

FORTRESS EVOLUTION HOST ATTACHED STEEL DECK FRAMING MASTER PLAN

10/13/2021

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DESIGN CRITERIA:

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

- DEAD LOADS
1.1. SYSTEM DEAD LOAD..... 10 TO 15 PSF
- LIVE LOADS
2.1. SYSTEM LIVE LOAD..... 40 TO 100 PSF
- SNOW LOAD
3.1. GROUND SNOW LOAD..... 0-60 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

- WIND LOADS
4.1. METHODOLOGY.....
4.2. ULTIMATE WIND SPEED.....
4.3. WIND EXPOSURE FACTOR.....
4.4. DIRECTIONALITY/OTHER FACTORS.....
4.5. MEAN ROOF HEIGHT.....
4.6. SYSTEM MOUNTING HEIGHT.....
4.7. DESIGN WIND PRESSURE.....
- SEISMIC LOADS.....

OPEN STRUCTURE
UP TO 160 MPH
(ASD =
SQRT(0.6)*Vult)

B & C
Kd=0.85, G=0.85,
Kz=0.85, Kzt=1.0
UP TO 10 FEET
0 FEET (AT GRADE)
10 TO 50 PSF

DOES NOT GOVERN
(MAX SDC = B)

REFER DESIGN PRESSURE TABLES
HEREIN FOR MORE INFORMATION
ABOUT ALLOWABLE LOADING
CONDITIONS

THIS SYSTEM IS DESIGNED AS AN
OPEN FRAME 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 CODES AND STANDARDS STATED USING ASCE 7-16 ALLOWABLE STRESS DESIGN METHODOLOGY WITH CRITERIA AS OUTLINED HEREIN. THE CONTRACTOR SHALL CONTACT THE AUTHORITY HAVING JURISDICTION TO ENSURE APPROPRIATE CRITERIA BEFORE CONSTRUCTION BEGINS. DESIGN CONSIDERS A CONSTANT LATERAL LIVE LOADING TO ACCOUNT FOR STANDARD USE. ADDITIONAL LATERAL LOADING FOR WIND HAS BEEN CONSIDERED AS REQUIRED. DESIGN ALSO CONSIDERS A 5% ACCIDENTAL ECCENTRICITY AS DETAILED IN ASCE 7-16. METRIC CONVERSIONS HAVE BEEN PROVIDED (IN PARENTHESES) AND ARE EQUIVALENTLY CERTIFIED

GENERAL NOTES

- 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. LOADING AND WIND PRESSURE DESIGN SHALL UTILIZE ASCE 7-16 OR ASCE 7-10 ASD METHODOLOGY AS REQUIRED BY LOCAL CODES AND CODES FOR SITE SPECIFIC REQUIREMENTS AS APPLICABLE. DESIGN CRITERIA OR SPANS BEYOND STATED HEREIN MAY REQUIRE ADDITIONAL SITE SPECIFIC SEALED ENGINEERING.
- NO 33-1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS SYSTEM. WIND LOAD DURATION FACTOR Cd=1.6 HAS BEEN USED FOR WOOD ANCHOR DESIGN.
- PRODUCT APPROVED FOR USE IN SEISMIC DESIGN CATEGORY A-B PER REQUIREMENTS OF ASCE 7 AND CALIFORNIA BUILDING CODE 2019. FOR SEISMIC DESIGN CATEGORY C-F AND ANY CONCRETE CONNECTIONS, ADDITIONAL REVIEW BY THIRD-PARTY ENGINEERS IS REQUIRED FOR THE VALIDITY OF THE DESIGN.
- 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. ALL STRUCTURAL MEMBERS AS SHOWN HAVE BEEN DESIGNED TO CARRY IN PLACE DESIGN LOADS ONLY AS SPECIFIED HEREIN; THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUPPORT OF ANY ADDITIONAL LOADS AND FORCES IMPOSED DURING MANUFACTURING, TRUCKING, ERECTING, AND HANDLING.
- ANY EXISTING HOST STRUCTURE MUST BE CAPABLE OF SUPPORTING THE LOADED SYSTEM AS VERIFIED BY THE ENGINEER & OR ARCHITECT OF RECORD, et.al. THE HOST STRUCTURE WHICH IS DESIGNED, CERTIFIED, AND INSPECTED BY OTHERS MUST PROVIDE SUFFICIENT, CAPACITY FOR THIS SPECIFIED DECK SYSTEM. NO WARRANTY OR GUARANTEE TO THESE CONDITIONS, EITHER EXPRESSED OR IMPLIED, IS OFFERED WITH THIS CERTIFICATION.
- PARAMETERS SHALL FOLLOW MANUFACTURER SPECIFICATIONS AS WELL AS THE INFORMATION HEREIN. WHERE DIFFERENCES OCCUR BETWEEN THIS REPORT AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, THIS REPORT SHALL GOVERN.

MATERIALS & CONCRETE

- ALL STEEL BEAMS AND LEDGERS HEREIN SHALL CONFORM TO ASTM A500 AND CURRENT EDITION OF AISC WITH MINIMUM Fy = 43.8 KSI AND Fu = 58.6 KSI MIN. ALL OTHER UNSPECIFIED STEEL COMPONENTS SHALL CONFORM TO ASTM 653-09 GR37 WITH Fy = 33.3 KSI AND Fu = 48.6 KSI MIN. JOISTS, BEAMS, AND OTHER MEMBERS MAY INCLUDE AN EXTERIOR BAKED-ON COATING BY THE MANUFACTURER.
- CONCRETE MIXTURES SHALL BE DESIGNED TO REACH A COMPRESSIVE STRENGTH OF 3,000 PSI IN 7 DAYS U.N.O. 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.
- CONCRETE FOOTERS ARE TO INCLUDE STEEL REINFORCEMENT AS LISTED IN THE FOOTER DESIGN SCHEDULE NOTES.
- MINIMUM REBAR COVER FOR CONCRETE FOOTINGS IS 3" FOR CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH AND 2" FOR CONCRETE EXPOSED TO EARTH OR WEATHER.

NON-STRUCTURAL ELEMENTS:

- 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. SPECS. DETAILS PROVIDED HEREIN ARE FOR REFERENCE ONLY

INSTALLATION & CONSTRUCTION

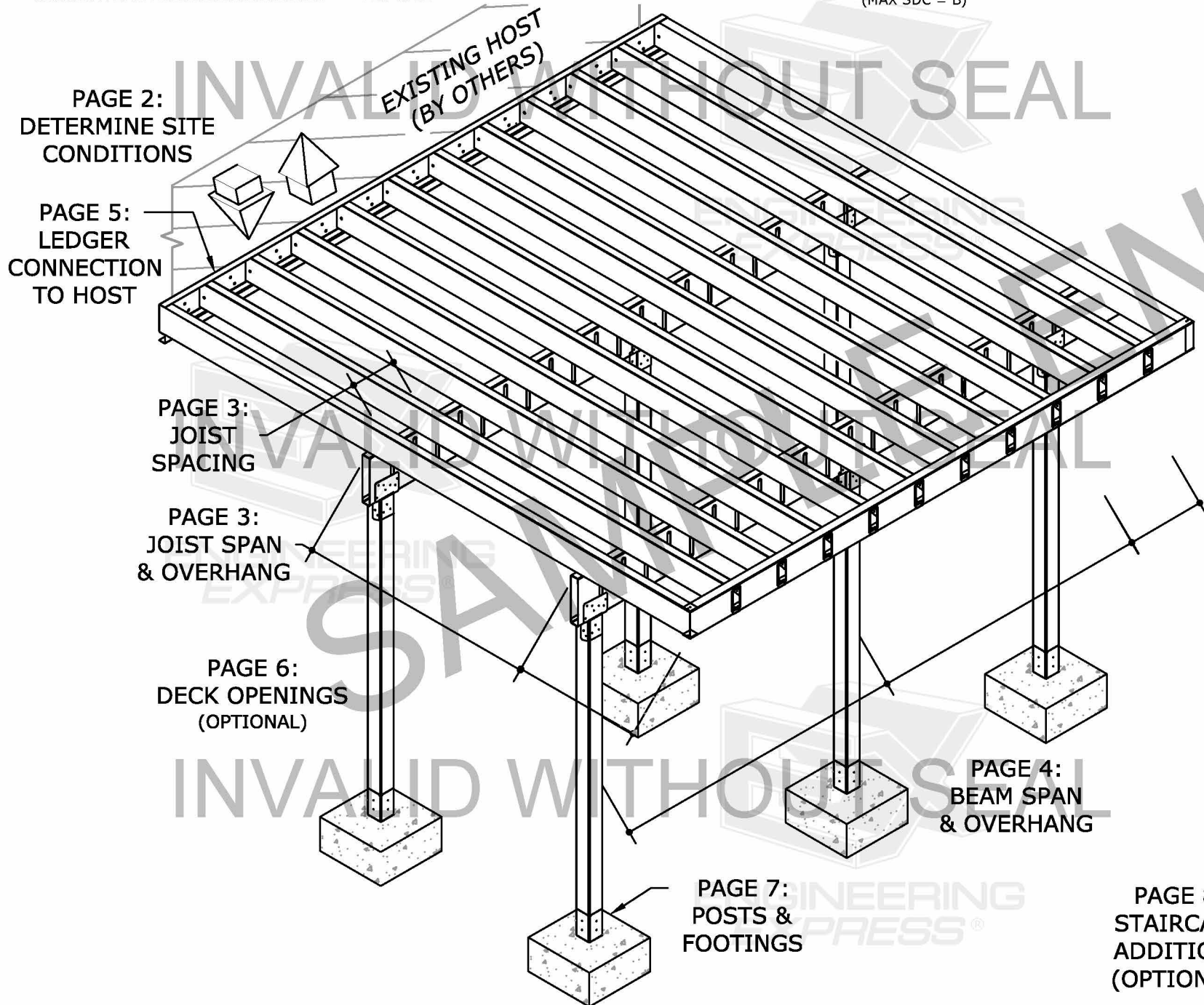
- ALL FOOTINGS ARE TO BE INSTALLED BELOW ANY CODE REQUIRED FROST LINE. ADDITIONALLY, IN HIGH VELOCITY HURRICANE ZONES (MIAMI-DADE & BROWARD COUNTIES, FL), TOP OF FOOTING SHALL BE 8" MINIMUM BELOW GRADE.
- SURROUNDING SOIL TO BE WELL COMPACTED BY MECHANICAL MEANS TO 90% OPTIMUM DENSITY, BE FREE OF MUCK 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.
- THE CONTRACTOR IS RESPONSIBLE TO INSULATE ALL MEMBERS FROM DISSIMILAR MATERIALS TO PREVENT ELECTROLYSIS.

