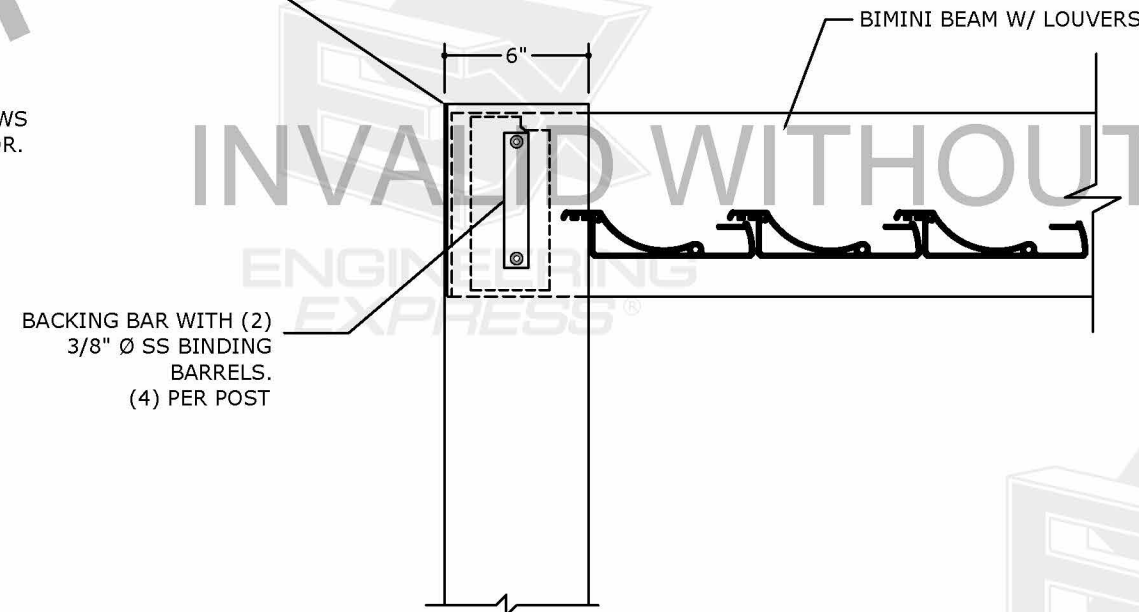
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3 BIMINI BEAM
3 SCALE: N.T.S. DETAIL VIEW



4 CORNER POST ASSEMBLY DIAGRAM
3 SCALE: N.T.S. ISOMETRIC



5 CORNER POST CONNECTION
3 SCALE: N.T.S. DETAIL

ANY LOUVERED ROOF SYSTEM COMPONENTS/DETAILS NOT LISTED HEREIN SHALL BE PER MANUFACTURER'S RECOMMENDATIONS

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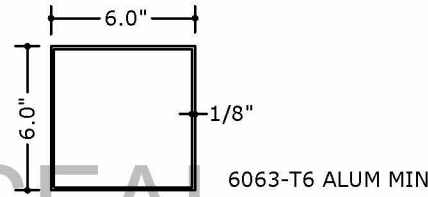
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BASEPLATE CONNECTION SCHEDULE

MAX LATERAL PRESSURE (PSF)	REQUIRED BASEPLATE
20 PSF OR LESS	A, B, OR C
30 PSF OR LESS	B OR C
50 PSF OR LESS	C
>50 PSF	ENG. REQUIRED

LATERAL PRESSURES PER P6 PRESSURE TABLE 1 (OR OUTSIDE ENGINEERING)

