

Self-Realization and Skills Development Center for Early Mothers



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Sister Elizabeth Namazzi
Sisters of Mary, Mother of the Church

**Self Realization and Skills
Development Center for
Early Mothers**

Team CEE 16.5

Trevor Coffman
Andrew McAferty
Steven Millett

Cover Page

Date	Issue Date	S - 01
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	Scale

STRUCTURAL - GENERAL NOTES

GENERAL REQUIREMENTS

DESIGN CRITERIA AND LOADS

All designs used LRFD load combinations for determining demand and capacity

Live Loads..... 20 psf

Earthquake Loads..... Cs = 0.29

Clinic.....

Convent.....

Ed. Center.....

Dead Loads

Metal Roof..... 5 psf

Mahogany..... 50 pcf

Cay-Fired Brick..... 150pcf

FOUNDATION STRUCTURAL NOTES

REFERENCE STANDARDS:

IBC 2012: International Building Code Ch.18

MATERIALS: The foundation walls are to be constructed out of clay fired bricks or concrete in order to meet the minimum footing width, depth, thickness and minimum rebar size and spacing.

Assumed Soil properties

Footing shall rest on tamped earth with a minimum bearing capacity of 2000psf or equivalent 5000psf "bedrock".

FOUNDATION MINIMUM SIZE

Depth: 3' or bedrock equivalent

Thickness= 8" minimum

Width= 18" minimum

REBAR SIZE AND SPACING

Size= #4 (diameter= 1/2") ≈ 13mm

Spacing= #4 @ 4' OC.

Reinforcement/rebar notes: SI rebar sizing given as 13mm which is slightly larger than the minimum #4 diameter. Minimum spacing per IBC Table 1807.1.6.3(2).

RING BEAM STRUCTURAL NOTES

REFERENCE STANDARDS:

ACI 318-14: Building code requirements for Structural Concrete.

MATERIALS: The ring beam will be constructed from light aggregate concrete and is reinforced with steel rebar along the length of the beam and with stirrups.

BEAM MINIMUM SIZE

Height: 12"

Width= 8"

REBAR SIZE AND SPACING

Size= #4 (diameter= 1/2") ≈ 13mm

Size= #3 (diameter= 3/8") ≈ 10mm

Reinforcement/rebar notes: SI rebar sizing given as 13mm and 10mm which are slightly larger than the minimum #4 and #3 diameter, respectively. Beam designed using ACI 318-14 standards.

SHEAR WALL STRUCTURAL NOTES

REFERENCE STANDARDS:

ACI 530-13: 2013 American Concrete Institute Building code requirements and specification for Masonry Structures

MATERIALS: Brick and Mortar Notes

Assumed Brick properties

Length= 200cm = 7.87"

Width= 10.2cm= 4.0"

Thickness= 6.5cm= 2.56"

Type: Clay fired bricks

Compressive strength, f'c=1000psi

Assumed Mortar properties

Type "N" mortar (masonry cement/lime)

Type "N" mix design:

1 part portland cement

1 part lime

6 parts sand

Type "S" or "M" mortar OK.

Mortar note: Design of three buildings calculated assuming strength properties for type "N" mortar. Minimum cement and lime proportions must be used, type "S" and "M" mortar mix designs meet these proportions.

WALL MEMBER SIZING

Interior wall thickness.....1 brick (4")

Exterior/Shear wall thickness.. 2 bricks (8")

TIMBER STRUCTURAL NOTES

REFERENCE STANDARDS:

Conform to :
NDS - "2011 National Design Specification (NDS) for Wood Construction"

Materials: All designs for the three buildings were calculated assuming strength properties for African Mahogany. Any other timber used for construction must be at minimum the same strength of African Mahogany in bending, tension, compression, and shear.

TRUSS MEMBER SIZING:

Clinic Top and Bottom Chord..... 4x8

Clinic Inner Chord..... 4x4

Convent Top and Bottom Chord..... 4x6

Convent Inner Chord..... 4x4

Education Center Top and Bottom Chord.....4x6

Education Center Inner Chord.....4x4

FASTENERS: All fasteners in used for construction shall be 10d Box Nails with a 0.147 diameter, or equivalent.

ROOF NAILING: All corrugated metal roofing will be nailed to the top chord of each roof truss 4 time every 30".

Timber Connectors: All timber truss members shall be connected using 1 1/2" plywood gusset plates on either side of each connection. As detailed in section S09 - Roof Connection Details.



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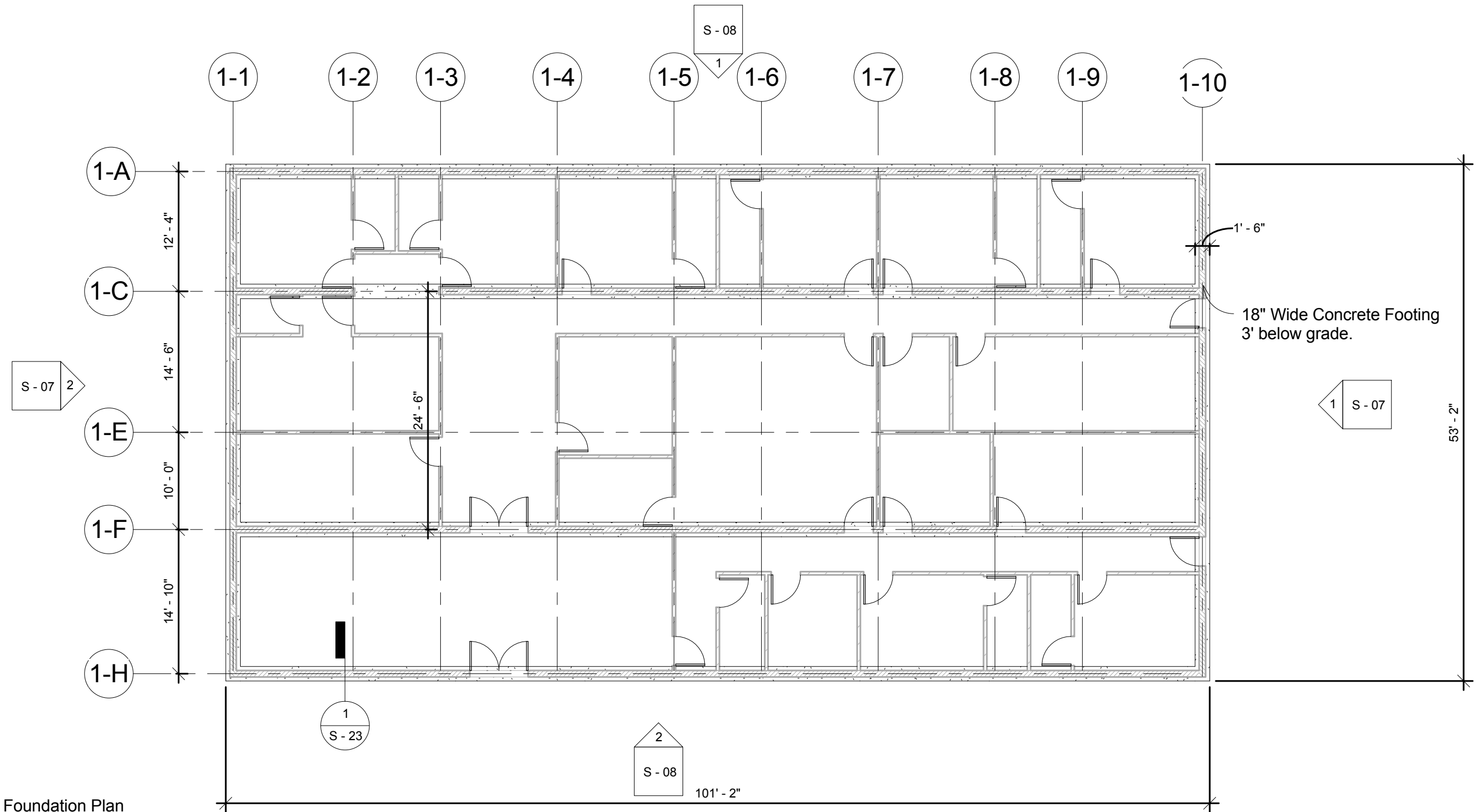
Trevor Coffman

Andrew McAferty

Steven Millett

Structural Notes, Schedules

Date	Issue Date	S - 02
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	Scale



1 Clinic Foundation Plan
1" = 10'-0"



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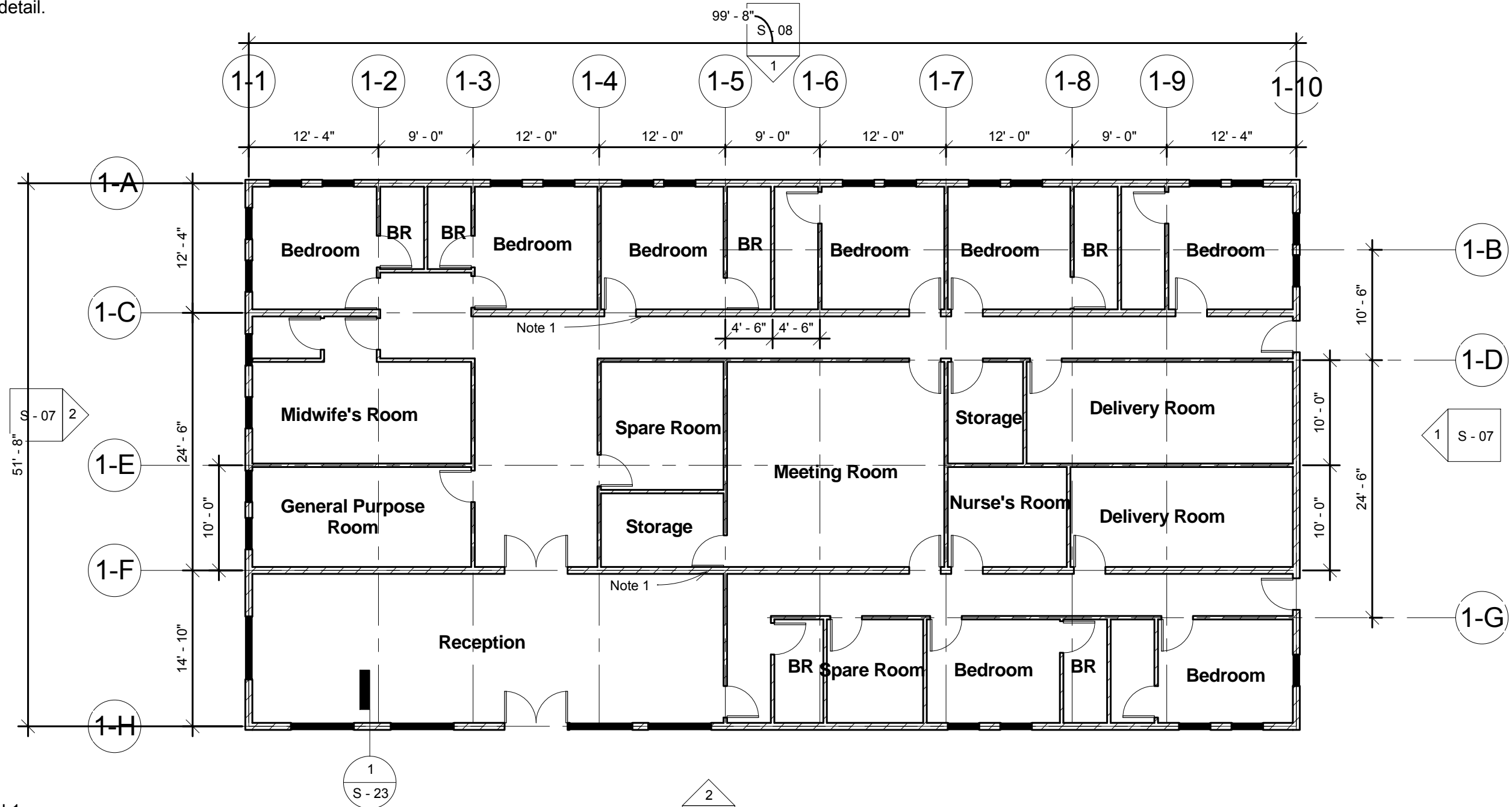
Clinic Foundation Plan

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 03

Scale 1" = 10'-0"

1. Structural Shear walls will be all exterior walls of the clinic and the two interior walls located at grid lines 1-C and 1-F. See S6-01 for detail.



1 Clinic Level 1
1" = 10'-0"



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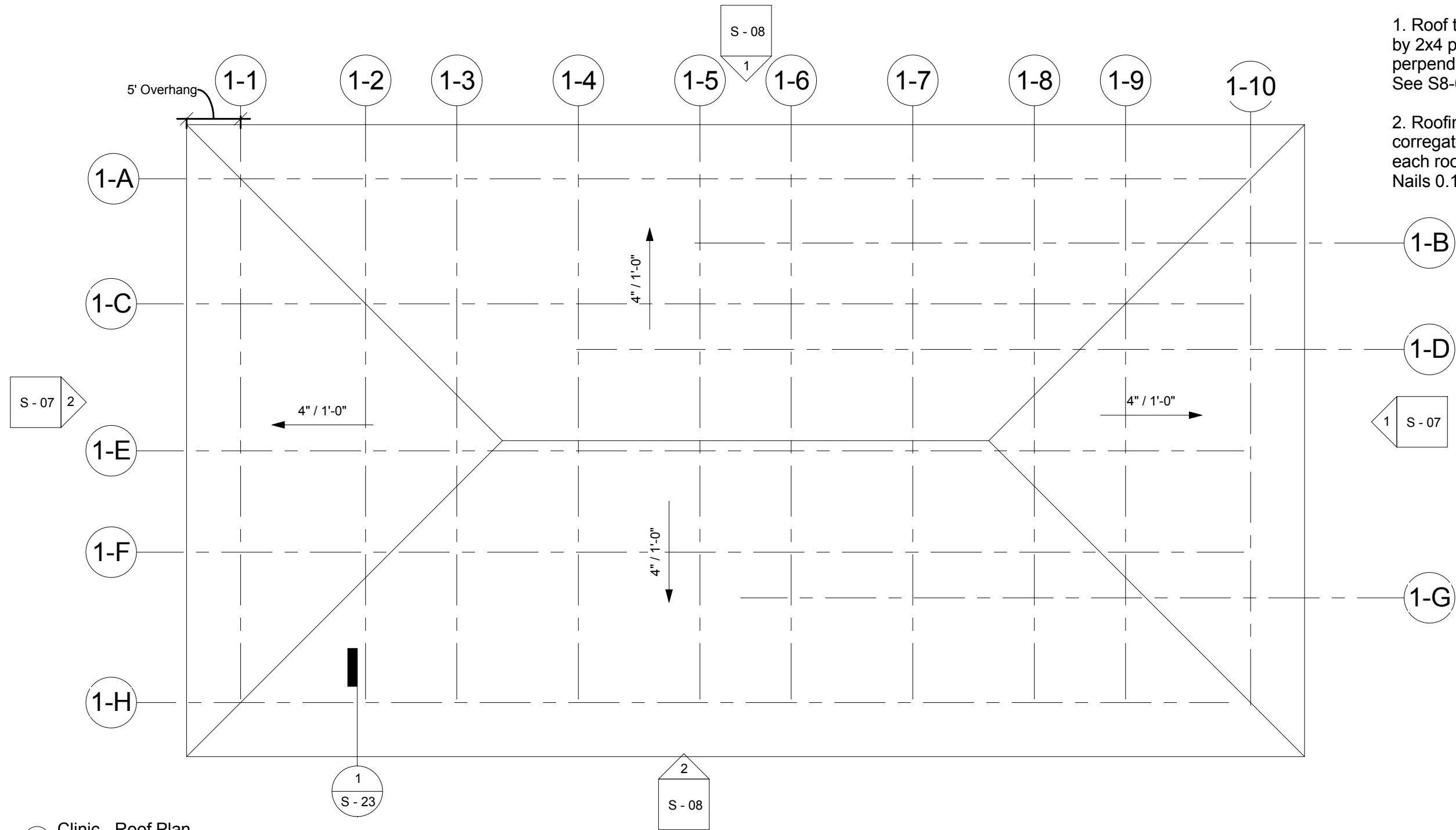
Trevor Coffman
Andrew McAferty
Steven Millett

Clinic Plan View

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 04

Scale 1" = 10'-0"



1. Roof trusses will be braced by 2x4 purlins @ 2' OC running perpendicular to the top chord. See S8-01 For Detail.
2. Roofing will consist of corrugated metal connected to each roof truss by 4 10d Box Nails 0.147" Dia every 30".