FASTENERS & ANCHORS

- ALL FASTENERS TO BE #12 SAE GRADE 2 WITH APPROPRIATE CORROSION RESISTANT OR STAINLESS STEEL 304 UNLESS NOTED OTHERWISE (FY = 65 KSI MIN). 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.
- ALL FASTENERS SHALL BE SPACED WITH 2xDIAMETER END DISTANCE AND 2.5xDIAMETER MIN. SPACING TO ADJACENT FASTENERS, UNLESS NOTED OTHERWISE. PROVIDE (5) PITCHES MINIMUM PAST THE THREAD PLANE FOR ALL FASTENERS.
- ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS. MINIMUM EDGE DISTANCE AND EMBEDMENT SHALL BE PER ATTACHMENT CONDITIONS AS NOTED IN CONNECTION DETAILS AND SCHEDULES HEREIN. MINIMUM EMBEDMENT AND EDGE DISTANCE EXCLUDES STUCCO, FOAM, BRICK, AND OTHER WALL FINISHES. ALL CONCRETE ANCHORS SHALL BE INSTALLED TO NON-CRACKED CONCRETE ONLY.

OTHER

- 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.
- NO CERTIFICATION IS OFFERED FOR WATERPROOFING, SIZING, OR OPERATION OF GUTTERS
- THIS DOCUMENT SHALL NOT BE USED OR REPRODUCED WITHOUT THE ORIGINAL SIGNATURE & RAISED SEAL OF THE CERTIFYING P.E. ALTERATIONS, ADDITIONS OR OTHER MARKINGS TO THIS DOCUMENT ARE NOT PERMITTED AND INVALIDATE OUR CERTIFICATION. PHOTOCOPIES AND UNSEALED DOCUMENTS ARE NOT TO BE ACCEPTED.
- 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.
- EXCEPT AS EXPRESSLY PROVIDED HEREIN, NO ADDITIONAL CERTIFICATIONS OR AFFIRMATIONS ARE INTENDED.
- ALTERATIONS, ADDITIONS, HIGHLIGHTING, OR OTHER MARKINGS TO THIS DOCUMENT ARE ONLY PERMITTED TO HIGHLIGHT SITE-SPECIFIC CONDITIONS, HOWEVER ANY CHANGES, ALTERATIONS OR ADDITIONS WILL INVALIDATE THIS CERTIFICATION.



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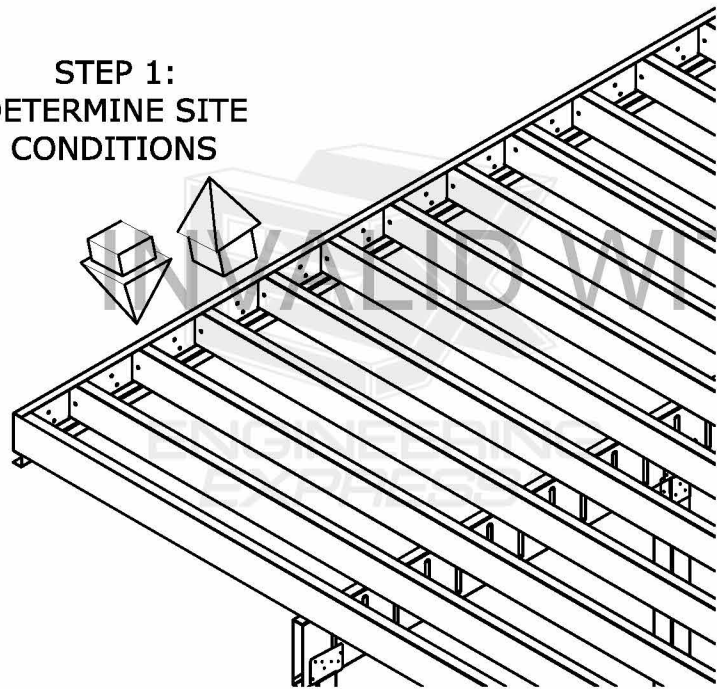
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STEP 1:
DETERMINE SITE
CONDITIONS



DESIGN PRESSURE:

THE TABLES AND SCHEDULES IN THIS MASTER PLAN USE BENCHMARK DESIGN PRESSURES FOR DETERMINATION OF MOST SPANS, SPACINGS, AND MEMBERS. THE INFORMATION ON THIS SHEET MAY BE USED TO DETERMINE THE DESIGN PRESSURE BENCHMARK TO BE USED FOR EACH SPECIFIC INSTALLATION. IN ALL CASES, IT IS ACCEPTABLE TO USE A HIGHER BENCHMARK THAN DETERMINED FROM THE INFORMATION HEREIN.

WIND PRESSURES ARE TO BE CALCULATED PER ASCE 7-16 HOST-ATTACHED CANOPY; SNOW LOADING IS TO BE DETERMINED PER ASCE 7-16 AND LOCAL DESIGN STANDARDS.

DESIGN BENCHMARK CONSIDERATIONS:

THE DESIGN PRESSURE BENCHMARKS USED HEREIN ARE BASED ON STANDARD EXPECTED DEAD + LIVE LOADING CONDITIONS. LOADING COMBINATIONS IN ALL SITUATIONS, IT IS ACCEPTABLE TO USE THE VALUES HEREIN, OR SUBSTITUTE OUTSIDE ENGINEERED CALCULATIONS (PER ASCE 7-16 LOAD COMBINATIONS) FOR THE DETERMINATION OF A DESIGN LOAD BENCHMARK TO BE USED HEREIN.

DESIGN LOADING BENCHMARKS USED ARE **50 PSF, 75 PSF, 100 PSF, AND 150 PSF**. DESIGN CONDITIONS EXCEEDING THE LARGEST BENCHMARK ARE NOT CERTIFIED PER THIS MASTER PLAN.

TABLE 1.1 - LIVE LOAD CONSIDERATIONS

SITE USE (REFERENCED CODE)	LIVE LOAD
RESIDENTIAL MIN (IRC 2018; FRC 2020)	40 PSF
COMMERCIAL MIN (IRC 2018)	60 PSF
RESIDENTIAL (IBC 2018; FBC 2020)	
MAXIMUM ALLOWABLE PER THIS MASTER PLAN (REFER SITE SPECIFIC DESIGN SPECIFICATIONS)	100 PSF

NOTE: LOADING REQUIREMENTS ARE DEPENDENT ON SITE USAGE AND PROJECT DESIGN SPECIFICATIONS. CONFIRM SITE USAGE AND REQUIRED DESIGN SPECIFICATIONS WITH AUTHORITY HAVING JURISDICTION BEFORE USE. REFER LOCAL JURISDICTION FOR METRIC CONVERSIONS OR EQUIVALENT STANDARDS.

TABLE 1.2: DESIGN LOADING FROM SITE SPECIFIC LOADING FACTORS

MAX DEAD LOAD	MAX LIVE LOAD (PER TABLE 1.1)	MAX WIND LOAD*	MAX SNOW LOAD*	SEISMIC CATEGORY	INSTALLATION LOCATION	DESIGN LOAD BENCHMARK
10 PSF (479 Pa)	40 PSF (1915 Pa)	30 PSF (1436 Pa)	30 PSF (1436 Pa)	CATEGORY "B" MAX	FOOTINGS INSTALLED AT GRADE	50 PSF (2394 Pa)
15 PSF (718 Pa)	60 PSF (2873 Pa)	40 PSF (1915 Pa)	40 PSF (1915 Pa)			75 PSF (3591 Pa)
15 PSF (718 Pa)	60 PSF (2873 Pa)	70 PSF (3352 Pa)	50 PSF (2394 Pa)			100 PSF (4788 Pa)
15 PSF (718 Pa)	100 PSF (4788 Pa)	70 PSF (3352 Pa)	50 PSF (2394 Pa)			150 PSF (7182 Pa)

NOTE: THIS TABLE IS PROVIDED AS A CONSERVATIVE, GENERAL GUIDELINE FOR DESIGN LOAD VALUES FOR USE WITH THIS MASTER PLAN ONLY. LOAD BENCHMARKS MAY BE CALCULATED AND CERTIFIED SEPARATELY USING ASCE CHAPTER 2.4 (USING ASD LOAD COMBINATIONS). IN MANY CASES, IT MAY BE ACCEPTABLE PER THE AUTHORITY HAVING JURISDICTION TO CONSIDER DEAD AND LIVE LOADING ONLY AS MAXIMUM DESIGN CONDITIONS, OR TO CONSIDER WIND, SNOW, SEISMIC, OR OTHER LOADING DIFFERENTLY THAN WHAT IS SHOWN IN TABLE 1.2 ABOVE.

*EXTREME WEATHER LOADING: DURING HIGH WIND AND SNOW CONDITIONS, LIVE LOAD MAY BE CONSIDERED AT A REDUCED VALUE (EQUAL TO DEAD LOAD) FOR DETERMINATION OF DESIGN BENCHMARKS.