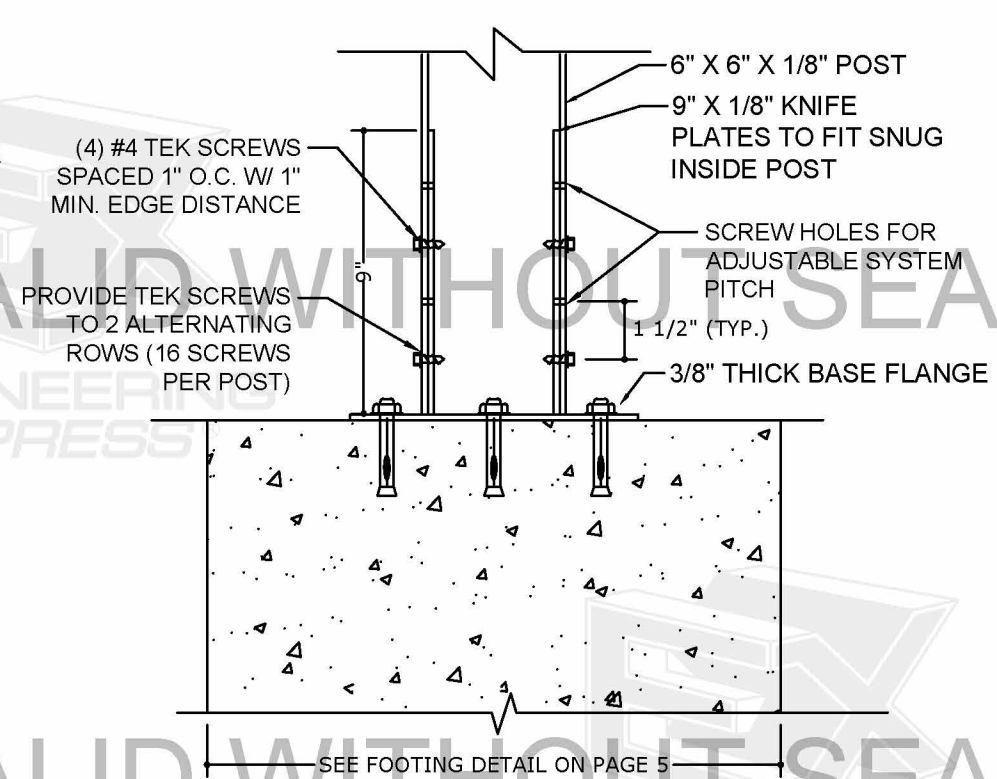
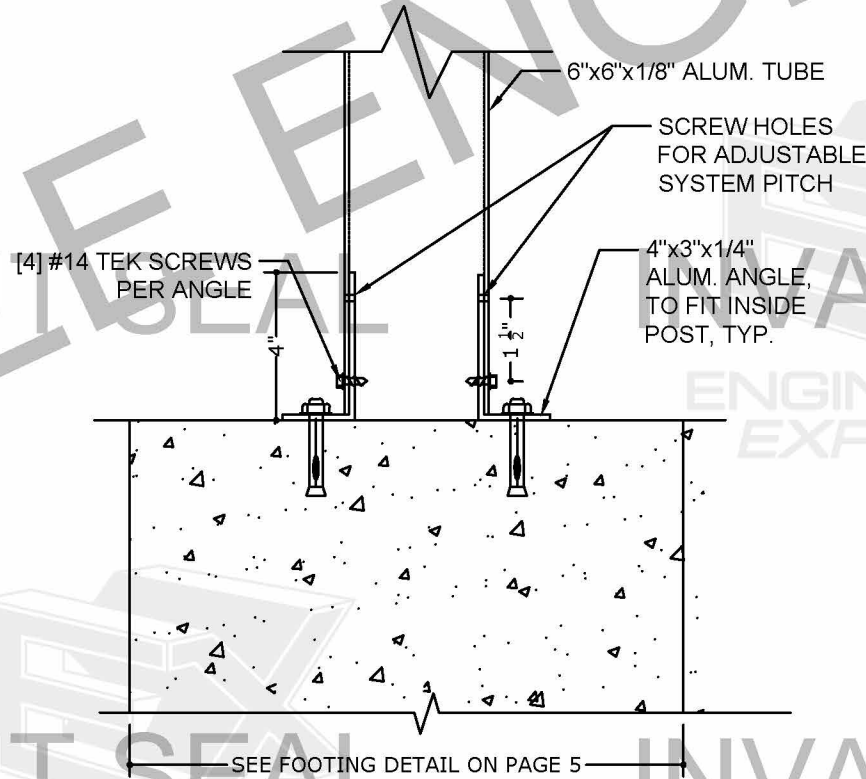
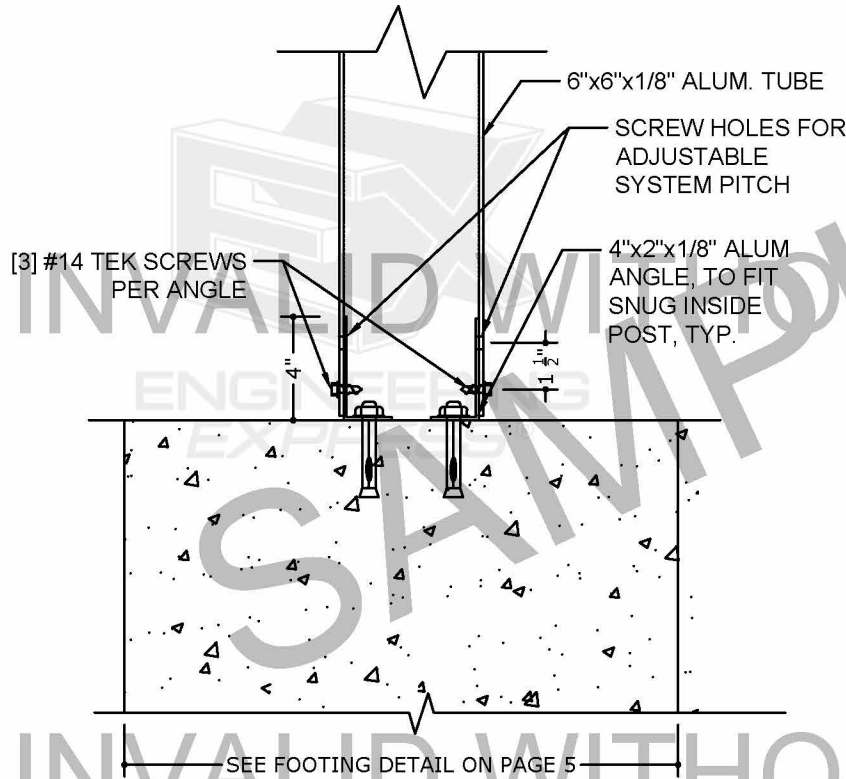