1 Clinic - Roof Plan
1" = 10'-0"



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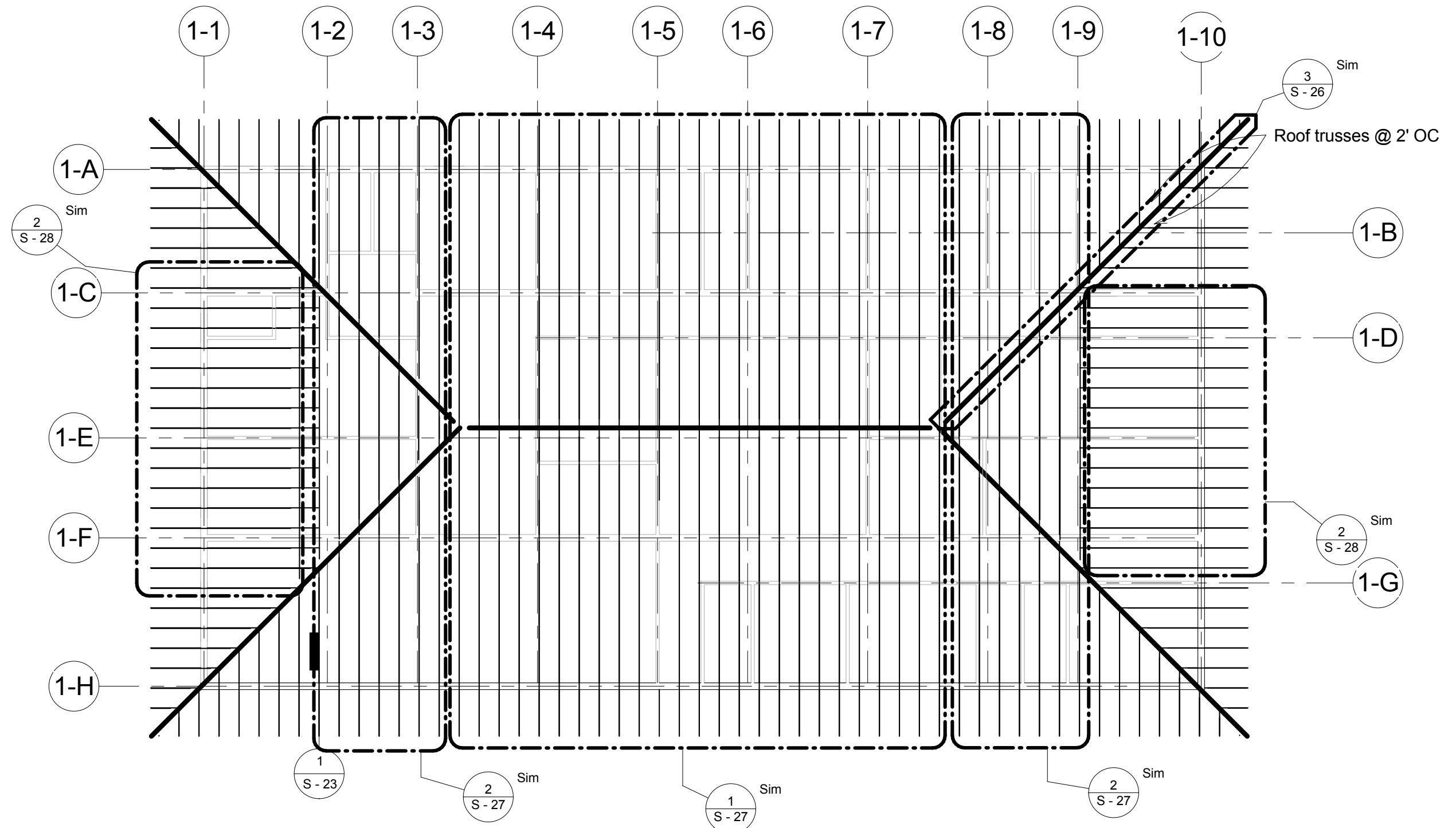
Trevor Coffman
Andrew McAferty
Steven Millett

Clinic Roof Plan

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 05

Scale 1" = 10'-0"



1 Clinic Truss Layout
1" = 10'-0"



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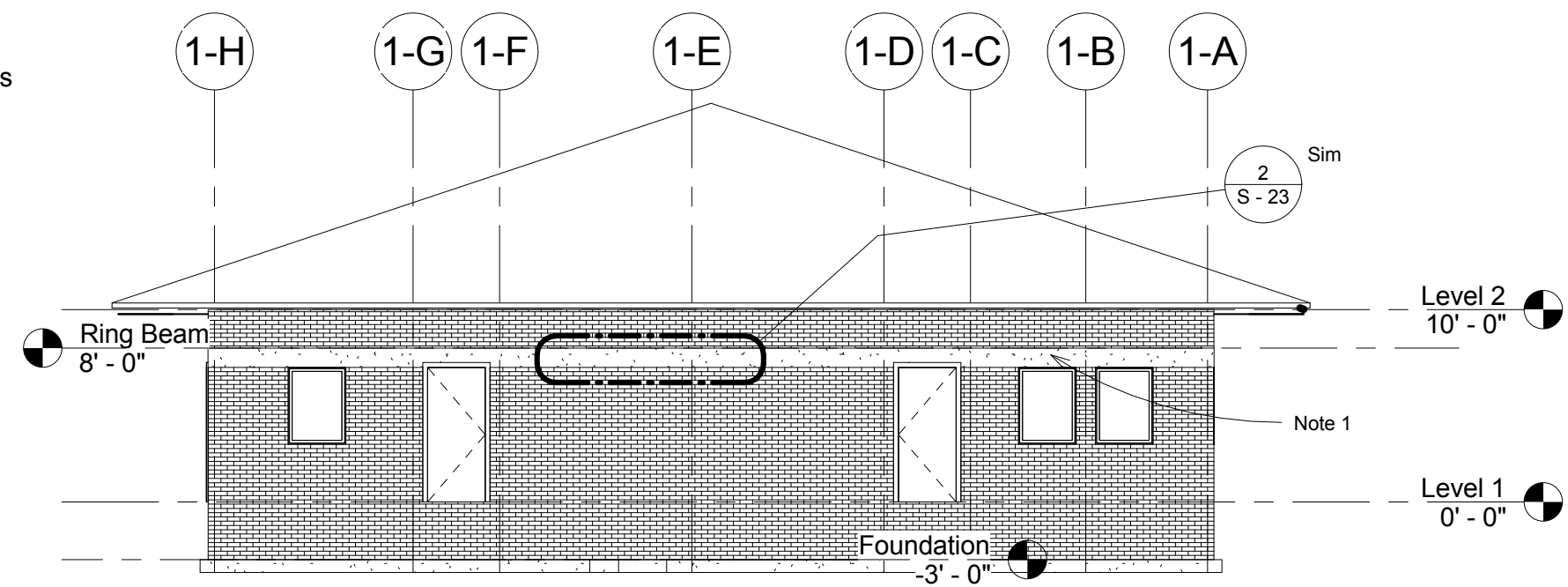
Clinic Roof Truss Plan

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

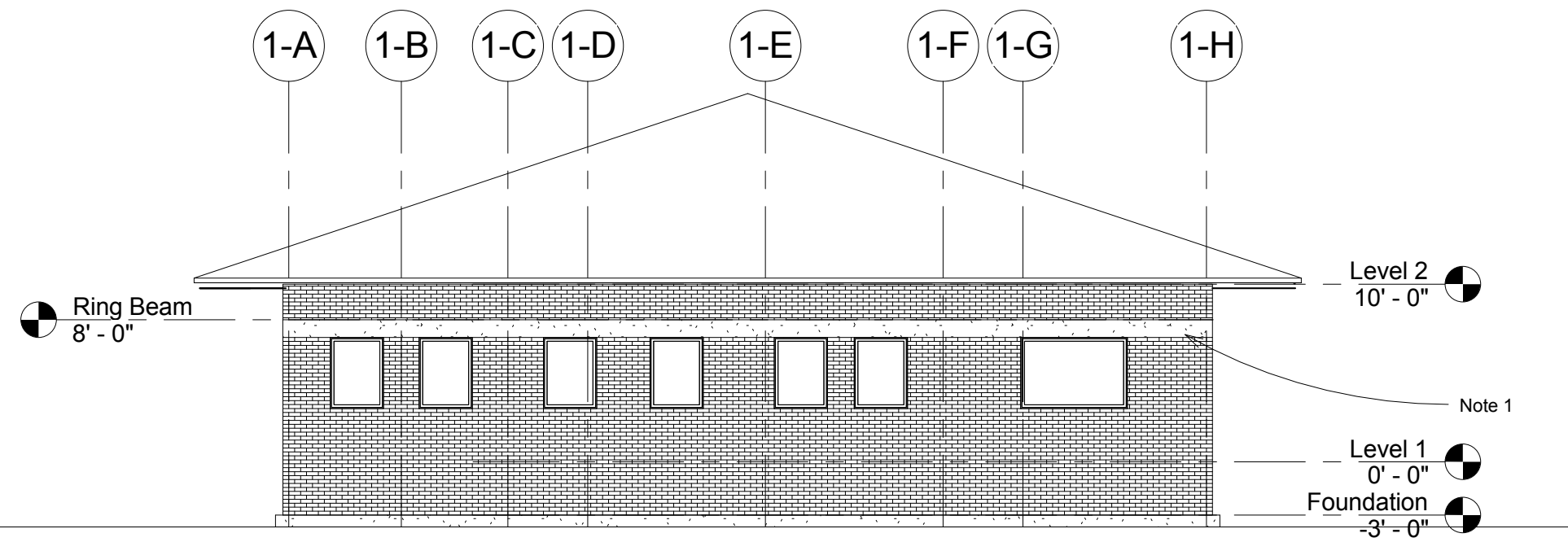
S - 06

Scale 1" = 10'-0"

1. Reinforced concrete ring beam will wrap clinic exterior walls at 8' above grade and act as headers for all doors and window.



1 Clinic - East
1/8" = 1'-0"



2 Clinic - West
1/8" = 1'-0"

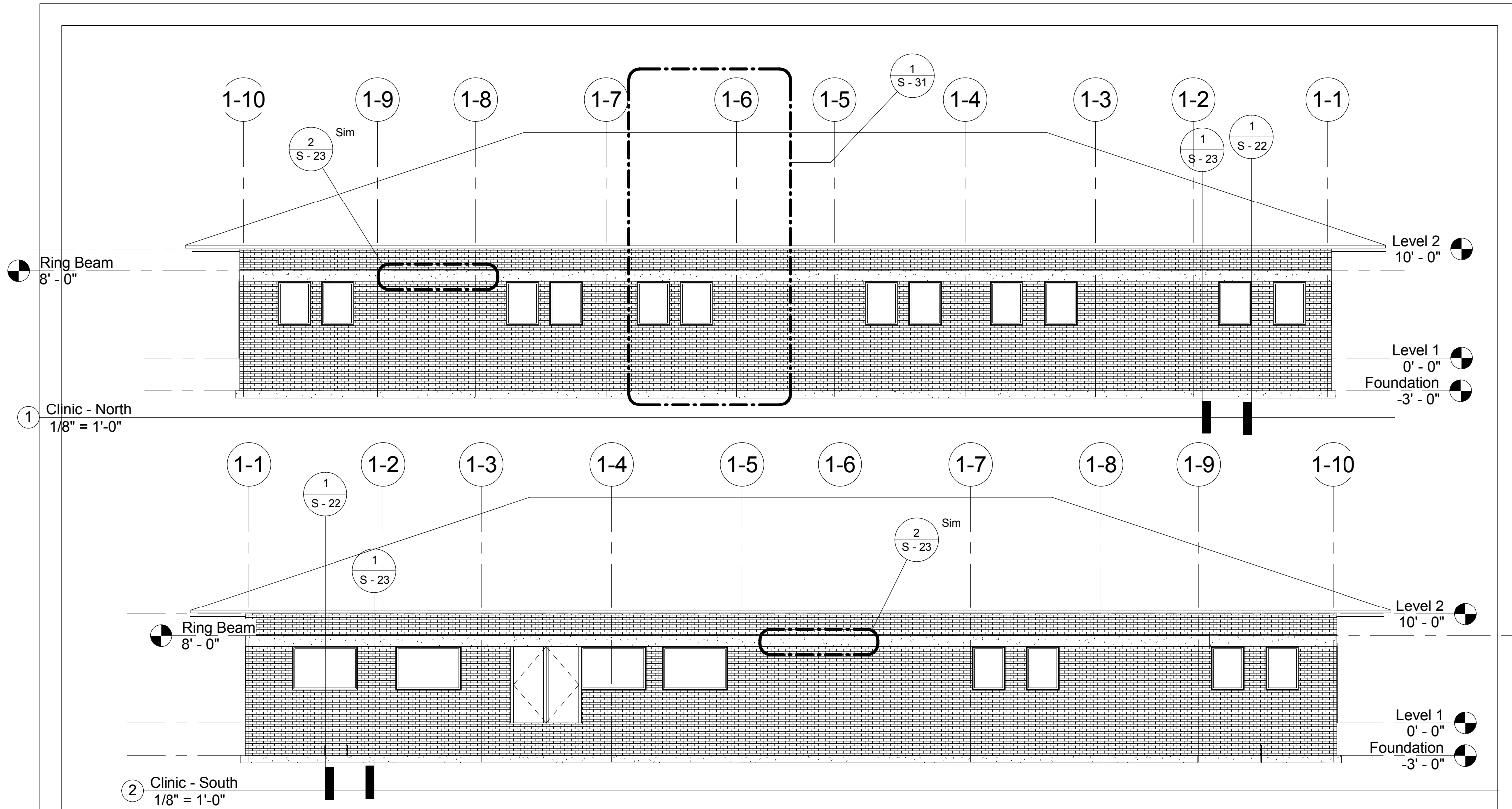


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Clinic East / West Elevations		
Date	Issue Date	S - 07
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	Scale 1/8" = 1'-0"
Project Liaison	Rachel Vranizan	

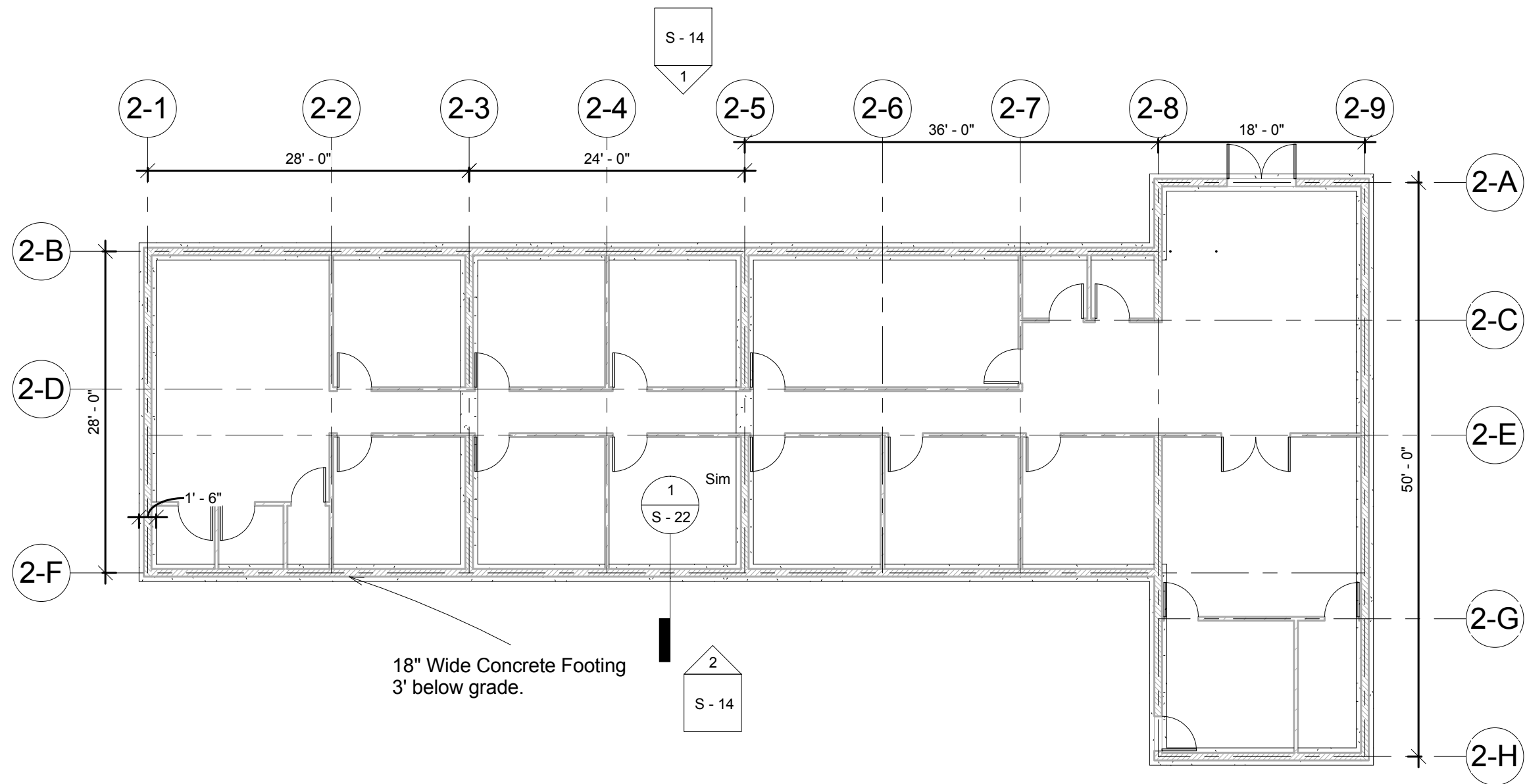


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Clinic North / South Elevations		
Date	Issue Date	S - 08
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	Scale 1/8" = 1'-0"



1 Convent Foundation Plan
1" = 10'-0"



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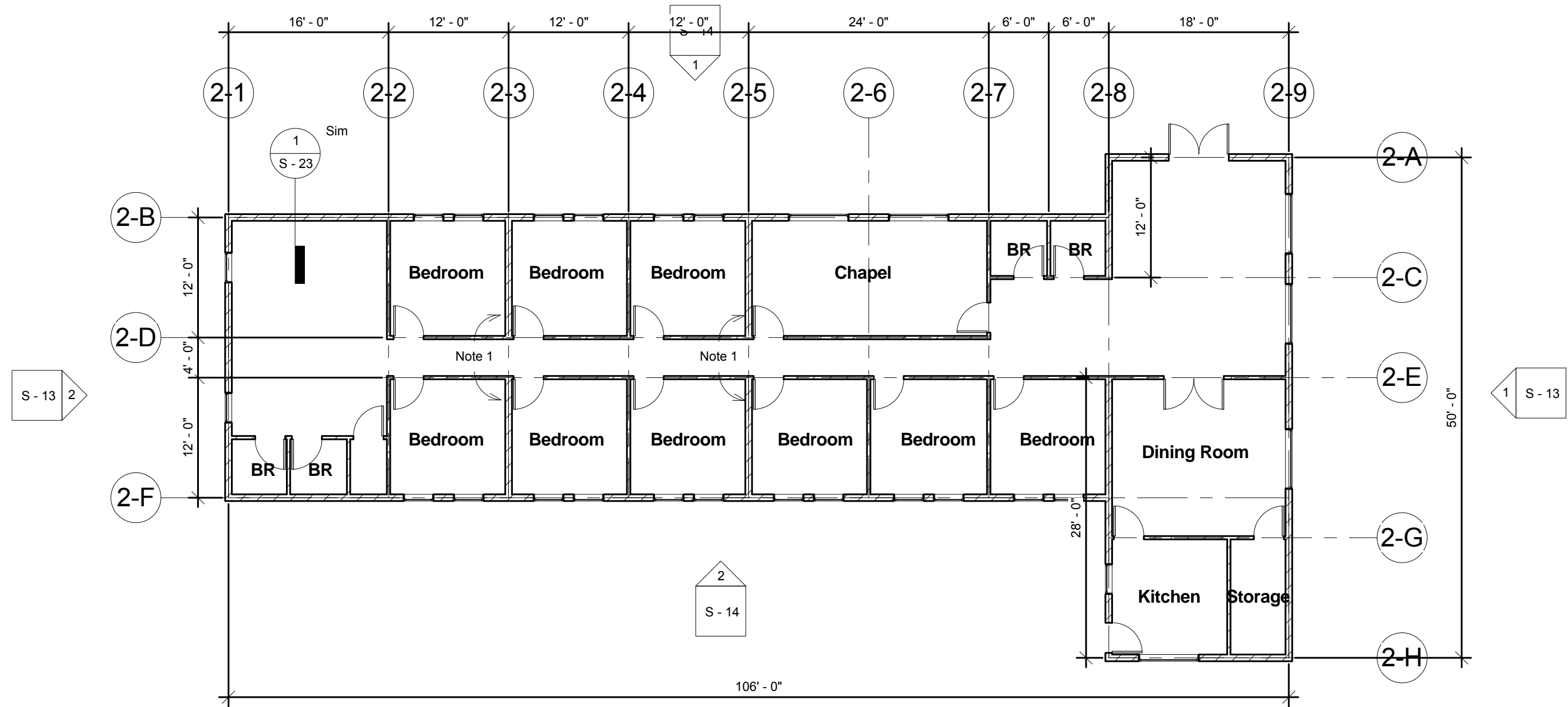
Convent Foundation Plan

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 09

Scale 1" = 10'-0"

1. Structural Shear walls will be all exterior walls of the convent and the two interior walls located at grid lines 2-3 and 1-5. See S6-01 for detail.



