STRUCTURAL CALCULATIONS

FOR

Mbandazi Village

Mbandazi Village, Rwanda

FOR

Journeyman International

SUBMITTED BY
Joshua Shockey

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO.

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Project Description

The Mbandazi Village project consists of two buildings: the wellness center and the shopping center/housing. The building covered in this design was the shopping center/housing.

Global considerations for this project include the improvement of life in this area of Rwanda. Though my scope of this project was a residential development and an economic center, the whole project also includes a wellness center. Altogether this is an important step to bring a developing nation up to speed as well as bring people together.

Culturally, this project does not seem to add anything. Moreover, I felt like this culturally impacted me. In the U.S., we have nearly everything available to us, using the biggest, most efficient materials and tools. When designing this part of the project, I had to keep in mind what was available in that region of the world. This made me realize the privilege that I have in America where I do not have to worry about much.

The social impact of this project as a whole is a place to come together to shop but also to relax. How often do you hear about a wellness center in developing countries? This project is an opportunity to give the people of Rwanda the experience of what we live in everyday. The ability to relax is something that all people should get to enjoy.

For this project, the environmental and economical impact seemed to be hand in hand. This building was designed probably a little more in depth in the gravity system than many other people would have done it. I designed more beams and girders into similar spans and loadings. This allowed me to adjust the rebar and sizes of the framing members to be more accurate to the demands placed on them. Economically, this project pushes a little further. The bottom floor was designed to be a shopping center to help stimulate the economy.

Working on a project alone is very difficult, especially when all I had was schooling and no professional practice. This project specifically had very many aspects that were never covered in our design studios. A senior project should be something challenging, pushing you to learn something new. However, nearly every step of the way was a new design problem I needed to fix. From curved framing members to curved diaphragm to different roof heights, everything seemed to be one huge problem to recognize and fix after another. I learned that asking for help is important in order to continue with a project when you are stuck and to talk with colleagues to pool together ideas on how to solve a problem. I learned to find the seismic design values without using an online program that gives you everything with a simple push of a button. I learned that ETABS is the best and simultaneously the most confusing design program to use. I jumped into the famous “trash in, trash out” saying with my first ETABS model after putting all my eggs in one basket. This project taught me that when I am on my own, I need to exhaust every possible effort, scour through every code book, use every note from class, and to ask questions when absolutely stuck. I also learned that students can not just jump into designing by themselves after graduating. We need to be guided through the problems we encounter, to use our colleagues in order to do our best. At the end of the day, the more I worked with others, the more confident I felt about what I was doing. The second I decided to try to solve something I had no idea about, it would take me a day at least to find a solution.

Reflection

This project pushed me far past what I thought I could do. I felt like I was relearning everything from my design labs. This project was very rewarding, knowing that I am able to make a difference so far from where this is planning to be built. A lot of useful information was gained from the questions I asked and the problems I solved. It made me very excited for my next chapter in life and what I will learn at my job. I hope to one day look back at this project and laugh at what I currently think is very difficult.

Design Assumptions for the lateral load resisting system

1) Pinned columns at base, for conservative design.

2) Fixity only at connection from beams to shear walls, with shear wall stiffness significantly higher than beam stiffness..

Project Information

Project: Mbandazi Village
Location: Mbandazi Village, Rwanda
Architect: Journeyman International
Owner:
Jurisdiction:
Building Code: 2018 International Building Code (IBC)
ASCE 7-16
ACI 318-19
AISC 15th Edition

Structural Systems:
Vertical/Lateral
Concrete floor framing
Steel roof framing
Concrete slab floors
Steel decking roof
Concrete slab - on - grade
Concrete Shear Walls

Concrete foundation

Building Description:
Construction Type: 1b
Risk Category: II
Sprinkler System: No

Other:
Soils Engineer:
Soils Report No.:
Soils Report Date: 25th March, 2021

Soil Bearing : D+L: 2000 psf

Structural Materials

Material Specifications Typical unless noted otherwise in calculations

Concrete: NWC S-O-G w/ Spread FTGs (3000 psf)

Reinforcing: ASTM A615 (Fy = 60 ksi)

Wall Reinforcing: ASTM A615 (Fy = 60 ksi)

Steel: ASTM A992 (Fy = 50 ksi), UNO

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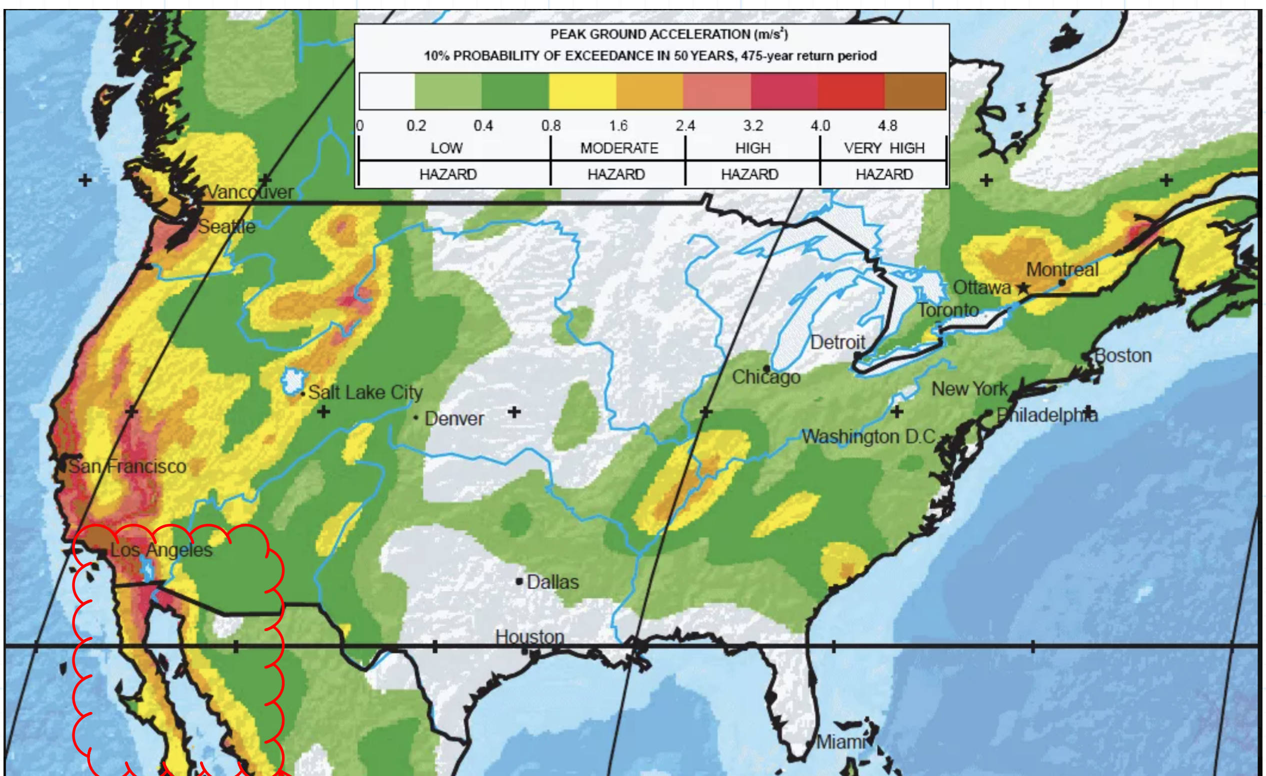
Rwanda sits very close to a divergent plate.

https://www.geoengineer.org/news/is-africa-gradually-splitting-into-two-sections



https://www.thoughtco.com/seismic-hazard-maps-of-the-world-1441205#step5

Baja California also has a divergent plate. I used the the PGA to get a Ss and S1 values

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. UL1

SUPERIMPOSED UNIT LOADS

FLOOR

	JOISTS	GIRDERS	COLUMNS	SEISMIC
WOOD CEILING	3.0	3.0	3.0	3.0
MEP	2.0	2.0	2.0	2.0
TERRAZO	9.5	9.5	9.5	9.5
MISC.	2.0	2.0	2.0	2.0
SLAB(5")	62.5	62.5	62.5	62.5
16" x 24" JOISTS	40	40	40	40
18" x 30" GIRDERS		27	27	27
16" SQ COLUM			7	7
12" WALLS				10
TOTAL DEAD LOAD	119	146	153	163
PARTITIONS				10
DESIGN LOAD	120	150	160	180

LIVE LOAD (REDUCIBLE) = 40.0 PSF ASCE 7-16 T4.3-1 (15)

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. UL2

SUPERIMPOSED UNIT LOADS

ROOF

	JOISTS	GIRDERS	COLUMNS	SEISMIC
WOOD CEILING	3.0	3.0	3.0	3.0
MEP	2.0	2.0	2.0	2.0
MTL DECK	3.0	3.0	3.0	3.0
MISC.	2.0	2.0	2.0	2.0
BEAMS	4.0	4.0	4.0	4.0
GIRDERS		3.0	3.0	3.0
16" SQ COLUM			7.0	7.0
12" WALLS				5.0
TOTAL DEAD LOAD	14	17	24	29
PARTITIONS				5
DESIGN LOAD	15	20	25	35

LIVE LOAD (REDUCIBLE) = 20.0 PSF ASCE 7-16 T4.3-1 (15)

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. SL1

ESTIMATING A SLAB THICKNESS

UNIFORM SLAB THICKNESS ∴ WORST SPAN WILL GOVERN

$L_{SLAB} = 9'-7\frac{1}{2}" = 115.5"$

$t_{SLAB} = L/20$ TO $L/24$ ← ACI 318-19 T7.3.1.1

5.8" TO 4.8"

ASSUME 5.5" SLAB

= 68.75 sf

P

DL = 68.75 + 16.5 = 86 psf

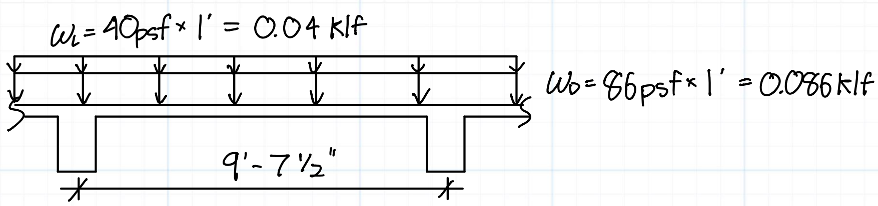
SLAB DESIGN

No fire rating for Rwanda. Following a 2-hr rating. Min. slab thickness is 5” with 3/4” siliceous aggregate per IBC T 721.1(3), 722.2.1.1, 722.2.2.1, & 722.2.3(1).

DL = 86 PSF
LL = 40 PSF
TL = 126 PSF

LC: $1.2D+1.6L = 1.2(86)+1.6(40) = 167$ psf

LOOKING @ 12" PIECE OF SLAB



SLAB DEFLECTION

$f'_c = 3\text{ ksi}$

$E_c = 3122\text{ ksi}$ — ACI 318-19 19.2.2.1(b) (P356) $E_c = 57000\sqrt{3000}/1000$

$f_r = 7.5\lambda\sqrt{f'_c} = 7.5(1)\sqrt{3000} = 0.411\text{ ksi}$ ($\lambda \to 1$)

$L = 10'\text{-}\tfrac{1}{2}'' = 10.04'$

$M_{MID} = 0.04wL^2 - \dfrac{wx(L-x)}{2}$

w IS THE UNFACTORED LOAD SINCE WE ARE LOOKING @ DEFLECTION

X IS 0.4L. THIS EQUATION IS USED TO ACCOUNT FOR THE EXTRA MOMENT FROM A CONT. SLAB

$$M_{MID} = 0.04(0.126\text{ klf})(10.04\text{ ft})^2 - \left(\frac{(0.126\text{ klf})(0.4\times10.09\text{ ft})(10.09\text{ ft} - 0.4(10.09\text{ ft}))}{2}\right)$$

$$= -1.02\text{ k-ft}$$

CONCRETE REMAINS THEORETICALLY UNCRACKED

$$\frac{M_{MID}}{f_r} = S_{REQ} = \frac{12''(t)^2}{6} \Rightarrow t = \sqrt{\frac{6(M_{MID}\times12)}{(12\text{ in})f_r}} = \sqrt{\frac{6(1.02\text{ k-ft}\times12)}{(12\text{ in})(0.411\text{ ksi})}} = 3.9\text{ in}$$

$$I = \frac{bt^3}{12} = \frac{12\text{ in}(3.9\text{ in})^3}{12} = 59\text{ in}^4$$

$$\Delta = \frac{5wL^4}{384EI} = \frac{5(.126\text{ klf})(10.04\text{ ft})^4\times12^3}{384(3122\text{ ksi})(59\text{ in}^4)} = 0.16\text{ in} = \frac{\ell}{770} < \frac{\ell}{240}\ \checkmark$$

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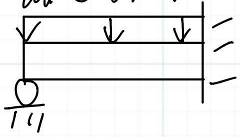
SLAB SHEAR



$$V_{u\,max} = \frac{5}{8}\omega_u L = \frac{5}{8}(0.167\text{ klf})(10.04\text{ ft}) = 1.04\text{ k/ft}$$ (UPPER)