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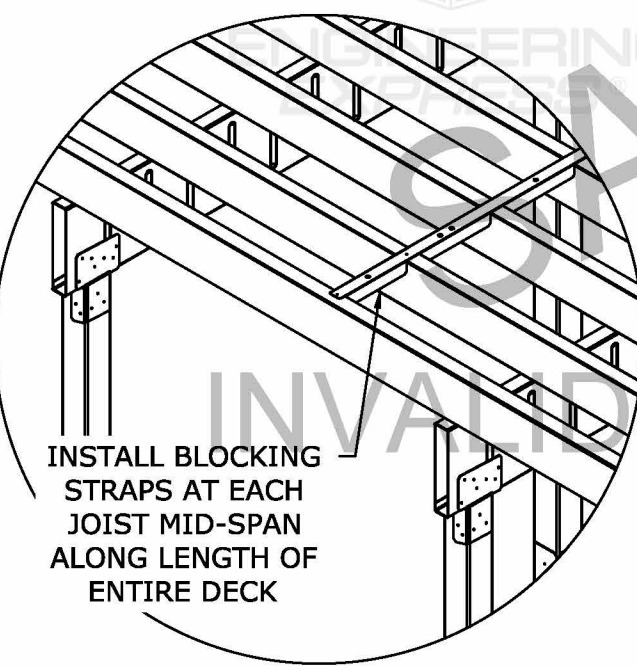
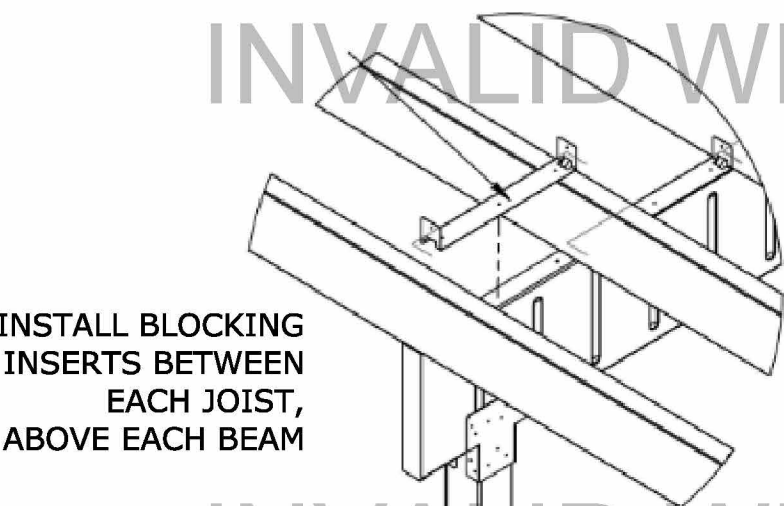
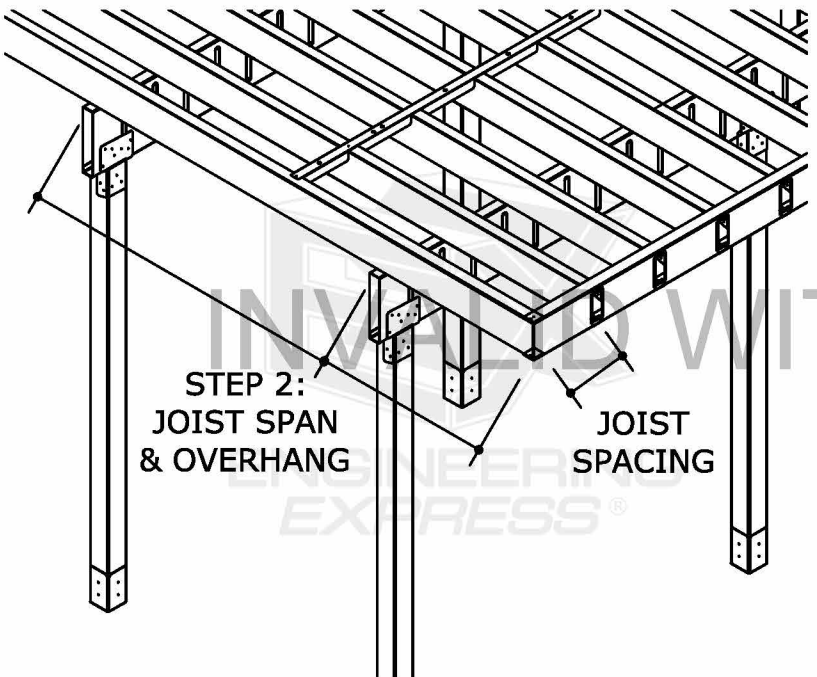
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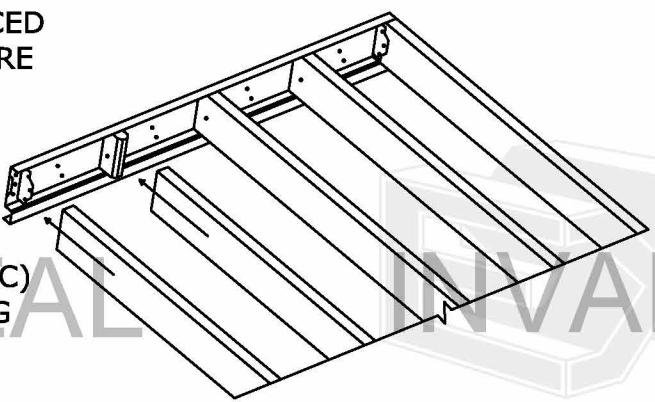
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SLIDE JOIST INTO PRE- SPACED LEDGER BRACKET AND SECURE WITH (1) SELF-DRILLING SCREW ON EACH SIDE

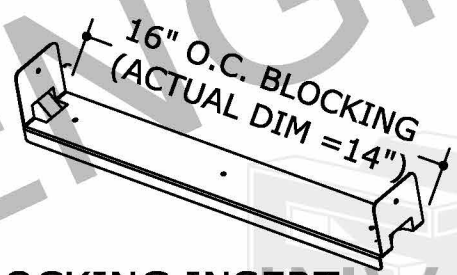
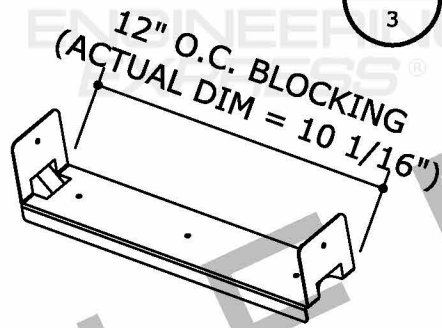


USE F-50 LEDGER BRACKET (C) AT NON- STANDARD SPACING AND AT EACH END. USE (3) SELF-DRILLING SCREWS

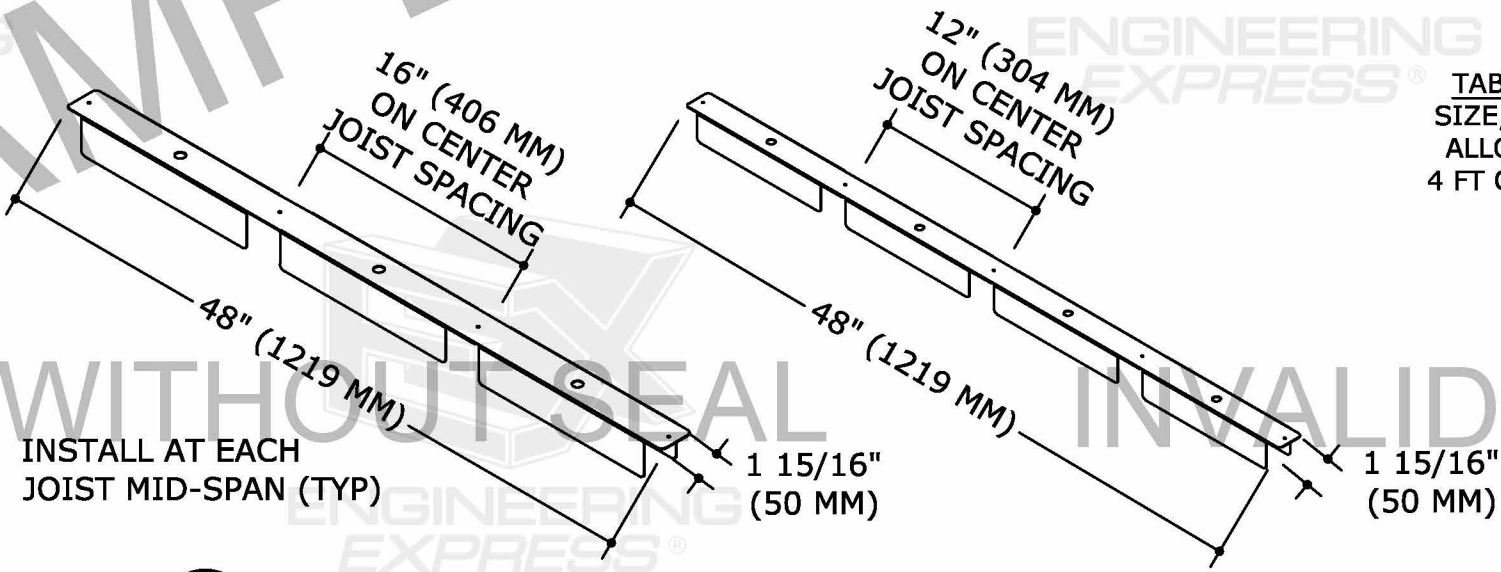
12" (304 MM) OR 16" (406 MM) ON CENTER SPACING



1 RIM JOIST TRACK
3 SCALE: NOT TO SCALE VIEW



2 12" O.C & 16" O.C. BLOCKING INSERT
3 SCALE: NOT TO SCALE VIEW



3 JOIST MID-SPAN BLOCKING STRAP
3 SCALE: NOT TO SCALE VIEW

TABLE 2.1: JOIST SIZE, SPACING AND ALLOWABLE SPAN. NO OVERHANG

DESIGN PRESSURE BENCHMARK	JOIST SIZE 2X6 16GA	
	JOIST SPACING	
	12 IN (30 cm)	16 IN (40 cm)
ALLOWABLE JOIST SPAN		
50 PSF (2394 Pa)	16' - 0" (4.8 m)	16' - 0" (4.8 m)
75 PSF (3591 Pa)	15' - 6" (4.7 m)	14' - 0" (4.2 m)
100 PSF (4788 Pa)	14' - 0" (4.2 m)	12' - 6" (3.8 m)
150 PSF (7182 Pa)	12' - 0" (3.6 m)	10' - 0" (3.0 m)

TABLE 2.2: JOIST SIZE, SPACING AND ALLOWABLE SPAN. 2 FT OVERHANG MAX

DESIGN PRESSURE BENCHMARK	JOIST SIZE 2X6 16GA	
	JOIST SPACING	
	12 IN (30 cm)	16 IN (40 cm)
ALLOWABLE JOIST SPAN		
50 PSF (2394 Pa)	16' - 0" (4.8 m)	14' - 6" (4.4 m)
75 PSF (3591 Pa)	14' - 6" (4.4 m)	13' - 0" (3.9 m)
100 PSF (4788 Pa)	14' - 0" (4.2 m)	12' - 0" (3.6 m)
150 PSF (7182 Pa)	11' - 6" (3.5 m)	10' - 0" (3.0 m)