1 Convent Level 1
1" = 10'-0"



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Convent Plan View

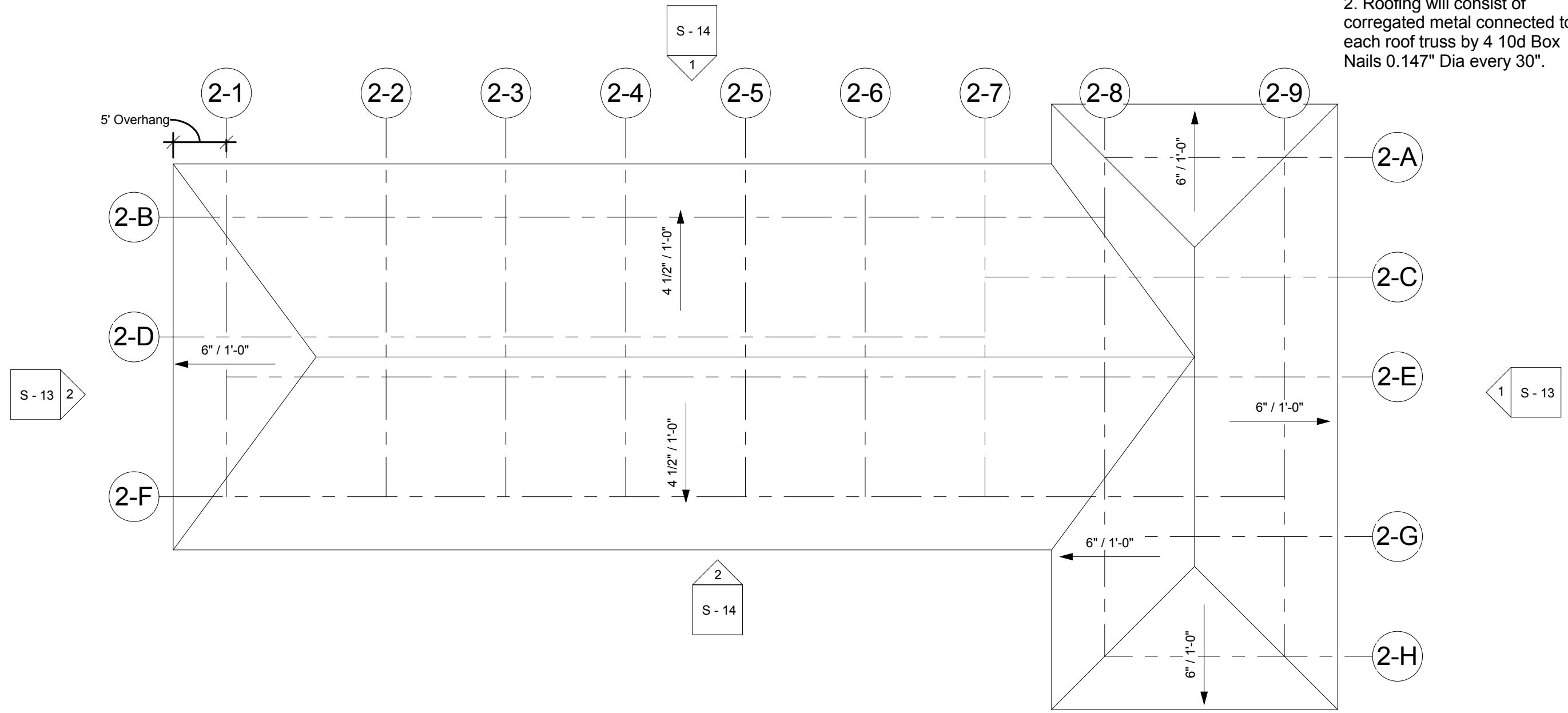
Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 10

Scale 1" = 10'-0"

1. Roof trusses will be braced by 2x4 purlins @ 2' OC running perpendicular to the top chord. See S8-01 For Detail.

2. Roofing will consist of corrugated metal connected to each roof truss by 4 10d Box Nails 0.147" Dia every 30".



1 Convent - Roof Plan
1" = 10'-0"

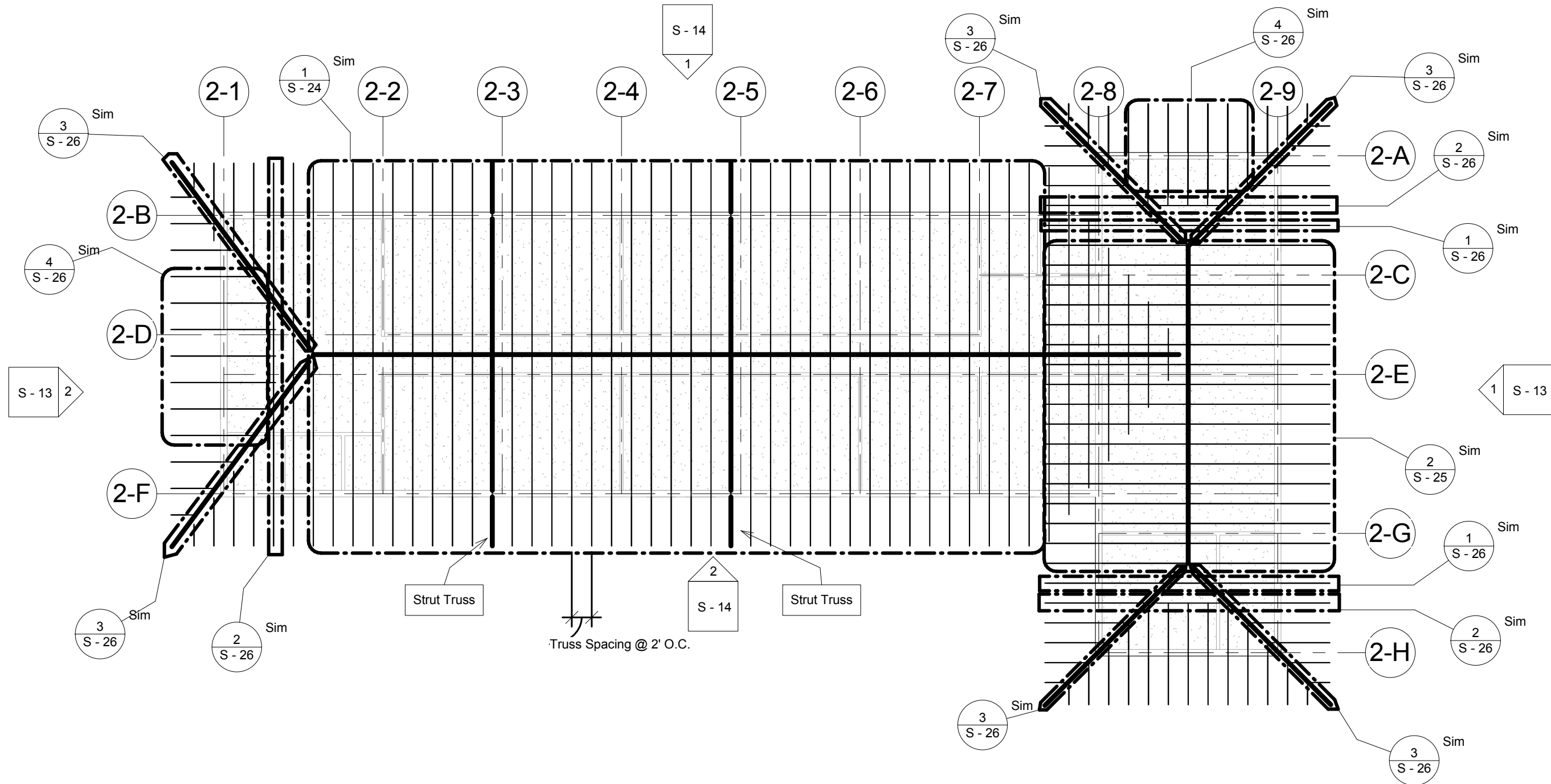


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Convent Roof Plan		
Date	Issue Date	S - 11
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	
		Scale 1" = 10'-0"



1 Convent Truss Layout
1" = 10'-0"



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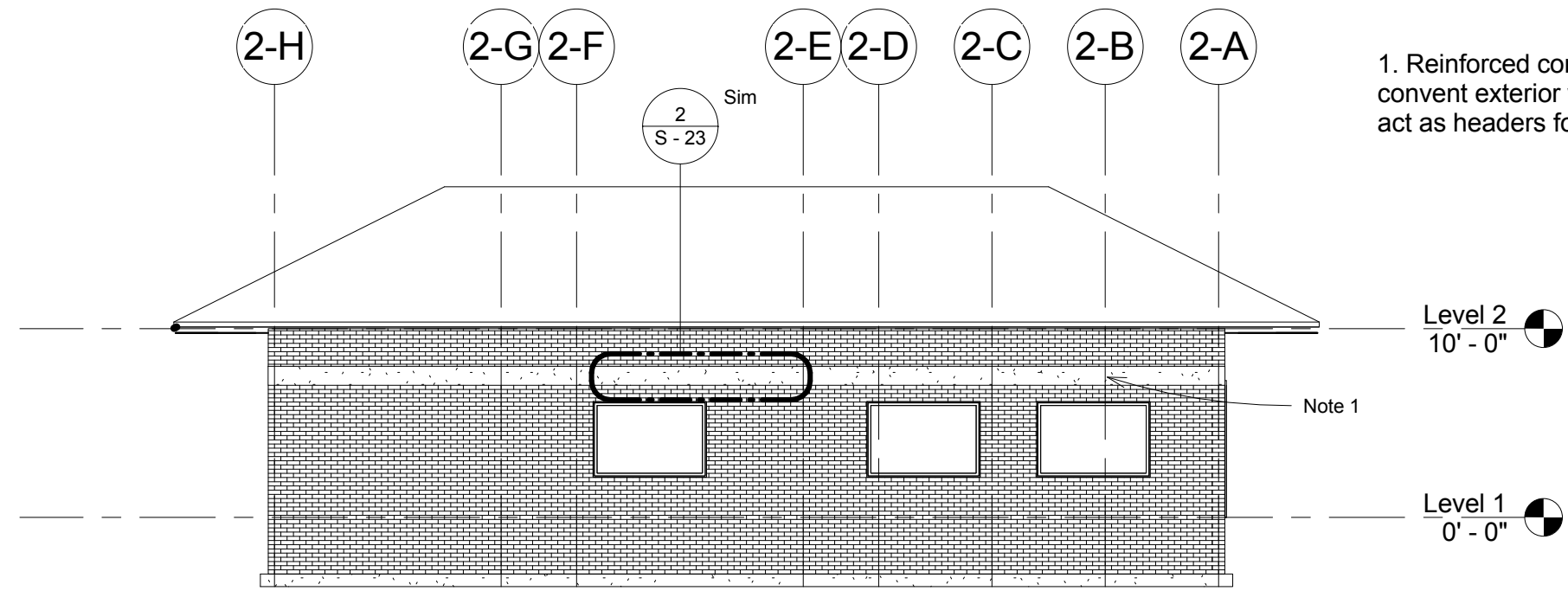
Trevor Coffman
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Convent Roof Truss Plan

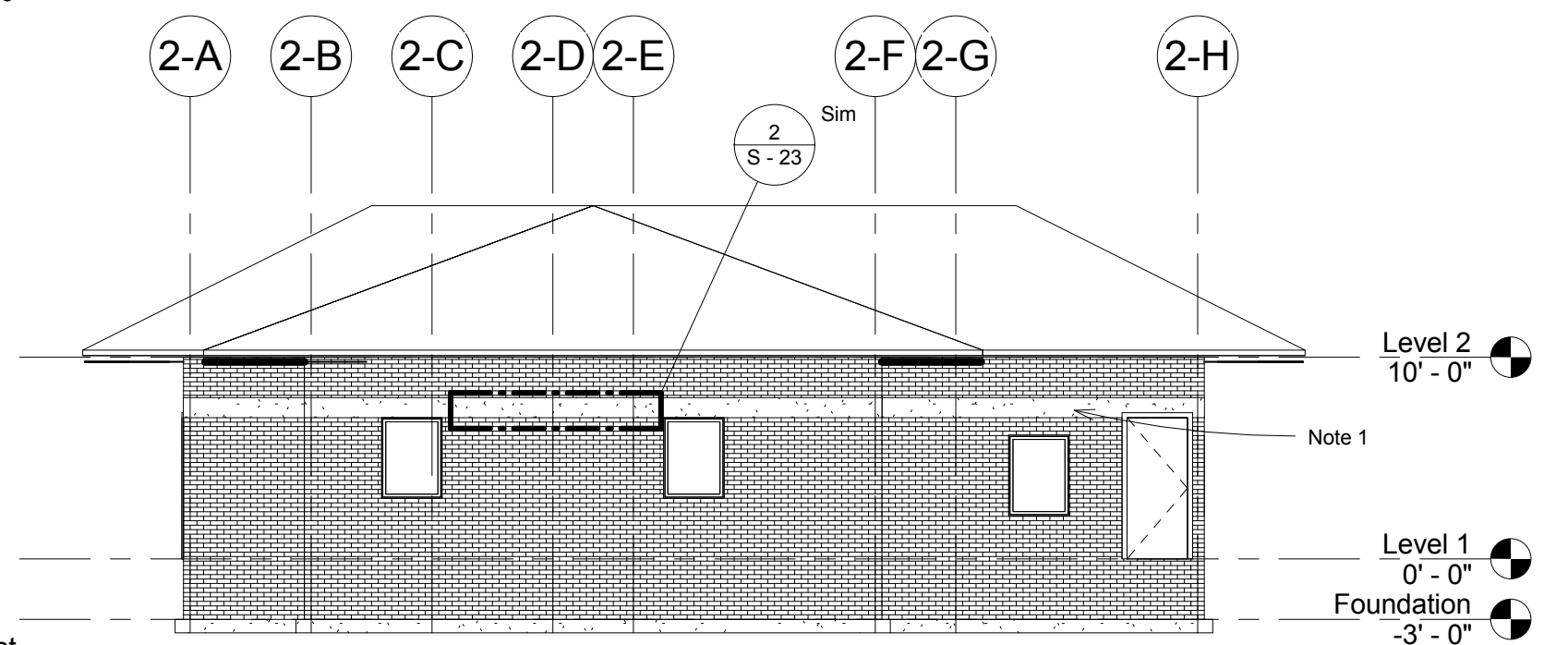
Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 12

Scale 1" = 10'-0"



① Convent - East
1/8" = 1'-0"



② Convent - West
1/8" = 1'-0"



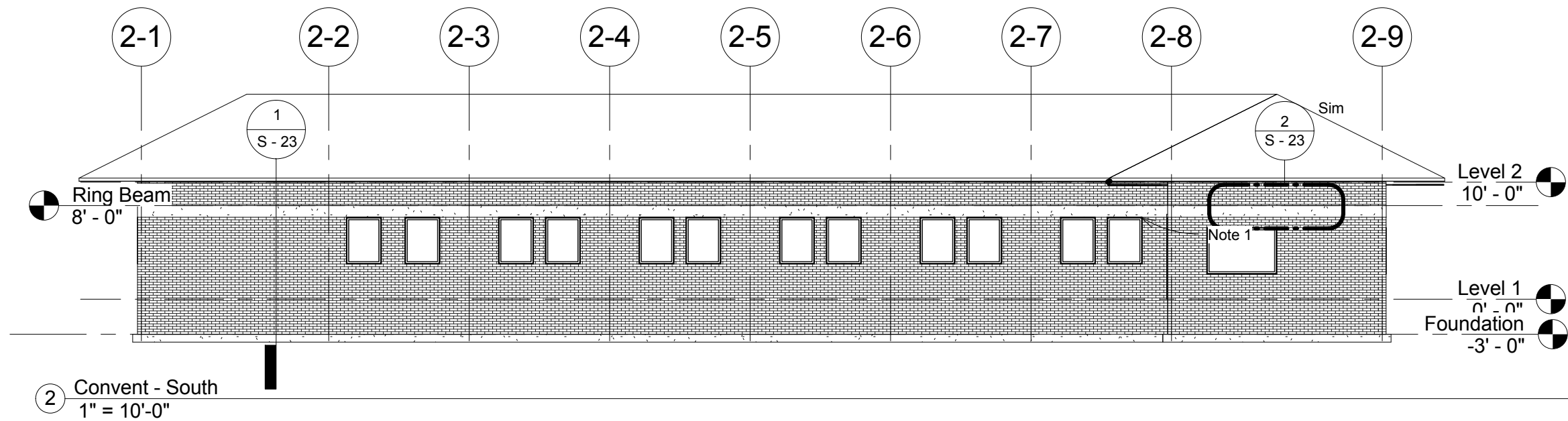
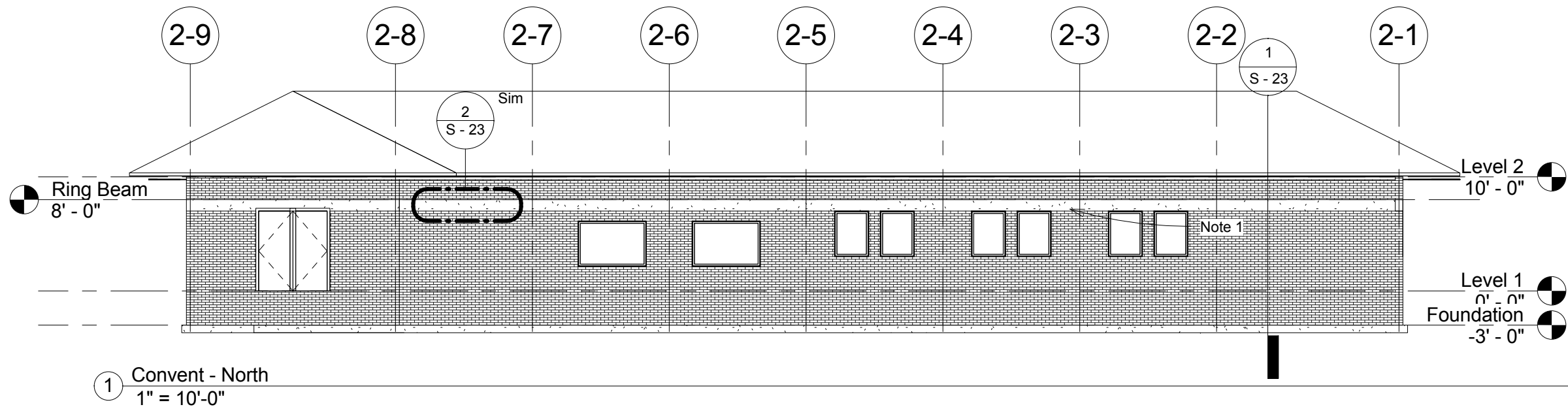
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Convent East / West Elevations		
Date	Issue Date	S - 13
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	
		Scale 1/8" = 1'-0"

1. Reinforced concrete ring beam will wrap convent exterior walls at 8' above grade and act as headers for all doors and window.