→ AISC T 3.23 (3-211)

$$V_u = \frac{1.15}{2}\omega_u L = \frac{23}{40}(0.167\text{ klf})(10.04\text{ ft}) = 0.96\text{ k/ft}$$

→ ACI 318-19 T6.5.4 (75)

$$\phi_v V_c = \phi 2\sqrt{f'c}\,bd \Rightarrow d \geq \frac{V_u \times 1000}{\phi 2\sqrt{f'c}\,b} = \frac{(1.04k)\times 1000}{0.75(2)\sqrt{3000}(12\text{ in})}$$

$$d = 1.05''$$

$$t_{SLAB} \geq d + d = 2(1.05\text{ in}) = 2.1\text{ in}$$

AS STATED ABOVE, THE MIN. THICKNESS OF THE SLAB IS 5", SO THAT WILL BE THE DESIGNED THICKNESS

5" THICK SLAB

PROJECT MBANDAZI VILLAGE
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SLAB FLEXURAL

FIXED LOADS

DL = 79 PSF
LL = 40 PSF

TL = 119 PSF

LC: 1.2D+1.6L = 1.2(79)+1.6(40) = 159 psf

USING t=5in (FROM)

$d = \frac{1}{2}t = \frac{1}{2}(5in) = 2.5in$

$w_u = 0.159\ klf$

$M_u^+ = \frac{w_u L^2}{11} = \frac{(0.159klf)(9.625ft)^2}{11} = 1.34\ k\text{-}ft$

ACI 318-19
T6.5.2 (74)

$M_u^- = \frac{w_u L^2}{10} = \frac{(0.159klf)(9.625ft)^2}{10} = 1.47\ k\text{-}ft$ ←

$A_s \sim \frac{M_u}{\phi f_y jd} = \frac{(1.47k\text{-}ft \times 12)}{0.9(60ksi)(0.95 \times 2.5in)} = 0.14\ in^2/ft$

USE #4 @ 12" O.C. (0.2 in²/ft)

$A_{ST} = 0.0018bh = 0.0018(12in)(5in) = 0.108\ in^2$

#4@12" O.C. S&T

$\rho = \frac{A_s}{bh} = \frac{0.2in^2}{12in \times 5in} = 0.3\%$

$a = \frac{A_s f_y}{0.85 f'_c b} = \frac{(0.2in^2)(60ksi)}{0.85(3ksi)(12in)} = 0.392in$

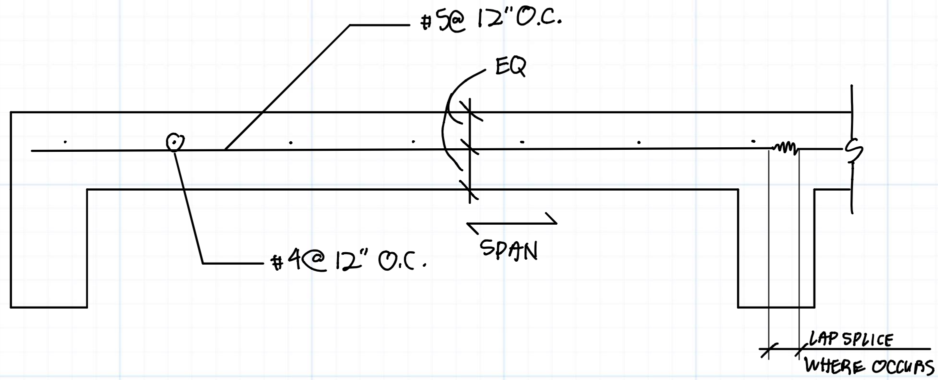
$\phi M_n = \phi\left[A_s f_y\left(\frac{h}{2} - \frac{a}{2}\right)\right] = 0.9\left[(0.2in^2)(60ksi)\left(\frac{6in}{2} - \frac{0.392in}{2}\right)\right]/12 = 2.52\ k\text{-}ft$

$\phi M_n = 2.52\ k\text{-}ft > M_u = 1.47\ k\text{-}ft$ ✓

PROJECT MBANDAZI VILLAGE

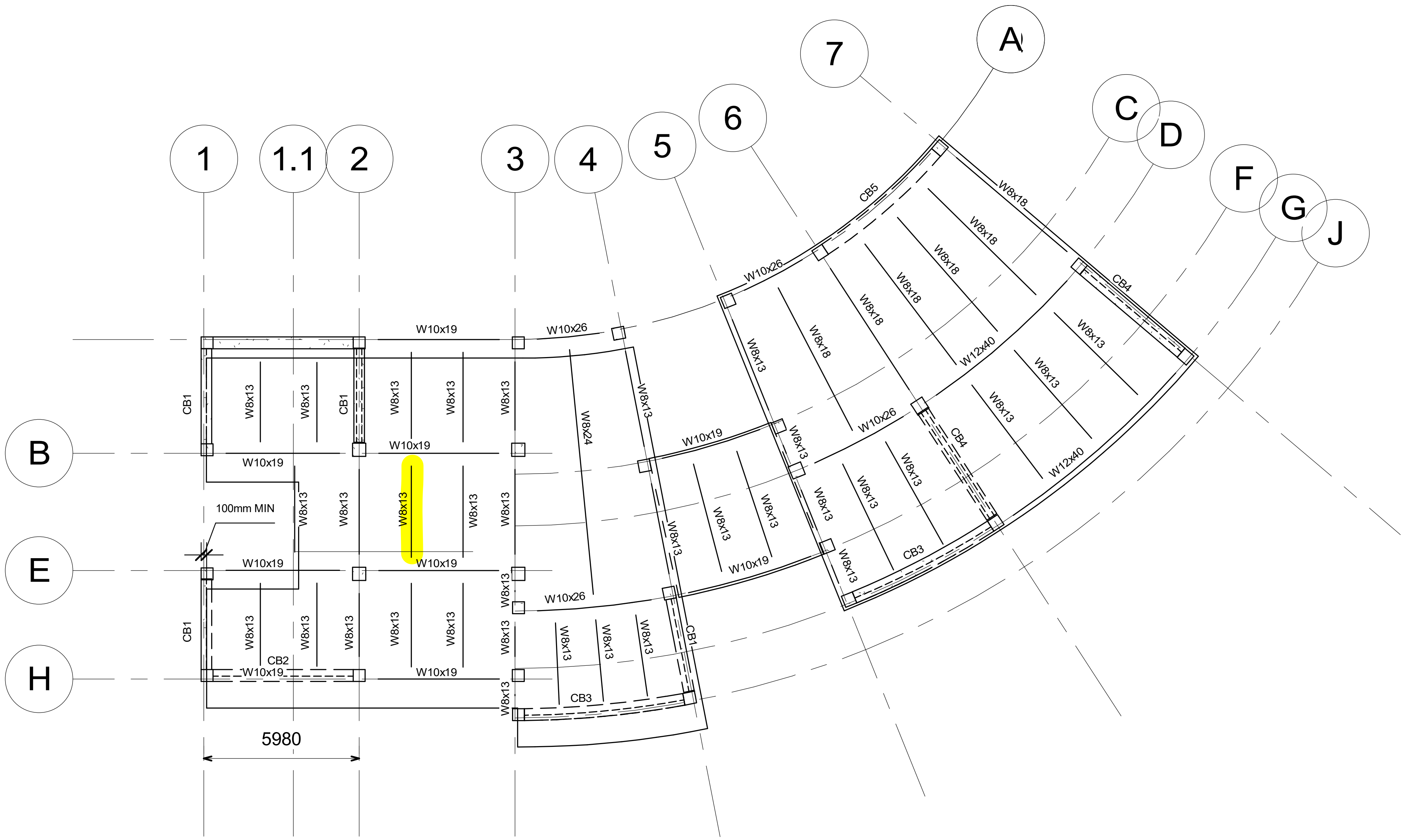
PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. SL6



SHEET NOTES

1. TOP OF CONCRETE ELEVATION = VARIES. SEE ELEVATIONS FOR HEIGHTS
2. SEE S.407, S.408, S.409, S.411, & S.412 FOR JOIST AND GIRDER DETAILS
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

RF1

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

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PLOT DATE: 6/1/2021 12:02:12 AM

SHEET NAME: ROOF FRAMING PLAN

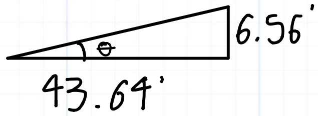
SCALE: 1 : 200

NUMBER:

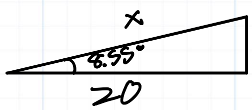
PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. RF2



$\theta = \tan^{-1}\left(\frac{6.56}{43.64}\right) = 8.55°$



$LL = \frac{20}{x} = \cos(8.55°) = 20.22 psf$

B1

$DL = 15$ PSF

$LL = 20.2$ PSF

$TW = 7.14'$

$L = 14.98'$

PLAN VIEW: $L = 14.81'$

ACTUAL: $L = \frac{14.81'}{\cos(8.55)} = 14.98'$

$w = 1.2(15) + 1.6(20.2) = 50.3^{PSF} \times 7.14' = 0.40^{klf}$

$M_u = \frac{wL^2}{8} = \frac{0.40(14.98)^2}{8} = 11.22^{k\text{-}ft}$

$Z_{x\,REQ'D} = \frac{M_u}{\phi_b f_y}$ $\phi_b = 0.9$

$= \frac{11.22^{k\text{-}ft} \times 12}{0.9 \times 50^{ksi}} = 2.99\ in^3$

START W/ W8×13

$Z_x = 11.4\ in^3 > 2.99\ in^3$ ✓

CAPACITY AISC TG-2 (6-101)

$V_u = \frac{wL}{2} = \frac{0.4(14.98)}{2} = 3.0^k$ < $\phi_v V_n = 55.1^k$ ✓

$M_u = 11.22^{k\text{-}ft}$ < $\phi_b M_n = 42.8^{k\text{-}ft}$ ✓ $L_b = 17'$ $\phi M_n = 11.5$

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PROJECT NO. DATE
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DEFLECTION

LL => L/360 DL => L/240

$$\frac{LL}{DL} = 0.67$$

$$\frac{LL}{DL} = \frac{20.2}{15} = 1.3 > 0.67$$

LIVE LOAD GOVERNS Δ

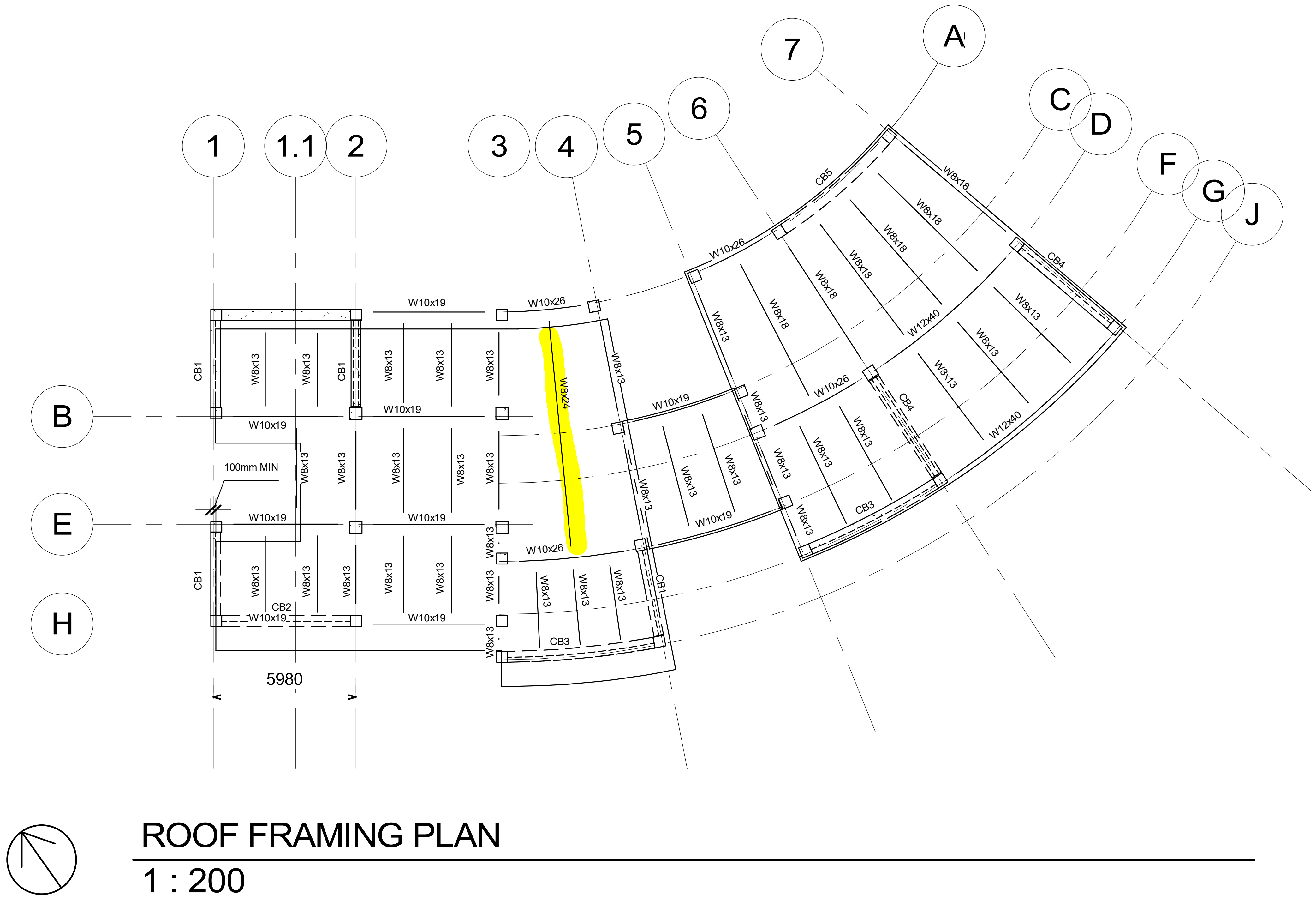
$$\Delta_{ACT} = \frac{5wL^4}{384EI} = \frac{5(0.020^{ksf} \times 7.14')(14.98')^4 \times 12^3}{384\ (29000^{ksi})(39.6 in^4)} = 0.14''$$

$$\Delta_{ALL} = 14.98 \times 12/360 = 0.50'' > \Delta_{ACT} = 0.14'' \checkmark$$