TABLE 2.3: JOIST SIZE, SPACING AND ALLOWABLE SPAN. 4 FT OVERHANG MAX

DESIGN PRESSURE BENCHMARK	JOIST SIZE 2X6 16GA	
	JOIST SPACING	
	12 IN (30 cm)	16 IN (40 cm)
ALLOWABLE JOIST SPAN		
50 PSF (2394 Pa)	16' - 0" (4.8 m)	13' - 0" (3.5 m)
75 PSF (3591 Pa)	11' - 0" (3.3 m)	7' - 6" (2.2 m)
100 PSF (4788 Pa)	9' - 6" (2.8 m)	6' - 6" (1.9 m)
150 PSF (7182 Pa)	5' - 6" (1.6 m)	3' - 0" (0.9 m)

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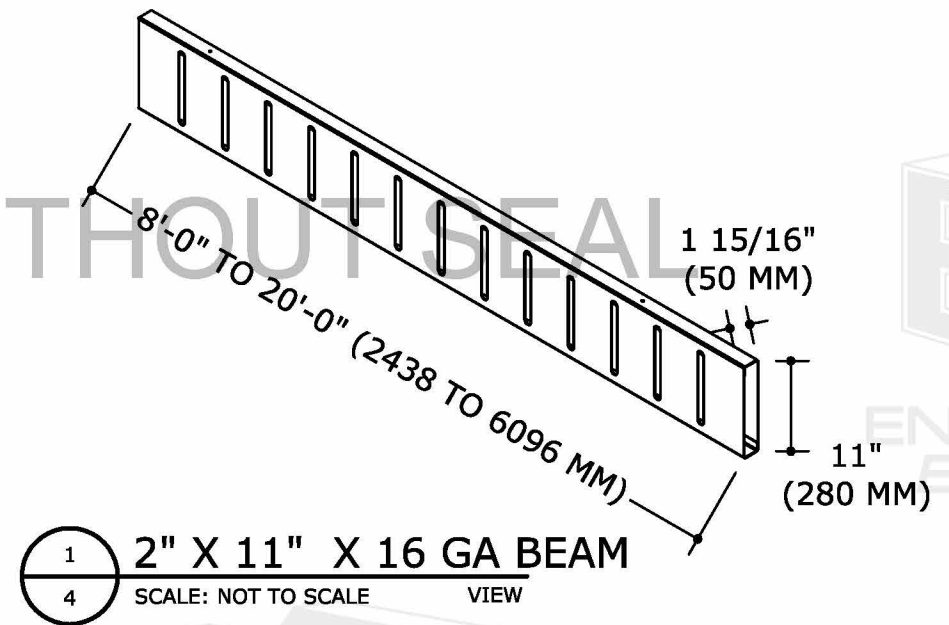
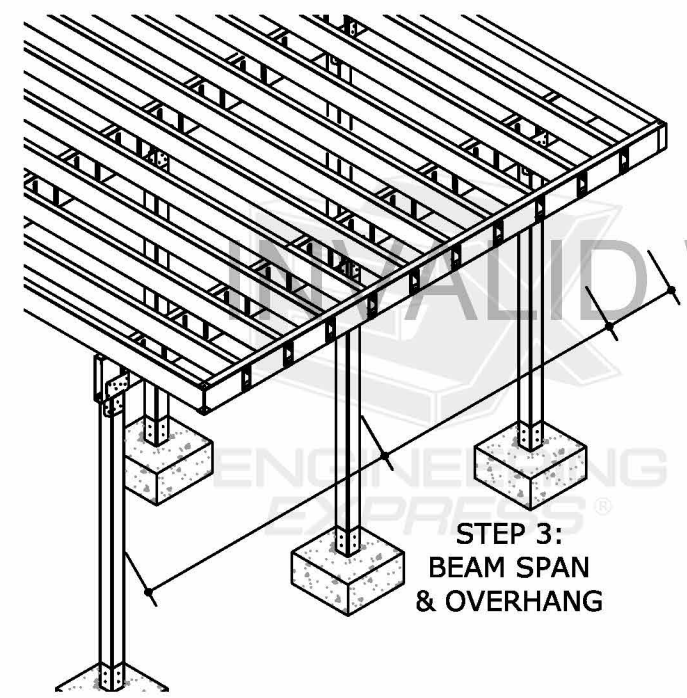
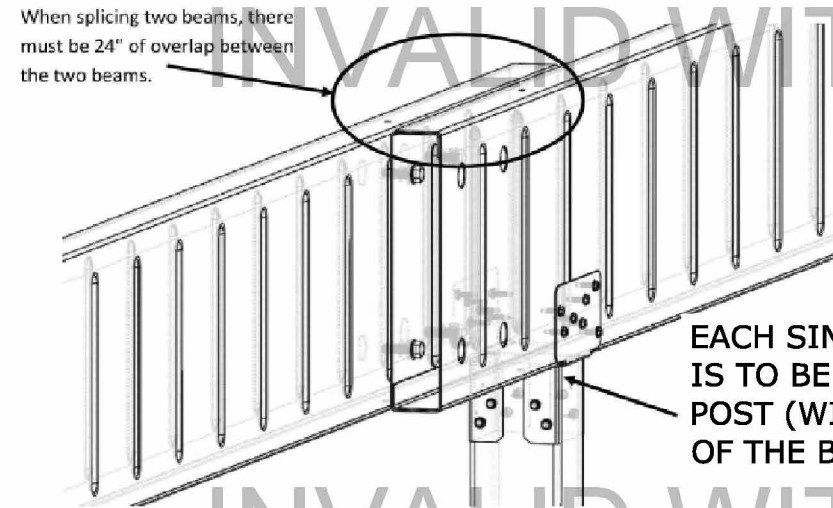
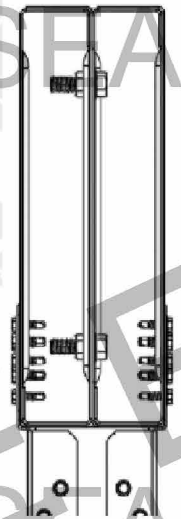


TABLE 3.1 - ALLOWABLE SINGLE BEAM SPAN
(2'-0" MAX BEAM OVERHANG)

DESIGN PRESSURE BENCHMARK	MAXIMUM JOIST SPAN				
	8 FT (2.4 m)	10 FT (3.0 m)	12 FT (3.7 m)	14 FT (4.3 m)	16 FT (4.9 m)
	ALLOWABLE BEAM SPAN				
50 PSF (2394 Pa)	16' - 0" (4.8 m)	14' - 0" (4.2 m)	13' - 0" (3.9 m)	11' - 6" (3.5 m)	11' - 0" (3.3 m)
75 PSF (3591 Pa)	13' - 0" (3.9 m)	11' - 6" (3.5 m)	10' - 6" (3.2 m)	9' - 6" (2.8 m)	9' - 0" (2.7 m)
100 PSF (4788 Pa)	11' - 0" (3.3 m)	10' - 0" (3.0 m)	9' - 0" (2.7 m)	8' - 0" (2.4 m)	7' - 6" (2.2 m)
150 PSF (7182 Pa)	9' - 0" (2.7 m)	8' - 0" (2.4 m)	7' - 6" (2.2 m)	6' - 6" (1.9 m)	6' - 0" (1.8 m)



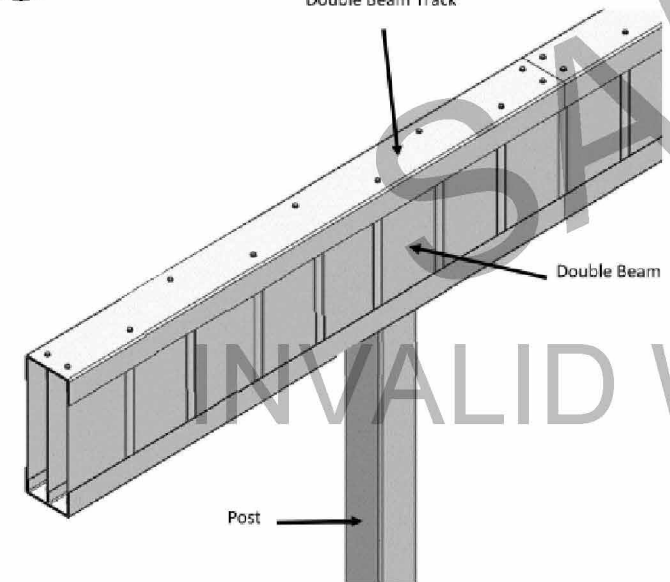
2 SINGLE BEAM - SPLICE CONNECTION
4 NOT TO SCALE



SINGLE SPLICE CONNECTION
MAX SHEAR CAPACITY =
3700 LB

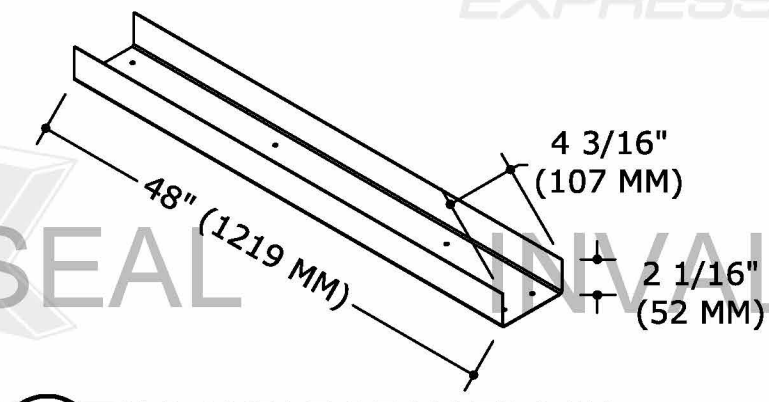
TABLE 3.2 - ALLOWABLE DOUBLE BEAM SPAN
(2'-0" MAX BEAM OVERHANG)

DESIGN PRESSURE BENCHMARK	MAXIMUM JOIST SPAN				
	8 FT (2.4 m)	10 FT (3.0 m)	12 FT (3.7 m)	14 FT (4.3 m)	16 FT (4.9 m)
	ALLOWABLE BEAM SPAN				
50 PSF (2394 Pa)	16' - 0" (4.8 m)	16' - 0" (4.8 m)	16' - 0" (4.8 m)	16' - 0" (4.8 m)	16' - 0" (4.8 m)
75 PSF (3591 Pa)	16' - 0" (4.8 m)	16' - 0" (4.8 m)	15' - 0" (4.5 m)	14' - 0" (4.2 m)	13' - 0" (3.9 m)
100 PSF (4788 Pa)	16' - 0" (4.8 m)	14' - 6" (4.4 m)	13' - 0" (3.9 m)	12' - 0" (3.6 m)	11' - 0" (3.3 m)
150 PSF (7182 Pa)	13' - 0" (3.9 m)	11' - 6" (3.5 m)	10' - 6" (3.2 m)	10' - 0" (3.0 m)	9' - 0" (2.7 m)



INSTALL DOUBLE BEAM
TRACKS ON TOP AND
BOTTOM SIDES OF BEAMS.
SPLICE BEAMS AT MID-SPAN
OF TRACK, AND VICE VERSA.
TRACK OR BEAM SPLICES DO
NOT NEED TO BE PLACED
OVER POSTS FOR
DOUBLE-BEAMS.

