

30' Dodecagon Wood Gazebo for:

Peters Construction Corp.
515 W. Seerley Blvd.
Cedar Falls, IA 50613

DESIGN ENGINEER:



East: 22 Denver Road, Suite B Denver, PA 17517
717.335.2750 Fax: 717.335.2753

West: 406 S Main Street, PO Box 509 Kouts, IN 46347
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Drawing Index

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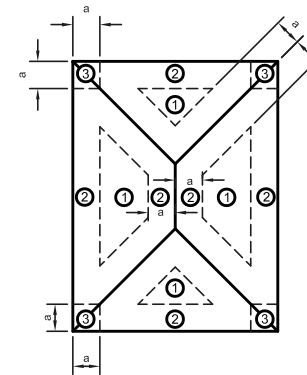
2

Structural Specifications and Notes

This plan is intended to reflect only the structural design of this building. The contractor shall review all applicable local, state, and federal building codes prior to the start of construction to ensure building conformance. Timber Tech Engineering, LLC is not responsible for information pertaining to this project if not shown on drawings or listed below. Revisions to the plans shall be approved by engineer of record. All standards indicated in these notes shall adhere to the referenced standards chapter of the governing code listed below.

DESIGN REQUIREMENTS

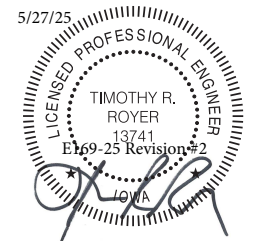
- Governing Code:
Including, not limited to: IBC 2018
- Risk Category II
- Dead Loads:
 - A. Roof 5 psf + self weight
 - B. Floor 10 psf
- Live Loads:
 - A. Roof (See also note #5) 50.4 psf
 - B. Floor 100 psf
- Snow Loads:
 - A. Design Roof Snow Load (ASD) 50.4 psf
 - B. Ground Snow (P_g ASD) 60 psf
 - C. Flat Roof Snow (P_f ASD) 50.4 psf
 - D. Snow Exposure Factor (C_e) 1.0
 - E. Thermal Factor (C_t) 1.2
 - F. Slope Factor (C_s) 1.0
 - G. Snow Load Risk Factor (I) 1.0
 - H. Drift Surcharge Load (P_d) n/a
 - I. Drift Surcharge Width (W) n/a
 - J. Unbalanced snow loads have been considered
- Wind Loads (ASCE 7-16)
 - A. Basic Wind Speed (V) 180 mph
 - B. ASD Wind Speed ($V_{asd} = V \cdot 0.6$) 139 mph
 - C. Wind Exposure Category C
 - D. Internal Pressure Coefficient (GC_{pi}) 0
 - E. Component & Cladding (C&C) Wind Load
 - i. Roof Zone 1 +78, -78 psf
 - ii. Roof Zone 2 +120, -120 psf
 - iii. Roof Zone 3 +120, -120 psf
 - iv. Dimension a 4'
- Earthquake Design Data:
 - A. Analysis based on equivalent lateral force procedure
 - B. Cantilevered Column: Timber Frame
 - C. Mapped and Design Spectral Response Acceleration
 - i. S_s 0.37
 - ii. S_1 0.24
 - iii. S_{DS} 0.37
 - iv. S_{D1} 0.31
 - D. Occupancy Risk Factor, I_e 1.0
 - E. Site Class D
 - F. Seismic Design Category D
 - G. Response Modification Factor (R) 1.5
 - H. Deflection Amplification Factor (C_d) 1.5
 - I. Seismic Response Coefficient (C_s) 0.25
 - J. Design Seismic Base Shear (V) 4027 lb
- Roof Rain Load
 - A. Rain Intensity (I) n/a in/hr



C&C Roof Zone Definitions

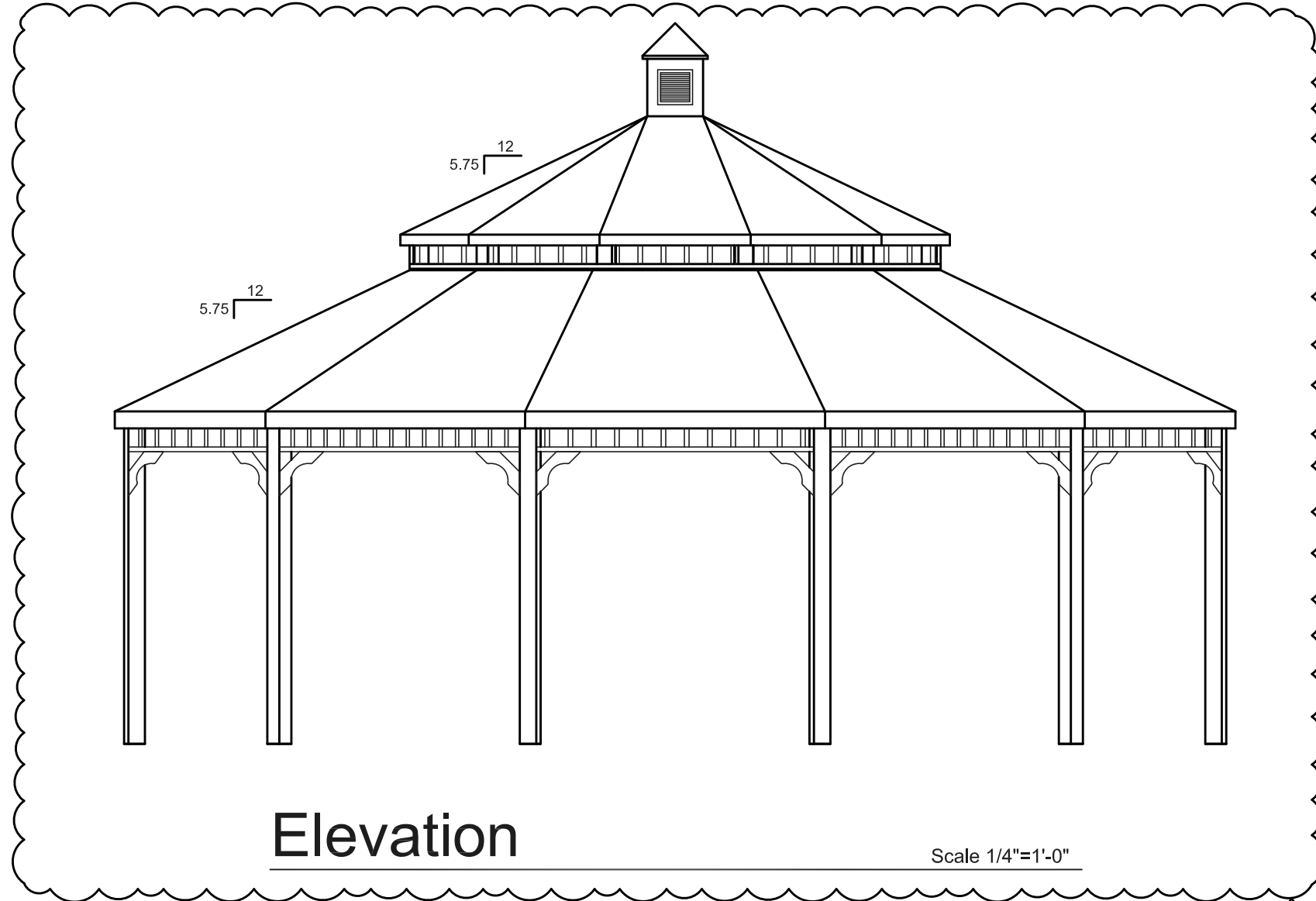
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|---------------------------|---------|
| Original Certified Date | 5/9/25 |
| Revision 1 Certified Date | 5/13/25 |
| Revision 2 Certified Date | 5/27/25 |

TTE DRAWING NUMBER: E169-25



Timothy R. Royer, P.E. IA Eng.# 13741
Expiration Date: 12/31/2025

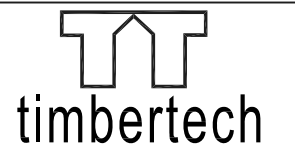
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Elevation

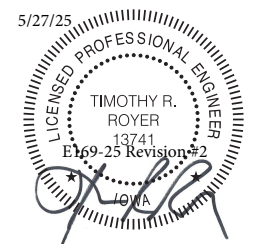
Scale 1/4"=1'-0"