B1: **W8×13**

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = VARIES. SEE ELEVATIONS FOR HEIGHTS
2. SEE S.407, S.408, S.409, S.411, & S.412 FOR JOIST AND GIRDER DETAILS
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

RF4

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

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ROOF FRAMING PLAN

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NUMBER:

PROJECT MBANDAZI VILLAGE
PROJECT NO. ____ DATE ____
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B2

$DL = 15$ PSF

$LL = 20.2$ PSF

$TW = 10.04'$

$L = 34.67'$

PLAN VIEW = 34.28'

$ACTUAL = \frac{34.28'}{\cos(8.55°)} = 34.67'$

$w = 1.2(15) + 1.6(20.2) = 50.3^{PSF} \times 10.04' = 0.51^{klf}$

$M_u = \frac{wL^2}{8} = \frac{0.51(34.67)^2}{8} = 76.63^{k\text{-}ft}$

$Z_{X\,REQ'D} = \frac{M_u}{\phi_b f_y}$ $\phi_b = 0.9$

$= \frac{76.63^{k\text{-}ft} \times 12}{0.9 \times 50^{ksi}} = 20.43\,in^3$

START W/ W8×24

$Z_x = 23.1\,in^3 > 20.43\,in^3$ ✓

CAPACITY AISC T6-2 (6-100)

$V_u = \frac{wL}{2} = \frac{0.51(34.67)}{2} = 8.84^k$ < $\phi_v V_n = 58.3^k$ ✓

$L_b = 10'$ $\phi M_n = 76.3$

$M_u = 76.63^{k\text{-}ft}$ < $\phi_b M_n = 86.6$ k-ft ✓

PROJECT	MBANDAZI VILLAGE		
PROJECT NO.		DATE	
CLIENT	JI	BY JSS	SHEET NO. RF6

DEFLECTION

LL => L/360 DL => L/240

$\frac{LL}{DL} = 0.67$

$\frac{LL}{DL} = \frac{20.2}{15} = 1.3 > 0.67$

LIVE LOAD GOVERNS Δ

$\Delta_{ACT} = \frac{5wL^4}{384EI} = \frac{5(0.020^{ksf} \times 10.04')(34.67')^4 \times 12^3}{384\,(29000^{ksi})(82.7\ in^4)} =$ "

$\Delta_{ALL} = 34.67 \times 12/360 = 1.16'' > \Delta_{ACT} = 0.27''$ ✓

B2: **W8×24**

SHEET NOTES

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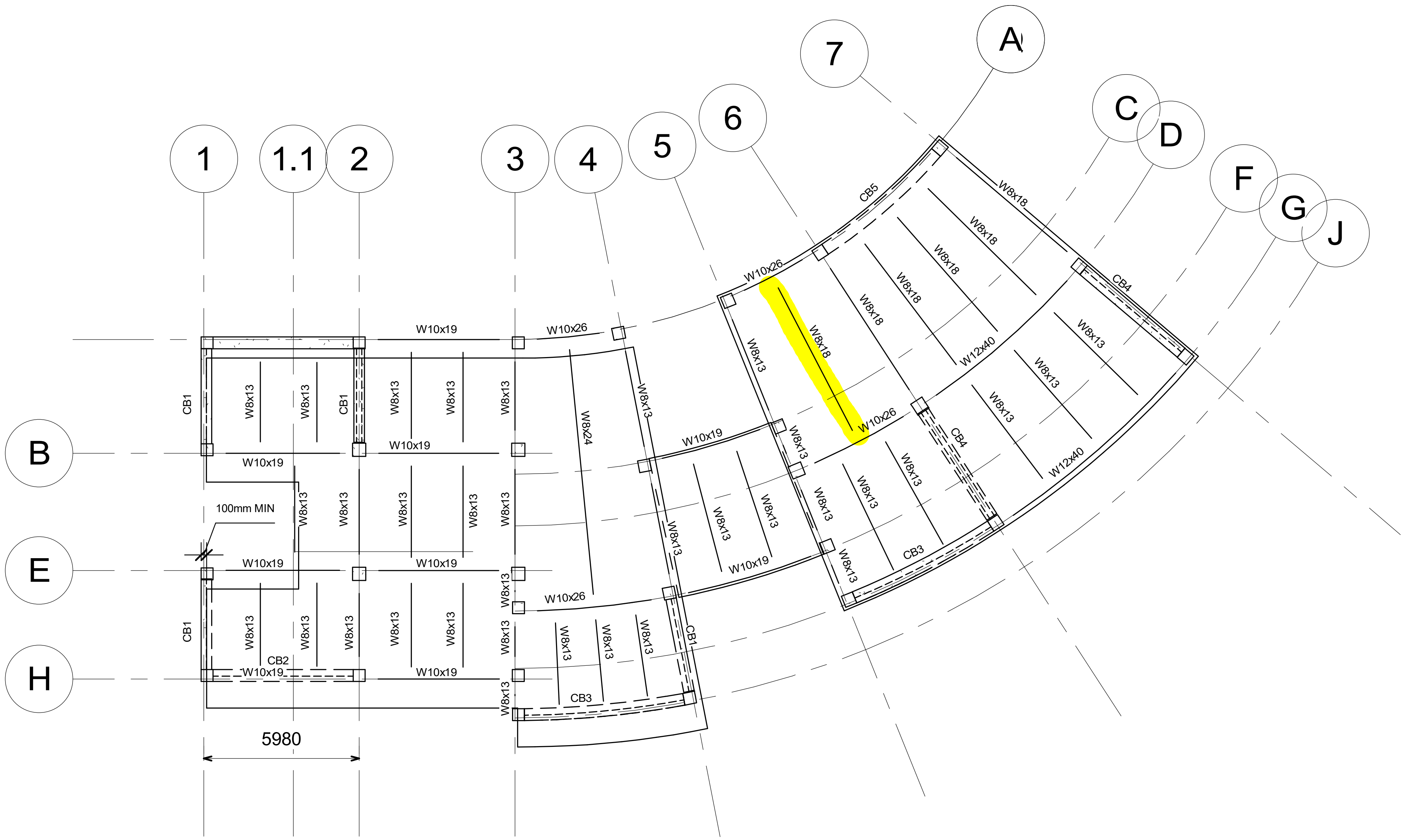
2. SEE S.407, S.408, S.409, S.411, & S.412 FOR JOIST AND GIRDER DETAILS
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

RF7	
JOURNEYMAN INTERNATIONAL 3471 N. MAIN ST. PRINEVILLE, OR	
SEAL:	
PROJECT:	MBANDAZI VILLAGE
SITE:	MBANDAZI VILLAGE
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SHEET NAME:	ROOF FRAMING PLAN
SCALE:	1 : 200
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PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. RF8

B3

DL = 15 PSF

LL = 20.2 PSF

TW = 9.00'

L = 23.54'

PLAN VIEW = 23.54'

$ACTUAL = \frac{23.54'}{\cos(8.55°)} = 23.80'$

$w = 1.2(15) + 1.6(20.2) = 50.3^{PSF} \times 9.00' = 0.45^{klf}$

$M_u = \frac{wL^2}{8} = \frac{0.45(23.80)^2}{8} = 31.86^{k\text{-}ft}$

$Z_{X\,REQ'D} = \frac{M_u}{\phi_b f_y}$ $\phi_b = 0.9$

$= \frac{31.86^{k\text{-}ft} \times 12}{0.9 \times 50^{ksi}} = 8.5\ in^3$

START W/ W8×18

$Z_x = 17.0\ in^3 > 8.5\ in^3$ ✓

CAPACITY AISC T6-2( )

$V_u = \frac{wL}{2} = \frac{0.34(23.80)}{2} = 4.05^k$ < $\phi_v V_n = 56.2^k$ ✓

$L_b = 16'$, $\phi M_n = 31.5$

$M_u = 31.86^{k\text{-}ft}$ < $\phi_b M_n = 63.8^{k\text{-}ft}$ ✓

DEFLECTION

LL => L/360 DL => L/240

$\frac{LL}{DL} = 0.67$

$\frac{LL}{DL} = \frac{20.2}{15} = 1.3 > 0.67$

LIVE LOAD GOVERNS Δ

$$\Delta_{ACT} = \frac{5wL^4}{384EI} = \frac{5(0.020^{ksf} \times 9.00')(23.54')^4 \times 12^3}{384\,(29000^{ksi})(61.9\ in^4)} = 0.69''$$

$\Delta_{ALL} = 23.54 \times 12/360 = 0.78'' > \Delta_{ACT} = 0.69''$ ✓

B2: **W8×18**

SHEET NOTES

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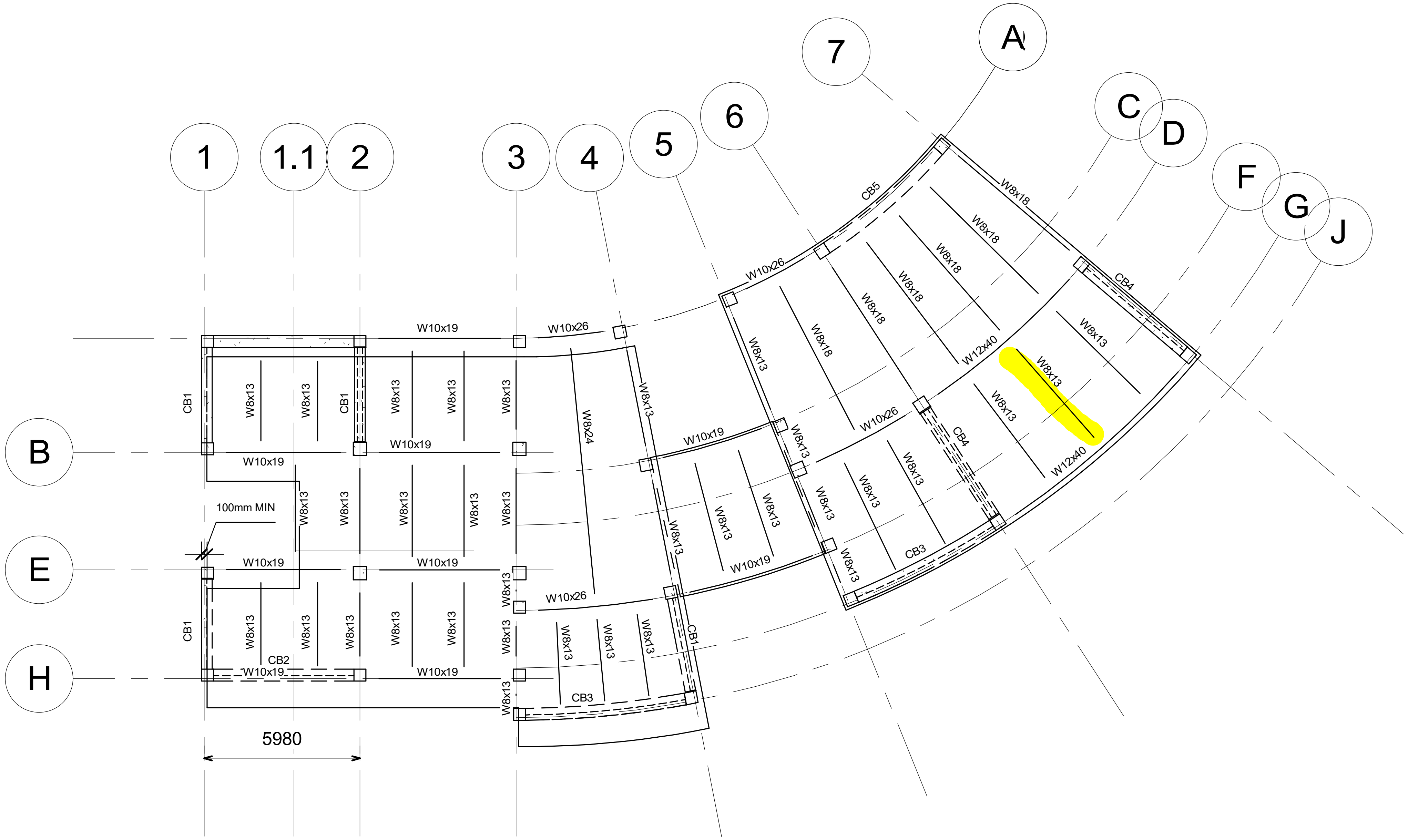
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