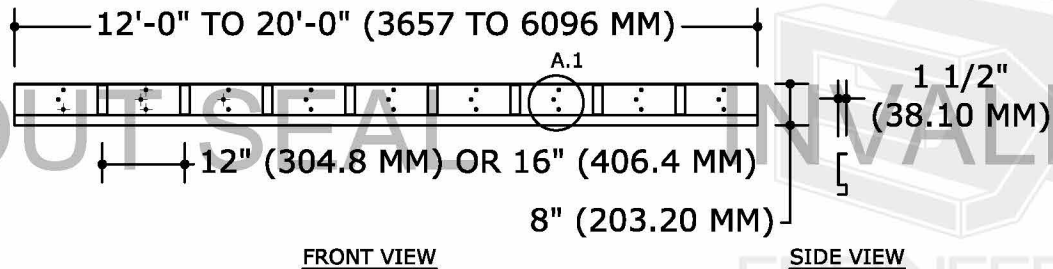
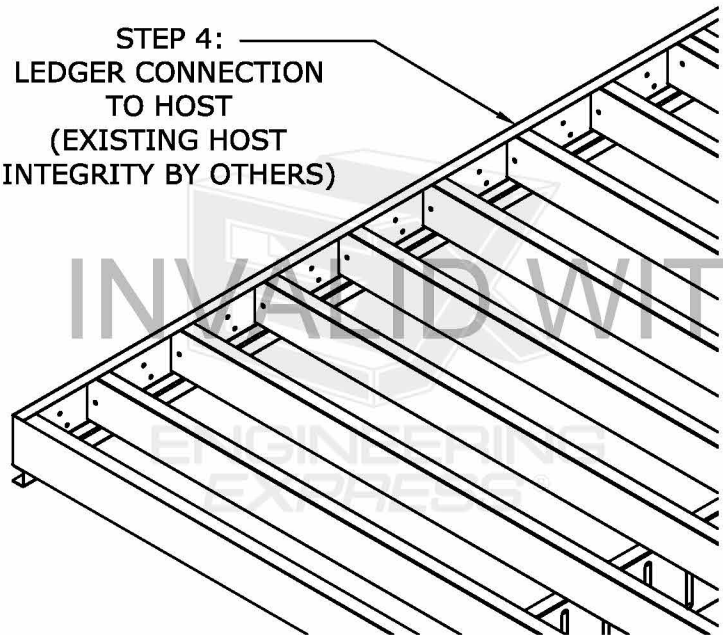
DOUBLE BEAM CONNECTION:
MAX SHEAR CAPACITY =
3700 LB
MAX MOMENT CAPACITY = 3050
LB-FT (36.6 KIP-IN)



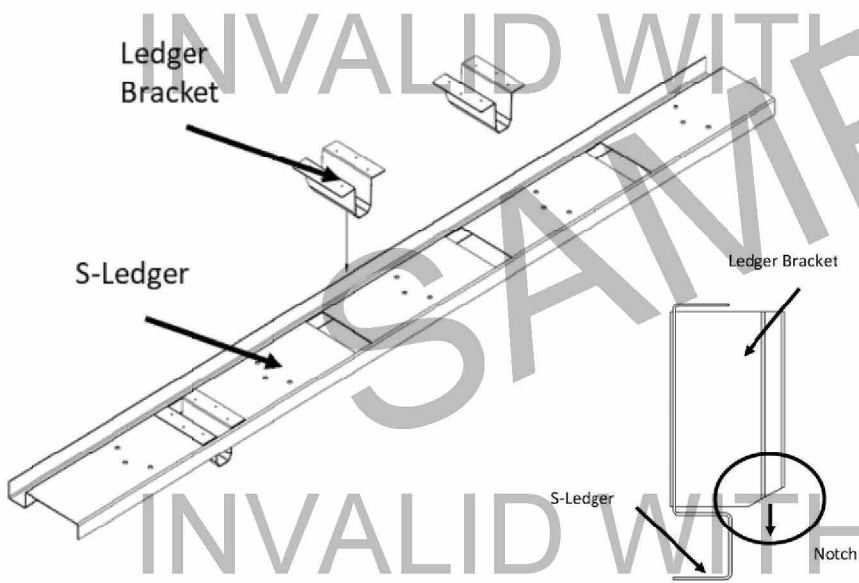
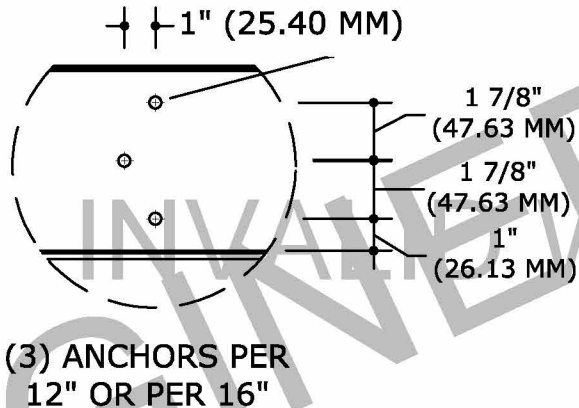
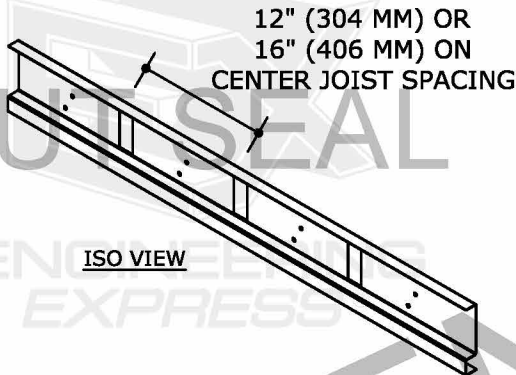
4 4' DOUBLE BEAM TRACK
4 SCALE: NOT TO SCALE VIEW

3 DOUBLE BEAM - SPLICE CONNECTION WITH TRACK
4 NOT TO SCALE

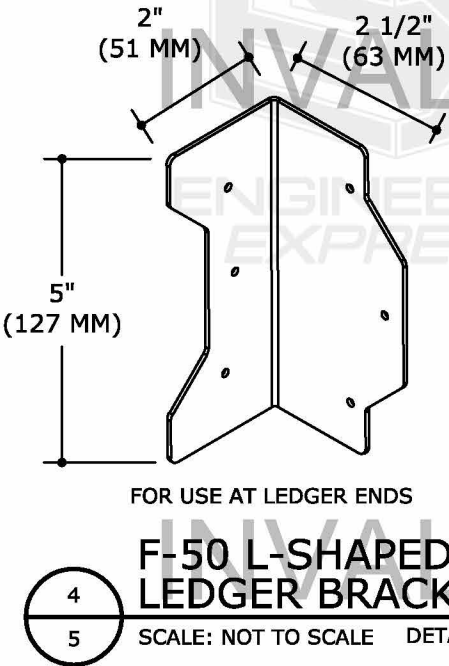
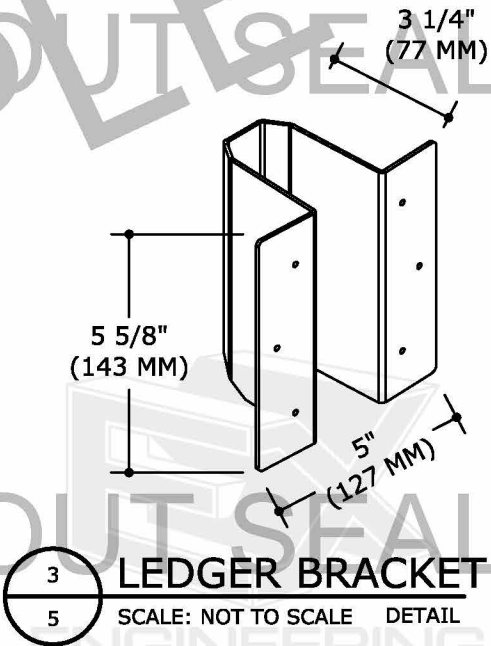
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AVAILABLE WITHOUT PRE-PUNCHED SPACING,
WITH 12" O.C. PRE-PUNCHED SPACING, AND
WITH 16" O.C. PRE-PUNCHED SPACING



Note: Ledger Bracket has a notch that
makes joist installation easier. This
notch should point down towards the
ground



10/13/2021

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LEDGER CONNECTION SELECTION:
FOR ALL PRESSURE BENCHMARKS (UP
TO 150 PSF), FOR ALL JOIST
CONFIGURATIONS WHERE THE JOIST
SPAN TO THE FIRST BEAM IS LESS THAN
16FT, USE THE FOLLOWING
CONNECTIONS TO THE APPROPRIATE
HOST STRUCTURE. ANCHORS LISTED
ARE ASSUMED HAVE SPACING TO MATCH
THE JOIST SPACING (12" O.C. OR 16"
O.C.).