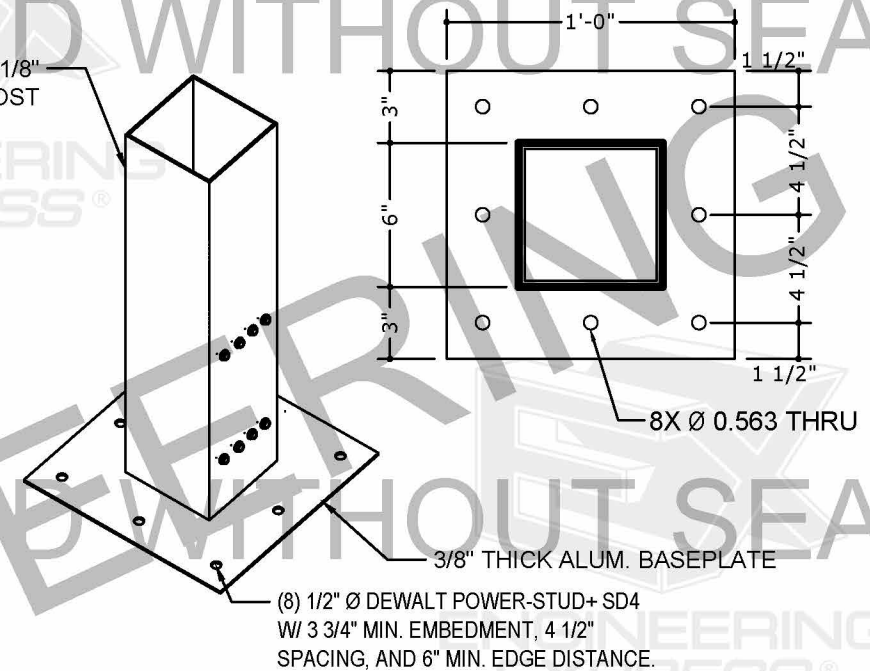
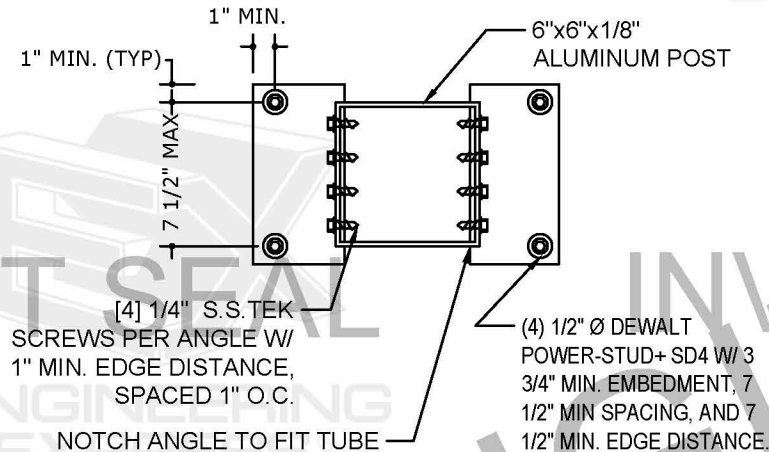
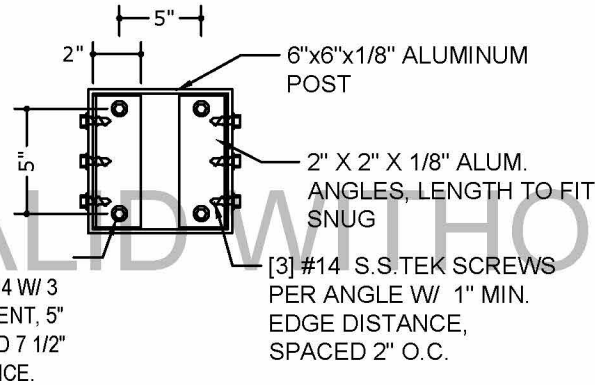
POST BASE CONNECTIONS