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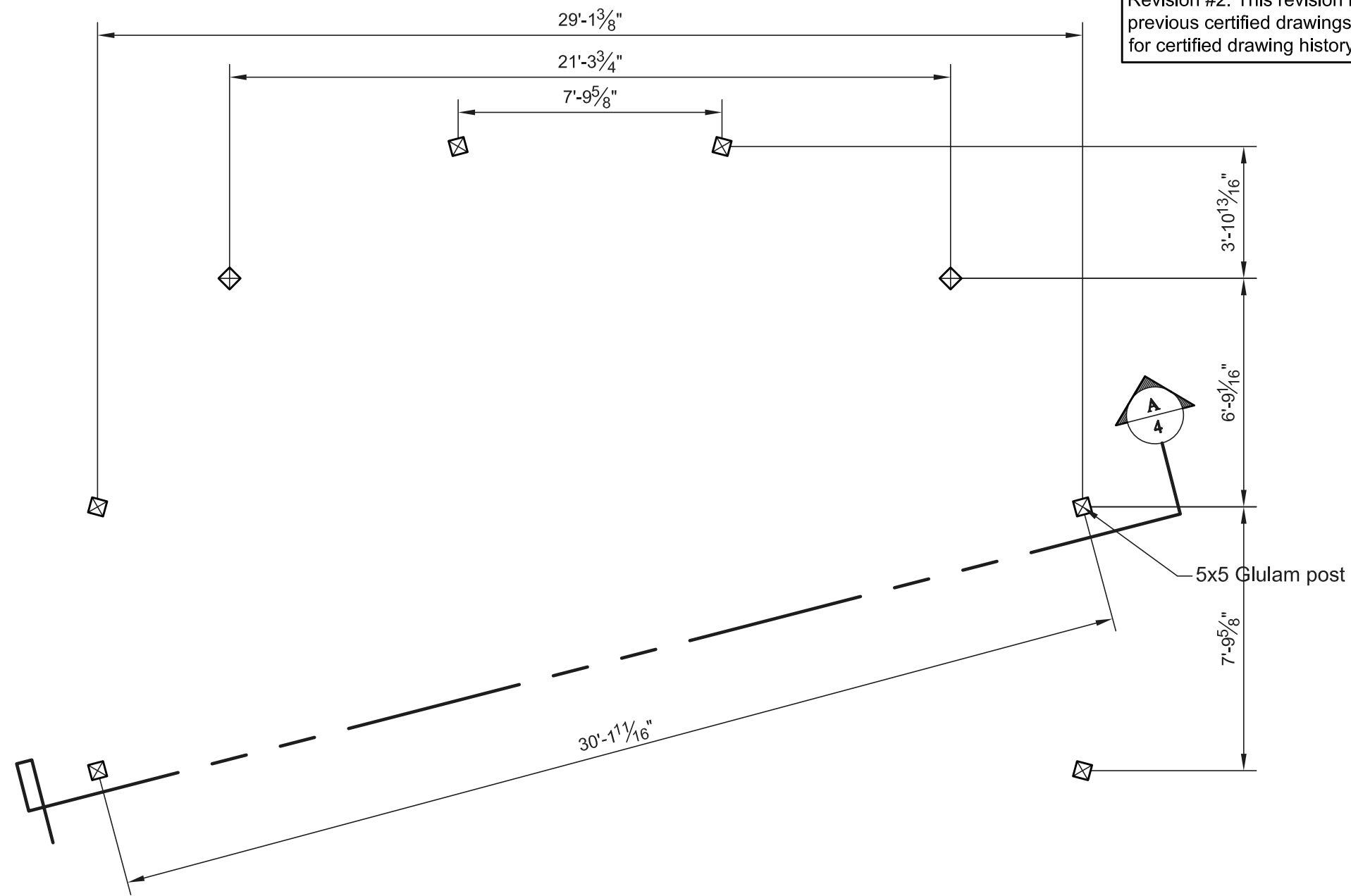
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 Country Lane Woodworking
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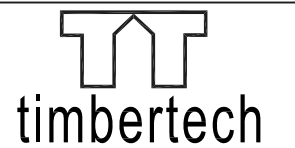
Drawing Title:
 Elevation

Project:
 30' Wood Dodecagon Gazebo for
 Peters Construction Corp.
 515 W. Seerley Blvd.
 Cedar Rapids, IA 50613

| Revisions: | Date: | By: |
|-------------------------|------------------------|-----|
| 1-Remove Handrail | 5/13/25 | kms |
| 2-No Floor | 5/27/25 | kms |
| 2-Add Cupola | 5/27/25 | kms |
| Drawing Number: E169-25 | Page: 1 of 11 | |
| Engineered By: T. Royer | Start Date: 5/8/25 | |
| Drafted By: K.Salyer | Certified Date: 5/9/25 | |

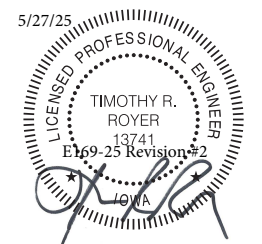


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Drawing Title:
 Post Layout Plan

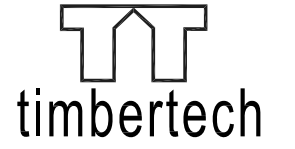
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Post Layout Plan

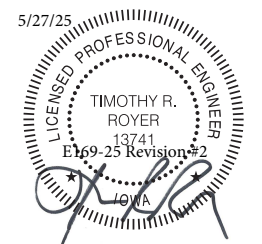
Scale 1/4"=1'-0"

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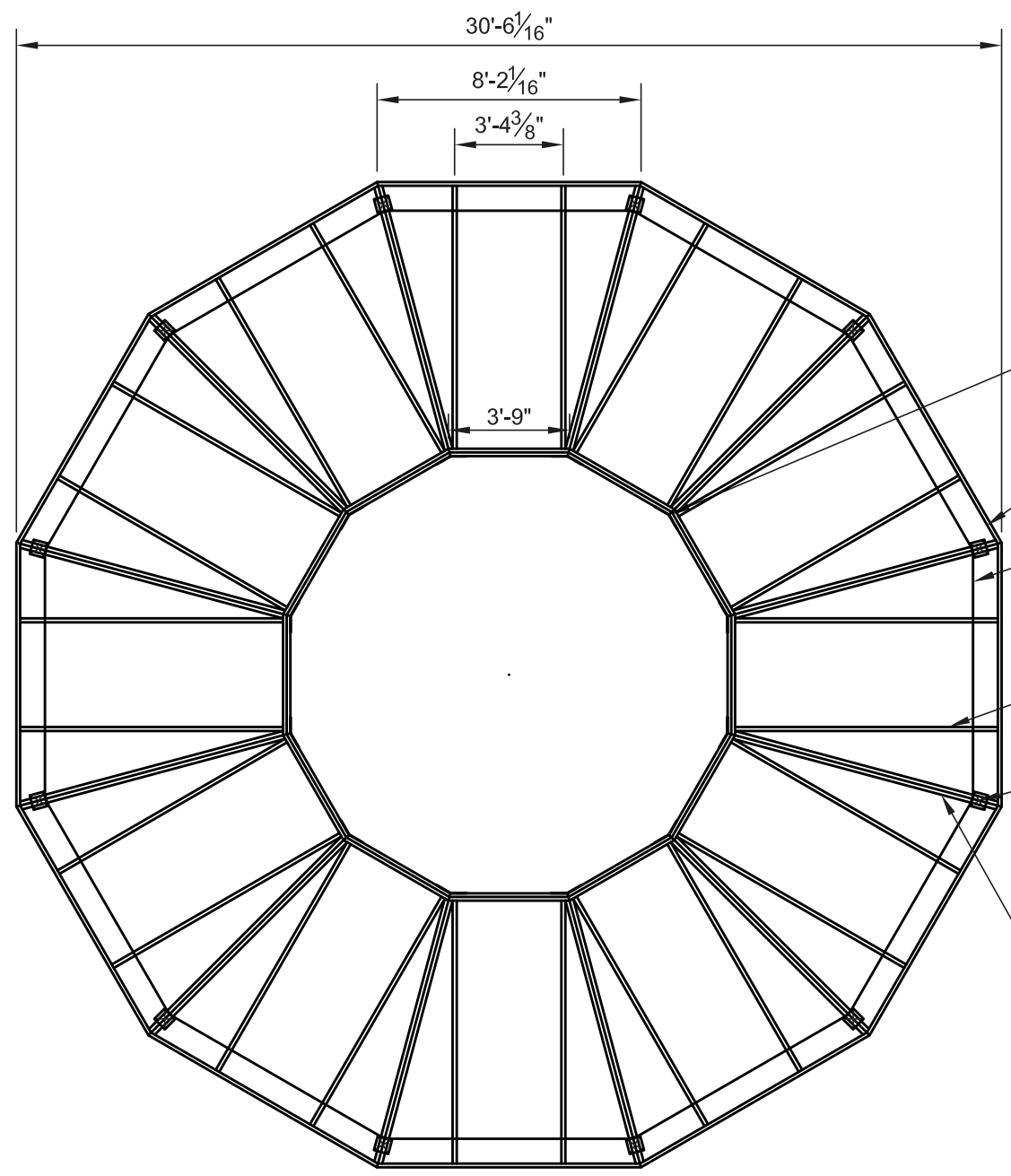
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Contractor:
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Drawing Title:
 Roof Framing Plan
 Pagoda Framing Plan

Project:
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| Drawing Number: E169-25 | Page: 3 of 11 | |
| Engineered By: T. Royer | Start Date: 5/8/25 | |
| Drafted By: K.Salver | Certified Date: 5/9/25 | |



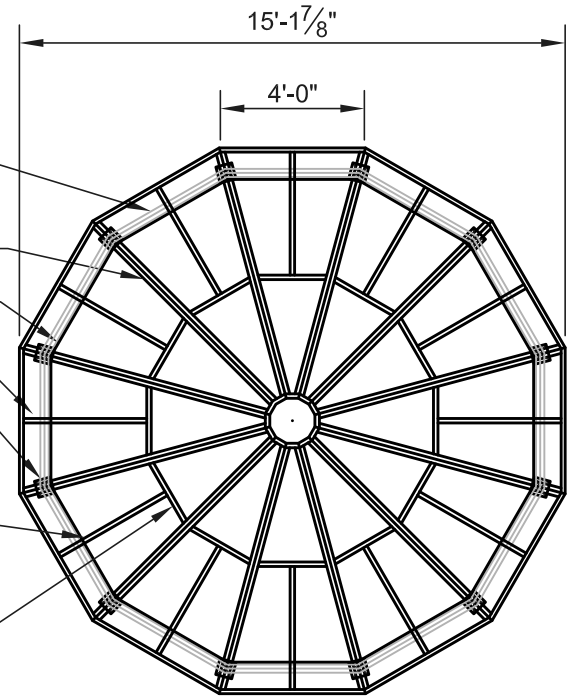
Roof Framing Plan Scale 3/16"=1'-0"

"A5" angle each inside corner, fasten w/ (20) SDS25212 screws by Simpson

- 2x8 fascia
- (2) 2x10 top plate
- 2x8 intermediate rafter
- 5x5 glulam post

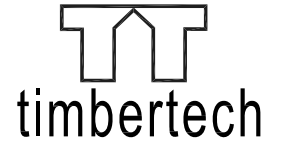
Lower compression ring below
 (2) 2x8 hip rafter at post locations, fasten together w/ (3) 3/8"Ø bolts

- (2) 2x6 rafter
- 2x10 top plate, flat
- 2x6 fascia
- 4x4 stub post
- 2x6 intermediate rafter, fasten to blocking w/ (3) #10x3 1/2" wood screws
- 2x6 blocking, fasten to rafter at each end w/ (3) #10x3 1/2" wood screws