**ATTACHMENT TO SOUTHERN YELLOW PINE
#2 WOOD (G=0.55 MIN):**
(3) 3/8" DIAMETER STAINLESS STEEL
LAG SCREW WITH MINIMUM 3" THREAD
PENETRATION, 3/4" EDGE DISTANCE

**ATTACHMENT TO GROUT FILLED
CMU BLOCK:**
(3) 1/4" DIAMETER STAINLESS STEEL
HILTI KWIK CON II+ INTO BLOCK FACE
WITH 1-3/4" EMBEDMENT, 3" EDGE
DISTANCE

**ATTCHMENT TO 3000 PSI, UNCRACKED
CONCRETE:**
(3) 1/4" DIAMETER STAINLESS STEEL
ITW TAPCON WITH 1-1/2" EMBEDMENT,
2-1/2" EDGE DISTANCE

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STEEL DECK FRAMING
MASTER PLAN

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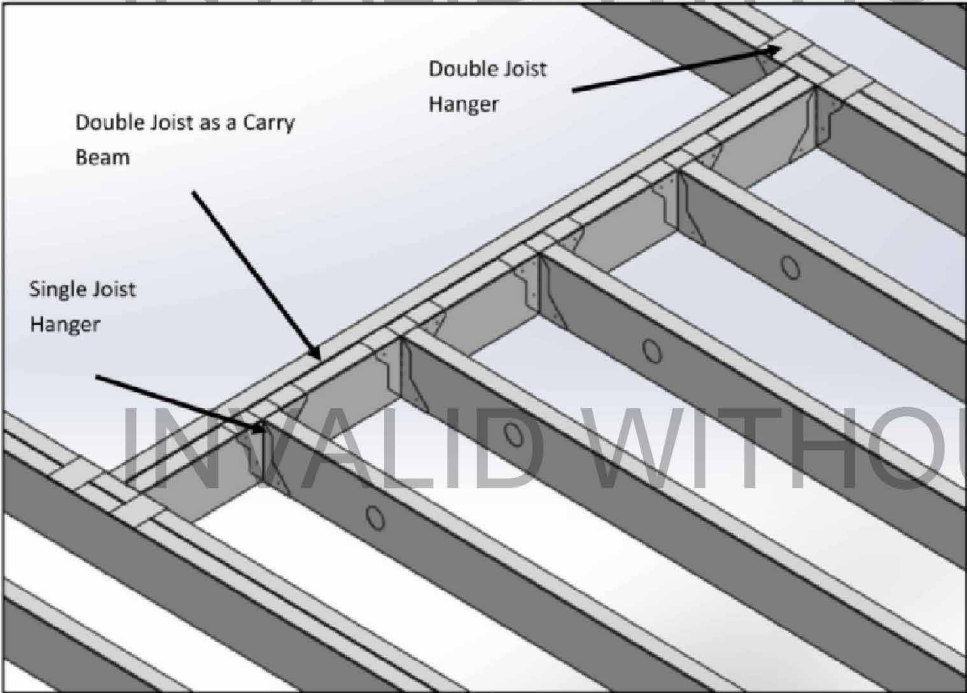
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5

STEP 5:JOISTS AS CARRY BEAMS & DECK OPENINGS
(OPTIONAL - ADDITIONAL ENGINEERING REQUIRED)

10/13/2021
PE SEAL REQUIRED

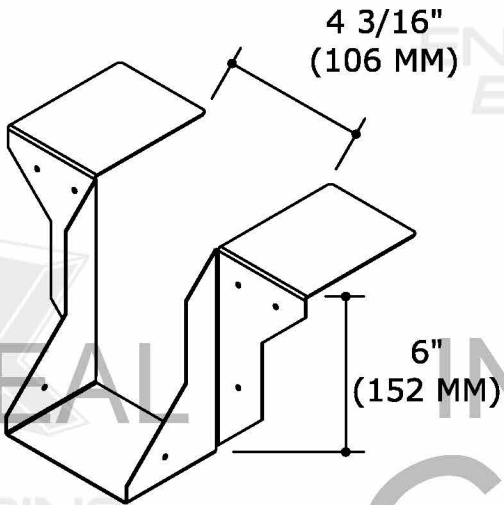
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CUSTOM LAYOUTS OR OPENINGS IN THE DECK MAY BE CREATED BY USING JOIST HANGER BRACKETS AS SHOWN.

THIS MASTER PLAN IS GENERIC AND DOES NOT CERTIFY CUSTOM OPENINGS OR THE USE OF JOIST HANGERS AS SHOWN. SEPARATE SITE-SPECIFIC ENGINEERING MAY BE USED IN TANDEM WITH THIS CERTIFIED MASTER PLAN TO DESIGN CUSTOM LAYOUTS USING THE CONNECTION CAPACITIES LISTED HERE:

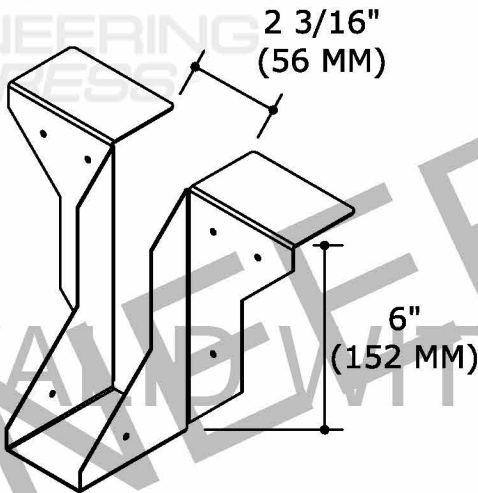
OPENINGS AND CUSTOM LAYOUTS DO NOT AFFECT MAXIMUM SPANS AND DESIGN CRITERIA LISTED HEREIN.



1
6
DOUBLE JOIST HANGER BRACKET
SCALE: NOT TO SCALE DETAIL

DOUBLE JOIST HANGER
BRACKET LOADING CAPACITY:

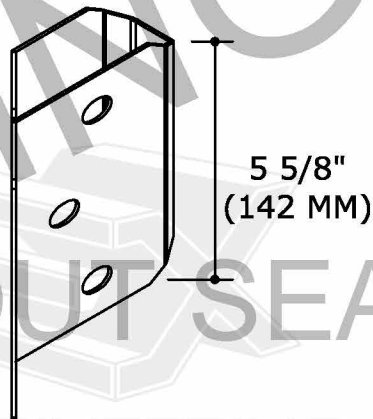
SHEAR CAPACITY, V =4000 LB



2
6
SINGLE JOIST HANGER BRACKET
SCALE: NOT TO SCALE DETAIL

SINGLE JOIST HANGER
BRACKET LOADING CAPACITY:

SHEAR CAPACITY, V =4000 LB



3
6
45° BRACKET HANGER BRACKET
SCALE: NOT TO SCALE DETAIL

45° BRACKET
LOADING CAPACITY:

SHEAR CAPACITY, V =1700 LB

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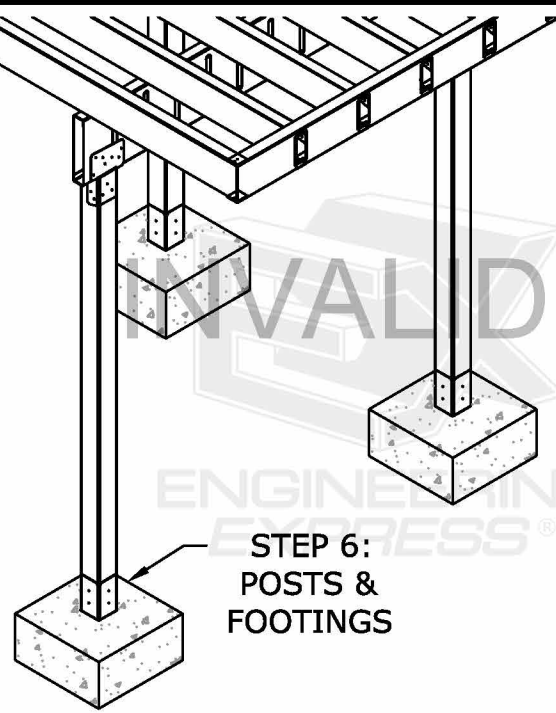
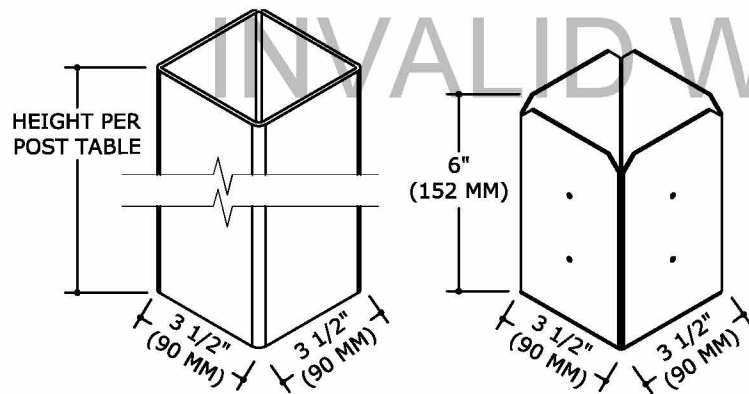
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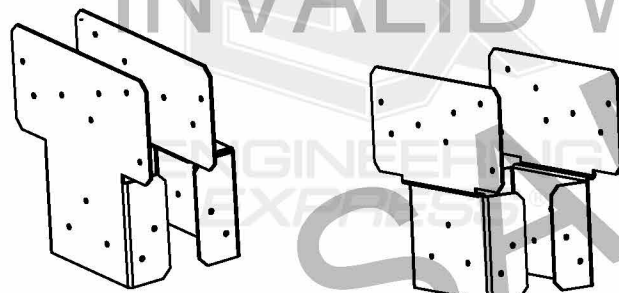
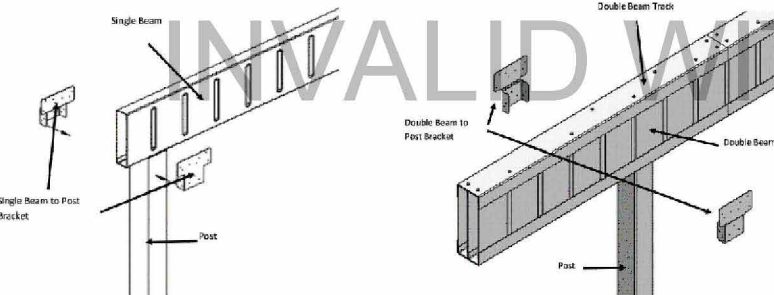
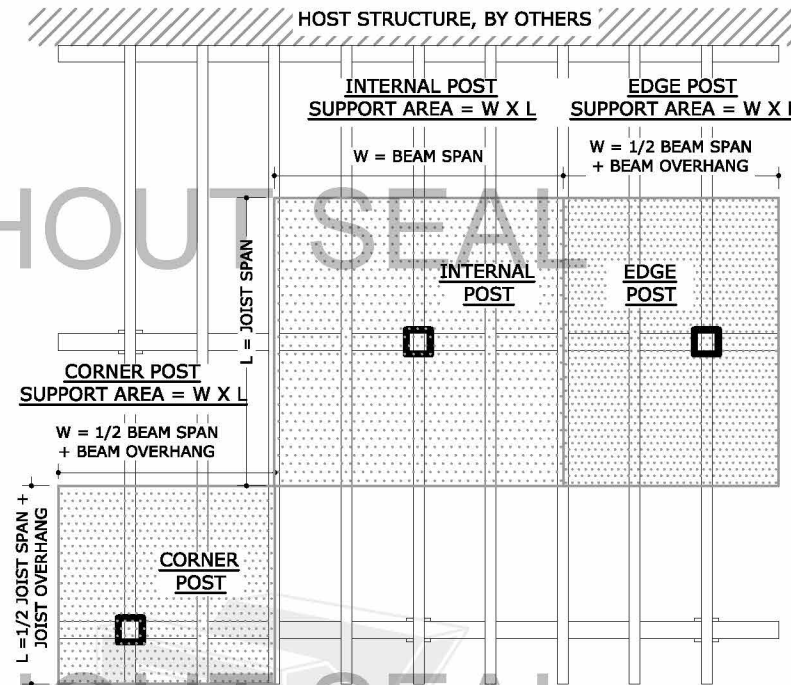
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7