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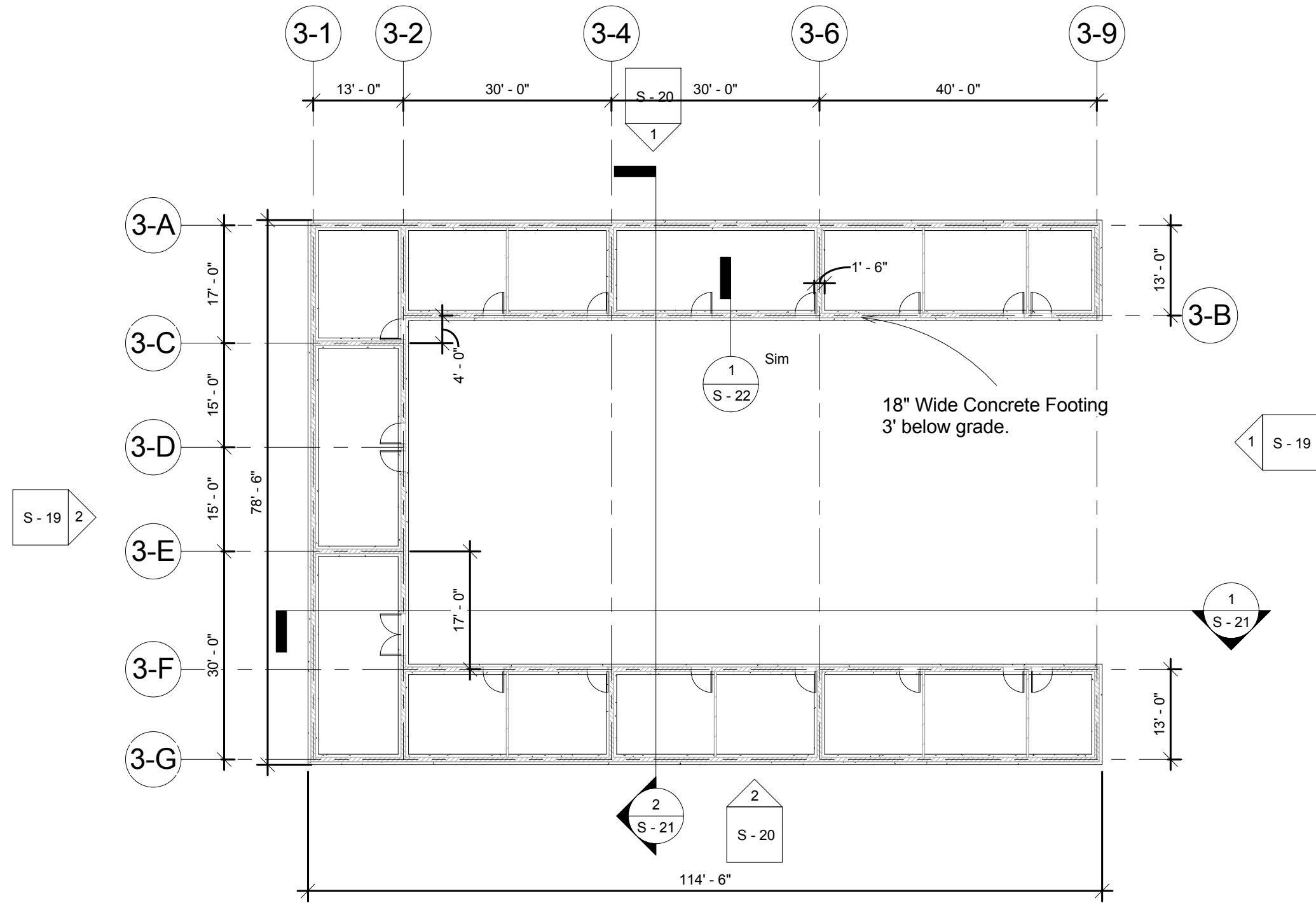
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Convent North / South Elevations

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 14

Scale 1" = 10'-0"



1 Education Center Foundation Plan
 1/16" = 1'-0"



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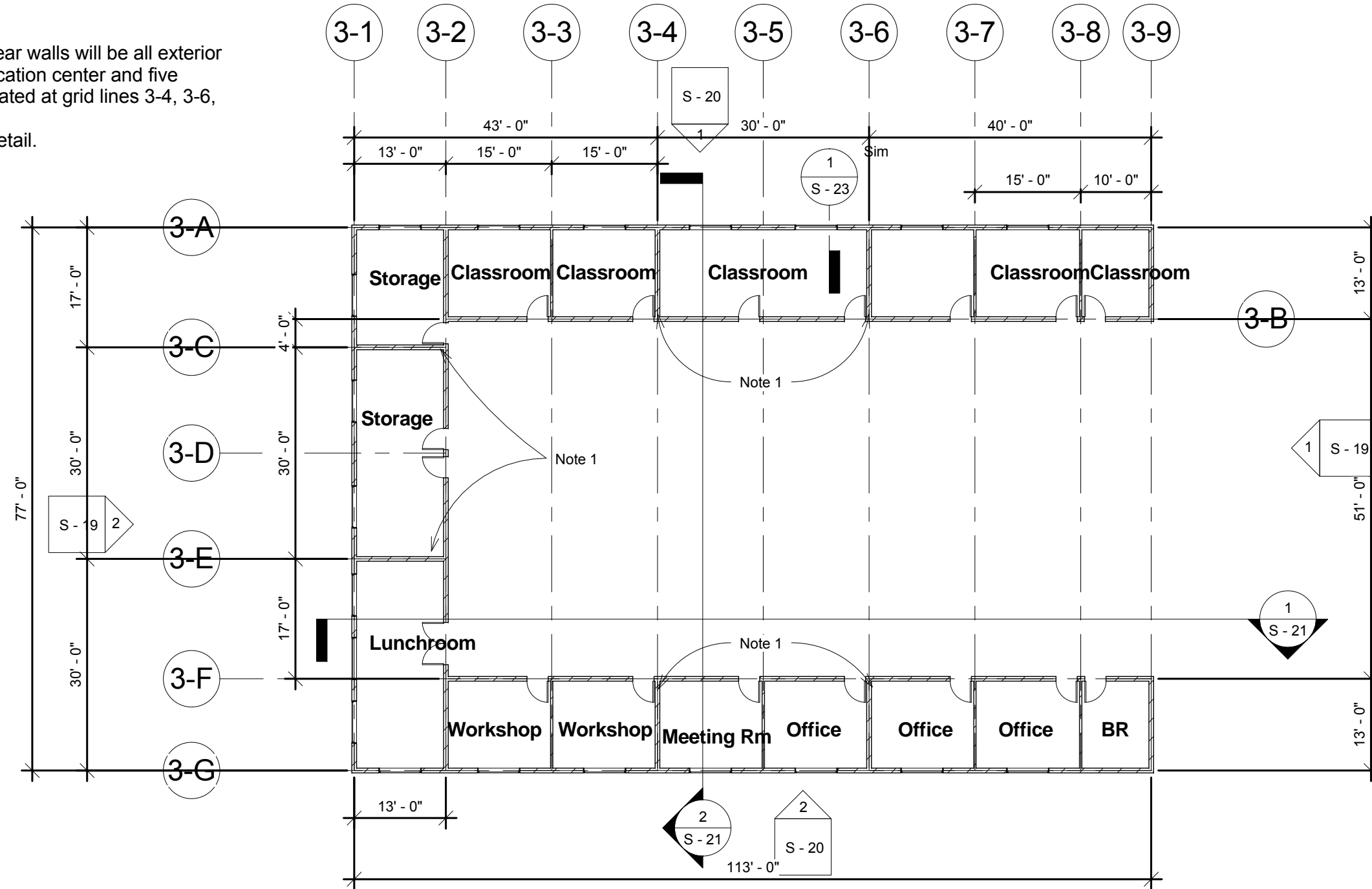
Education Center Foundation Plan

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 15

Scale 1/16" = 1'-0"

1. Structural Shear walls will be all exterior walls of the education center and five interior walls located at grid lines 3-4, 3-6, 3-C, and 3-E.
See S6-01 for detail.



1 Education Center Level 1
1/16" = 1'-0"



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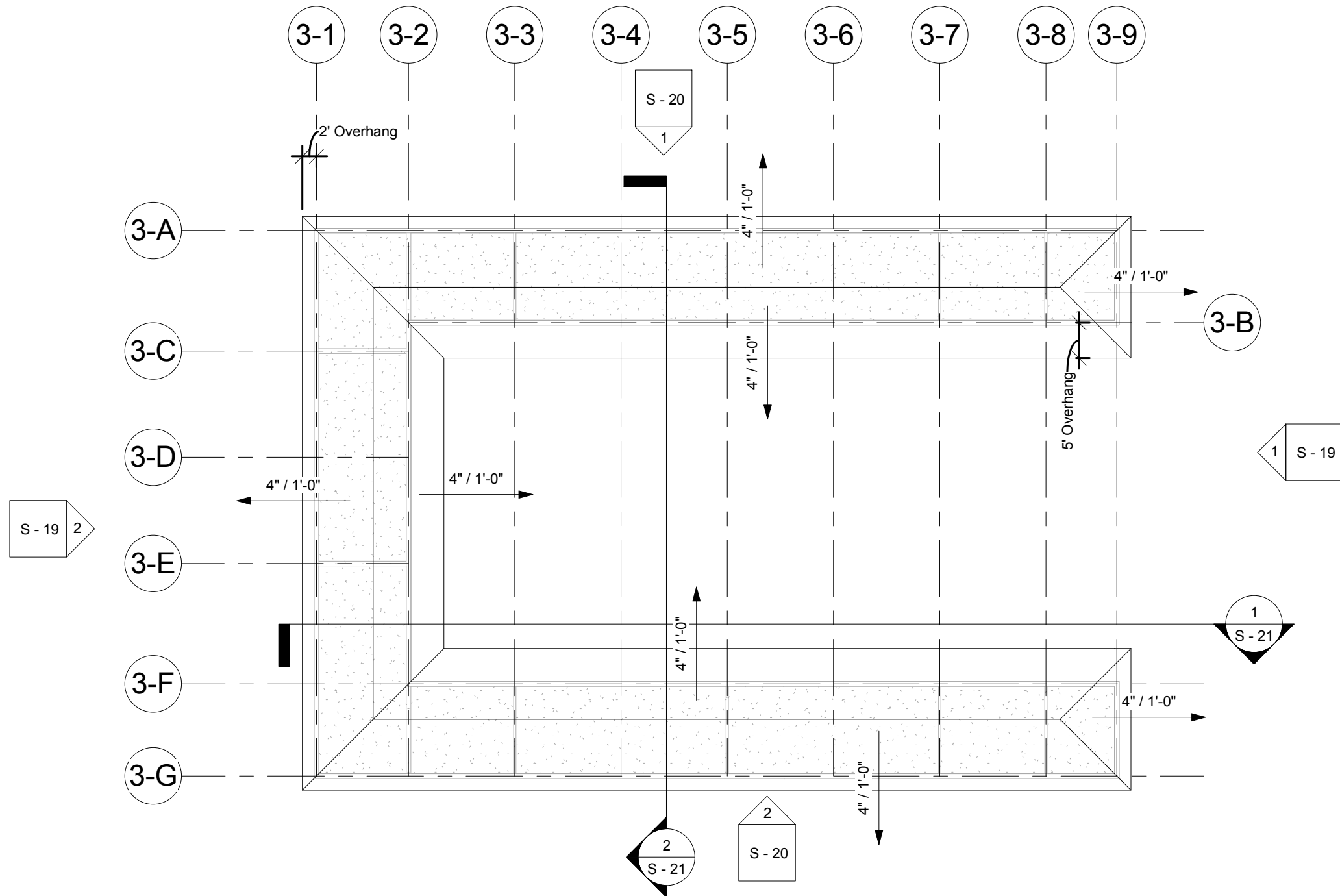
Trevor Coffman
Andrew McAferty
Steven Millett

Education Center Plan View

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 16

Scale 1/16" = 1'-0"



1. Roof trusses will be braced by 2x4 purlins @ 2' OC running perpendicular to the top chord. See S8-01 For Detail.
2. Roofing will consist of corrugated metal connected to each roof truss by 4 10d Box Nails 0.147" Dia every 30".

1 Education Center - Roof Plan
1/16" = 1'-0"

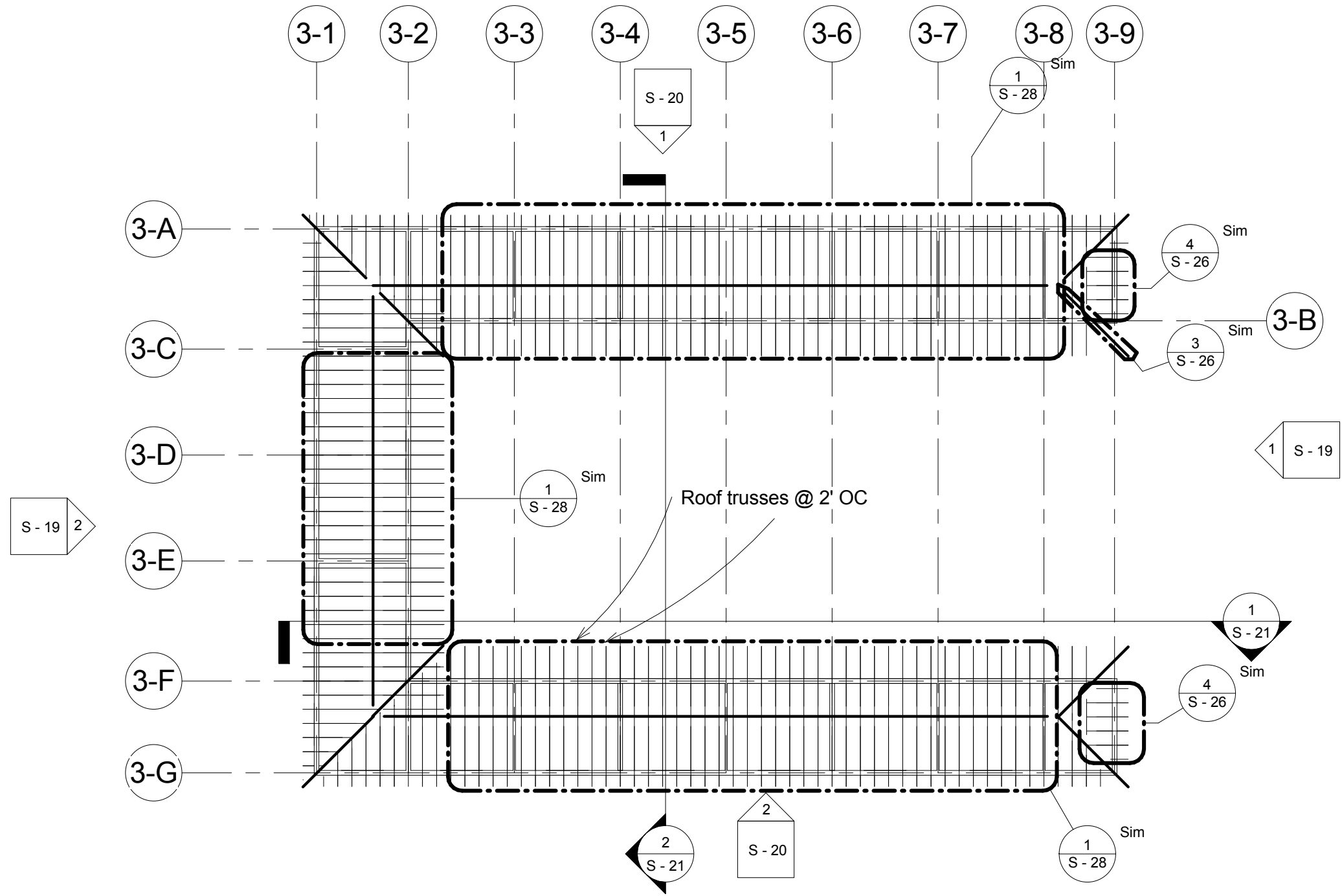


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Education Center Roof Plan		
Date	Issue Date	S - 17
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	
		Scale 1/16" = 1'-0"