RF10

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3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

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MBANDAZI VILLAGE

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ROOF FRAMING PLAN

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1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. RF11

B4

$DL = 15$ PSF

$LL = 20.2$ PSF

$TW = 8.37'$

$L = 18.54'$

PLAN VIEW = 18.33'

$ACTUAL = \frac{18.33'}{\cos(8.55°)} = 18.54'$

$w = 1.2(15) + 1.6(20.2) = 50.3^{PSF} \times 8.37' = 0.42^{klf}$

$M_u = \frac{wL^2}{8} = \frac{0.42(18.54)^2}{8} = 18.05^{k\text{-}ft}$

$Z_{x\,REQ'D} = \frac{M_u}{\phi_b f_y}$ $\phi_b = 0.9$

$= \frac{18.05^{k\text{-}ft} \times 12}{0.9 \times 50^{ksi}} = 4.81\ in^3$

START W/ W8×13

$Z_x = 11.4\ in^3 > 4.81\ in^3$ ✓

CAPACITY AISC TG-2 (6-101)

$V_u = \frac{wL}{2} = \frac{0.42(18.54')}{2} = 3.89^k$ < $\phi_v V_n = 55.1^k$ ✓

$M_u = 18.05^{k\text{-}ft}$ < $\phi_b M_n = 42.8\ ^{k\text{-}ft}$ ✓ $L_b = 12$, $\phi M_n = 18$

DEFLECTION

LL => L/360 DL => L/240

$\frac{LL}{DL} = 0.67$

$\frac{LL}{DL} = \frac{20.2}{15} = 1.3 > 0.67$

LIVE LOAD GOVERNS Δ

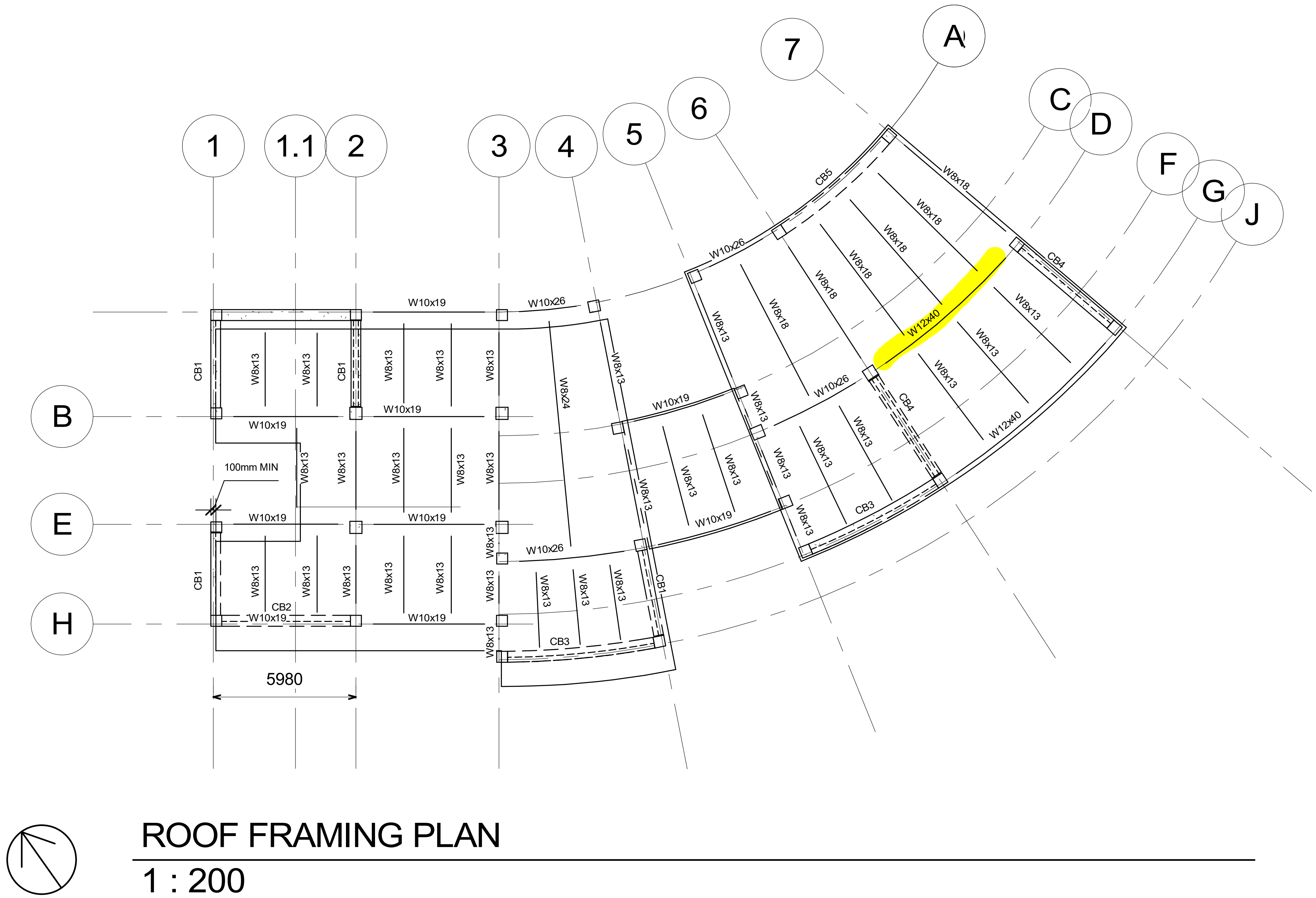
$$\Delta_{ACT} = \frac{5wL^4}{384EI} = \frac{5(0.020^{ksf} \times 8.37')(18.54')^4 \times 12^3}{384\,(29000^{ksi})(39.6\ in^4)} = 0.39''$$

$\Delta_{ALL} = 18.54 \times 12/360 = 0.62'' > \Delta_{ACT} = 0.39''$ ✓

B2: **W 8×13**

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = VARIES. SEE ELEVATIONS FOR HEIGHTS
2. SEE S.407, S.408, S.409, S.411, & S.412 FOR JOIST AND GIRDER DETAILS
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

RF13

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE: 6/1/2021 12:02:12 AM

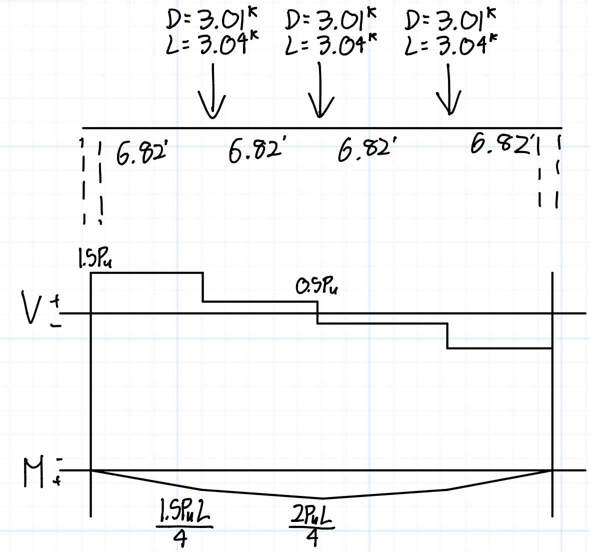
SHEET NAME: ROOF FRAMING PLAN

SCALE: 1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. RF14

G1



DL = 20 PSF

LL = 20.2 PSF

TRIB AREA = $(6.82' \times 11.75') + (8.13' \times 8.65') = 150.46^{ft^2}$

$P_u = 1.2(3.01) + 1.6(3.04) = 8.48^k$

$V_{max} = 1.5(8.48) = 12.72^k$

$M_{max} = 0.5(8.48)(27.28) = 115.7^{k\text{-}ft}$

$Z_{x\,REQ'D} = \frac{M_u}{\phi F_y} = \frac{115.7^{k\text{-}ft} \times 12}{0.9 \times 50ksi} = 30.9\, in^3$

START W/ W12×40

$Z_x = 57\ in^3 > 30.9\ in^3$

CAPACITY AISC T6-2 (6-95)

$V_u = 12.72^k < \phi_v V_n = 105^k$ ✓

$M_u = 115.7^{k\text{-}ft} < \phi_b M_n = 214^{k\text{-}ft}$ ✓

MAX $L_b = 24$, $\phi M_n = 114 \approx 115.7$ ✓

DEFLECTION

LL => L/360   DL => L/240

$\frac{LL}{DL} = 0.67$

$\frac{LL}{DL} = \frac{20.2}{20} = 1.01 > 0.67$

LIVE LOAD GOVERNS Δ

SEE P FOR DEFLECTION

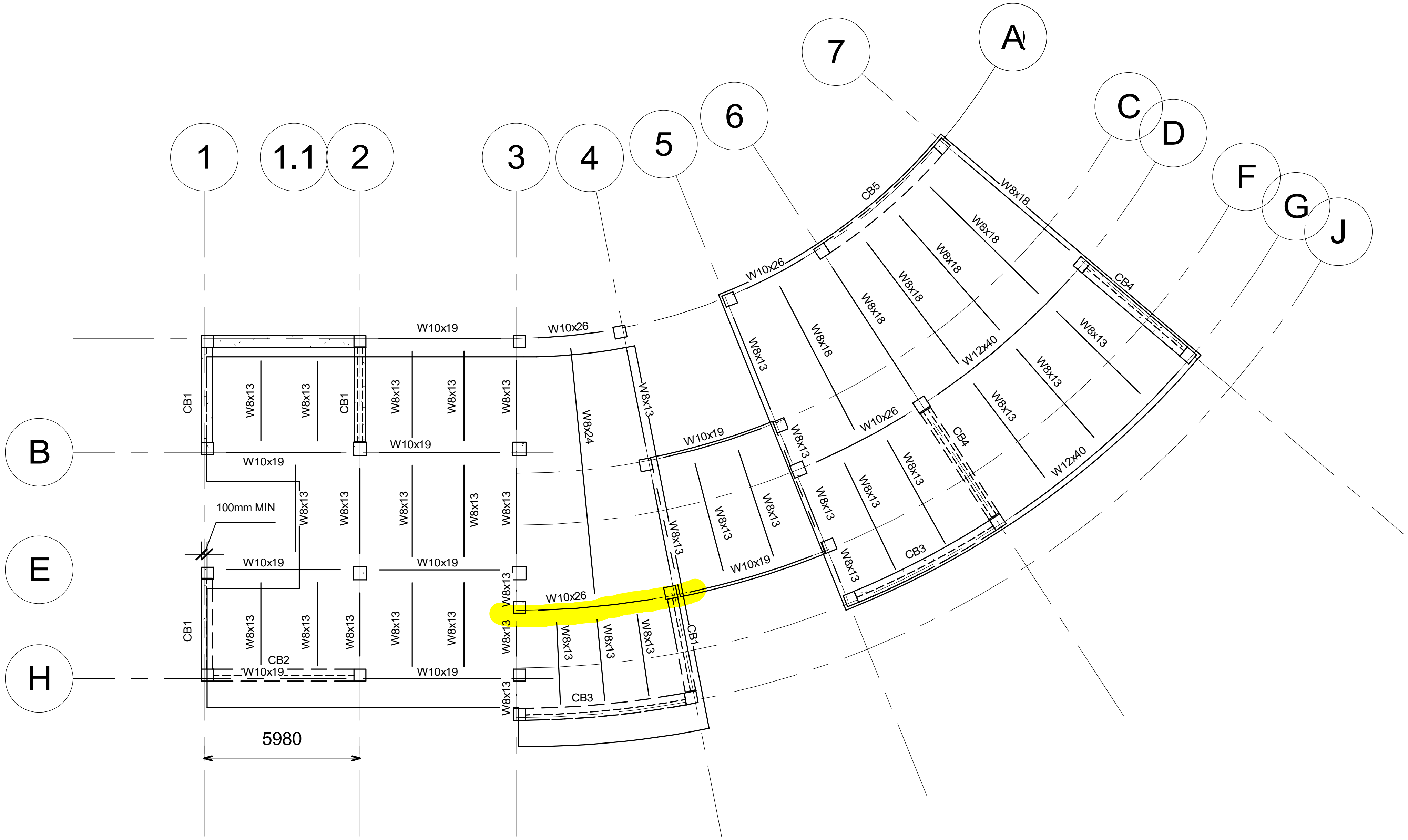
$\Delta_{ALL} = 27.28' \times 12/360 = 0.91'' > \Delta_{ACT} = 0.59''$ ✓