STEP 6:
POSTS &
FOOTINGS3 1/2" X 3 1/2" X
11 GA POST
SCALE: NOT TO SCALE DETAIL3 1/2" POST BRACKET
SCALE: NOT TO SCALE DETAIL

6" X 6" X 1/8" POST & ACCESSORIES PER SAME CONSTRUCTION AND
MATERIALS WITH DIMENSIONS AS NOTED AND HEIGHT PER TABLE 6.2

SINGLE BEAM
TO POST BRACKET
SCALE: NOT TO SCALE DETAILDOUBLE BEAM
TO POST BRACKET
SCALE: NOT TO SCALE DETAILSINGLE BEAM TO POST
SCALE: NOT TO SCALE DETAILDOUBLE BEAM TO POST
SCALE: NOT TO SCALE DETAIL

NOTE: POST SUPPORT AREA MAY BE CALCULATED SEPARATELY FOR EACH POST.
EACH POST MAY UTILIZE DIFFERENT POST AND FOOTER SELECTIONS FROM THE
TABLES HEREIN BASED ON THE SITE DESIGN CONDITIONS & ITS SUPPORT AREA

1 POST SUPPORT AREA CALCULATION
SCALE: NOT TO SCALE DETAILTABLE 7.1 - ALLOWABLE DECK HEIGHT
3 1/2" X 3 1/2" X 11 GA POST

DESIGN PRESSURE BENCHMARK	CALCULATED POST SUPPORT AREA				
	50 FT^2 4.6 m^2	100 FT^2 9.3 m^2	150 FT^2 13.9 m^2	200 FT^2 18.6 m^2	250 FT^2 23.2 m^2
ALLOWABLE DECK HEIGHT					
50 PSF (2394 Pa)	10' - 0" (3.0 m)	10' - 0" (3.0 m)	9' - 0" (2.7 m)	8' - 0" (2.4 m)	7' - 0" (2.1 m)
75 PSF (3591 Pa)	10' - 0" (3.0 m)	9' - 0" (2.7 m)	7' - 6" (2.2 m)	6' - 6" (1.9 m)	5' - 6" (1.6 m)
100 PSF (4788 Pa)	10' - 0" (3.0 m)	8' - 0" (2.4 m)	6' - 6" (1.9 m)	5' - 6" (1.6 m)	4' - 0" (1.2 m)
150 PSF (7182 Pa)	9' - 6" (2.8 m)	6' - 6" (1.9 m)	5' - 0" (1.5 m)	3' - 0" (0.9 m)	N/A

TABLE 7.2 - ALLOWABLE DECK HEIGHT
6" X 6" X 1/8" POST

DESIGN PRESSURE BENCHMARK	CALCULATED POST SUPPORT AREA				
	50 FT^2 4.6 m^2	100 FT^2 9.3 m^2	150 FT^2 13.9 m^2	200 FT^2 18.6 m^2	250 FT^2 23.2 m^2
ALLOWABLE DECK HEIGHT					
50 PSF (2394 Pa)	15' - 0" (4.5 m)	15' - 0" (4.5 m)	15' - 0" (4.5 m)	14' - 0" (4.2 m)	12' - 6" (3.8 m)
75 PSF (3591 Pa)	15' - 0" (4.5 m)	15' - 0" (4.5 m)	14' - 0" (4.2 m)	12' - 0" (3.6 m)	11' - 0" (3.3 m)
100 PSF (4788 Pa)	15' - 0" (4.5 m)	15' - 0" (4.5 m)	12' - 6" (3.8 m)	11' - 0" (3.3 m)	N/A
150 PSF (7182 Pa)	15' - 0" (4.5 m)	13' - 0" (3.9 m)	10' - 6" (3.2 m)	N/A	N/A

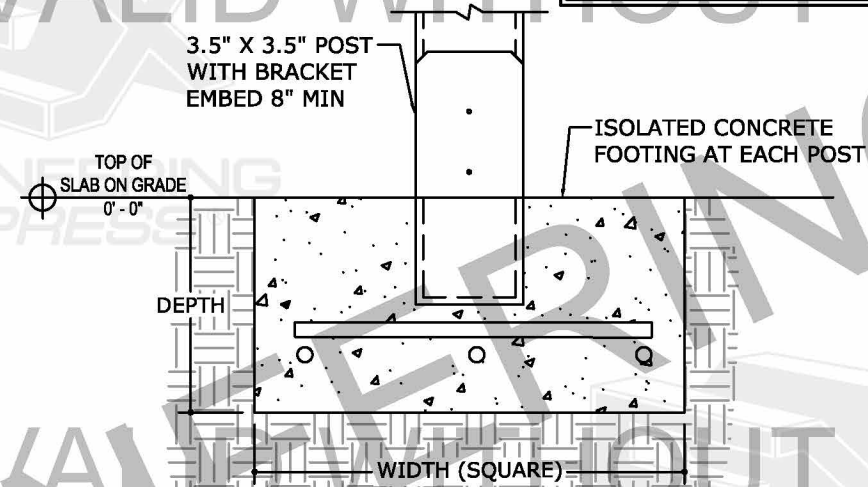
8 CONCRETE FOOTING WITH EMBEDDED POST
SCALE: NOT TO SCALE DETAIL

TABLE 7.3 - FOOTING SELECTION

DESIGN UPLIFT PRESSURE (-)	POST SUPPORT AREA								
	36 FT^2	50 FT^2	75 FT^2	100 FT^2	125 FT^2	150 FT^2	175 FT^2	200 FT^2	250 FT^2
-10 PSF	1	1	2	3	3	4	4	5	6
-15 PSF	1	2	3	4	5	5	6	6	8
-20 PSF	2	3	4	5	6	6	7	8	9
-25 PSF	2	3	5	6	7	8	8	9	9
-30 PSF	3	4	5	6	8	8	9	9	N/A
-35 PSF	4	4	6	7	8	9	9	N/A	N/A
-40 PSF	4	5	6	8	9	9	N/A	N/A	N/A
-45 PSF	4	5	7	8	9	N/A	N/A	N/A	N/A

TABLE 7.4 - 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	#5 TOP & BOT EACH WAY	#6	
5	36"	36"	30"	22.5 CUFT	3375 LBS	4		#6	
6	42"	42"	30"	30.6 CUFT	4594 LBS	4		#8	
7	42"	42"	36"	36.8 CUFT	5513 LBS	5		#8	
8	48"	48"	36"	48.0 CUFT	7200 LBS	6		#11	
9	48"	48"	48"	64.0 CUFT	9600 LBS	8	#14		#4 VERTICAL TIES

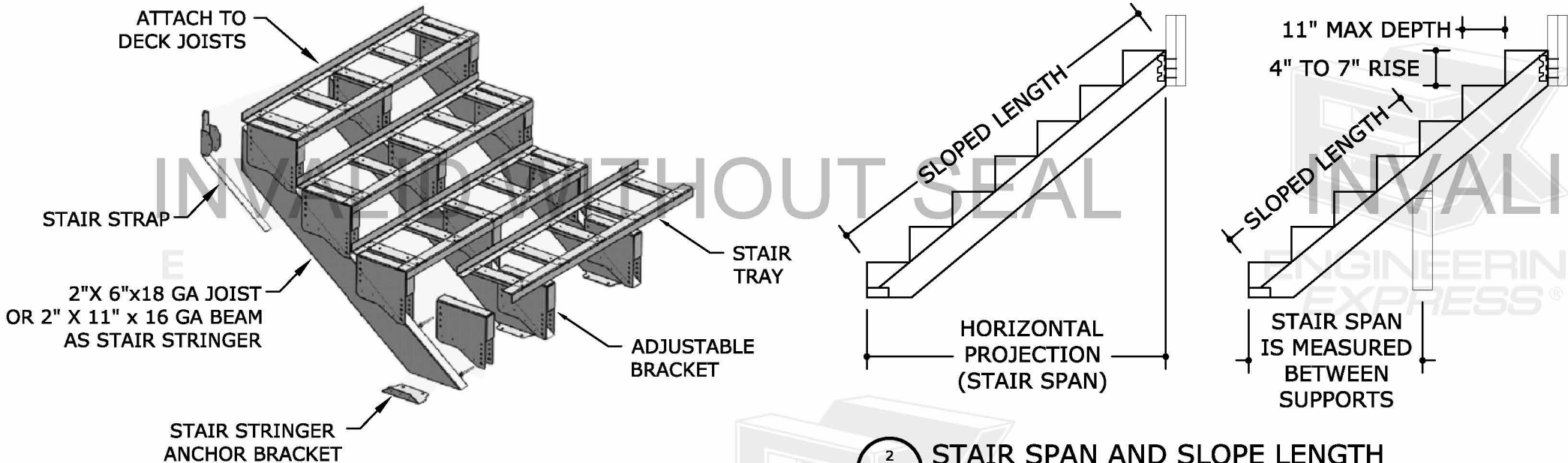
FOOTING TABLE NOTES:

- F.S. AGAINST UPLIFT OF 33% HAS BEEN APPLIED TO ALL LOADS.
- AT 2000PSF 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 PER SEPARATE ENGINEERING
- SITE SPECIFIC ENGINEERING REQUIRED FOR ANY VALUES, SIZES, CONCRETE TYPES, OR SOIL BEARING PRESSURES NOT COINCIDING WITH LIMITS OF THIS MASTER PLAN.