1 Education Center Truss Layout
1/16" = 1'-0"

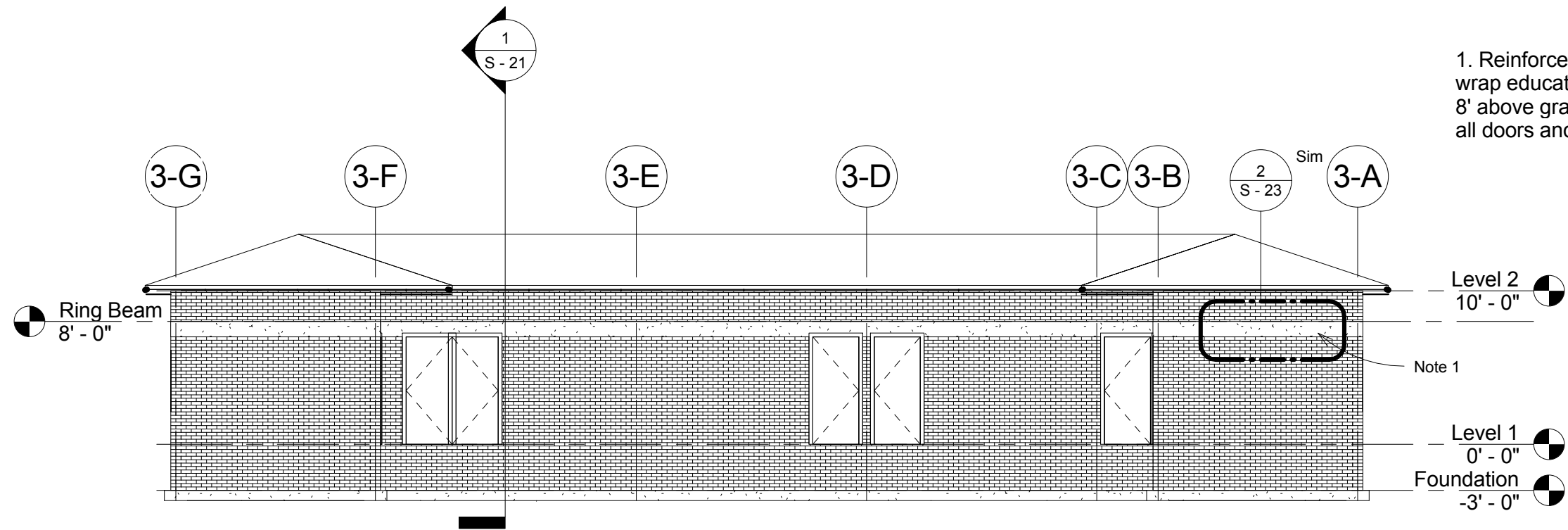


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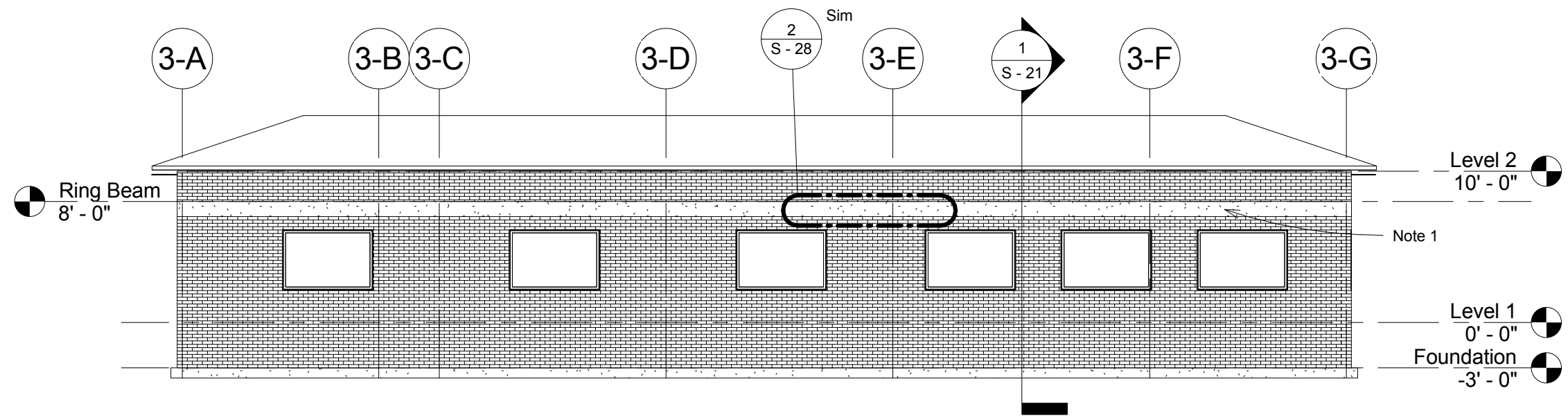
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Steven Millett

Education Center Roof Truss Plan		
Date	Issue Date	S - 18
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	Scale 1/16" = 1'-0"
Project Liaison	Rachel Vranizan	



1. Reinforced concrete ring beam will wrap education center exterior walls at 8' above grade and act as headers for all doors and window.

1 Education Center - East
1/8" = 1'-0"



2 Education Center - West
1/8" = 1'-0"

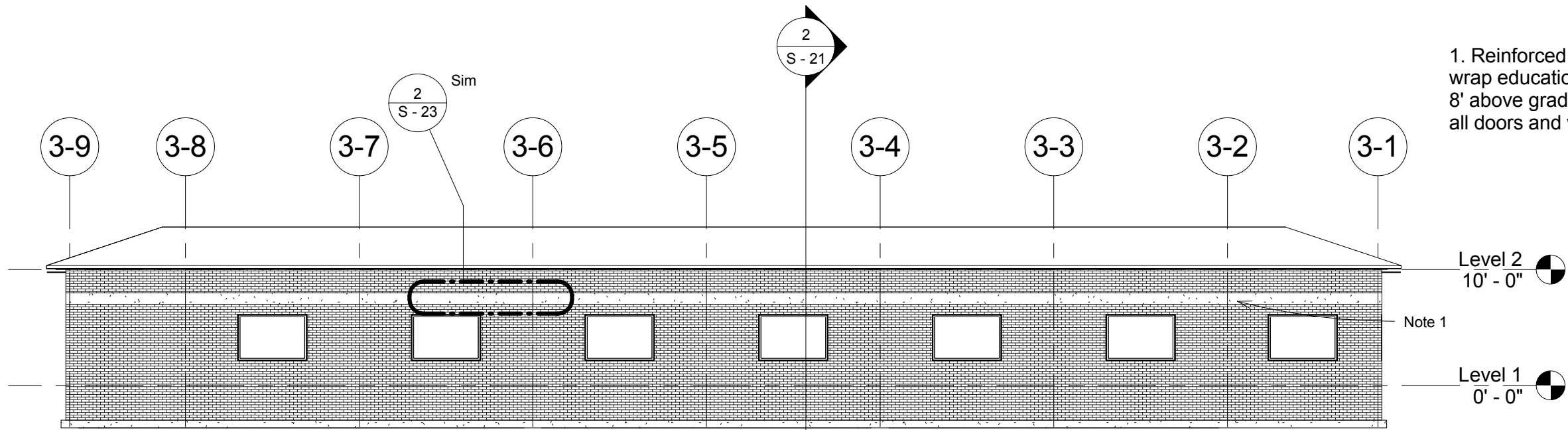


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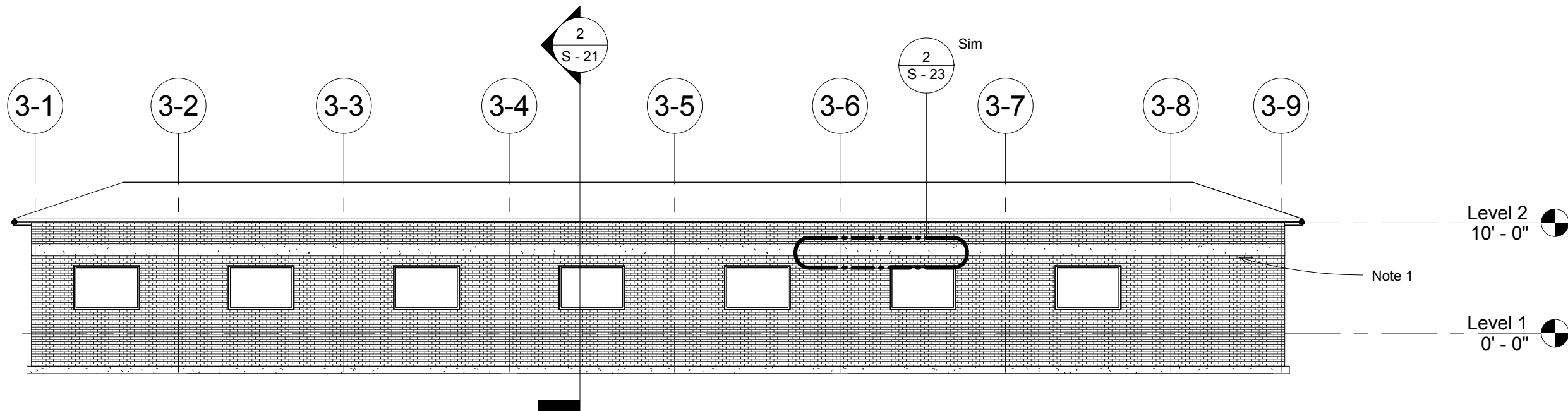
Team CEE 16.5
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Andrew McAferty
Steven Millett

Ed. Center East / West Elevations		
Date	Issue Date	S - 19
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	
		Scale 1/8" = 1'-0"



1. Reinforced concrete ring beam will wrap education center exterior walls at 8' above grade and act as headers for all doors and window.

① Education Center - North
1" = 10'-0"



② Education Center - South
1" = 10'-0"



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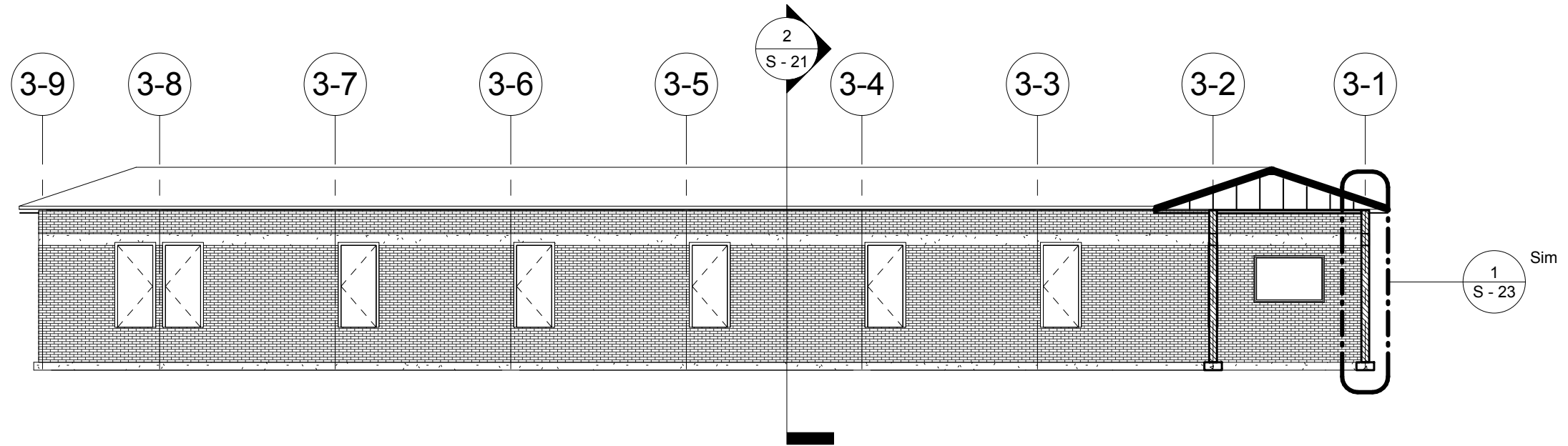
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Andrew McAferty
Steven Millett

Ed. Center North / South Elev.

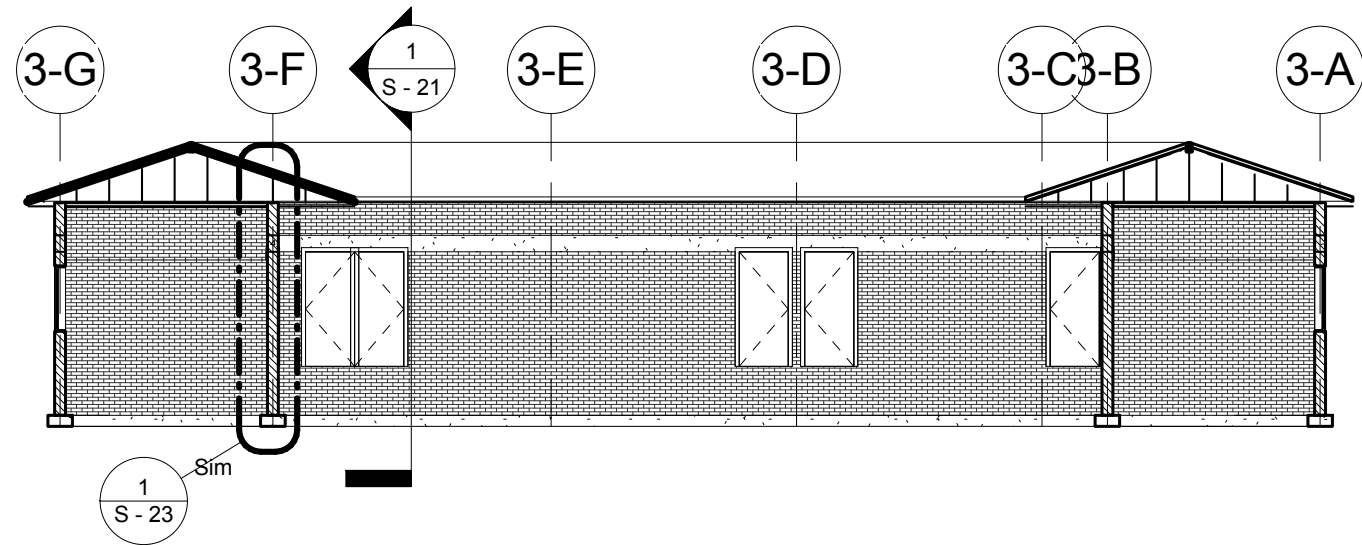
Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 20

Scale 1" = 10'-0"



1 Section 1
3/32" = 1'-0"



2 Section 2
3/32" = 1'-0"



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Ed. Center Sections

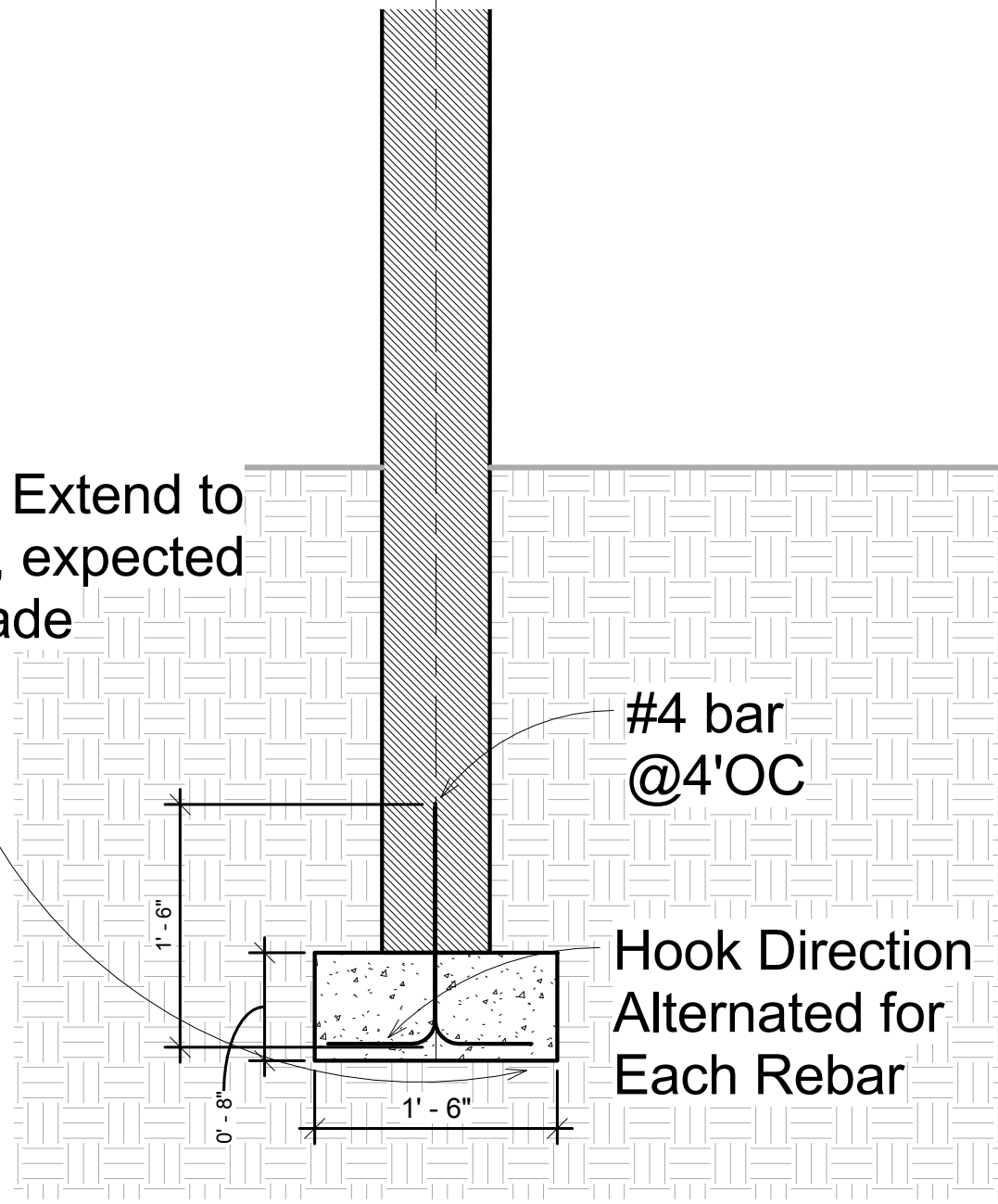
Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 21

Scale 3/32" = 1'-0"