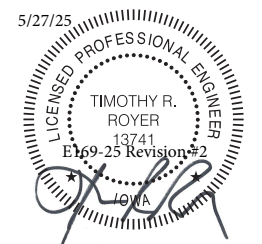
Pagoda Framing Plan Scale 3/16"=1'-0"

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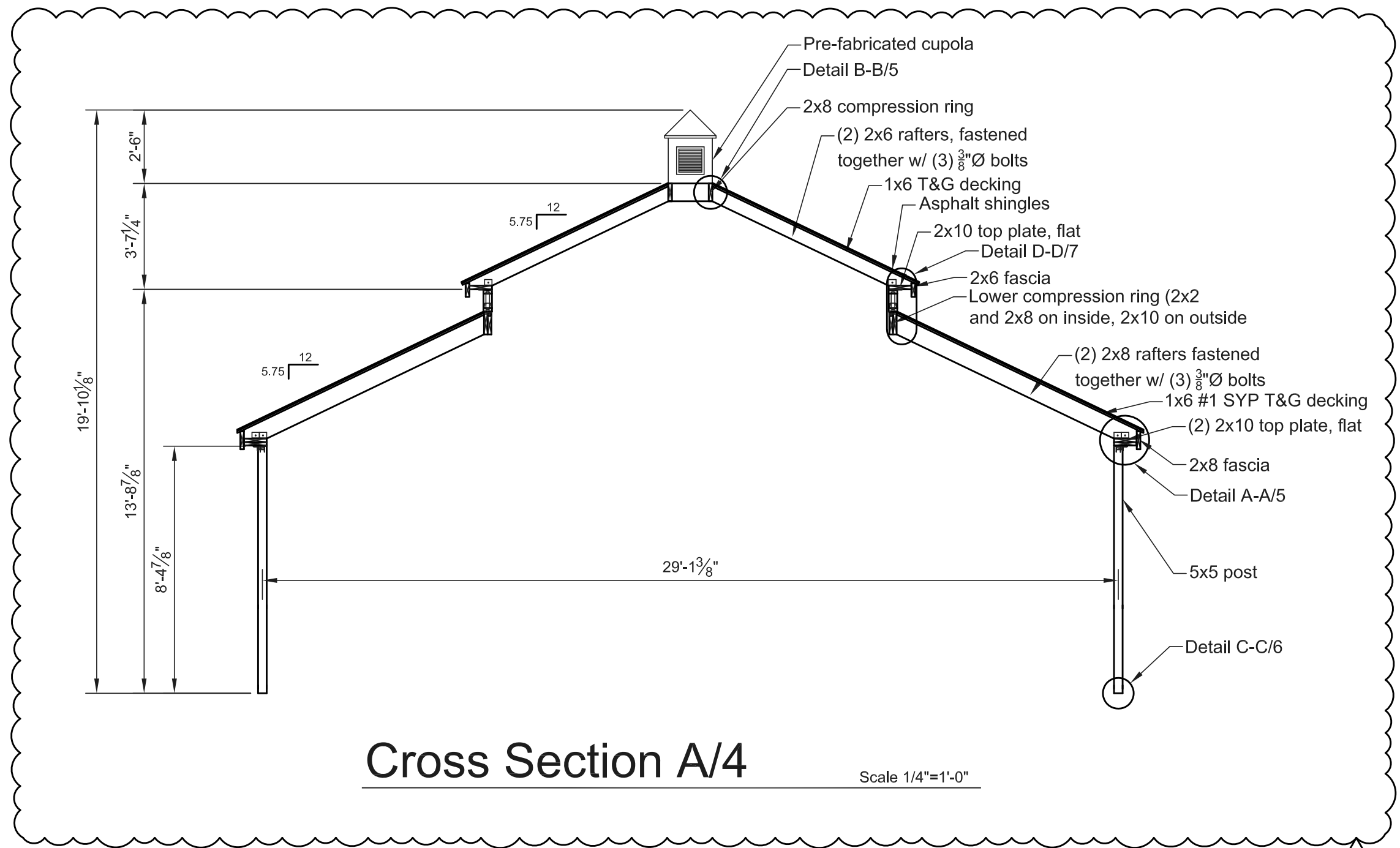
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Contractor:
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Drawing Title:
 Cross Section A/4

Project:
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|-------------------------|------------------------|-----|
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| 2-No Floor | 5/27/25 | kms |
| 2-Add Cupola | 5/27/25 | kms |
| Drawing Number: E169-25 | Page: 4 of 11 | |
| Engineered By: T. Royer | Start Date: 5/8/25 | |
| Drafted By: K.Salver | Certified Date: 5/9/25 | |



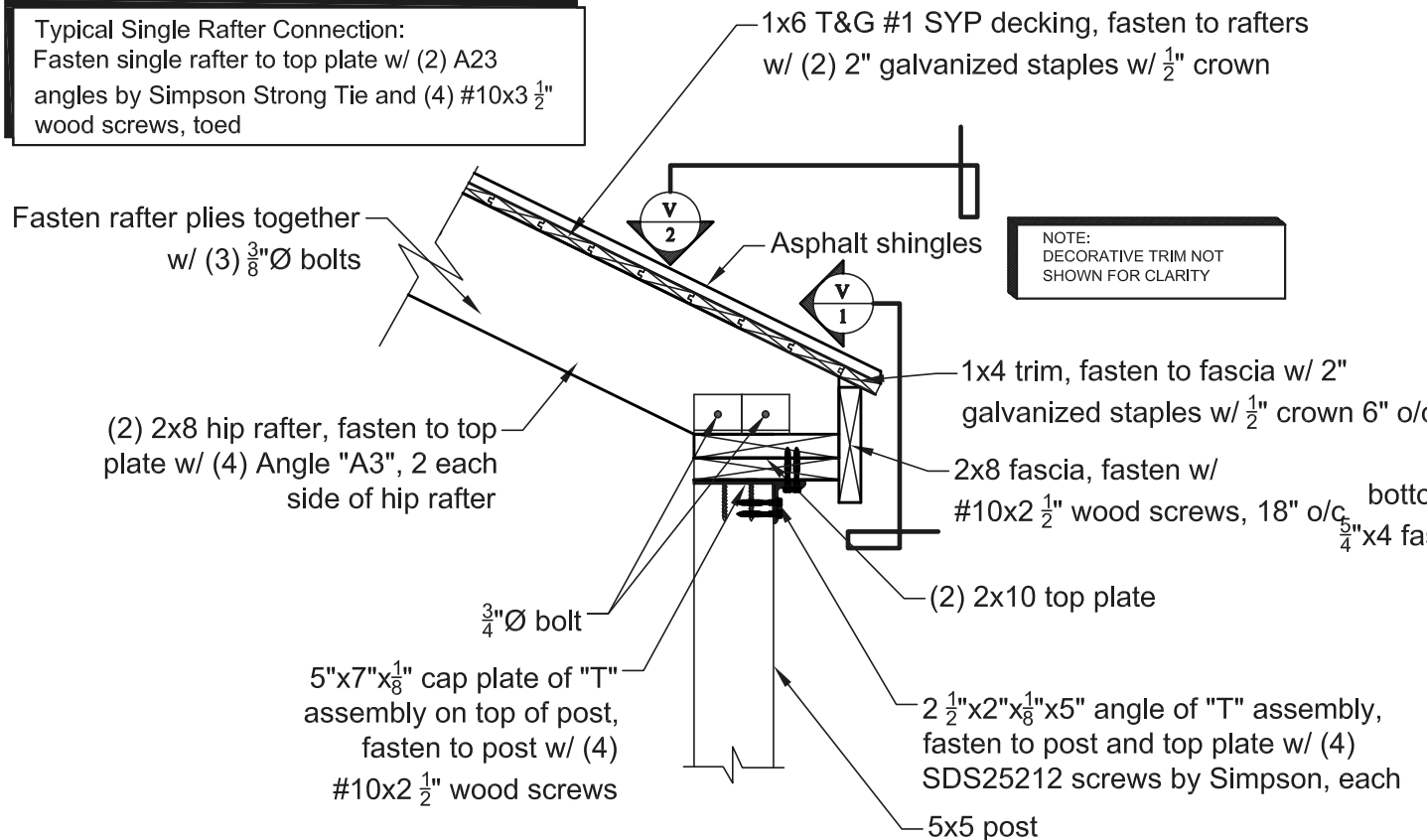
Cross Section A/4

Scale 1/4"=1'-0"

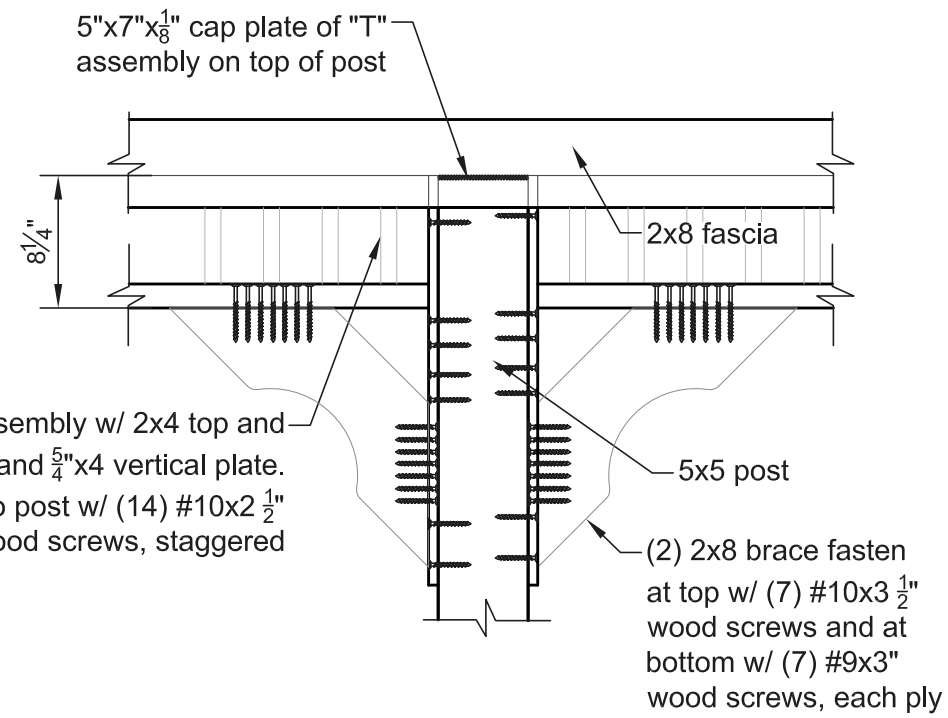


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Typical Single Rafter Connection:
Fasten single rafter to top plate w/ (2) A23 angles by Simpson Strong Tie and (4) #10x3 1/2" wood screws, toed