1 6" X 6" X 1/8" ALUMINUM POST
4 SCALE: N.T.S. DETAIL VIEW

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2 SURFACE MOUNTED CONNECTION "A"
4 SCALE: N.T.S. DETAIL VIEW

3 SURFACE MOUNTED CONNECTION "B"
4 SCALE: N.T.S. DETAIL VIEW

4 SURFACE MOUNTED CONNECTION "C"
4 SCALE: N.T.S. DETAIL VIEW

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POST-BASE ATTACHMENT AND FOOTINGS

TABLE 8.1 - FOOTING SELECTION

DESIGN UPLIFT PRESSURE (-)	CANOPY LAYOUT
	12' X 12' - 4 COLUMNS (6' X 6' = 36 FT ² PER COLUMN)
-10 PSF	1
-15 PSF	1
-20 PSF	2
-25 PSF	2
-30 PSF	3
-35 PSF	4
-40 PSF	4
-45 PSF	4

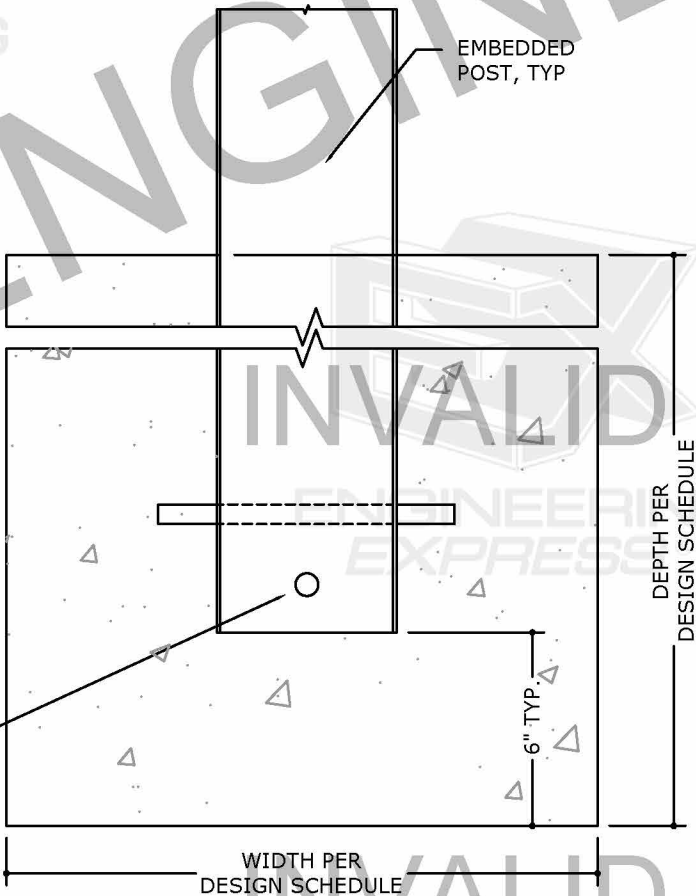
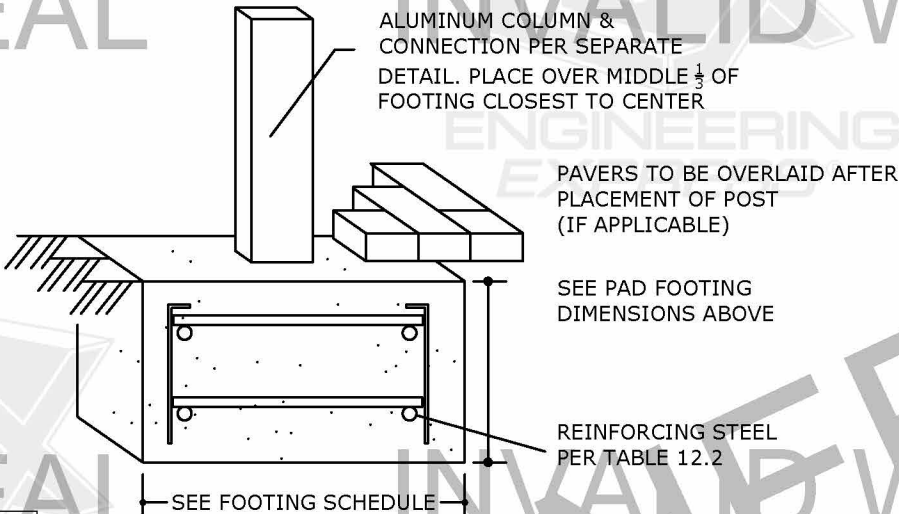
USE CANOPY LAYOUT TO
DETERMINE FOOTING # TO
DETERMINE SIZE &
REINFORCEMENT REQUIRED
FOR EACH POST