2-B

Strip Footing Will Extend to depth of bedrock, expected to be 3' below grade



#4 bar @4'OC

Hook Direction Alternated for Each Rebar

1 Typical Foundation, 3' Deep
1" = 1'-0"

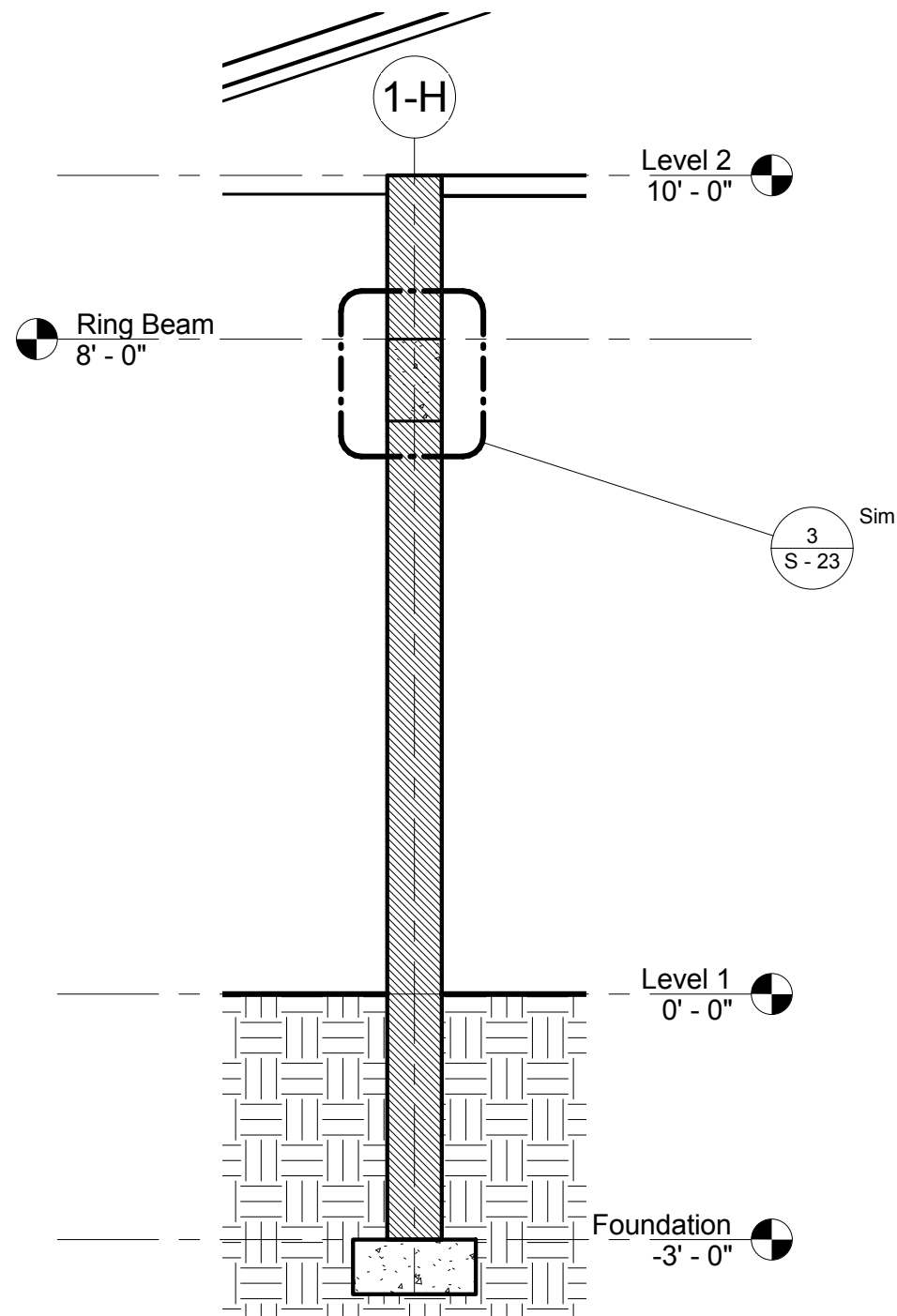


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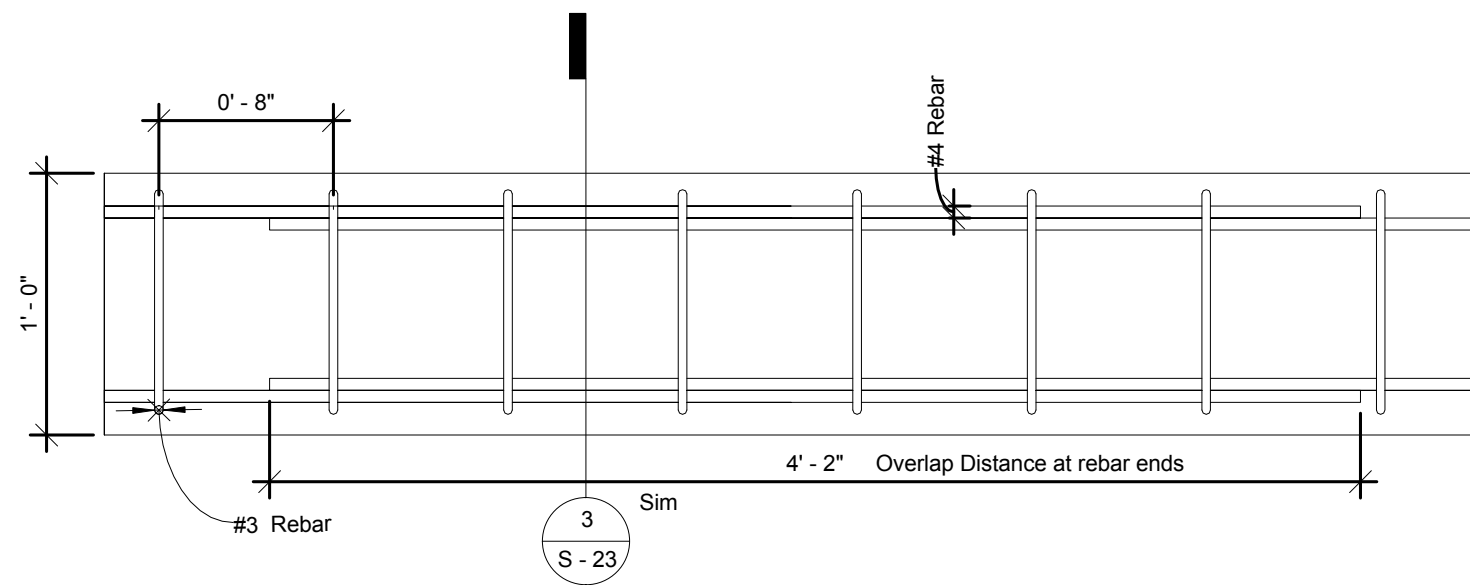
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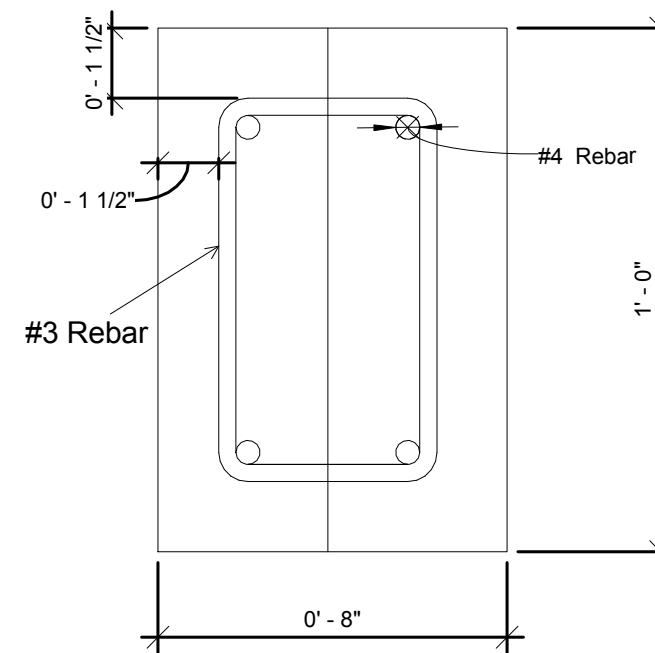
Foundation Details		
Date	Issue Date	S - 22
Faculty Advisor	Dr. Nathan Canney	
Project Liaison	Cory Hitzemann	
Project Liaison	Rachel Vranizan	Scale 1" = 1'-0"



1 Shear Wall Typical
1/2" = 1'-0"



2 Ring Beam Side View
1 1/2" = 1'-0"



3 Ring Beam Cross Section
3" = 1'-0"



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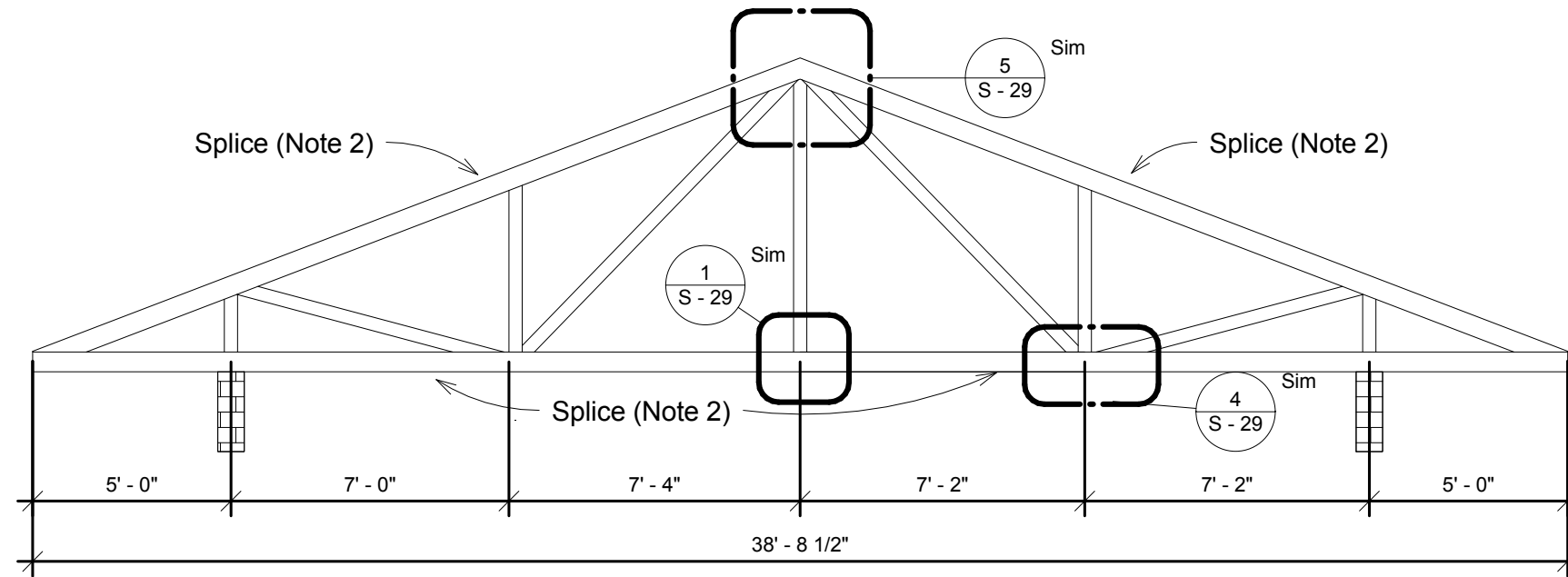
Trevor Coffman
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Steven Millett

Shear Wall Details

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 23

Scale As indicated

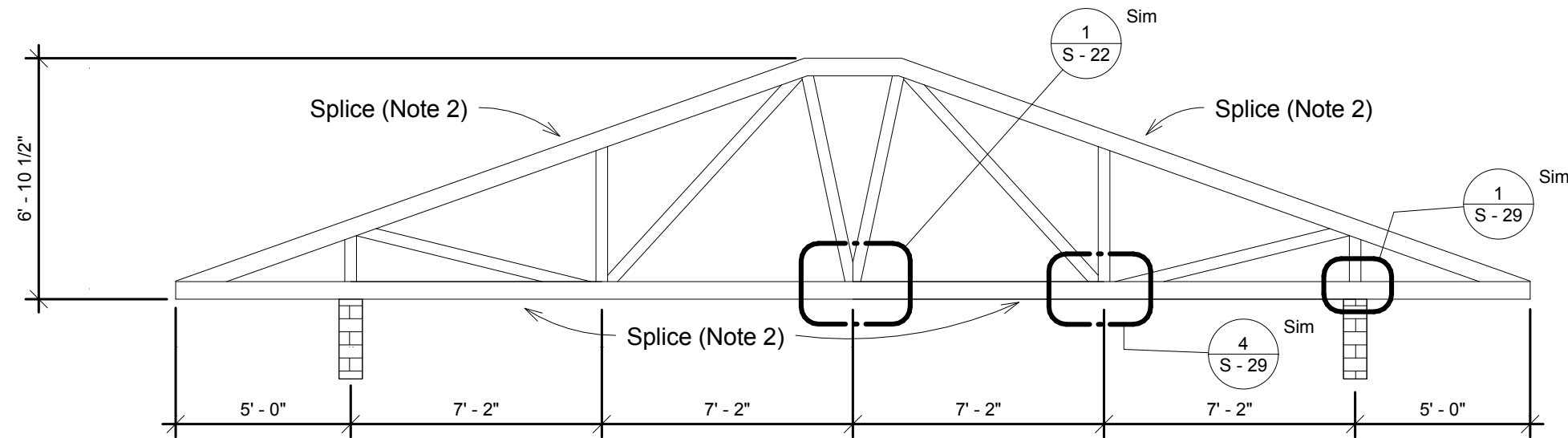


1 Convent Neck Main Truss
1/4" = 1'-0"

1. For Convent Trusse Sizing:

Top Chord: 4x6
Bottom Chord: 4x6
Inner Chord: 4x4

2. Typical Splice Detail on S9-02



2 Convent Neck Hip 1
1/4" = 1'-0"



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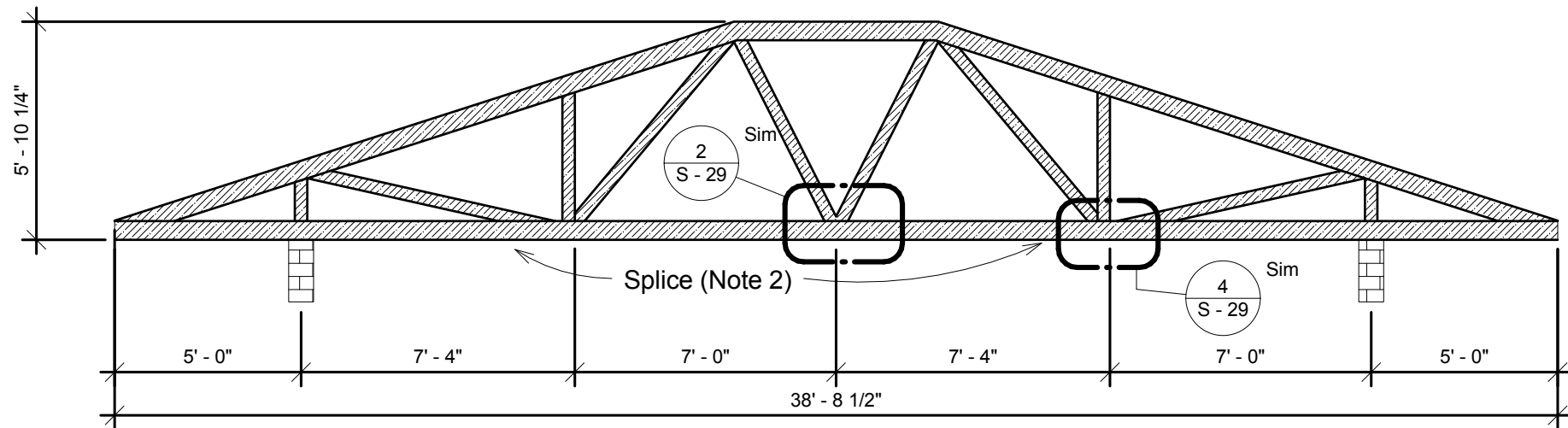
Trevor Coffman
Andrew McAferty
Steven Millett

Roof Truss Details

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

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Scale 1/4" = 1'-0"

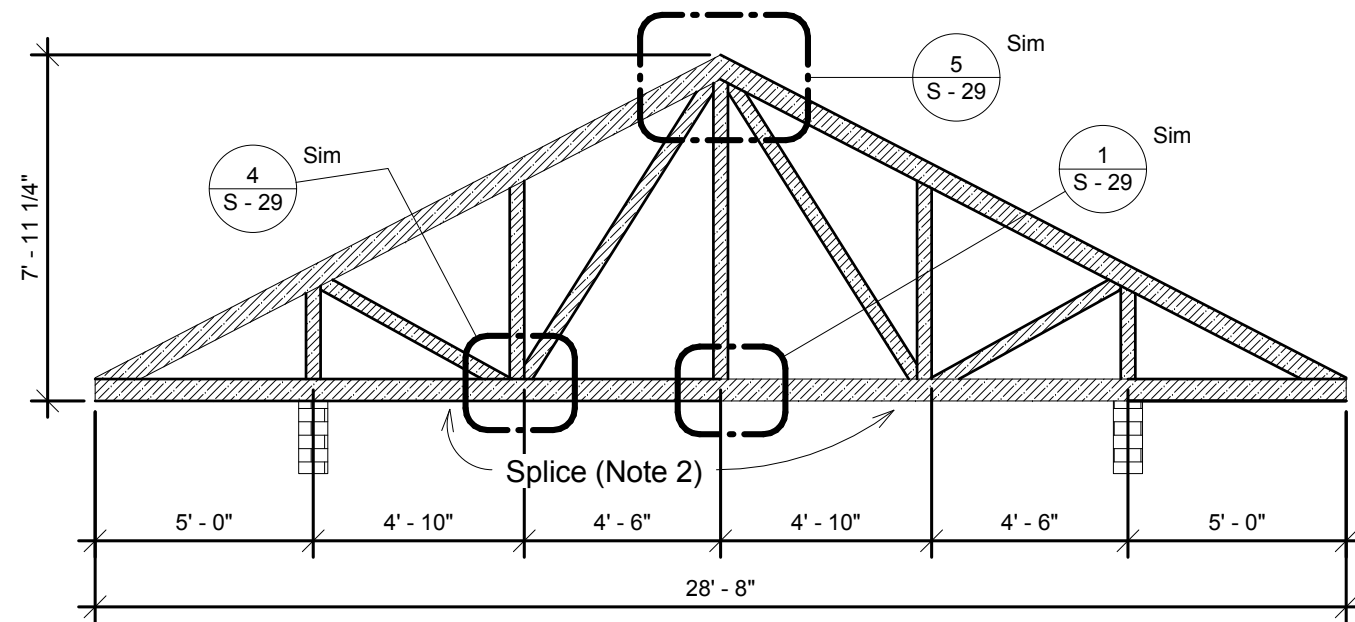


1. For Convent Trusse Sizing:

Top Chord: 4x6
 Bottom Chord: 4x6
 Inner Chord: 4x4

2. Typical Splice Detail on S9-02

① Convent Neck Hip 2
 1/4" = 1'-0"



② Convent T Main Truss
 1/4" = 1'-0"