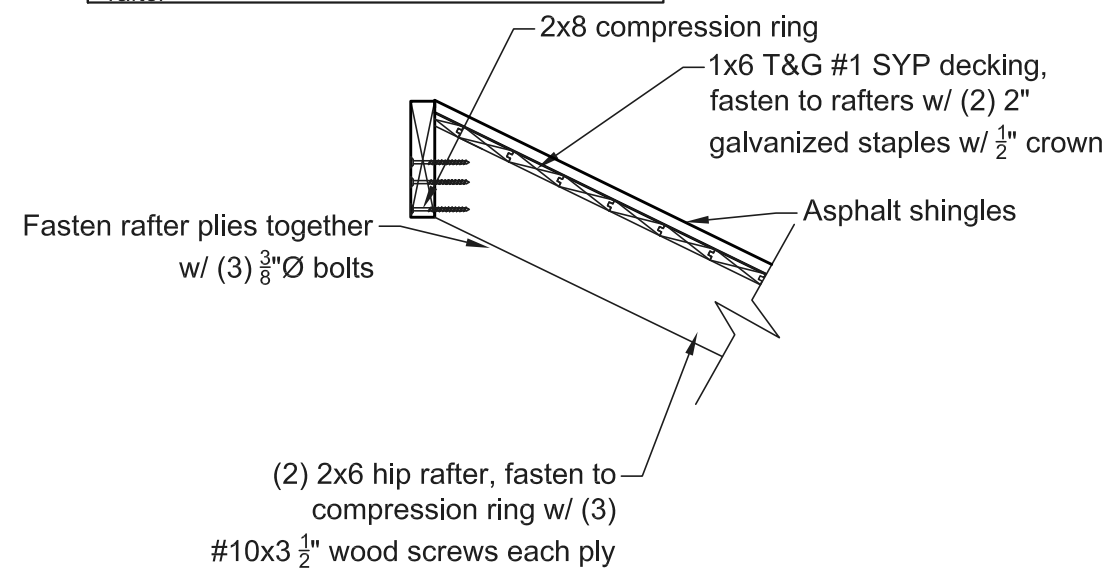


Detail A-A/5 Scale 1" = 1'-0"

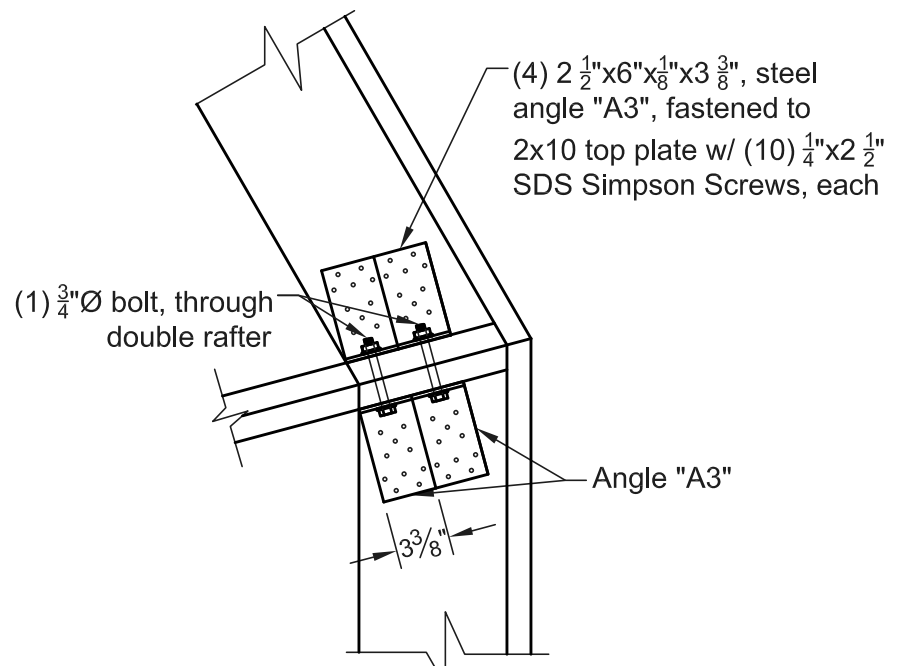


View 1 Detail A-A/5 Scale 1" = 1'-0"

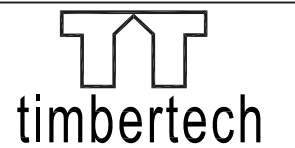
Typical Single Rafter Connection:
(3) #10x3 1/2" wood screws from blocking into rafter



Detail B-B/5 Scale 1" = 1'-0"

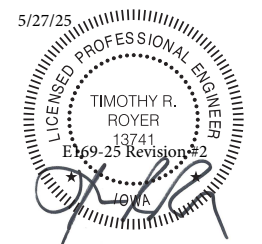


View 2 Detail A-A/5 Scale 1" = 1'-0"



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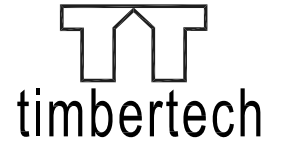
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Drawing Title:
Detail A-A/5
Detail B-B/5

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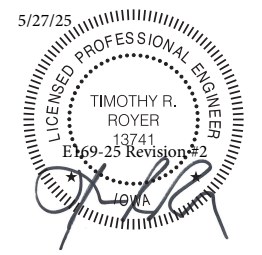
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| Drawing Number: E169-25 | Page: 5 of 11 | |
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| Drafted By: K. Salyer | Certified Date: 5/9/25 | |

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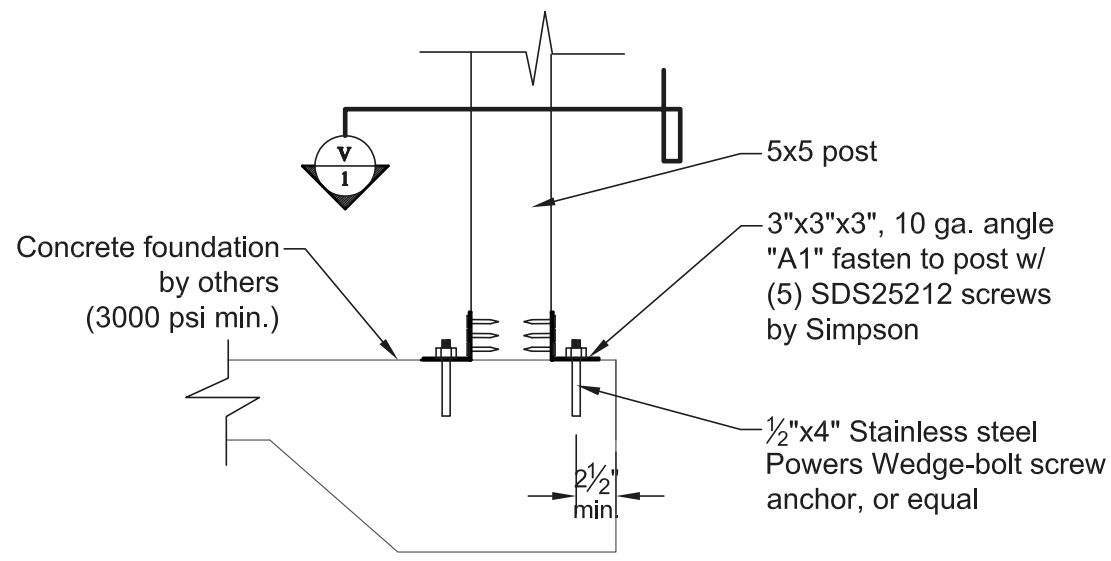
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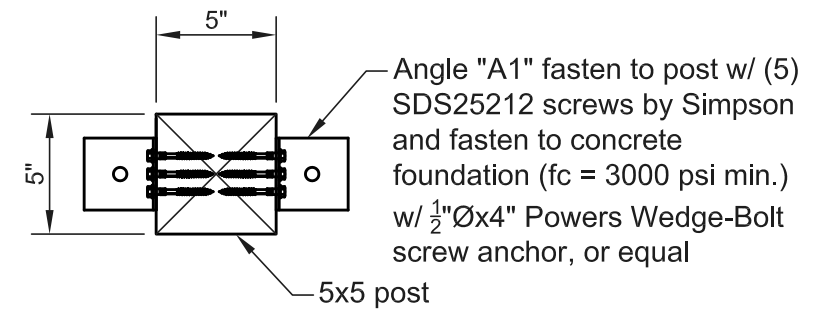
Drawing Title:
 Detail C-C/6