G1 : **W12×40**

RF15

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = VARIES. SEE ELEVATIONS FOR HEIGHTS
2. SEE S.407, S.408, S.409, S.411, & S.412 FOR JOIST AND GIRDER DETAILS
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

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PLOT DATE:

6/1/2021 12:02:12 AM

SHEET NAME:

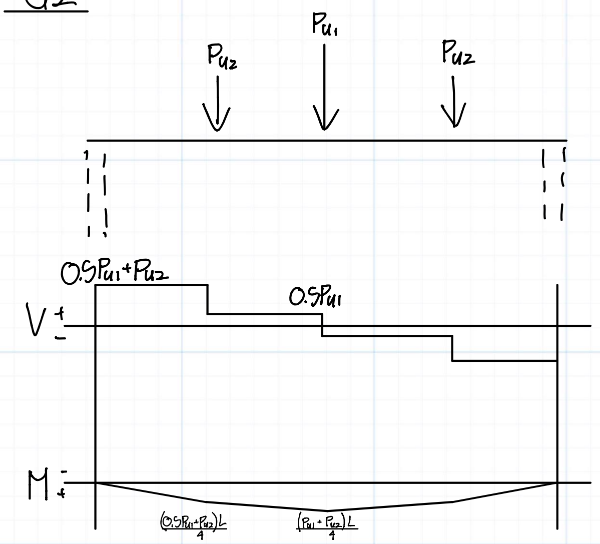
ROOF FRAMING PLAN

SCALE:

1 : 200

NUMBER:

G2



DL = 20 PSF

LL = 20.2 PSF

TRIB AREA$_1$ = (5.70' × 6.91') + (10.04' × 17.14') = 211.47 ft^2

TRIB AREA$_2$ = (5.70' × 6.91') = 39.39

$P_{u1} = 1.2(4.23) + 1.6(4.27) = 11.91^k$

$P_{u2} = 1.2(0.79) + 1.6(0.80) = 2.23^k$

$V_{max} = 0.5(11.91) + 2.23 = 8.19^k$

$M_{max} = (11.91 + 2.23)(20.08)/4 = 70.98^{k\text{-}ft}$

$Z_{x\,REQ'D} = \frac{M_u}{\phi F_y} = \frac{70.98^{k\text{-}ft} \times 12}{0.9 \times 50\ ksi} = 18.9\ in^3$

START W/ W10×26

$Z_x = 31.3\ in^3 > 18.9\ in^3$

CAPACITY

AISC T6-2 (6-100)

$V_u = 8.19^k < \phi_v V_n = 80.3^k$ ✓

$M_u = 70.98^{k\text{-}ft} < \phi_b M_n = 117^{k\text{-}ft}$ ✓

MAX $L_b = 15$, $\phi M_n = 72.7 > 71.0$ ✓

DEFLECTION

LL => L/360 DL => L/240

$\frac{LL}{DL} = 0.67$

$\frac{LL}{DL} = \frac{20.2}{20} = 1.01 > 0.67$

LIVE LOAD GOVERNS Δ

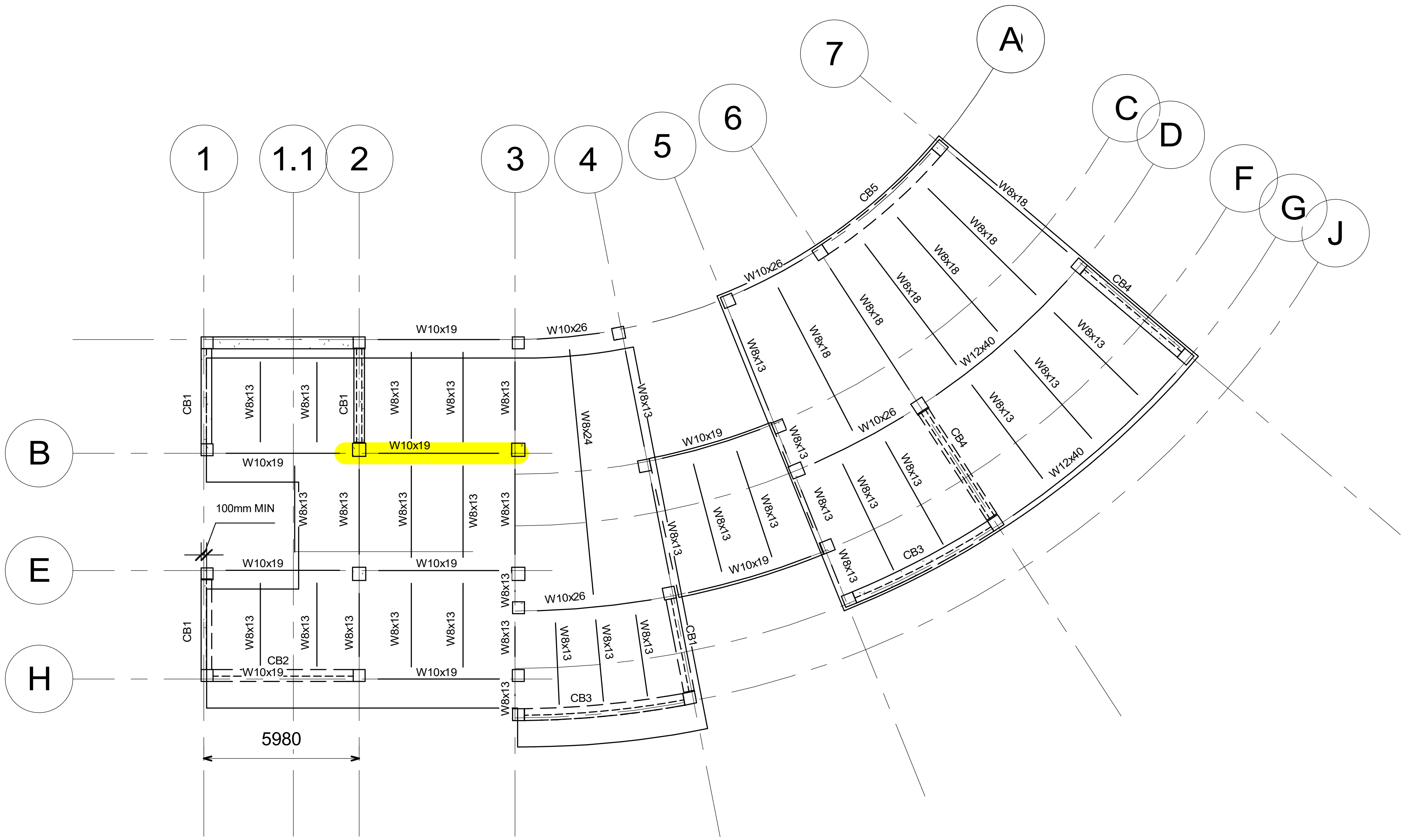
SEE P FOR DEFLECTION

$\Delta_{ALL} = 20.28' \times 12/360 = 0.68'' > \Delta_{ACT} = 0.37''$ ✓

G2 : **W 10 × 26**

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = VARIES. SEE ELEVATIONS FOR HEIGHTS
2. SEE S.407, S.408, S.409, S.411, & S.412 FOR JOIST AND GIRDER DETAILS
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

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PLOT DATE:

6/1/2021 12:02:12 AM

SHEET NAME:

ROOF FRAMING PLAN

SCALE:

1 : 200

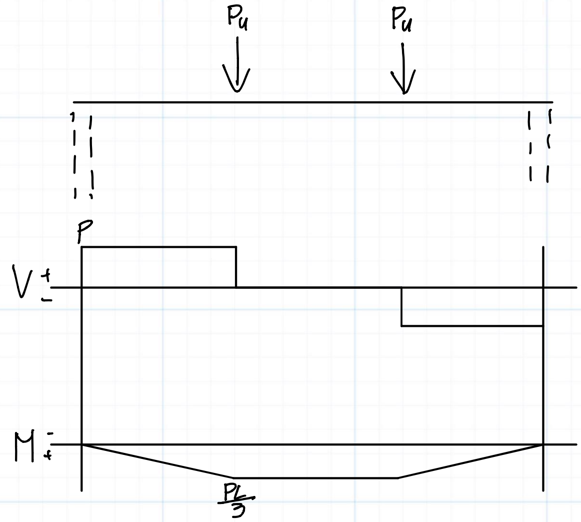
NUMBER:

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. RF18

G3



DL = 20 PSF

LL = 20.2 PSF

TRIB AREA$_1$ = (6.56' × 7.40') + (6.56' × 7.18') = 95.64 ft^2

$P_u = 1.2(1.91) + 1.6(1.93) = 5.38^k$

$V_{max} = 5.38^k$

$M_{max} = 5.38(19.67')/3 = 35.27^{k\text{-}ft}$

$Z_{x\,REQ'D} = \frac{M_u}{\phi F_y} = \frac{35.27^{k\text{-}ft} \times 12}{0.9 \times 50ksi} = 9.4\,in^3$

START W/ W10×19

$Z_x = 21.6\,in^3 > 9.4\,in^3$

CAPACITY AISC T6-2 (6-100)

$V_u = 5.38^k < \phi_v V_n = 76.5^k$ ✓

$M_u = 35.3^{k\text{-}ft} < \phi_b M_n = 81^{k\text{-}ft}$ ✓ MAX $L_b = 12$, $\phi M_n = 36.7 > 35.3$ ✓

DEFLECTION

LL => L/360 DL => L/240

$\frac{LL}{DL} = 0.67$

$\frac{LL}{DL} = \frac{20.2}{20} = 1.01 > 0.67$

LIVE LOAD GOVERNS Δ

SEE P FOR DEFLECTION

$\Delta_{ALL} = 19.67' \times 12/360 = 0.66'' > \Delta_{ACT} = 0.32''$ ✓

G2 : W10×19

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF1

ESTIMATE JOIST SIZE

$L_{JOIST} = 34' \rightarrow h_{BEAM} = L/16$ TO $L/18.5$ ACI 318-19 T9.3.1.1 (129)

26" TO 23"

$h_{BEAM} = 24"$

$b = h/1.5$

$b = 16"$

16"×24" JOISTS

ESTIMATE A GIRDER SIZE

ASSUMING BUILDING DL = 160, LL = 40 => $1.2(160) + 1.6(40) = 256 psf \times 10' = 2.56^{klf}$

$P = 2.56^{klf} \times \left(\frac{23.25'}{2} + \frac{18.25'}{2}\right) = 53.12^{k}$

AISC T3-22c (3-207) $M_u = 0.465PL$ (L = 27.25')

$M_u = 673^{k\text{-}ft}$

$d = 1.5b$

$20M_u = bd^2 \Rightarrow b = \sqrt[3]{\frac{20M_u}{1.5^2}}$

$b = 18"$

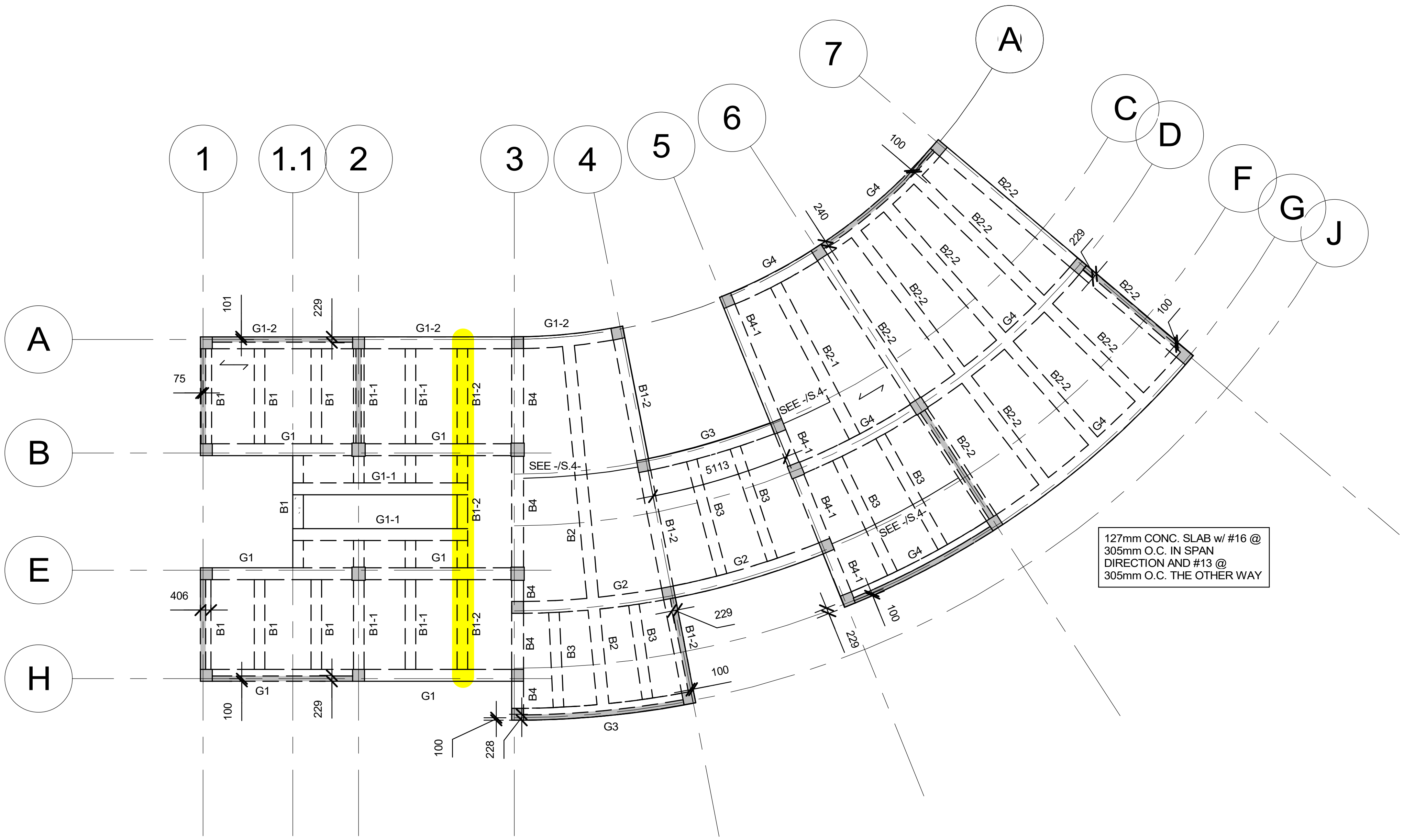
$d = 27"$

$h = 30"$

18"×30" GIRDERS

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

FF2

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

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CHECKED BY:

PLOT DATE:

6/1/2021 12:00:33 AM

SHEET NAME:

FIRST FLOOR FRAMING PLAN

SCALE:

1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF3

B1

$DL = 120\ PSF \times 7.14' = 0.8568^{klf}$

$LL = 40\ PSF \times 7.14' = 0.2856^{klf}$

$TW = 7.14'$

$1.2D + 1.6L = 1.49^{klf}$

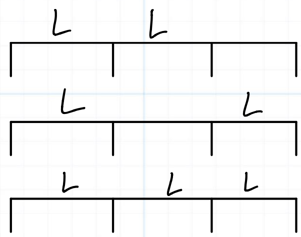
16"×24" BM

-SEE P FOR ETABS RESULTS

$M_u^- = 32.32^{k\text{-}ft}$

$M_u^+ = 26.00^{k\text{-}ft}$

$V_u = 12.83^k$



ESTIMATE STEEL REINFORCEMENT

$$A_s^- \approx \frac{M_u^-}{\phi f_y j d} = \frac{32.32^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.9 \times 21")} = 0.38\,in^2$$

USE: (2)-#4 $(A_s = 2 \times 0.2 = 0.4\,in^2)$

$$\rho = \frac{0.4}{16 \times 21} = 0.12\%$$

$$A_s^+ \approx \frac{M_u^+}{\phi f_y j d} = \frac{26.00^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.93 \times 21")} = 0.30\,in^2$$

USE: (2)-#4 $(A_s = 2 \times 0.2 = 0.4\,in^2)$

$$\rho = \frac{0.4}{16 \times 21} = 0.12\%$$

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF4

VERIFY FLEXURAL CAPACITY, ϕM_n

BM DIMENSIONS: $b = 16''$, $d = 21''$, $h = 24''$

$b_{eff} = 2[8t_{fl}] + b_w = 2[8(5)] + 16 = 96''$

$= 6'-6'' = 78''$ MY TW WAS 7' BUT I AM USING 6'-6" SINCE THE AREA I AM DESIGNING HAS DIFFERENT TW & I AM TRYING TO FIND WORST SCENARIO

$= 2\left[\frac{14.81' \times 12}{8}\right] + 16 = 60''$ ←

@ SUPPORT (-M)

USING (2)-#4 = $0.4 in^2$

$$a = \frac{A_s^- f_y}{0.85 f'_c b} = \frac{(0.4 in^2)(60^{ksi})}{0.85(3^{ksi})(16'')} = 0.59''$$

ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - a/2\right)\right]/12 = 0.9\left[0.4 in^2 \times 60^{ksi}\left(21'' - \frac{0.59''}{2}\right)\right]/12 = 37.27^{k\text{-}ft}$$

$$\boxed{\phi M_n = 37.27^{k\text{-}ft} > M_u = 31.21^{k\text{-}ft} \checkmark}$$

@ MIDSPAN (+M)

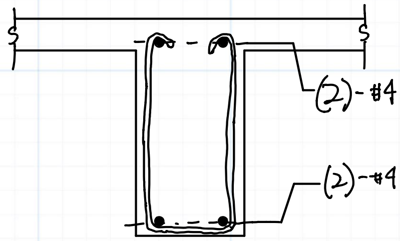
USING (2)-#4 = $0.4 in^2$

$$a = \frac{A_s^+ f_y}{0.85 f'_c b} = \frac{(0.4 in^2)(60^{ksi})}{0.85(3^{ksi})(60'')} = 0.16''$$

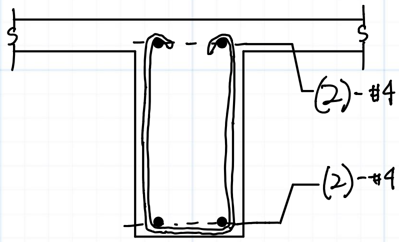
ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - a/2\right)\right]/12 = 0.9\left[0.4 in^2 \times 60^{ksi}\left(21'' - \frac{0.16''}{2}\right)\right]/12 = 37.66^{k\text{-}ft}$$

$$\boxed{\phi M_n = 37.66^{k\text{-}ft} > M_u = 24.13^{k\text{-}ft} \checkmark}$$



SXN@ SUPPORT



SXN@ MIDSPAN

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF5

SHEAR CHECK

$V_u = 12.83^k$

2-LEGGED #3 STIRRUPS

$\phi_v V_c = \phi(2\lambda\sqrt{f'_c}\,bd) = 0.75(2\times 1.0\sqrt{3000})(16\times 21) = \underline{27.6^k}$

SPACING $d/2 = 21''/2 = 10.5'' \Rightarrow \underline{10''}$

$\phi_v V_s = \frac{\phi A_v f_y d}{s} = \frac{0.75(2\times 0.11 in^2)(60^{ksi})(21'')}{10''} = 20.8^k$

$\phi_v V_c + \phi_v V_s = 27.6^k + 20.8^k = \boxed{48.4^k > V_u = 12.83^k}$ ✓

USE #3 STIRRUPS @ 10" O/C

PROJECT MBANDAZI VILLAGE

PROJECT NO. ____ DATE ____

CLIENT JI BY JSS SHEET NO. FF6

See pgs A1-A4 for code

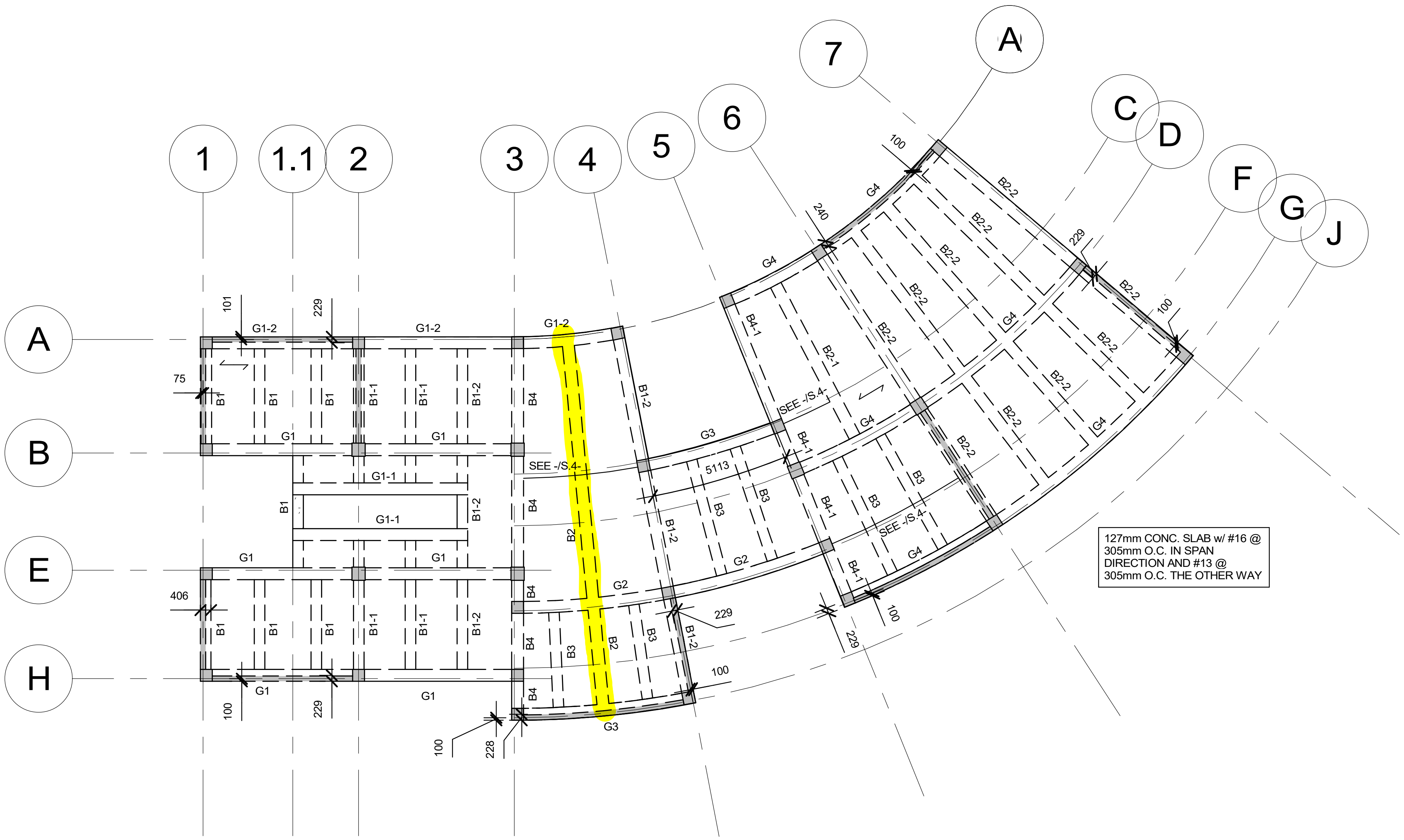
```
In [55]: runfile('/Users/joshuashockey/Documents/ARCE/JI/sxnprops.py',
wdir='/Users/joshuashockey/Documents/ARCE/JI')
b effective =  60 in

flange thickness =  5 in

h =  24 in

b =  16 in

Neutral Axis =  15.46 in

Ixx =  31513.38 in^4

fc =  3000 psi

Mcr+ =  69.778 k-ft

Mcr- =  126.326 k-ft

I cracked midspan =  1489.035 in^4

I cracked support =  1444.343 in^4

dead deflection =  0.005 in

live deflection =  0.002 in

Ma midspan [D,D+L,D+0.1L] =  [13.05 17.4  13.49] k-ft

I effective midspan [D,D+L,D+0.1L] =  [31513.38 31513.38 31513.38] in^4

Ma support [D,D+L,D+0.1L] =  [18.  24.  18.6] k-ft

I effective support [D,D+L,D+0.1L] =  [31513.38 31513.38 31513.38] in^4

deflection due to creep and live =  0.012 in

deflection due to creep, live, and dead =  0.017 in
```

<1"
< L/360 = 0.49"

< L/240 = 0.74"

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

FF7

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE: 6/1/2021 12:00:33 AM

SHEET NAME: FIRST FLOOR FRAMING PLAN

SCALE: 1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF8

B2

LONGER SPAN

$DL = 120\ PSF \times 10' = 1.2^{klf}$

$LL = 40\ PSF \times 10' = 0.4^{klf}$

$TW = 10'$

$1.2D + 1.6L = 2.08^{klf}$

SHORTER SPAN

$DL = 120\ PSF \times 5' = 0.6^{klf}$

$LL = 40\ PSF \times 5' = 0.2^{klf}$

$TW = 5'$

$1.2D + 1.6L = 1.04^{klf}$

18" × 30" BM

-SEE P FOR ETABS RESULTS

$M_u^- = 215.22^{k\text{-}ft}$

$M_u^+ = 199^{k\text{-}ft}$

$V_u = 41.51^{k}$

ESTIMATE STEEL REINFORCEMENT

6 - #5 1.86

$A_s^- \approx \frac{M_u^-}{\phi f_y j d} = \frac{215.22^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.9 \times 27")} = 1.97\ in^2$

USE: (6) - #5 $(A_s = 6 \times 0.31 = 1.86\ in^2)$

$\rho = \frac{1.86}{18 \times 27} = 0.38\%$

$A_s^+ \approx \frac{M_u^+}{\phi f_y j d} = \frac{199^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.93 \times 27")} = 1.76\ in^2$