TABLE 8.2 - FOOTING DETAILS

FOOTING DETAILS: USE FOOTING PER # FOUND IN TABLE ABOVE								
#	WIDTH	LENGTH	DEPTH	VOLUME	WEIGHT	REINFORCEMENT		
1	24"	24"	18"	6.0 CUFT	900 LBS	2	#4 TOP & BOT EACH WAY	-
2	30"	30"	18"	9.4 CUFT	1406 LBS	4		-
3	30"	30"	24"	12.5 CUFT	1875 LBS	4		& 5
4	36"	36"	24"	18.0 CUFT	2700 LBS	4		#4 VERTICAL TIES

- FOOTING TABLE NOTES:
- F.S. AGAINST UPLIFT OF 33% HAS BEEN APPLIED TO ALL LOADS.
 - AT 2000 PSF SOIL BEARING PRESSURE, GRAVITY DOES NOT GOVERN IN ANY CASE. ENSURE PROPER COMPACTION & EMBEDMENT FOR FROST & HEAVE REQUIREMENTS.
 - FOOTING WEIGHT CALCULATED PER 150 PCF STANDARD WEIGHT CONCRETE
 - FOOTINGS OF ALTERNATE SIZE & EQUAL OR GREATER VOLUME & WEIGHT ACCEPTABLE WITH SEPARATE FOOTING ENGINEERING
 - SITE SPECIFIC ENGINEERING REQUIRED FOR ANY VALUES, SIZES, CONCRETE TYPES, OR SOIL BEARING PRESSURES NOT COINCIDING WITH LIMITS OF THIS MASTER PLAN.

3KSI CONCRETE FOOTING PER
FOOTING SCHEDULE. POST MAY BE
EMBEDDED DIRECTLY INTO CONCRETE
AS AN ALTERNATIVE TO SURFACE
MOUNTING. PROVIDE 18" EMBEDMENT
& A KEY HOLE FOR (1)#5 REBAR 12"
LONG IN EACH DIRECTION, TYP.



1 POST EMBED DETAIL
8 NTS ELEVATION

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FOOTER SCHEDULE NOTES:

- FOOTERS SHALL BE 3000 PSI MINIMUM CONCRETE, BEARING ON SOIL WITH A MINIMUM BEARING CAPACITY OF 2000 PSF AS VERIFIED BY OTHERS.
- IN LIEU OF THE FOOTERS DETAILED HEREIN, POSTS MAY BE ANCHORED TO EXISTING CONCRETE SLABS DESIGNED AND VERIFIED BY OTHERS TO SUPPORT THE CANOPY SYSTEM AS DETAILED HEREIN.
- FOOTERS SHALL HAVE THE MINIMUM REINFORCEMENT INDICATED IN THE SCHEDULES HEREIN.
- ALL REINFORCEMENT SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO CURRENT REQUIREMENTS OF ASTM A615, GRADE 60 (U.O.N.), FREE FROM OIL, LOOSE SCALE AND LOOSE RUST AND BENT, LAPPED, PLACED, SUPPORTED AND FASTENED ACCORDING TO THE "ACI DETAILING MANUAL" (SP-66) AND THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318).
- MINIMUM REINFORCING STEEL CLEAR COVERAGE SHALL BE AS FOLLOWS. (PER ACI 318)
FOOTING: TOP, SIDES, BOTTOM = 1-1/2" MIN. INSTALLED ON A SMOOTH LEVEL SURFACES ONLY. MAINTAIN 3" IF NOT IN SMOOTH FORM.
- ALLOW 3 DAYS CURE TIME BEFORE INSTALLING ANCHORS INTO CONCRETE.
- ALL CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS AND RECOMMENDATIONS OF ACI 318 "SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS". A CERTIFICATE OF MANUFACTURER'S MIX AND STRENGTH IS TO BE PROVIDED TO THE INSPECTOR UPON REQUEST. NO WATER TO BE ADDED AFTER TRUCK LEAVES PLANT WITHOUT APPROVAL OF ENGINEER OR PLANT ENGINEER. PLANT CONTROL IS REQUIRED. MAXIMUM MIX TIME AT POINT OF DEPOSIT IS 90 MINUTES.
- THESE TABLES REPRESENT EMPIRICAL UPLIFT CALCULATIONS FOR FOOTING SIZES BASED ON STANDARD WEIGHT (150PCF) CONCRETE. THEY NEGLECT THE BENEFIT OF SKIN FRICTION AND OTHER BENEFICIAL SURCHARGE LOADING. NO WARRANTY, EXPRESSED OR IMPLIED, IS CONTAINED HEREIN AS TO ANY INFORMATION OTHER THAN THAT WHICH IS PUBLISHED HEREIN.
- ALL FOOTINGS ARE TO BE INSTALLED LOWER THAN CODE REQUIRED FROST LINE. GENERAL CONTRACTOR IS RESPONSIBLE FOR ADHERENCE TO LOCAL FROST LINE REQUIREMENTS. ADDITIONALLY, TOP OF FOOTINGS ARE TO BE 8" MINIMUM BELOW GRADE IN HVHZ (DADE & BROWARD COUNTIES, FL).