Project:
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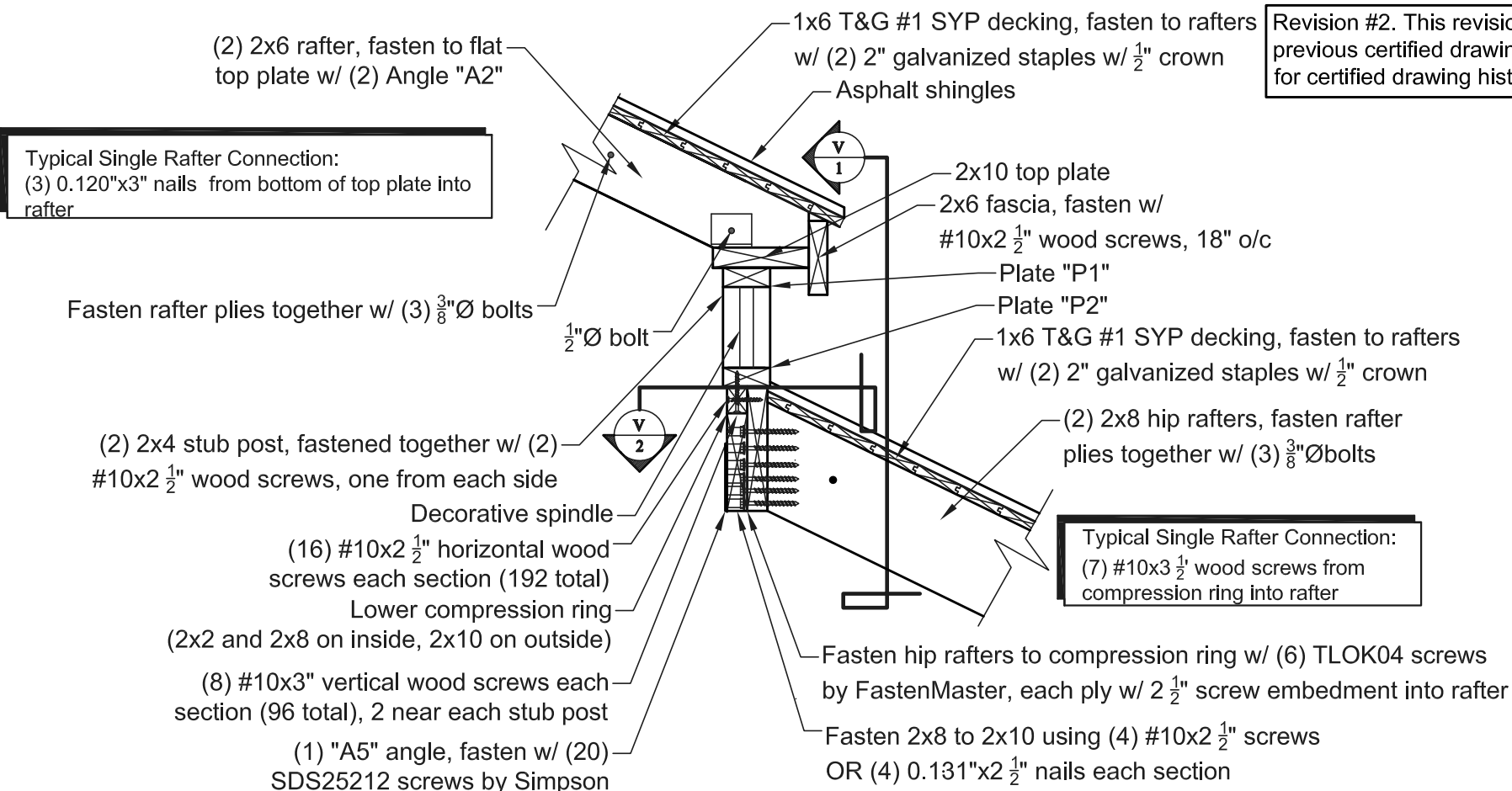
| Revisions: | Date: | By: |
|---------------------------------------|------------------------|-----|
| 1-Remove Handrail | 5/13/25 | kms |
| 2-No Floor | 5/27/25 | kms |
| Drawing Number: E169-25 Page: 6 of 11 | | |
| Engineered By: T. Royer | Start Date: 5/8/25 | |
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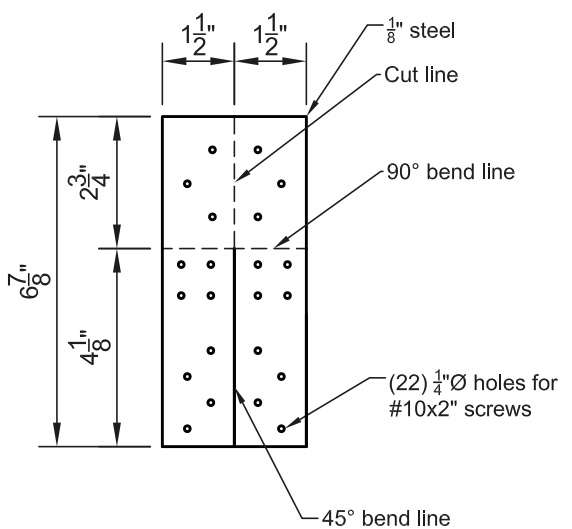
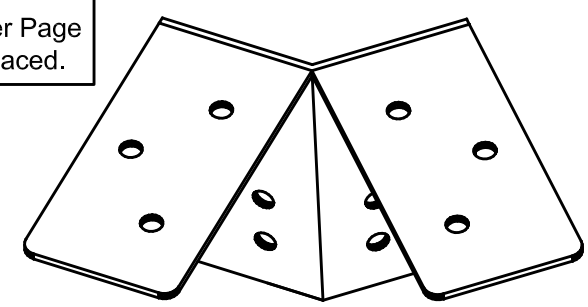
Detail C-C/6 Scale 1" = 1'-0"
 No Floor



View 1 Detail C-C/6 Scale 1 1/2" = 1'-0"
 No Floor

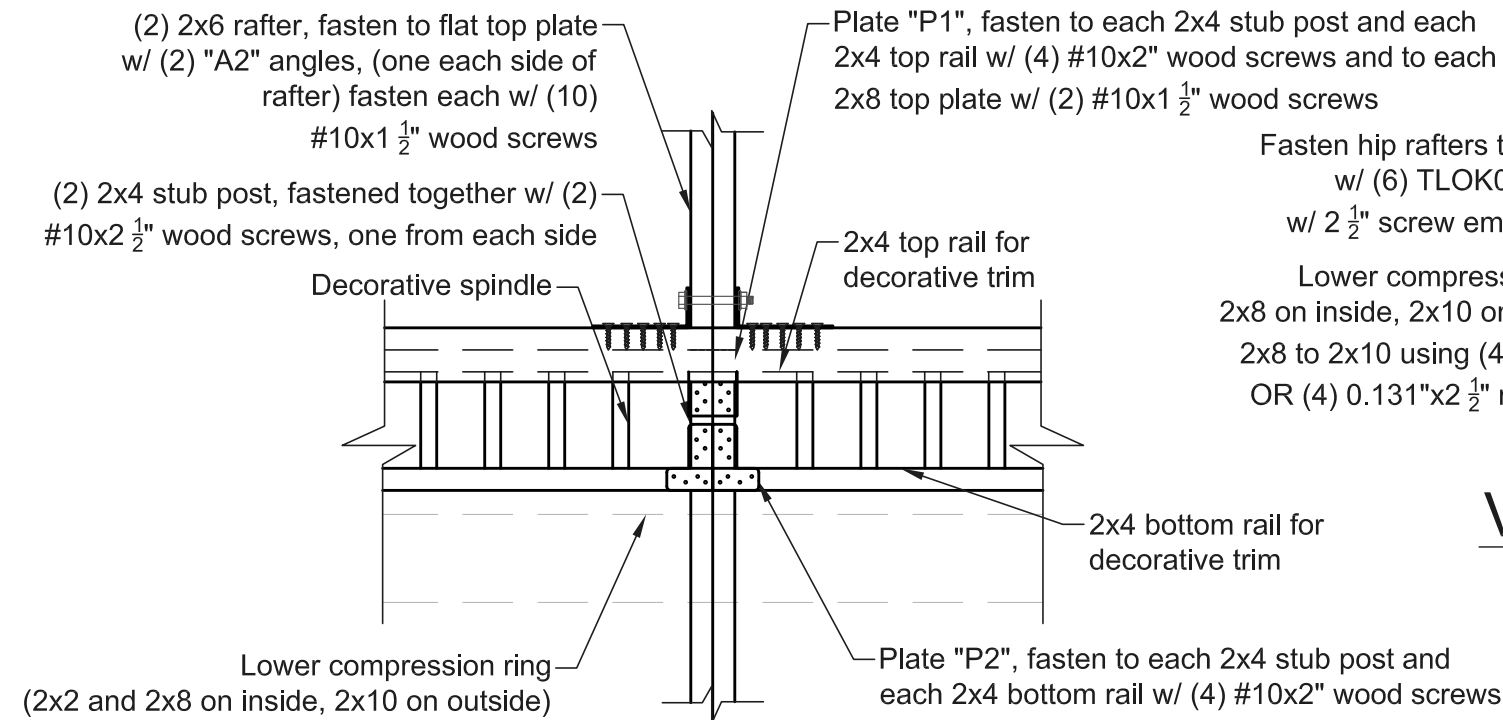


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Detail D-D/7 Scale 1" = 1'-0"

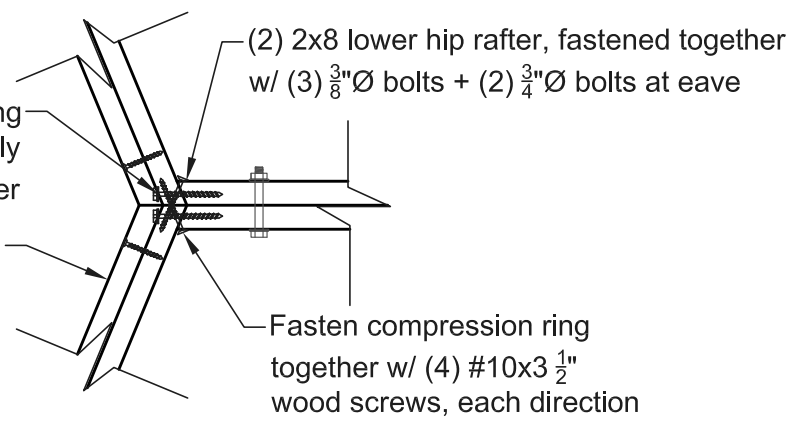
Plate "P1" Scale 3" = 1'-0"