USE: (6) - #5 $(A_s = 6 \times 0.31 = 1.86\ in^2)$

$\rho = \frac{1.86}{18 \times 27} = 0.38\%$

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. FF9

VERIFY FLEXURAL CAPACITY, ϕM_n

BM DIMENSIONS: $b = 18''$, $d = 25''$, $h = 28''$

$$b_{eff} = 2[8t_{f}] + b_w = 2[8(5)] + 18 = 98''$$

$$= 5'' = 60''$$

MY TW WAS 5' BUT I AM USING 6'-6" SINCE THE AREA I AM DESIGNING HAS DIFFERENT TW & I AM TRYING TO FIND WORST SCENARIO

$$= 2\left[\frac{14.06' \times 12}{8}\right] + 18 = 60'' \longleftarrow$$

@ SUPPORT (−M)

USING (6)-#5 = 1.86 in²

$$a = \frac{A_s^- f_y}{0.85 f'_c b} = \frac{(1.86\ in^2)(60^{ksi})}{0.85(3^{ksi})(18'')} = 2.43''$$

ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y\left(d - \frac{a}{2}\right)\right]/12 = 0.9\left[1.86\ in^2 \times 60^{ksi}\left(27'' - \frac{2.43''}{2}\right)\right]/12 = 215.82^{k\text{-}ft}$$

$$\boxed{\phi M_n = 215.82^{k\text{-}ft} > M_u = 215.22^{k\text{-}ft}\ \checkmark}$$

@ MIDSPAN (+M)

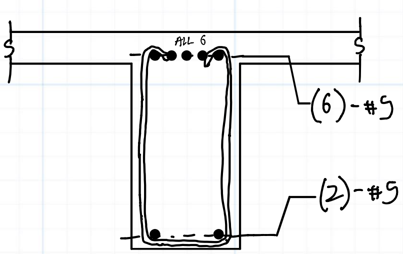
USING (6)-#5 = 1.86 in²

$$a = \frac{A_s^+ f_y}{0.85 f'_c b} = \frac{(1.86\ in^2)(60^{ksi})}{0.85(3^{ksi})(60'')} = 0.73''$$

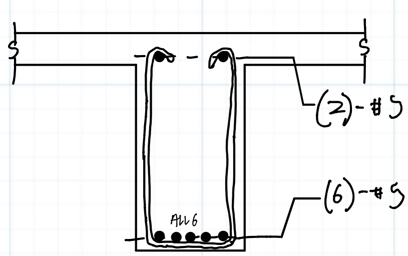
ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y\left(d - \frac{a}{2}\right)\right]/12 = 0.9\left[1.86\ in^2 \times 60^{ksi}\left(27'' - \frac{0.73''}{2}\right)\right]/12 = 222.9^{k\text{-}ft}$$

$$\boxed{\phi M_n = 222.9^{k\text{-}ft} > M_u = 199^{k\text{-}ft}\ \checkmark}$$



SXN@ SUPPORT



SXN@ MIDSPAN

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF10

SHEAR CHECK

$V_u = 41.51^k$

2-LEGGED #3 STIRRUPS

$\phi_v V_c = \phi(2\lambda\sqrt{f'_c}\,bd) = 0.75(2\times1.0\sqrt{3000})(18\times25) = \underline{37.0^k}$

SPACING $d/2 = 27''/2 = 13.5'' \Rightarrow \underline{12''}$

$\phi_v V_s = \dfrac{\phi A_v f_y d}{s} = \dfrac{0.75(2\times0.11in^2)(60^{ksi})(25'')}{12''} = 20.63^k$

$\phi_v V_c + \phi_v V_s = 37.0^k + 20.63 = \boxed{57.6\ k > V_u = 41.51^k}$ ✓

USE #3 STIRRUPS @ 12" O/C

See pgs A1-A4 for code

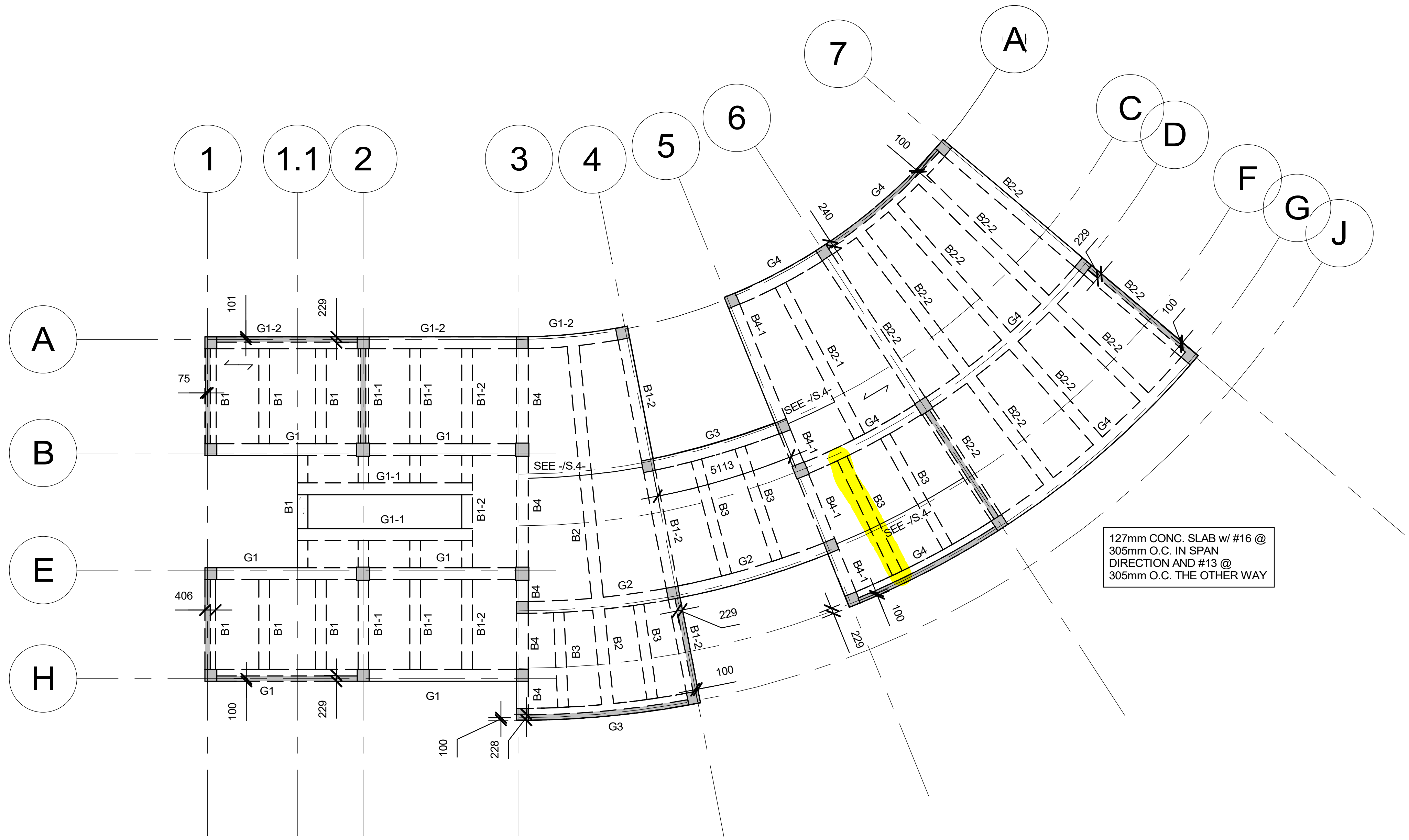
```
In [6]: runfile('/Users/joshuashockey/Documents/ARCE/JI/sxnprops.py',
wdir='/Users/joshuashockey/Documents/ARCE/JI')
b effective =  60 in

flange thickness =  5 in

h =  30 in

b =  18 in

Neutral Axis =  18.5 in

Ixx =  64562.5 in^4

fc =  3000 psi

Mcr+ =  119.467 k-ft

Mcr- =  192.187 k-ft

I cracked midspan =  9604.292 in^4

I cracked support =  8909.583 in^4

dead deflection =  0.1 in

live deflection =  0.033 in

Ma midspan [D,D+L,D+0.1L] =  [108.59 144.79 112.21] k-ft

I effective midspan [D,D+L,D+0.1L] =  [17717.444 12936.249 16815.699]
in^4

Ma support [D,D+L,D+0.1L] =  [124.17 165.56 128.31] k-ft

I effective support [D,D+L,D+0.1L] =  [64562.5   18417.764 63417.396]
in^4

deflection due to creep and live =  0.89 in

deflection due to creep, live, and dead =  1.15 in
```

<1"
< L/360 = 1.14"

< L/240 = 1.71"

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

FF12

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE: 6/1/2021 12:00:33 AM

SHEET NAME: FIRST FLOOR FRAMING PLAN

SCALE: 1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF13

B3

$DL = 120\ PSF \times 7.05 = 0.85^{klf}$

$LL = 40\ PSF \times 7.05' = 0.28^{klf}$

$TW = 7.05'$

$1.2D + 1.6L = 1.47^{klf}$

16"×24" BM

- SEE P FOR ETABS RESULTS

$M_u^- = 35.61^{k\text{-}ft}$

$M_u^+ = 52.75^{k\text{-}ft}$

$V_u = 12.52^{k}$

ESTIMATE STEEL REINFORCEMENT

$$A_s^- \approx \frac{M_u^-}{\emptyset f_y j d} = \frac{35.61^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.9 \times 21'')} = 0.42 in^2$$

USE: (2) - #4 $(A_s = 2 \times 0.2 = 0.4\ in^2)$

$$\rho = \frac{0.4}{16 \times 21} = 0.12\%$$

$$A_s^+ \approx \frac{M_u^+}{\emptyset f_y j d} = \frac{52.75^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.93 \times 21'')} = 0.60 in^2$$

USE: (3) - #4 $(A_s = 3 \times 0.2 = 0.6\ in^2)$

$$\rho = \frac{0.6}{16 \times 21} = 0.18\%$$

PROJECT: MBANDAZI VILLAGE
PROJECT NO.: DATE:
CLIENT: JI BY: JSS SHEET NO.: FF14

VERIFY FLEXURAL CAPACITY, ϕM_n

BM DIMENSIONS: $b = 16''$, $d = 21''$, $h = 24''$

$$b_{eff} = 2[8t_{fl}] + b_w = 2[8(5)] + 16 = 96''$$
$$= 7.05' = 84.6''$$
$$= 2\left[\frac{17.06' \times 12}{8}\right] + 16 = 67'' \longleftarrow$$

@ SUPPORT (-M)

USING (2)-#4 = 0.4 in²

$$a = \frac{A_s^- f_y}{0.85 f'_c b} = \frac{(0.4\,in^2)(60^{ksi})}{0.85(3^{ksi})(16'')} = 0.59''$$

ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - \tfrac{a}{2}\right)\right]/12 = 0.9\left[0.4\,in^2 \times 60^{ksi}\left(21'' - \frac{0.59''}{2}\right)\right]/12 = 37.27^{k\text{-}ft}$$

$$\boxed{\phi M_n = 37.27^{k\text{-}ft} > M_u = 35.61^{k\text{-}ft}\ \checkmark}$$

@ MIDSPAN (+M)

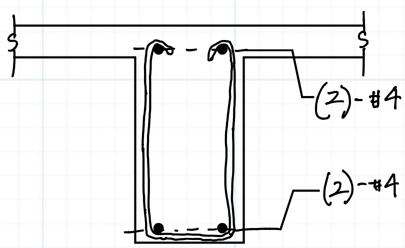
USING (3)-#4 = 0.6 in²

$$a = \frac{A_s^+ f_y}{0.85 f'_c b} = \frac{(0.6\,in^2)(60^{ksi})}{0.85(3^{ksi})(67'')} = 0.21''$$

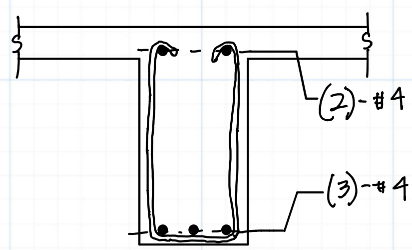
ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - \tfrac{a}{2}\right)\right]/12 = 0.9\left[0.6\,in^2 \times 60^{ksi}\left(21'' - \frac{0.21''}{2}\right)\right]/12 = 56.42^{k\text{-}ft}$$

$$\boxed{\phi M_n = 56.42^{k\text{-}ft} > M_u = 52.75^{k\text{-}ft}\ \checkmark}$$



SXN@ SUPPORT



SXN@ MIDSPAN

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF15

SHEAR CHECK

$V_u = 12.52^k$

2-LEGGED #3 STIRRUPS

$\phi_v V_c = \phi(2\lambda\sqrt{f'_c}\, bd) = 0.75(2 \times 1.0\sqrt{3000})(16 \times 21) = \underline{27.6^k}$