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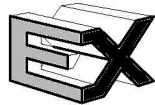
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WIND SPEED TO PRESSURE LOAD COMBINATION

CONVERSION TABLES FOR CANOPIES & PERGOLAS WITH 50% ROOF POROSITY

ASD DESIGN LOAD COMBINATION PRESSURES CONSIDER $D_L = 3$ PSF, $L_R = 20$ PSF, $S = 20$ PSF, AND WIND LOAD, W AS CALCULATED FOR THE SELECTED STRUCTURE USING ASCE 7-16 VULT WIND SPEED & ASD PRESSURE METHOD & CALCULATED AT MEAN SEA LEVEL FOR **OPEN-WALLED CANOPY STRUCTURES WITH AT LEAST 50% ROOF POROSITY**

TABLE 1:
LATERAL
PRESSURES

(WIND PRESSURE AGAINST SIDE OF
FREESTANDING OR HOST ATTACHED
STRUCTURES WITH OPEN WALLS)

DESIGN LATERAL PRESSURE		
ULT WIND SPEED (MPH)	ASCE EXPOSURE CATEGORY	LATERAL PRESSURE (PSF)
110 MPH	B	14
	C	17
120 MPH	B	17
	C	20
130 MPH	B	20
	C	24
140 MPH	B	23
	C	27
150 MPH	B	26
	C	31
160 MPH	B	30
	C	36

TABLE 2:
ROOF
PRESSURES

(WIND, AND LISTED GRAVITY LOADING AGAINST
ROOF OF FREESTANDING STRUCTURE
(+ = GRAVITY; - = UPLIFT))

DESIGN ROOF PRESSURE WITH OPEN WALLS			
ULT WIND SPEED (MPH)	ASCE EXPOSURE CATEGORY	MONOSLOPE (PSF)	
		$\theta < 7.5^{\circ}$	
		(+)	(-)
110 MPH	B	24	-10
	C	28	-10
120 MPH	B	25	-10
	C	28	-10
130 MPH	B	26	-10
	C	29	-11
140 MPH	B	27	-10
	C	31	-14
150 MPH	B	28	-10
	C	33	-16
160 MPH	B	30	-12
	C	36	-20

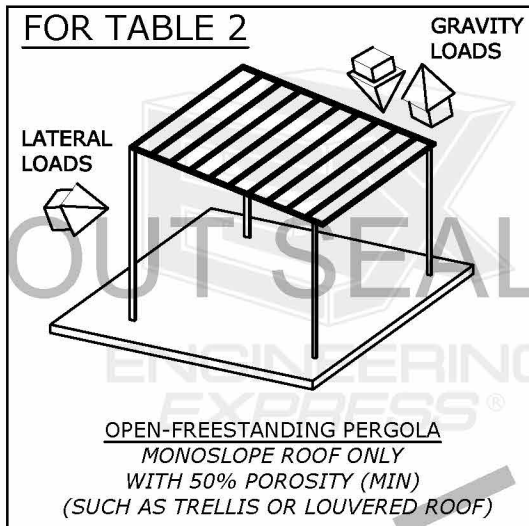
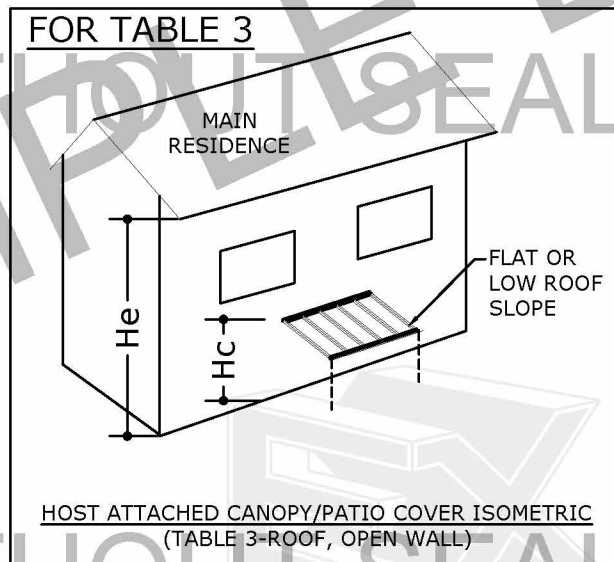