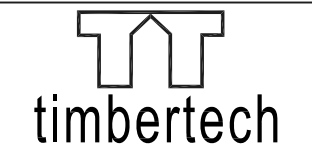
View 1 Detail D-D/7 Scale 1" = 1'-0"

Fasten hip rafters to compression ring w/ (6) TLOK04 screws, each ply w/ 2 1/2" screw embedment into rafter

Lower compression ring (2x2 and 2x8 on inside, 2x10 on outside); Fasten 2x8 to 2x10 using (4) #10x2 1/2" screws OR (4) 0.131"x2 1/2" nails each section

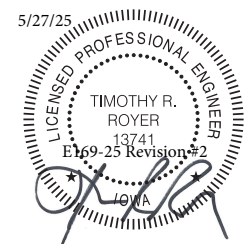


View 2 Detail D-D/7 Scale 1" = 1'-0"



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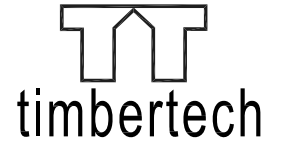
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 Detail D-D/7
 Plate "P1"

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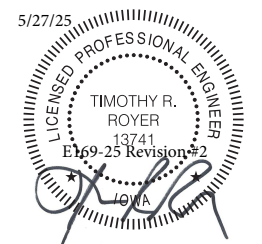
Drawing Number: E169-25 Page: 7 of 11
 Engineered By: T. Royer Start Date: 5/8/25
 Drafted By: K. Salyer Certified Date: 5/9/25

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Timothy R. Royer P.E. IA Cert # 13741
 Expiration Date: 12-31-2025

Contractor:
 Country Lane Woodworking
 540 Hollander Road
 New Holland, PA 17557
 PH: (717) 351-9250

Drawing Title:
 Plate "P2"

Project:
 30' Wood Dodecagon Gazebo for
 Peters Construction Corp.
 515 W. Seerley Blvd.
 Cedar Rapids, IA 50613

| Revisions: | Date: | By: |
|-------------------------|------------------------|-----|
| 1-Remove Handrail | 5/13/25 | kms |
| | | |
| | | |
| Drawing Number: E169-25 | Page: 8 of 11 | |
| Engineered By: T. Royer | Start Date: 5/8/25 | |
| Drafted By: K.Salyer | Certified Date: 5/9/25 | |

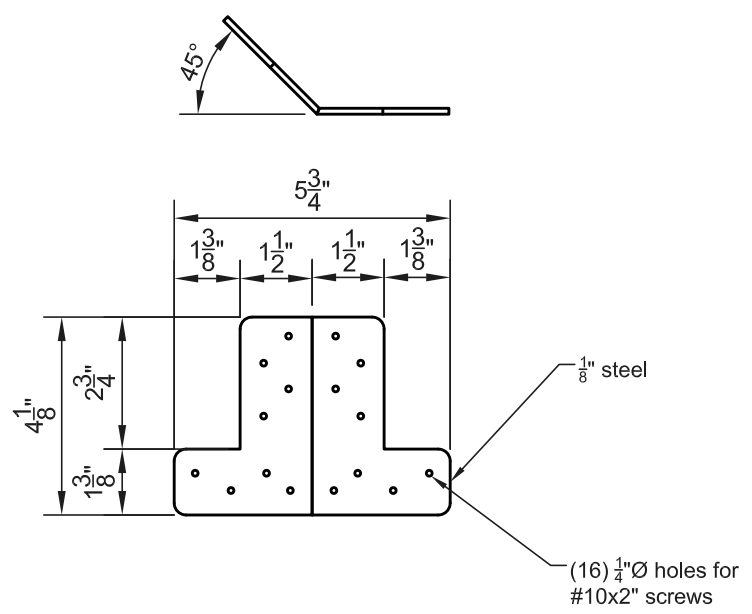
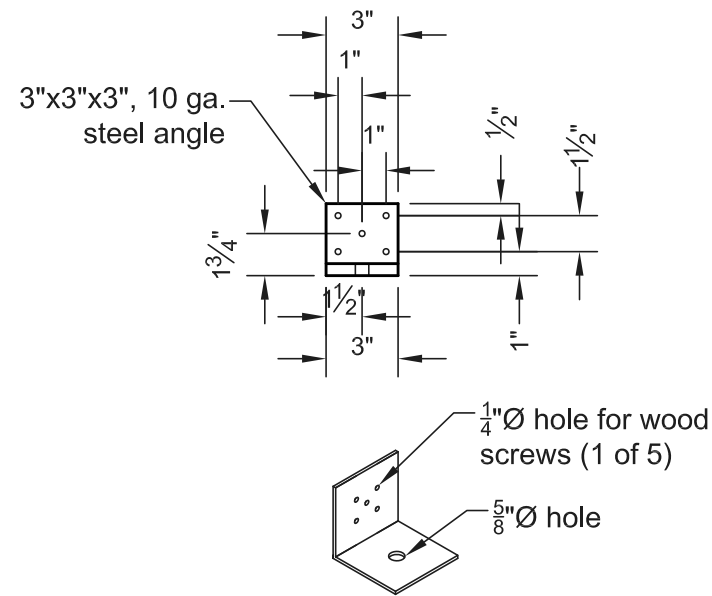
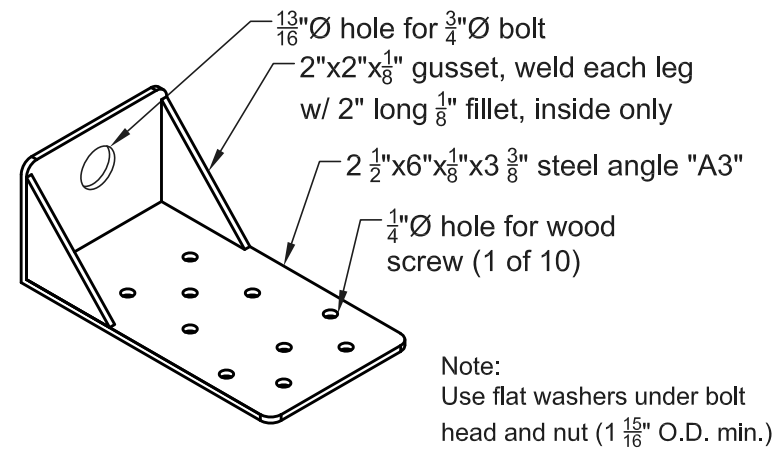


Plate "P2" Scale 3" = 1'-0"



Angle "A1"

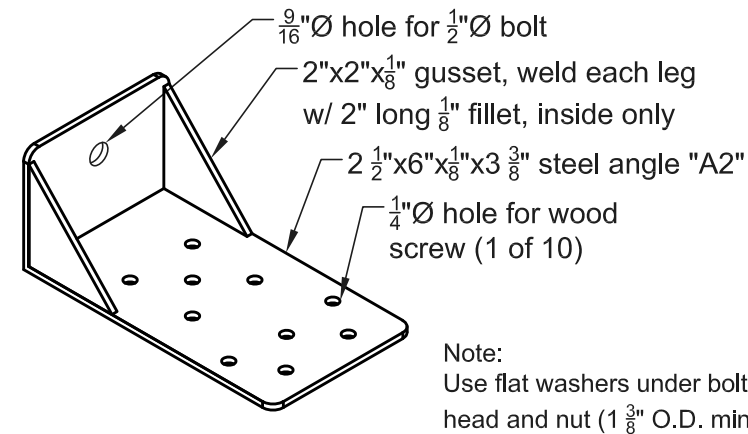
Scale 1 1/2" = 1'-0"



Angle "A3"

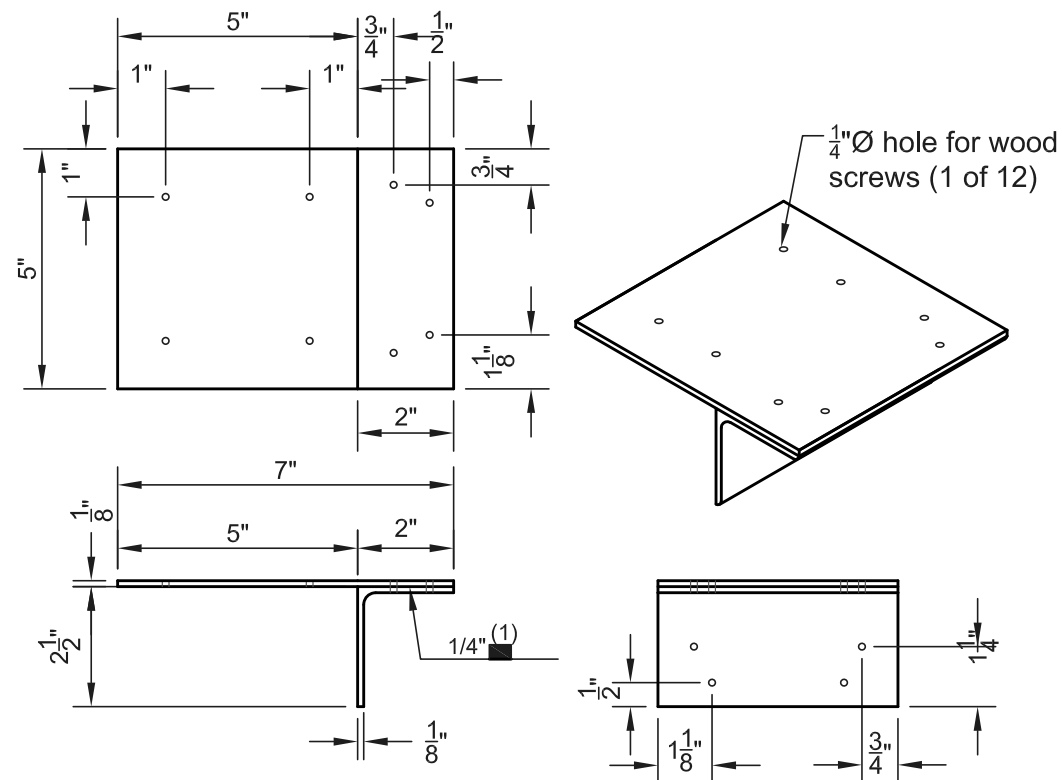
Scale 3" = 1'-0"