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 Steven Millett

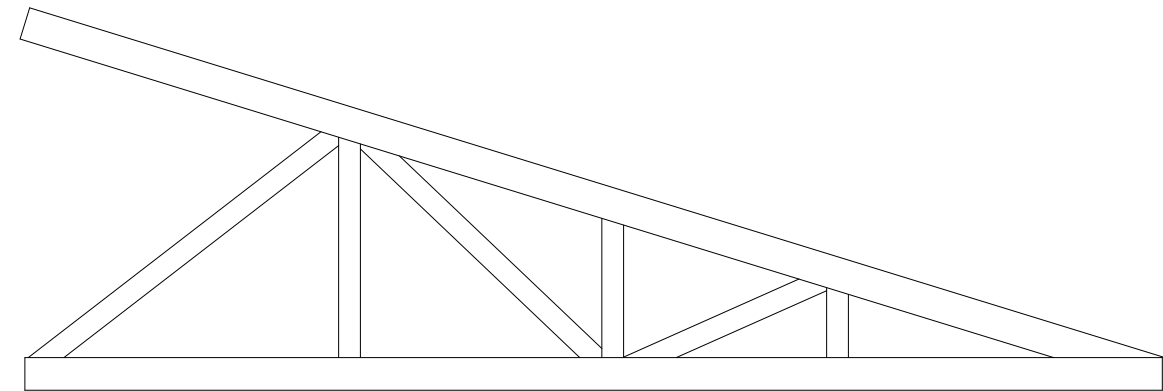
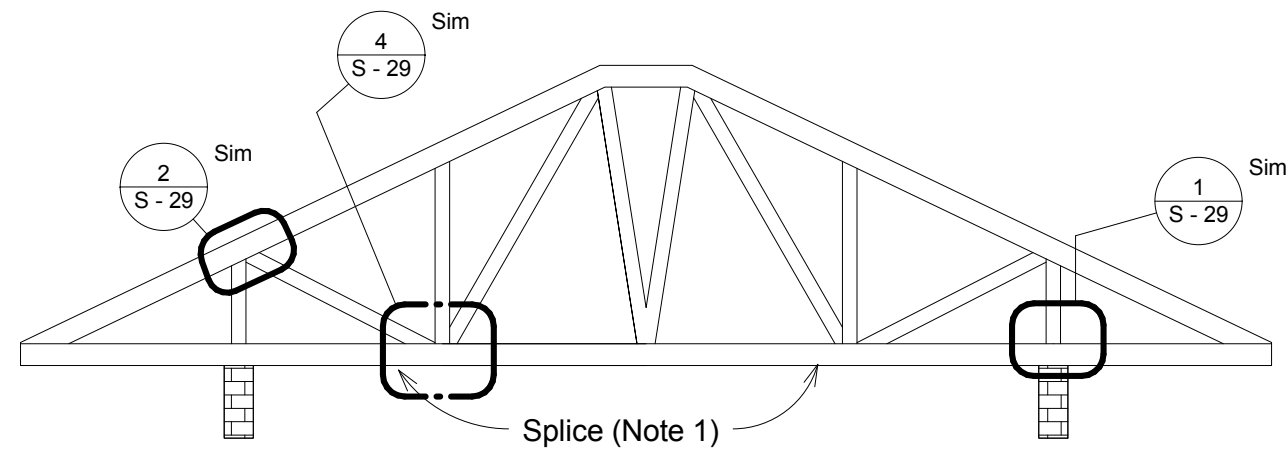
Roof Truss Details

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

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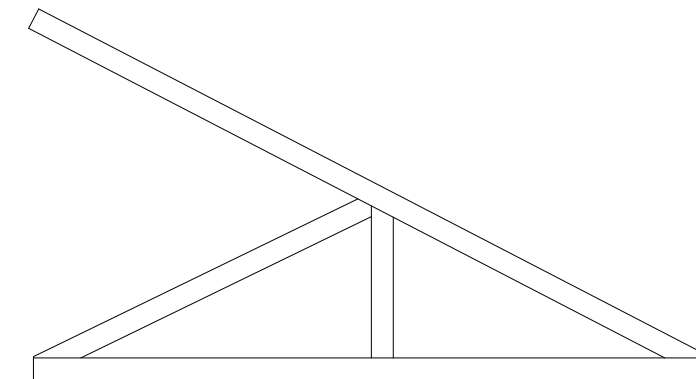
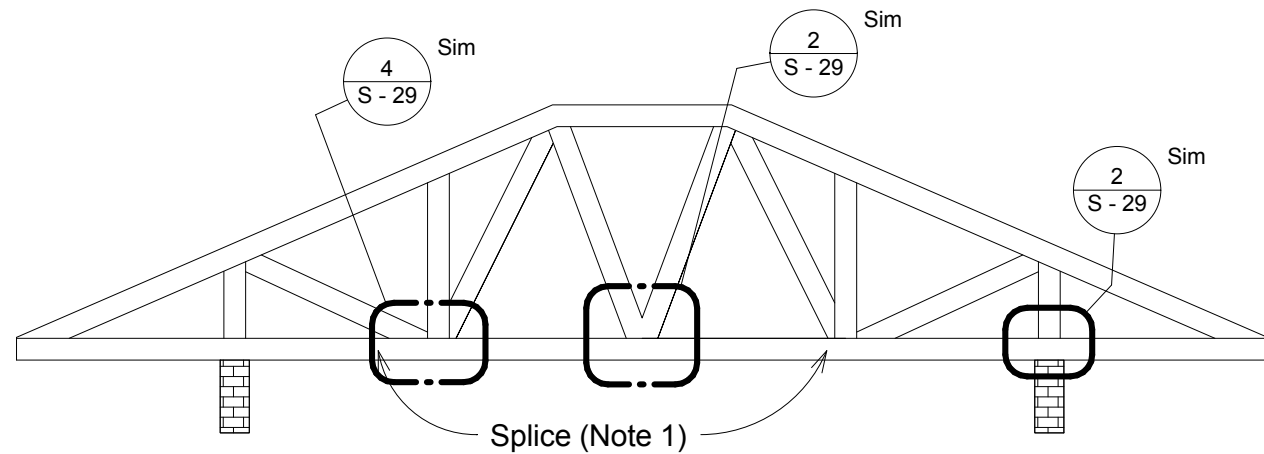
Scale 1/4" = 1'-0"

1. Typical Splice Detail on S9-02



1 Convent T Hip 1
1/4" = 1'-0"

3 Diagonal Truss Typ.
3/8" = 1'-0"



2 Convent T Hip 2
1/4" = 1'-0"

4 End Truss Typ.
3/8" = 1'-0"



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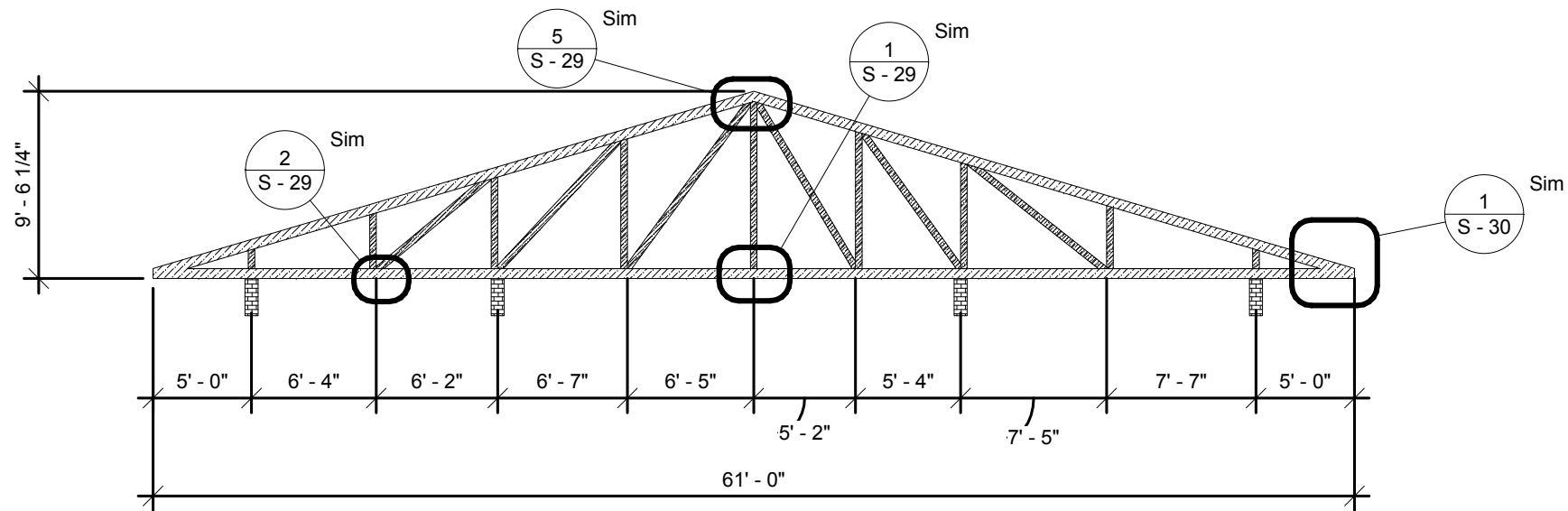
Trevor Coffman
Andrew McAferty
Steven Millett

Roof Truss Details

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

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Scale As indicated

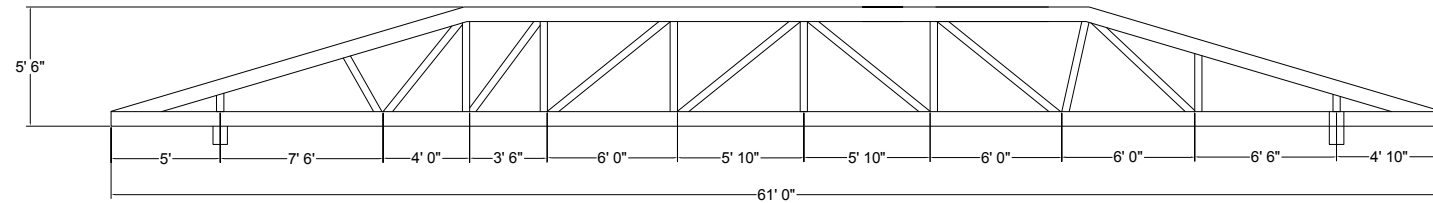


1. For Clinic Truss Sizing:

Top Chord: 4x8
 Bottom Chord: 4x8
 Inner Chord: 4x4

2. Typical Splice Detail on S9-02

① Clinic Main Truss
 1/8" = 1'-0"



② Clinic Hip Typ.
 1/8" = 1'-0"



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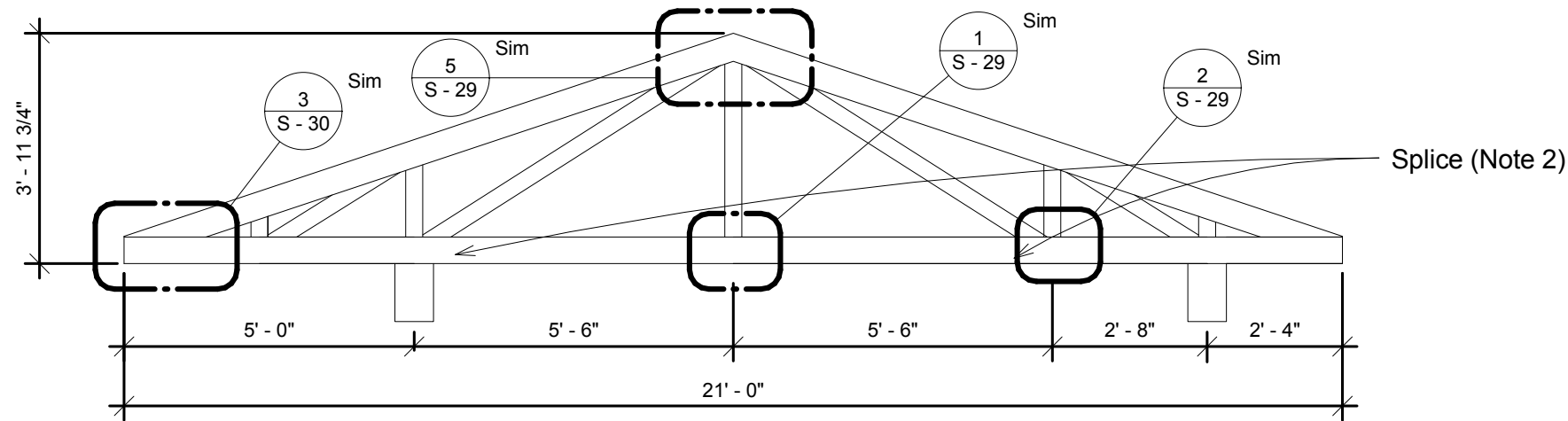
Trevor Coffman
 Andrew McAferty
 Steven Millett

Roof Truss Details

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

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Scale 1/8" = 1'-0"

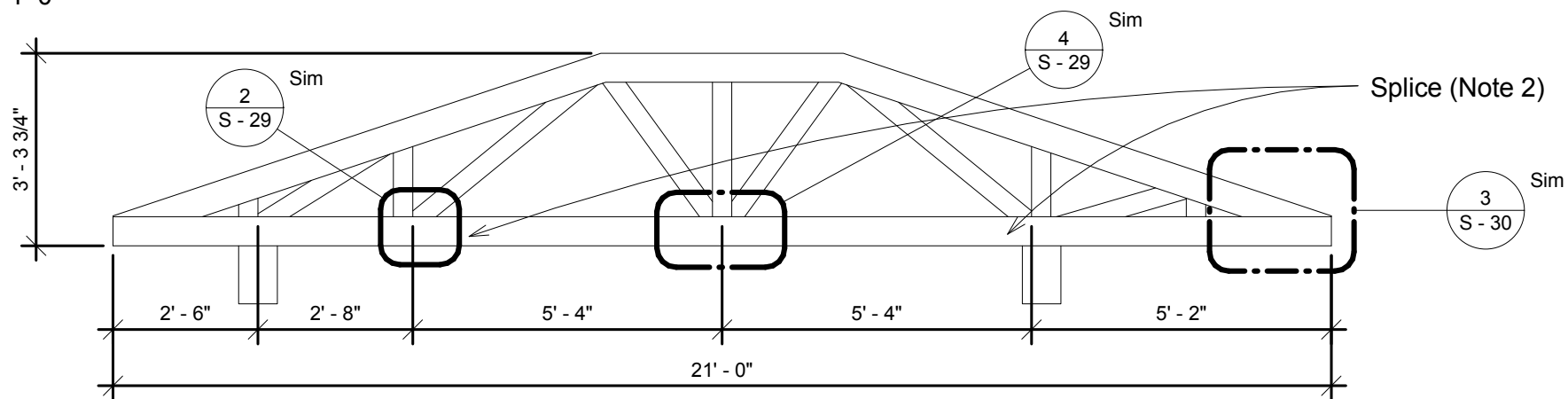


1. For Education Center Truss Sizing:

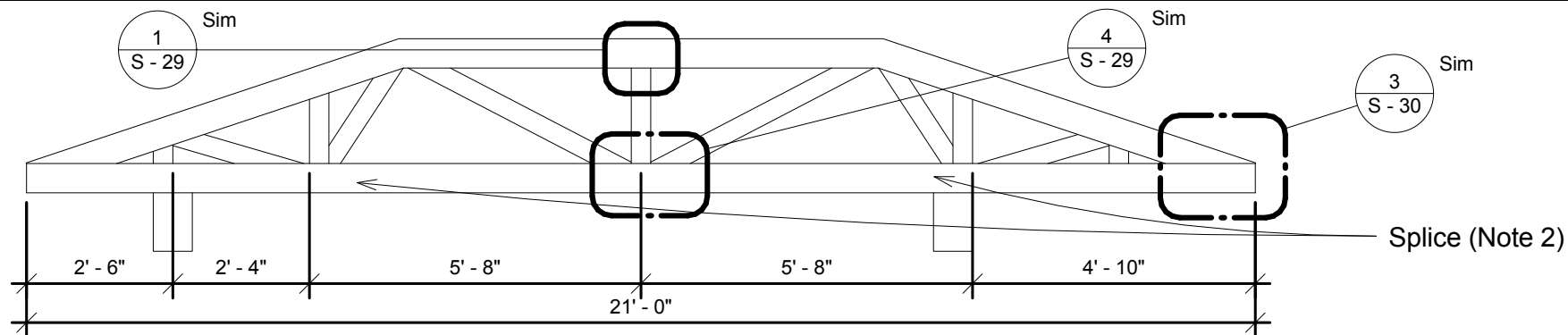
Top Chord: 4x6
 Bottom Chord: 4x6
 Inner Chord: 4x4

2. Typical Splice Detail on S9-02

① Education Center Main Truss
 3/8" = 1'-0"



② Education Center Hip 1
 3/8" = 1'-0"



③ Education Center Hip 2
 3/8" = 1'-0"



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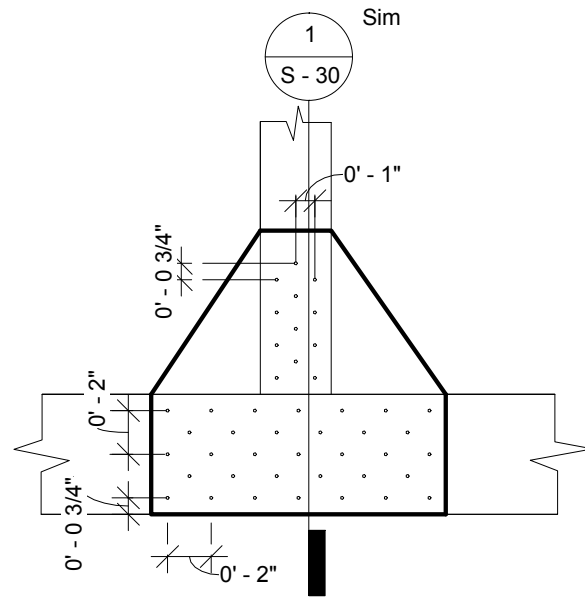
Trevor Coffman
 Andrew McAferty
 Steven Millett

Roof Truss Details

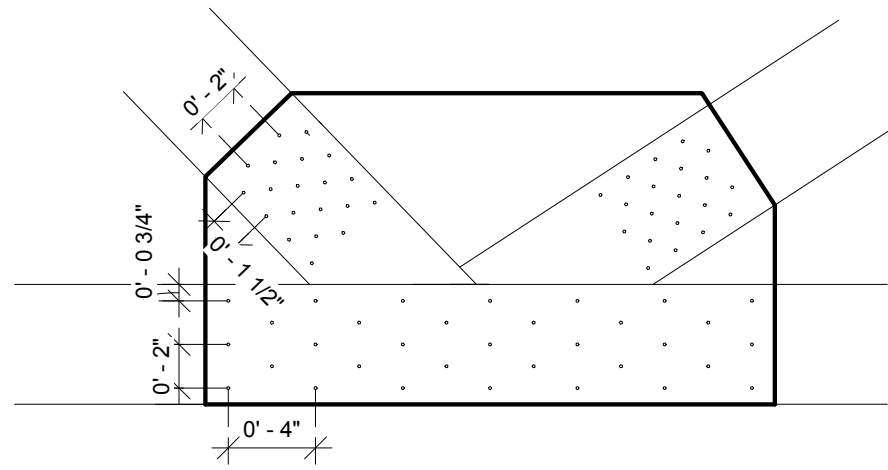
Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