TABLE 3 - ATTACHED CANOPY:

DESIGN ROOF PRESSURES FOR HOST ATTACHED CANOPY				
ULTIMATE WIND SPEED	ASCE EXPOSURE CATEGORY	CANOPY ATTACHED 1FT OR MORE BELOW EAVE ($h_c/h_e < 0.9$)	CANOPY ATTACHED 1FT OR LESS BELOW EAVE ($0.9 \leq h_c/h_e \leq 1$)	DESIGN WIND PRESSURE (PSF)
110 MPH	B	23	-10	23
	C	23	-10	23
120 MPH	B	23	-10	23
	C	23	-10	23
130 MPH	B	23	-10	23
	C	23	-10	23
140 MPH	B	23	-10	23
	C	23	-10	23
150 MPH	B	23	-10	23
	C	24	-10	24
160 MPH	B	23	-10	23
	C	25	-10	25



ABBREVIATIONS:

θ = SLOPE, DEGREES
(+) = POSITIVE (DOWNW-IN) PRESSURE
(-) = NEGATIVE (UP-OUT) PRESSURE
 H_c = CANOPY HEIGHT
 H_e = EAVE HEIGHT
PSF = POUNDS PER SQUARE FOOT (ASD)
MPH = MILES PER HOUR (Vult)

DESIGN LOAD COMBINATION CONDITIONS

PRESSURES PROVIDED IN THE TABLES HEREIN ARE ALLOWABLE STRESS DESIGN FACTORED LOAD COMBINATIONS PER ASCE 7-16 CHAPTER 2.4 & CORRESPONDING WIND PRESSURE DESIGN CHAPTERS. THE WIND PRESSURES UTILIZED IN THESE CALCULATIONS ASSUME A CANOPY OF HEIGHT = 12FT AND AN AREA OF 100 SQFT.

ASD LOAD COMBINATIONS HEREIN ASSUME A CONSTANT DEAD LOAD OF 2 PSF, ROOF LIVE LOAD, $L_R = 20$ PSF, SNOW LOAD, $S = 20$ PSF, AND WIND LOAD, W AS CALCULATED FOR THE SELECTED STRUCTURE & SITE SPECIFIC CONDITIONS. PRESSURES LISTED ARE VALID FOR DESIGN CONDITIONS EQUAL TO OR LESS THAN THE LOAD COMBINATION CONSIDERED.

FOR LOADING CONDITIONS EXCEEDING THE CONSTANTS STATED ABOVE (SUCH AS A ROOF OR SNOW LOADING EXCEEDING 20 PSF, OR THE CONSIDERATION OF SEISMIC LOADING), USE THE ONLINE LOAD COMBINATION TOOLS FOUND AT THE QR CODE PROVIDED.

INSTRUCTIONS FOR TABLE USE:

- IDENTIFY THE LOCAL VULT WIND VELOCITY BASED ON 3 SECOND GUST FACTOR FROM BUILDING DEPT OR PUBLISHED DATA. REFERENCED STANDARD WIND INFORMATION CAN BE FOUND AT HAZARDS.ATCOUNCIL.ORG AND AT THE QR CODE BELOW
- CONFIRM THAT THE SITE-SPECIFIC & LOCAL MUNICIPALITY DESIGN CONDITIONS ARE WITHIN THE LIMITATIONS OF THIS MASTER PLAN AS STATED ABOVE. CONFIRM THAT THESE CONDITIONS ALSO COMPLY WITH LOCAL CODE REQUIREMENTS
- IDENTIFY THAT THE STRUCTURE TO BE USED CONFORMS TO THE LIMITATIONS NOTED HEREIN. THIS DOCUMENT PROVIDES INFORMATION FOR OPEN-WALLED STRUCTURES THAT ARE EITHER FREESTANDING OR HOST-ATTACHED, AND HAVE A ROOF THAT IS AT LEAST 50% POROUS.
- READ OFF POSITIVE (DOWNWARD), NEGATIVE (UPLIFT), AND LATERAL PRESSURES AS ASD DESIGN LOAD COMBINATIONS FOR DIRECT USE WITH CORRESPONDING PRESSURE-DESIGNED SYSTEMS

ADDITIONAL ENGINEERING IS REQUIRED FOR DESIGN CONDITIONS THAT EXCEED THE CONSIDERATIONS OF THIS MASTER PLAN.