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Angle "A2"

Scale 3" = 1'-0"



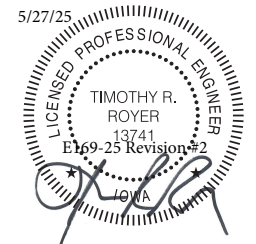
"T" Assembly

Scale 3" = 1'-0"



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Drawing Title:
 Angle "A1"
 Angle "A2"
 Angle "A3"
 "T" Assembly

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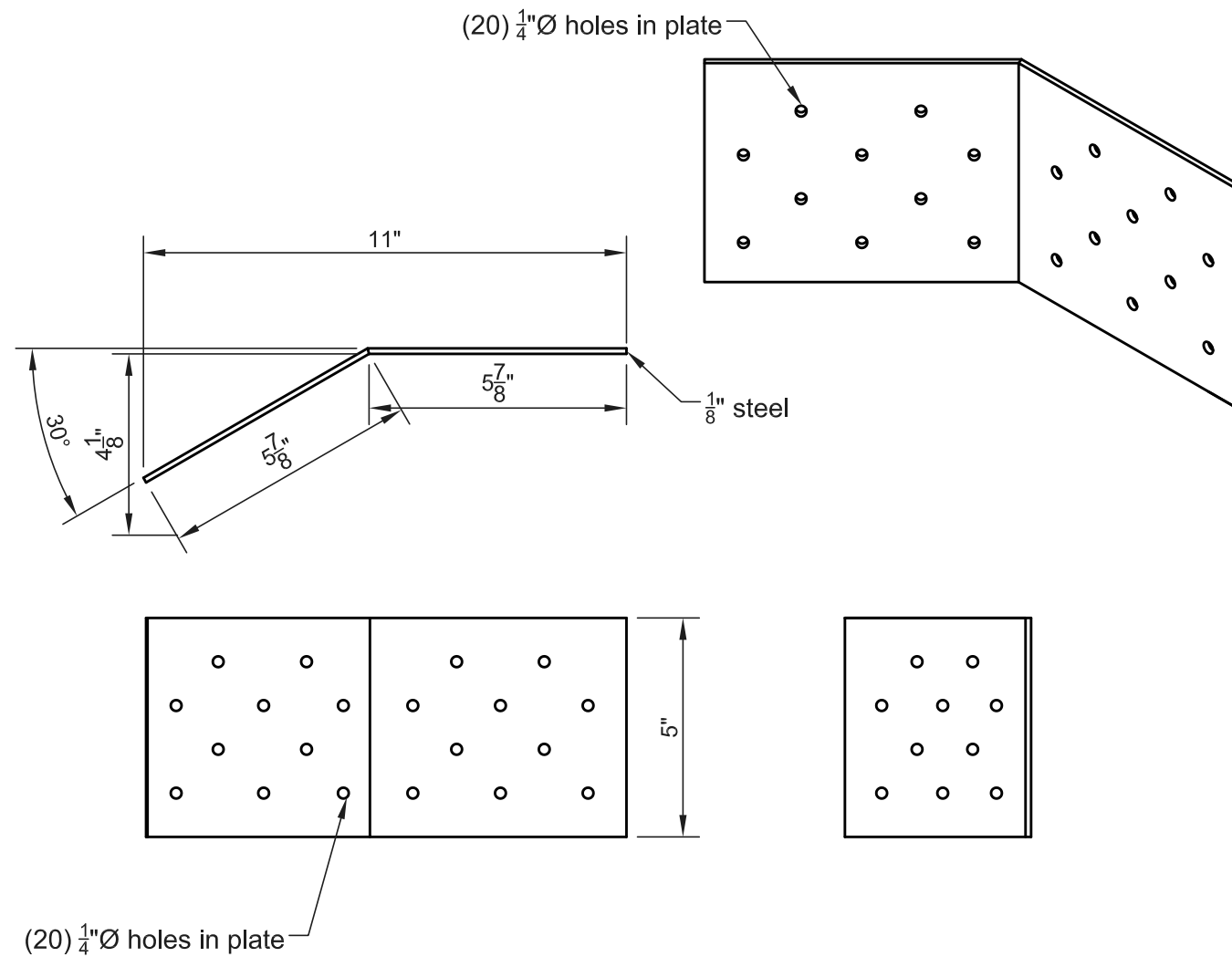
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Drawing Number: E169-25 Page: 9 of 11
 Engineered By: T. Royer Start Date: 5/8/25
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THIS DETAIL
NUMBER IS
NOT USED

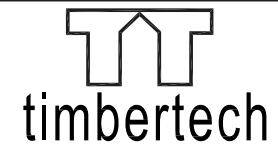
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Scale 3" = 1'-0"



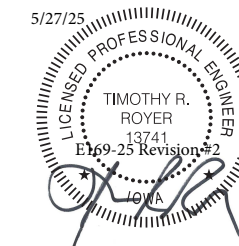
Angle "A5"

Scale 3" = 1'-0"



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Drawing Title:
Angle "A5"

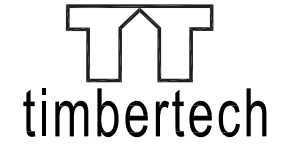
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| Revisions: | Date: | By: |
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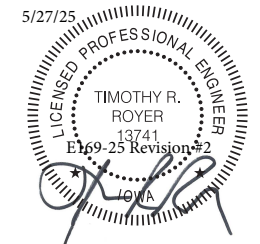
WOOD

1. General Requirements
 - A. Structural wood members and connections shall be of sufficient size or capacity to carry all design loads without exceeding the allowable design values specified in "The National Design specification for Wood Construction" (NDS), and its "Supplement" by the American Wood Council (AWC).
 - B. Wood members used for load supporting purposes shall have the grade mark of a lumber grading agency certified by the American Lumber Standards Committee.
2. Heavy Timbers
 - A. Structural solid sawn timbers shall be designed, fabricated and installed in accordance with the NDS by AWC.
 - B. Structural glued laminated soft wood timbers shall conform with the "American National Standard or Structural Glued Laminated Timber", (ANSI/AITC 190.1).
 - C. Structural decking shall conform to the NDS.
 - D. Glued laminated columns shall be manufactured with laminating combinations that will provide a minimum design value of 1,850 psi for compressive stress (Fc), and 2,200 psi for bending stress (Fb).
3. Dimension Lumber
 - A. All lumber species, graded visually or mechanically, shall comply with the NDS by AWC, and the "American Softwood Lumber Standard" (PS 20) by the U.S. Department of Commerce.
 - B. The minimum grade and species for posts, beams, headers, and other primary structural members shall be Dense Select Structural Southern Pine, unless specified otherwise.
 - C. Lumber used for secondary framing shall be #1 Southern Yellow Pine (SYP) or better.
 - D. Mechanically laminated columns shall conform with ANSI/ASAE EP 559.
4. Pressure Preservative Treatment (PPT)
 - A. Pressure treatment to be performed according to the American Wood Preservers' Association (AWPA) standards.
 - B. Pressure treated members shall have the inspection mark of an agency accredited by the American Lumber Standards Committee.
 - C. Preservative: Ammonia Copper Quaternary ammonia (ACQ) or Copper Boron Azole (CBA)
 - D. Minimum waterborne treatment retention shall be 0.4 pcf for members above ground, and 0.6 pcf for members in contact with earth.
 - E. Treat indicated items and the following:
 1. Wood members exposed to weather or insect infestation.
 2. Wood members in direct contact with earth or concrete.
 3. Wood members exposed to high moisture content (>19% for dimension lumber, >16% for glued laminated timber).
 4. Wood members less than 12 inches above grade.
 - F. Field treat newly exposed wood where cutting, drilling or notching pressure treated lumber.
 - G. Metal connectors used in treated wood shall be hot-dip galvanized as per ASTM A153.
5. Connections shall be designed and constructed according to the NDS by AWC and shall conform to the following:
 - A. The minimum connection shall be two #10x3 1/2" wood screws, or as detailed on the drawings.
 - B. Other connections as per standard construction practice.