STEP 7: STAIRCASE ADDITIONS (OPTIONAL)

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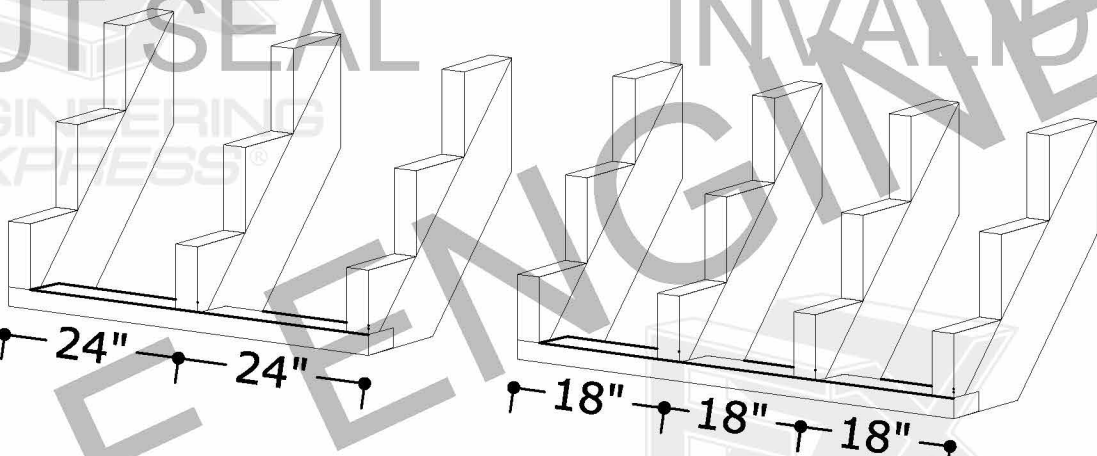


1 STRUCTURAL STAIR ADDITON
8 NOT TO SCALE ISO

2 STAIR SPAN AND SLOPE LENGTH
8 NOT TO SCALE ELEV

TABLE 8.1 - STRINGER: 2"x 6" x 16 GA JOIST - 48" WIDE STAIR

DESIGN PRESSURE BENCHMARK	3 STRINGERS ALLOWABLE SPANS		4 STRINGERS ALLOWABLE SPANS	
	HORIZ. PROJECTION	SLOPED LENGTH	HORIZ. PROJECTION	SLOPED LENGTH
50 PSF	11' - 11" (3.7 m)	14' - 6" (4.5 m)	13' - 4" (4.1 m)	16' - 4" (5 m)
75 PSF	9' - 7" (2.9 m)	11' - 9" (3.6 m)	11' - 11" (3.7 m)	14' - 6" (4.5 m)
100 PSF	8' - 3" (2.5 m)	10' - 1" (3.1 m)	10' - 3" (3.1 m)	12' - 6" (3.8 m)
125 PSF	7' - 4" (2.2 m)	8' - 11" (2.7 m)	9' - 1" (2.8 m)	11' - 1" (3.4 m)
150 PSF	6' - 4" (1.9 m)	7' - 9" (2.4 m)	8' - 3" (2.5 m)	10' - 1" (3.1 m)



3 MAX STAIR STRINGER SPACING
8 NOT TO SCALE DETAIL

TABLE 8.2 - STRINGER: 2"x 11" x 16 GA MAIN BEAM - 48" WIDE STAIR

DESIGN PRESSURE BENCHMARK	3 STRINGERS ALLOWABLE SPANS		4 STRINGERS ALLOWABLE SPANS	
	HORIZ. PROJECTION	SLOPED LENGTH	HORIZ. PROJECTION	SLOPED LENGTH
50 PSF	16' - 4" (5 m)	20' - 0" (6.2 m)	16' - 4" (5 m)	20' - 0" (6.2 m)
75 PSF	12' - 9" (3.9 m)	15' - 7" (4.8 m)	16' - 4" (5 m)	20' - 0" (6.2 m)
100 PSF	9' - 7" (2.9 m)	11' - 8" (3.6 m)	14' - 4" (4.4 m)	17' - 7" (5.4 m)
125 PSF	7' - 8" (2.3 m)	9' - 4" (2.9 m)	11' - 6" (3.5 m)	14' - 0" (4.3 m)
150 PSF	6' - 4" (1.9 m)	7' - 9" (2.4 m)	9' - 7" (2.9 m)	11' - 8" (3.6 m)

STAIR COMPONENTS & INSTALLATION:

- DECK JOISTS OR BEAMS (AS DEFINED HEREIN) - SHALL ACT AS HOST STRUCTURE FOR STAIR INSTALLATION
 - 2" X 6" X 18 GA JOIST / 2" X 11" X 16 GA BEAM
- STAIR STRINGERS ARE TO BE ATTACHED TO HOST STRUCTURE WITH FF-EVOLUTION STAIR STRAP (SEE STAIR STRAP DETAIL) WITH (6) #10-16 SMS SCREWS SAE GR. 5 TO HEADER AND (7) #10-16 SMS SCREWS SAE GR. 5 TO STRINGER (PER STRAP)
- STEEL STRINGER QUANTITY - USE WITH 2, 3 OR 4 STRINGERS CONFIGURATION AS NOTED IN TABLE
- PRE-SET STAIR BRACKET FASTENED TO STRINGER AT EACH SIDE WITH (3) #10-16 SMS SCREWS SAE GR. 5.
- BOTTOM CONNECTION:
 - TO 3KSI CONCRETE SLAB: STAIR ANCHOR CONNECTOR TO HOST STRUCTURE WITH PRE-DRILLED HOLES. ATTACH CLIP TO STRINGER WITH (3) #10-16 SMS SCREWS SAE GR. 5 AND (2) 1/4" DIA. DEWALT ULTRACON OR EQUIVALENT, 1-3/4" EMBED. INTO CONCRETE, 2-1/2" MINIMUM FROM ANY CONCRETE FACE.
 - TO EVOLUTION STEEL DECK FRAMING: F50 BRACKET FASTENED AT ENDS WITH (3) #10-16 SMS SCREWS SAE GR. 5 ON EACH SIDE.

STAIR PRESSURE BENCHMARK NOTE: TO PROVIDE GREATER FLEXIBILITY IN STAIR STRINGER SPANS, AN ADDITIONAL ABBREVIATED BENCHMARK OF 125 PSF HAS BEEN PROVIDED FOR LESS EXTREME CONDITIONS. THIS BENCHMARK CONSIDERS MAX LOADING CONDITIONS OF: 15 PSF DL + 100 PSF LL + 30 PSF WIND + 25 PSF SNOW.
ANY DECK JOIST OR BEAM ACTING AS THE HOST TO A STAIR ADDITION MUST HAVE A SPAN ACCEPTABLE FOR THE CORRESPONDING 150 PSF BENCHMARK IN ITS CORRESPONDING DESIGN TABLE. (THIS ONLY APPLIES TO THE SPAN(S) NEXT TO THE HOST MEMBER - OTHER MEMBERS MAY HAVE SPANS ACCEPTABLE FOR THE SITE DESIGN BENCHMARK)

STAIR ADDITIONAL NOTES:

- THE EVOLUTION STEEL STAIRS SYSTEM IS AN ASSEMBLAGE OF COLD-FORMED STEEL COMPONENTS INSTALLED WITH METAL CONNECTORS AND FASTENERS. THE STEEL COMPONENTS ARE FABRICATED FROM STEEL EQUIVALENT TO ASTM A36 (CHINA STANDARD Q235B), WITH MINIMUM YIELD STRESS $F_y = 34$ KSI AND MINIMUM TENSILE STRESS $F_u = 54$ KSI
- CALCULATIONS PERFORMED EVALUATE THE MAXIMUM ALLOWABLE STRINGER SPAN AND CONNECTIONS INTEGRITY FOR 48 IN WIDTH STAIR TREADS BASED ON 3 OR 4 STRINGERS CONFIGURATION USING COMPARATIVE AND/OR RATIONAL ANALYSIS. THE ANALYSIS DOES NOT TAKE IN CONSIDERATION OF TREADS AND TRAYS CAPACITY AND IT SHALL BE VERIFIED BY OTHERS.
- ALLOWABLE MAXIMUM SIMPLE SPANS LENGTH FOR STRINGERS ARE PROVIDED WITH RESPECT TO STRINGER TYPE AND CONFIGURATION. SEE FIGURE (2/7) FOR DEFINITION OF STRINGER SPAN AND SLOPED LENGTH.
- THE OUTER STEEL STRINGERS FRAMING SYSTEM IS DESIGNED TO RESIST A CONCENTRATED 200-LB OR 50 LB/FT UNIFORM SAFEGUARD-IMPOSED LOADS FOR UP TO 38-INCH HIGH RAIL POSTS ATTACHED TO THE SYSTEM.
- FASTENERS FOR STEEL-TO-STEEL CONNECTIONS SHALL BE SELF-DRILLING TAPPING SCREWS INSTALLED WITH AN EDGE DISTANCE AND CENTER-TO-CENTER SPACING OF NO LESS THAN 1/2-INCH. SCREWS SHALL EXTEND THROUGH THE STEEL A MINIMUM OF THREE THREAD PITCHES. COMPATIBILITY OF FASTENERS AND OTHER DISSIMILAR MATERIALS, INCLUDING THOSE FOR USE WITH CHEMICALLY TREATED WOOD, SHALL BE EVALUATED OR PROTECTED FROM CORROSION BY THE INSTALLER BEFORE CONSTRUCTION.
- DECK BOARDS SHALL BE POSITIVELY FASTENED TO EACH STRINGER.
- SPLICING OF STRINGERS IS OUTSIDE THE SCOPE OF THIS REPORT. MID-SPAN STAIR SUPPORTS ARE OUTSIDE THE SCOPE OF THIS REPORT.
- POSTS, SAFEGUARD, AND LEDGER TO BE PROVIDED PER SEPARATE CERTIFICATION.

FOR DIMENSIONS AND DETAILS NOT SHOWN AND FOR DETAILED INSTALLATION INSTRUCTIONS, REFER INFINITY DECKING TECHNICAL GUIDE PUBLISHED BY FORTRESS.

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