CALCULATION NOTES:

- INTERPOLATION OF THESE RESULTS ARE NOT PERMITTED WITHOUT SIGNED AND SEALED RESULTS.
- PRESSURES HEREIN ARE VALID FOR CONDITIONS EQUAL OR LESS THAN THE DESIGN CONDITIONS LISTED. FOR CONDITIONS EXCEEDING THOSE LISTED, VISIT ECALC.IO/WIND TO CALCULATE A SITE SPECIFIC PRESSURE
- TABLES USE ASCE ZONE 2 PRESSURES FOR A ROOF AREA=100FT², AND CANOPY HEIGHT $H_c = 12$ FT, C&C METHOD, FLAT TERRAIN. FOR MORE EXACT ANSWERS USE THE MATCHING ONLINE CALCULATOR AT ECALC.IO/WIND.

DESIGN NOTES

- PRESSURES HEREIN ARE CALCULATED IN CONFORMANCE WITH (ASD) "ALLOWABLE STRESS DESIGN METHODOLOGY" PER IBC (2018) / FBC (2020) SECTION 1605 & ASCE 7-16 SECTION 2.4.1, WITH WIND PRESSURES PER ASCE CHAPTER 30, AND LOADING CONDITIONS USING THE CODES & CRITERIA AS OUTLINED.
- 'WORST CASE' CRITICAL CONDITIONS SHALL BE ASSUMED FOR SAFE PRESSURE RATINGS.
- TOPOGRAPHIC FACTOR $K_{zt}=1.0$ FOR FLAT TERRAIN USE ONLY. NO HILLS SHALL BE NEARBY AREA.
- VERIFY USE OF K_d (DIRECTIONALITY FACTOR) WITH LOCAL BUILDING DEPARTMENT, $K_d=0.85$ USED HEREIN. PRESSURES SHALL BE ADJUSTED AS REQUIRED BY USE OF ALTERNATE K_d VALUES.

GENERAL NOTES

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- CONTRACTOR SHALL INVESTIGATE AND CONFORM TO ALL LOCAL BUILDING CODE AMENDMENTS WHICH MAY APPLY.
- IT IS RECOMMENDED THAT A LICENSED ENGINEER OR REGISTERED ARCHITECT PREPARE SITE SPECIFIC DOCUMENTS FOR USE IN CONJUNCTION WITH THIS DOCUMENT. SEPARATE 'SITE-SPECIFIC' SEALED ENGINEERING IS REQUIRED IN ORDER TO DEVIATE FROM LOADS OR CONFIGURATIONS CONTAINED HEREIN. CONTACT THIS ENGINEER OR A LICENSED PROFESSIONAL FOR ALTERNATE CONFIGURATION CALCULATIONS AS MAY BE REQUIRED.
- THE CONTRACTOR SHALL CAREFULLY CONSIDER POSSIBLE IMPOSING LOADS ON ROOF, INCLUDING BUT NOT LIMITED TO ANY CONCENTRATED LOADS WHICH MAY JUSTIFY GREATER DESIGN CRITERIA. ADDITIONAL ROOF LOAD CRITERIA SHALL BE PROPERLY ANALYZED BY A PROFESSIONAL ENGINEER. RESULTS ARE WIND ONLY.
- EXCEPT AS EXPRESSLY PROVIDED HEREIN, NO ADDITIONAL CERTIFICATIONS OR AFFIRMATIONS ARE INTENDED.
- ALTERATIONS, ADDITIONS OR OTHER MARKINGS TO THIS DOCUMENT ARE NOT PERMITTED AND INVALIDATE OUR CERTIFICATION.

NOTE: ROOF DESIGN LOADS SHOWN HEREIN INCLUDE A 50% REDUCTION IN TOTAL WIND PRESSURE TO ACCOUNT FOR A POROUS ROOF SURFACE AREA EXPOSED TO WIND AND SNOW (SUCH AS A TRELLIS OR OPERABLE LOUVERED ROOF WHEN IN THE FULLY OPENED POSITION). TO UTILIZE THESE VALUES, ROOF STRUCTURE SHOULD BE CLEAR OF OBSTRUCTION, AND ANY LOUVERS SHALL BE FULLY OPENED BEFORE ANY NAMED STORM OR SIMILAR HIGH-WIND EVENT. IF NOT, THE DESIGN PRESSURES SHOWN ABOVE SHALL BE DOUBLED BEFORE INSTALLATION & USE.

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