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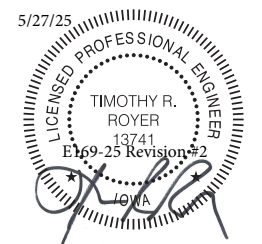
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| Drawing Number: E169-25 | Page: 11 of 11 | |
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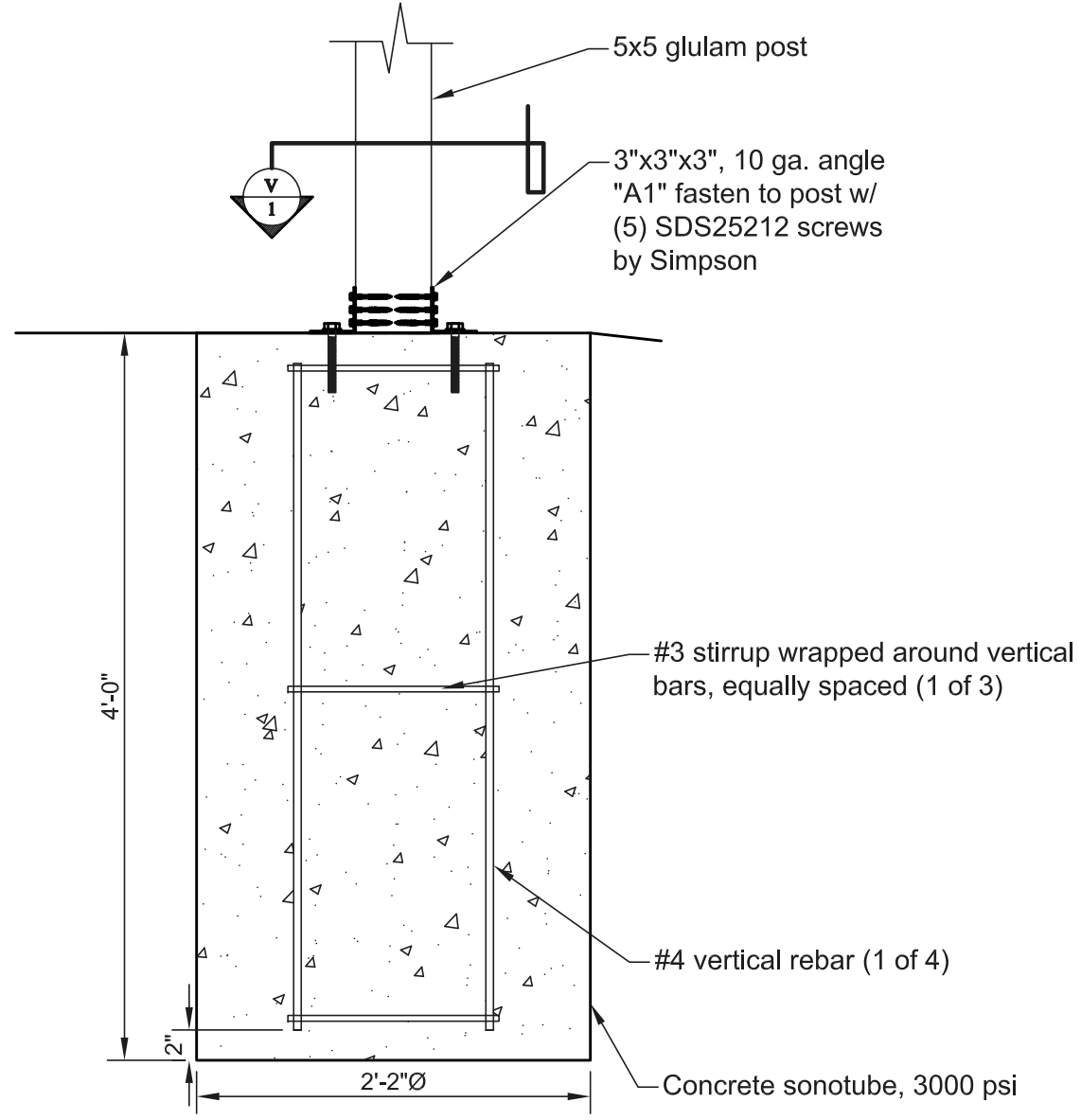
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Contractor:
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Drawing Title:
 Foundation Details

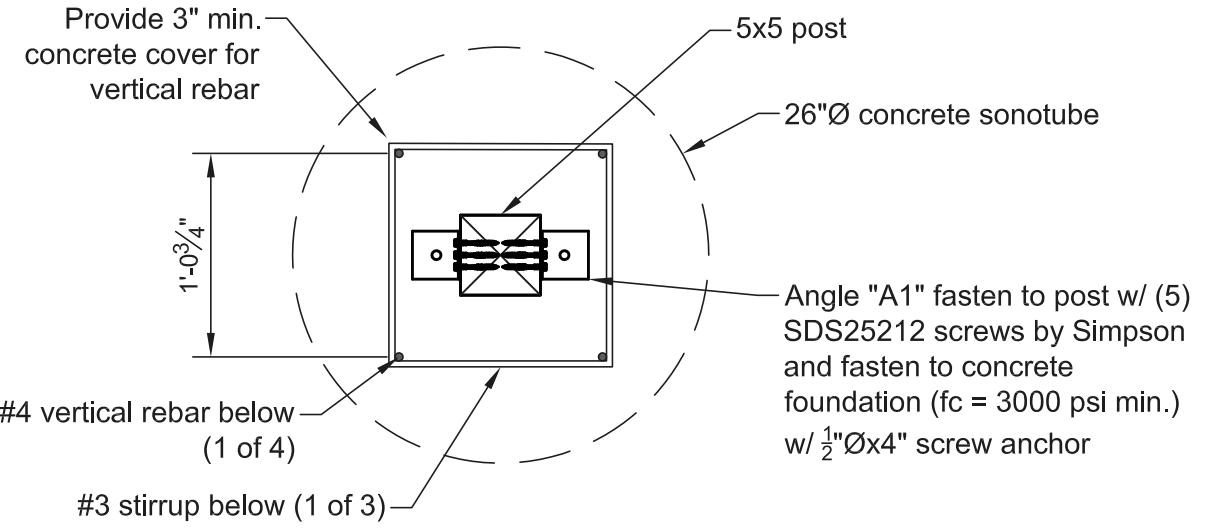
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| Revisions: | Date: | By: |
|-------------------------|------------------------|----------|
| 1-Remove Handrail | 5/13/25 | kms |
| 2-No Floor | 5/27/25 | kms |
| Drawing Number: E169-25 | | Page: F1 |
| Engineered By: T. Royer | Start Date: 5/8/25 | |
| Drafted By: K.Salver | Certified Date: 5/9/25 | |



Pier Design
 No Floor

Scale 1" = 1'-0"



View 1 Pier Design
 No Floor

Scale 1" = 1'-0"



EARTHWORK

1. Requirements
 - A. Provide a construction grade extending ten feet beyond building exterior walls or an alternative method per Section 1804.3 of the IBC.
 - B. Excavate for foundations to subgrade elevations regardless of character of materials and obstructions encountered, unless otherwise approved by the structural engineer.
 - C. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
2. Materials
 - A. Satisfactory soil: ASTM D2487 unified soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than two inches in any dimension, debris, waste, frozen materials, vegetation, or other deleterious matter.
 - B. Unsatisfactory soil: ASTM D2487 unified soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
 - C. Backfill and fill: satisfactory soil materials.
3. Execution
 - A. Footings have been designed for an assumed allowable loadbearing pressure of 2,000 psf on supporting soil at 1 foot deep into grade. Pressure may be increased 20% for each additional 1 ft of width and/or depth to a maximum of 6,000 psf. The contractor shall verify this assumption, and shall immediately notify the structural engineer in writing of any deficiency.
 - B. Place backfill and fill in layers not more than eight inches in loose depth at optimum moisture content. Compact each layer under footings and slabs to a dry density of at least 95 percent of maximum dry density as determined by ASTM D155.
 - C. Bottom of exterior footings shall be a minimum of 36 inches below finished grade, unless noted otherwise

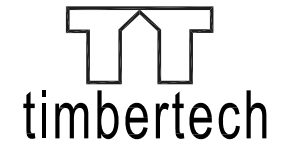
Structural Steel

1. Connections shall be designed and constructed according to AISC, and shall conform to the following:
 - A. Screw Anchors (exterior applications): Use screw anchors of the diameter and length indicated on the drawings as manufactured by Red Head or approved equal. Use LDT Stainless Steel bolts, or LDT bolts with EnvireX coating in concrete and CMU. Fill CMU cells at all bolt locations.
 - B. Connections exposed to weather or high relative humidity shall be hot-dip galvanized per ASTM A153 / A153M.

CAST-IN-PLACE CONCRETE

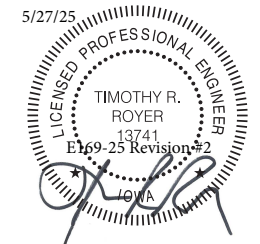
1. Concrete work shall conform to the following specifications by The American Concrete Institute (ACI).
 - A. "Building Code Requirements for Structural Concrete" (ACI 318).
 - B. "Hot Weather Concreting" (ACI 318).
 - C. "Cold Weather Concreting" (ACI 318).
2. Materials used shall adhere to the following:
 - A. Portland Cement: ASTM C150, type 1.
 - B. Fly Ash: ACI 318.
 - C. Aggregates: ASTM C33, maximum aggregate size is one inch.
 - D. Fiberglass reinforcement: PCI MNL 128 Standard.
 - E. Air-entraining admixture: ACI 318.
 - F. Chemical admixtures: ASTM C494, water reducing. All concrete, except footings, shall contain a water reducing admixture. No admixtures containing calcium chloride are permitted. All other additives shall not be used without prior approval of the structural engineer.
 - G. Vapor retarder: Clear 8-mil thick polyethylene.
3. Proportion normal-weight (145 pcf) concrete mixes to provide the following properties:
 - A. Compressive strength: 3,000 psi at 28 days (unless noted otherwise).
 - B. Slump limit: 4 inches (3 inches for slab-on-grade) at point of placement.
 - C. Water-cement ratio: 0.45 maximum at point of placement.
 - D. Air content: 5 to 7 percent for concrete exposed to freezing and thawing, 2 to 4 percent elsewhere.
4. Reinforcing steel shall be fabricated, detailed and placed in accordance with the ACI 318, and shall conform to the following:
 - A. Deformed reinforcing bars: ASTM A615/A 615M with a minimum yield strength of 60,000 psi (grade 60).
 - B. Welded wire fabric (WWF): ASTM A185, flat sheets, not rolls.
 - C. Ties/Stirrups: ASTM A615/A615M, grade 40.
5. Concrete work shall be executed according to the following:
 - A. Maintain tolerances and surface irregularities within ACI 117 limits of class A for concrete exposed to view, and class C for other concrete surfaces. Floor slabs shall be screeded, floated and steel troweled to a smooth, dense and plane surface.
 - B. Accurately position, support, and secure reinforcement.
 1. Reinforcing bars shall lap 48 bar diameters at splices in concrete unless otherwise noted.
 2. Provide corner bars to match all continuous reinforcing in concrete and masonry.
 3. Reinforcing bar hooks shall be ACI standard.
 4. WWF shall have ends lapped one full mesh, and shall extend onto supporting walls.
 5. Chairs, bolsters, bar supports, and spacers shall be sized and shaped for strength and support of reinforcement during concrete placement.
 - C. Provide minimum concrete cover on reinforcing bars as follows:
 1. Cast against earth.....3"
 2. Exposed to earth or weather (#5 or smaller)...1 1/2"
 3. Exposed to earth or weather (#6 or larger).....2"
 4. Slabs and walls not exposed.....3/4"
 - D. The contractor shall be responsible for stability and integrity of all excavations and existing structures.

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| Engineered By: T. Royer | Start Date: 5/8/25 | |
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