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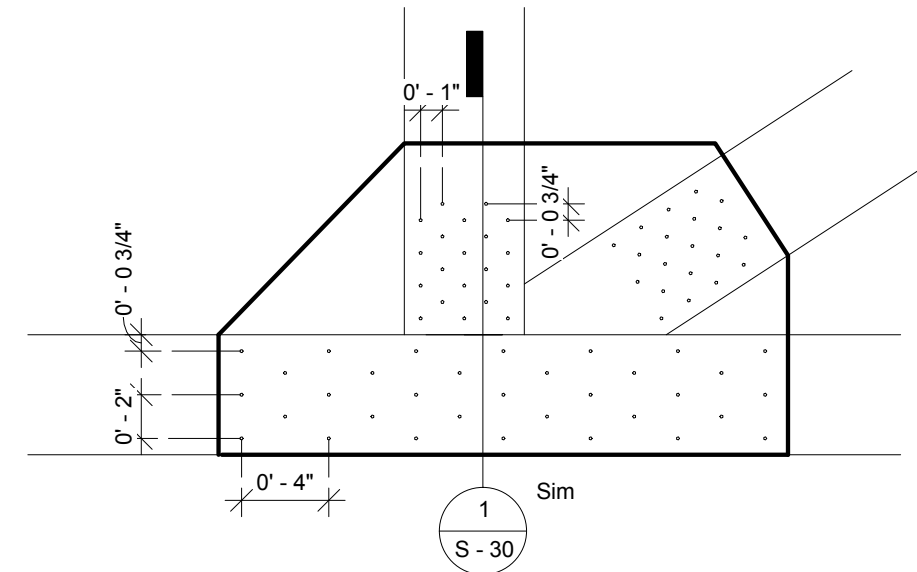
Scale 3/8" = 1'-0"



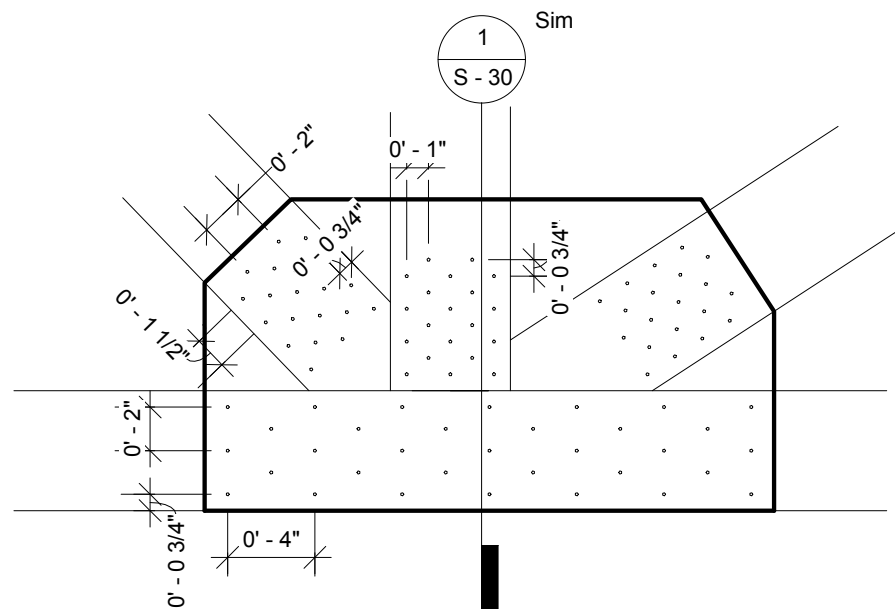
① 1 Member Chord Connection
1 1/2" = 1'-0"



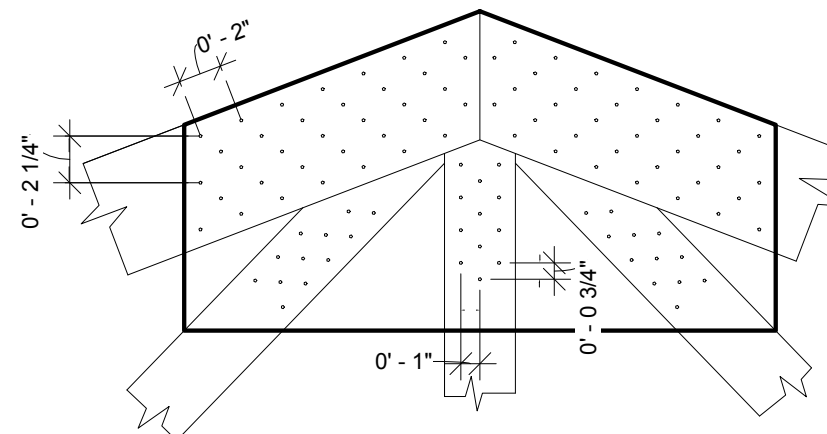
② 2 Member Chord Connection Type 1
1 1/2" = 1'-0"



③ 2 Member Connection Type 2
1 1/2" = 1'-0"



④ 3 Member Chord Connection
1 1/2" = 1'-0"



⑤ 3 Member Chord Connection Type 2
1 1/2" = 1'-0"

1. All nailing used for connection must be 10d Box Nails 0.147" Dia.
2. Inner chord members require 22 nails to connect to gusset plates.
3. Top and Bottom chord members require 51 nails.
4. Connection details are designed with withstand 3000 lbs tension in each of the inner chord members.



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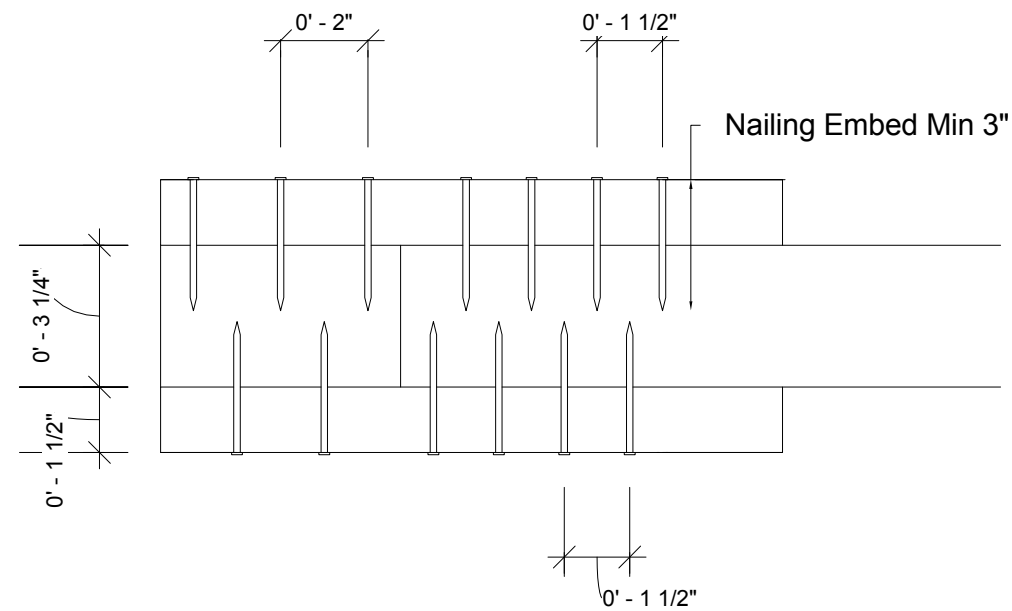
Trevor Coffman
Andrew McAferty
Steven Millett

Roof Connection Details

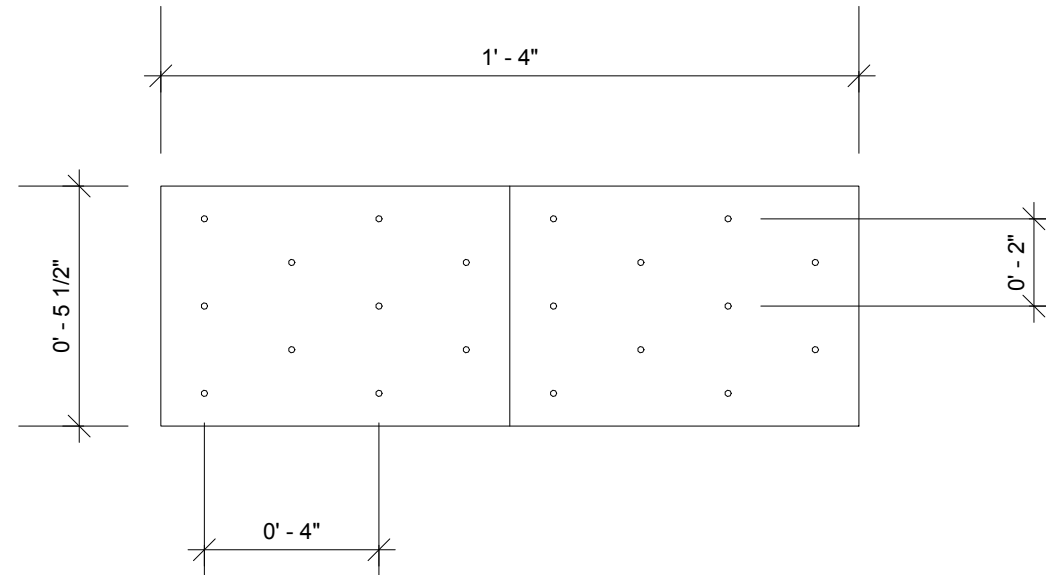
Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

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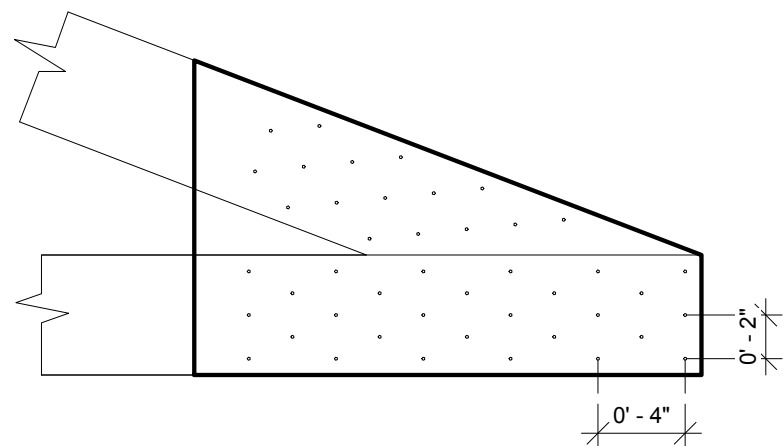
Scale 1 1/2" = 1'-0"



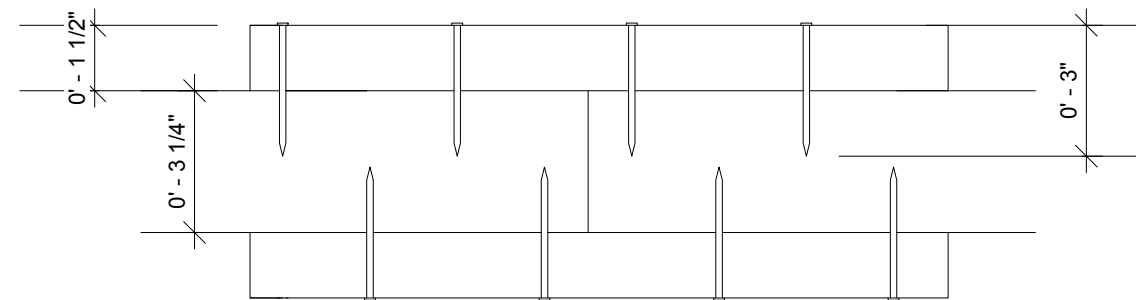
① Chord Connection Section Typ
3" = 1'-0"



② Typical Splice Connection
3" = 1'-0"



③ Corner Chord Connection
1 1/2" = 1'-0"



④ Splice Section
3" = 1'-0"



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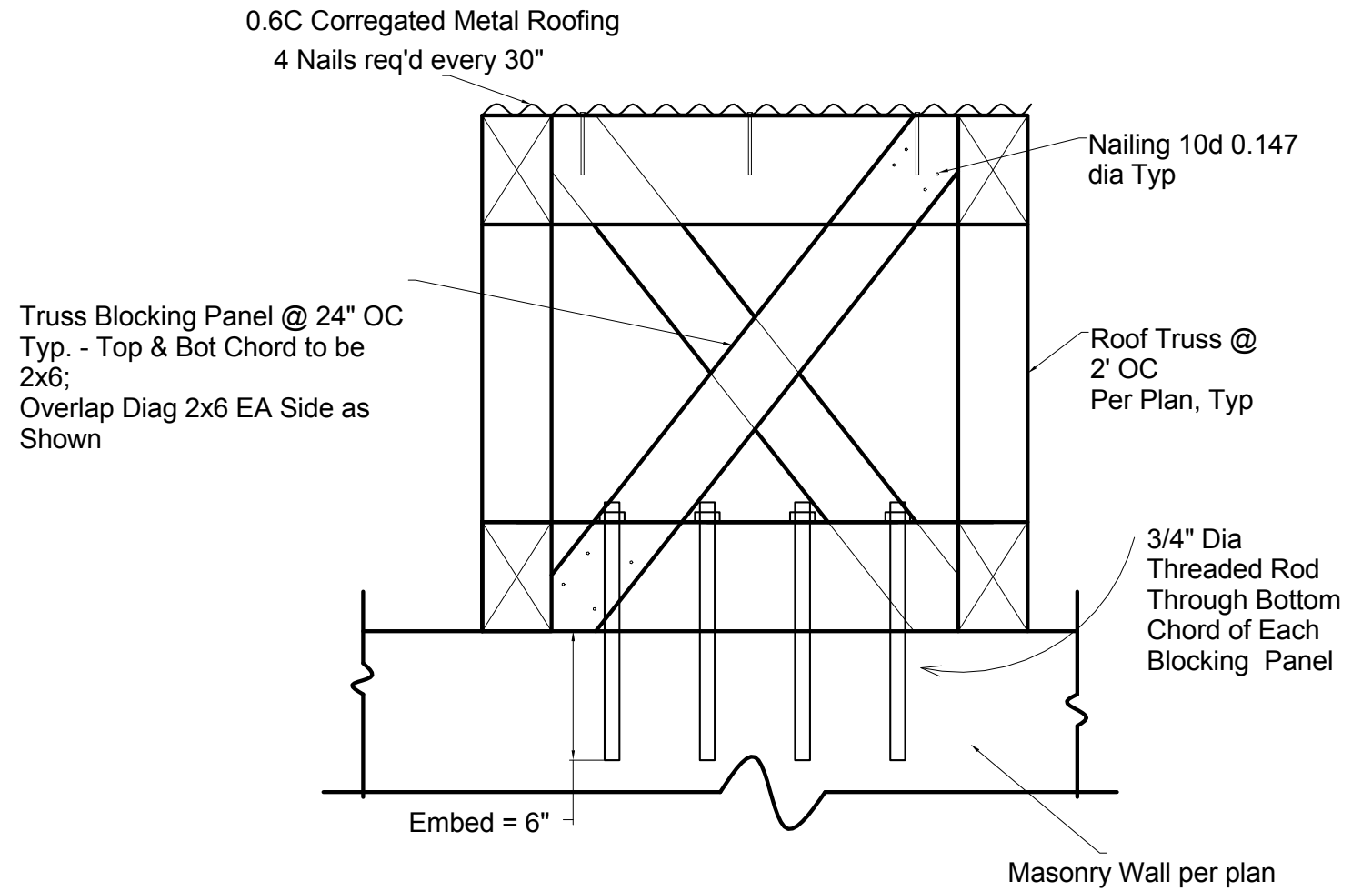
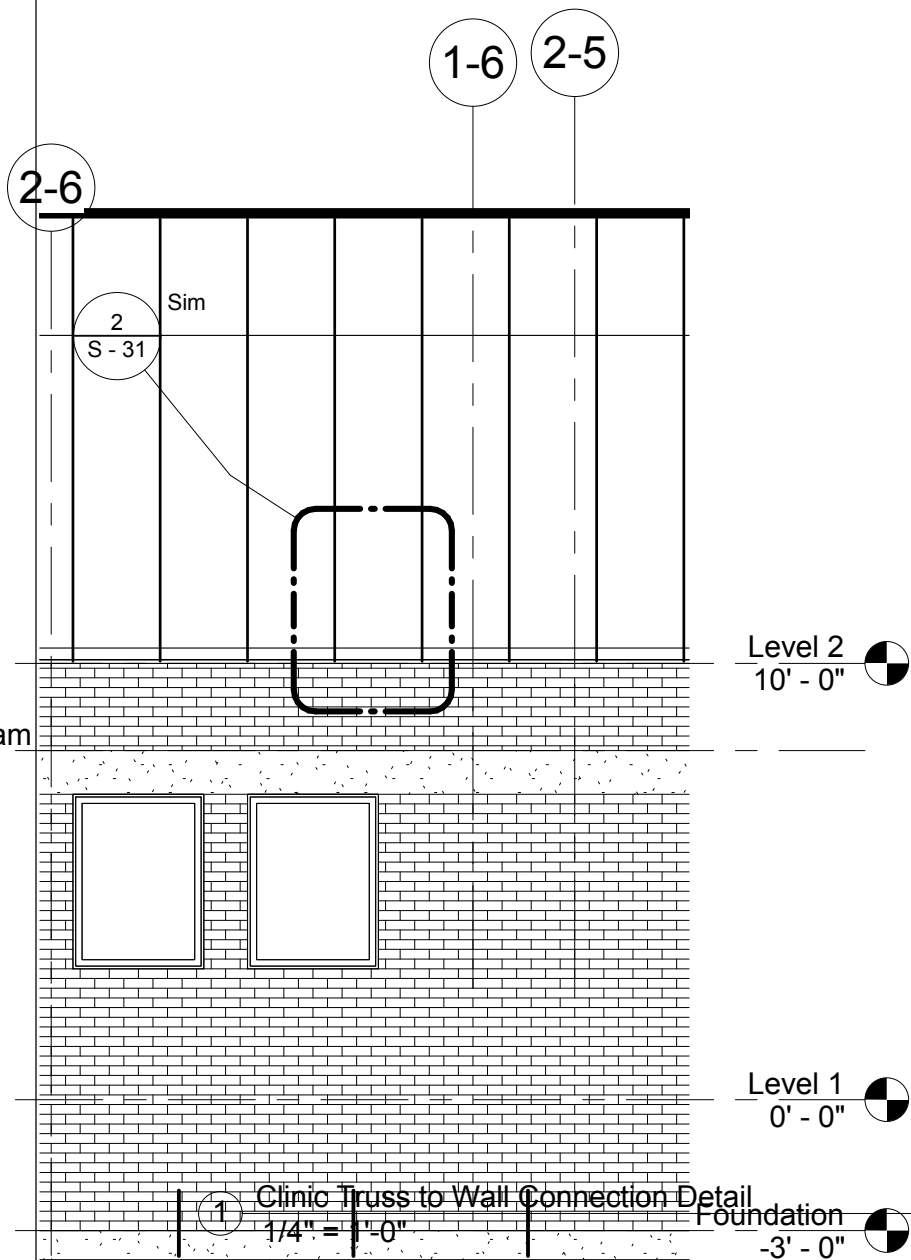
Trevor Coffman
Andrew McAferty
Steven Millett

Roof Connection Details

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

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Scale As indicated



2 Blocking Panel Typ
1 1/2" = 1'-0"



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Roof Connection Details

Date	Issue Date
Faculty Advisor	Dr. Nathan Canney
Project Liaison	Cory Hitzemann
Project Liaison	Rachel Vranizan

S - 31

Scale As indicated