SPACING $d/2 = 21''/2 = 10.5'' \Rightarrow \underline{10''}$

$\phi_v V_s = \frac{\phi A_v f_y d}{s} = \frac{0.75(2 \times 0.11 in^2)(60^{ksi})(21'')}{10''} = 20.8^k$

$\phi_v V_c + \phi_v V_s = 27.6^k + 20.8^k = \boxed{48.4^k > V_u = 12.52^k}$ ✓

USE #3 STIRRUPS @ 10" O/C

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF16

See pgs A1-A4 for code

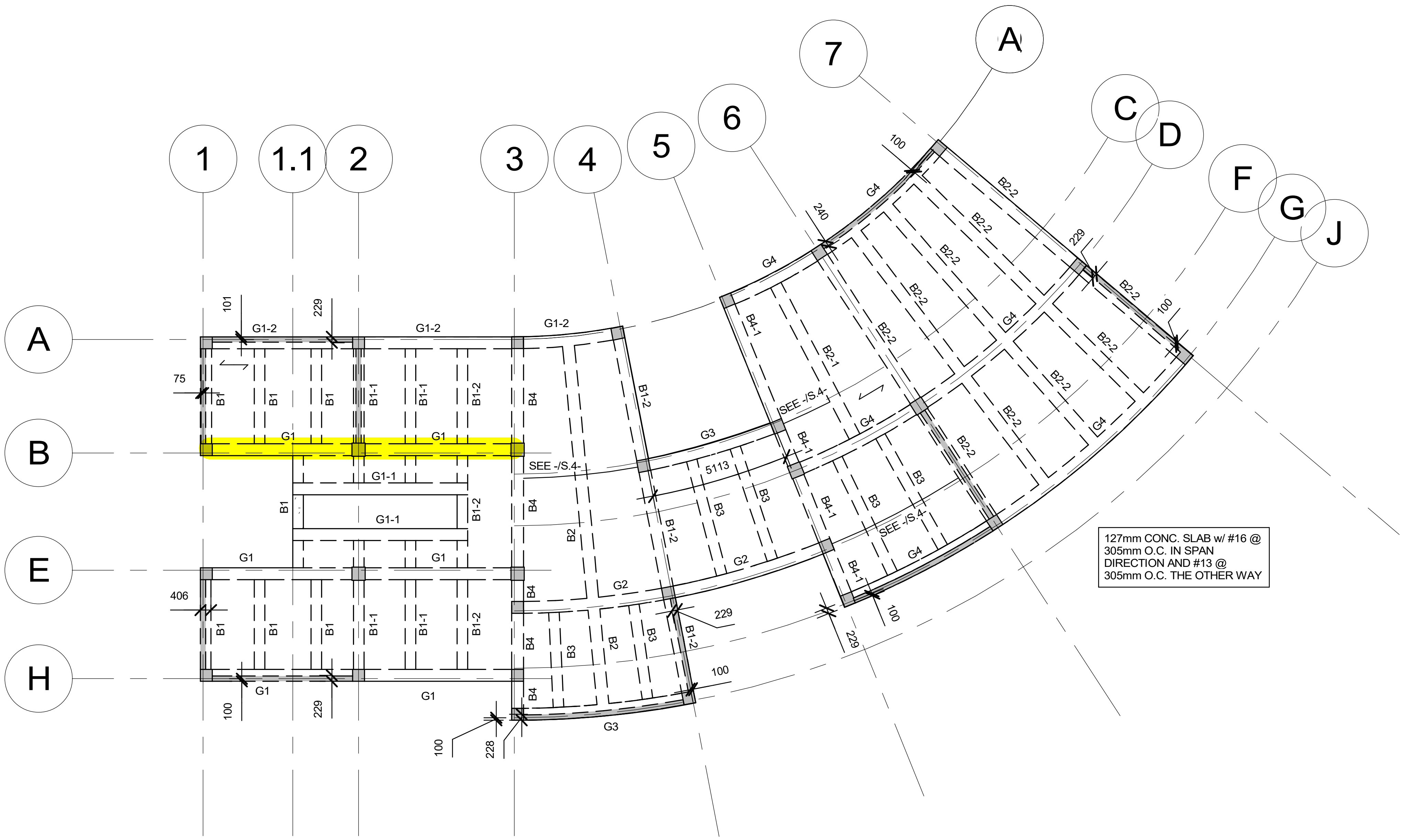
```
In [74]: runfile('/Users/joshuashockey/Documents/ARCE/JI/sxnprops.py',
wdir='/Users/joshuashockey/Documents/ARCE/JI')
b effective =  67 in

flange thickness =  5 in

h =  24 in

b =  16 in

Neutral Axis =  15.791 in

Ixx =  32793.109 in^4

fc =  3000 psi

Mcr+ =  71.09 k-ft

Mcr- =  136.753 k-ft

I cracked midspan =  2190.97 in^4

I cracked support =  1452.099 in^4

dead deflection =  0.02 in

live deflection =  0.007 in

Ma midspan [D,D+L,D+0.1L] =  [30.54 40.6  31.55] k-ft

I effective midspan [D,D+L,D+0.1L] =  [32793.109 32793.109 32793.109]
in^4

Ma support [D,D+L,D+0.1L] =  [20.62 27.41 21.3 ] k-ft

I effective support [D,D+L,D+0.1L] =  [32793.109 32793.109 32793.109]
in^4

deflection due to creep and live =  0.05 in

deflection due to creep, live, and dead =  0.07 in
```

<1"
< L/360 = 0.60"

< L/240 = 0.90"

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

FF17

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

6/1/2021 12:00:33 AM

SHEET NAME:

FIRST FLOOR FRAMING PLAN

SCALE:

1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

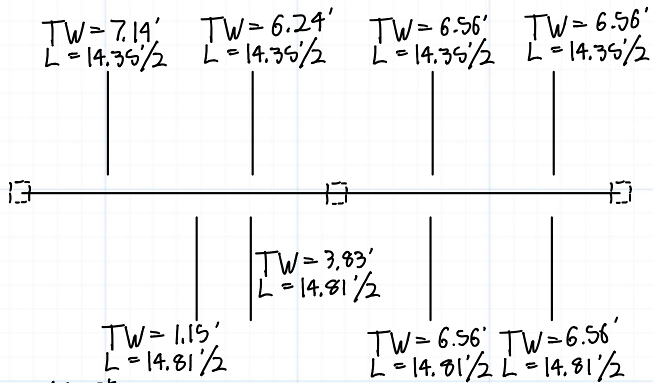
PROJECT NO. ______ DATE ______

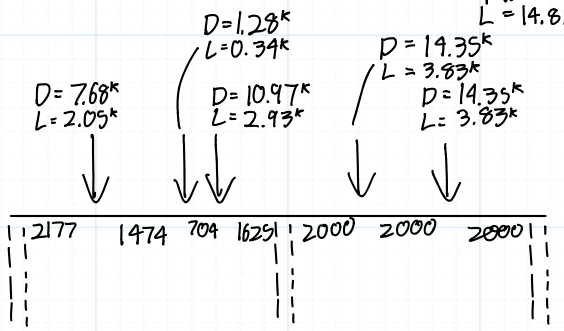
CLIENT JI BY JSS SHEET NO. FF18

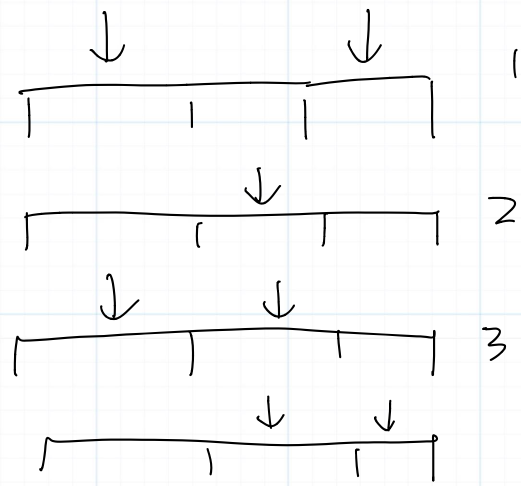
G1

DL = 150 PSF

LL = 40 PSF







18" × 30"

- SEE P FOR ETABS RESULTS

$M_u^- = 127.41^{k\text{-}ft}$

$M_u^+ = 110.58^{k\text{-}ft}$

$V_u = 29.81^{k}$

ESTIMATE STEEL REINFORCEMENT

$$A_s^- \approx \frac{M_u^-}{\phi f_y j d} = \frac{127.41^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.9 \times 27'')} = 1.17\ in^2$$

USE: (4) - #5 $\left(A_s = 4 \times 0.31 = 1.24\ in^2\right)$

$$\rho = \frac{1.24}{18 \times 27} = 0.26\ \%$$

$$A_s^+ \approx \frac{M_u^+}{\phi f_y j d} = \frac{110.58^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.93 \times 27'')} = 0.98\ in^2$$

USE: (3) - #5 $\left(A_s = 3 \times 0.31 = 0.93\ in^2\right)$

$$\rho = \frac{0.93}{18 \times 27} = 0.19\ \%$$

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF19

VERIFY FLEXURAL CAPACITY, ϕM_n

BM DIMENSIONS: $b = 18''$, $d = 27''$, $h = 30''$

$b_{eff} = 2[8t_{fr}] + b_w = 2[8(5)] + 18 = 96''$

$= 14.58' = 175''$

$= 2\left[\frac{19.69' \times 12}{8}\right] + 18 = 77''$ ←

@ SUPPORT (-M)

USING (4)-#5 = 1.24 in^2

$$a = \frac{A_s^- f_y}{0.85 f'_c b} = \frac{(1.24 in^2)(60^{ksi})}{0.85(3^{ksi})(18'')} = 1.62''$$

ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - a/2\right)\right]/12 = 0.9\left[1.24 in^2 \times 60^{ksi}\left(27'' - \frac{1.62''}{2}\right)\right]/12 = 146.14 \text{ k-ft}$$

$\phi M_n = 146.14^{\text{ k-ft}} > M_u = 127.41^{\text{ k-ft}}$ ✓

@ MIDSPAN (+M)

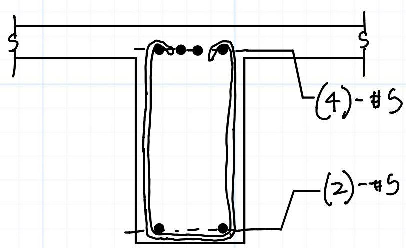
USING (3)-#5 = 0.93 in^2

$$a = \frac{A_s^+ f_y}{0.85 f'_c b} = \frac{(0.93 in^2)(60^{ksi})}{0.85(3^{ksi})(77'')} = 0.28''$$

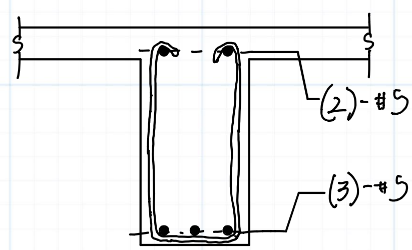
ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - a/2\right)\right]/12 = 0.9\left[0.93 in^2 \times 60^{ksi}\left(27'' - \frac{0.28''}{2}\right)\right]/12 = 112.41 \text{ k-ft}$$

$\phi M_n = 112.41^{\text{ k-ft}} > M_u = 110.58^{\text{ k-ft}}$ ✓



SXN@ SUPPORT



SXN@ MIDSPAN

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF20

SHEAR CHECK

$V_u = 29.81^k$

2-LEGGED #3 STIRRUPS

$\phi_v V_c = \phi(2\lambda\sqrt{f'_c}\,bd) = 0.75(2\times1.0\sqrt{3000})(18\times27) = 39.9^k$

SPACING $d/2 = 27''/2 = 13.5'' \Rightarrow 12''$

$\phi_v V_s = \dfrac{\phi A_v f_y d}{s} = \dfrac{0.75(2\times0.11 in^2)(60^{ksi})(27'')}{12''} = 22.3^k$

$\phi_v V_c + \phi_v V_s = 39.9^k + 22.3^k = \boxed{62.2^k > V_u = 29.81^k}$ ✓

USE #3 STIRRUPS @ 12" O/C

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF21

See pgs A1-A4 for code

```
In [78]: runfile('/Users/joshuashockey/Documents/ARCE/JI/sxnprops.py',
wdir='/Users/joshuashockey/Documents/ARCE/JI')
b effective =  77 in

flange thickness =  5 in

h =  30 in

b =  18 in

Neutral Axis =  19.416 in

Ixx =  70923.715 in^4

fc =  3000 psi

Mcr+ =  125.046 k-ft

Mcr- =  229.398 k-ft

I cracked midspan =  5584.82 in^4

I cracked support =  6927.097 in^4

dead deflection =  0.014 in

live deflection =  0.004 in

Ma midspan [D,D+L,D+0.1L] =  [54.9 69.6 56.4] k-ft

I effective midspan [D,D+L,D+0.1L] =  [70923.715 70923.715 70923.715]
in^4

Ma support [D,D+L,D+0.1L] =  [78.3 99.2 80.4] k-ft

I effective support [D,D+L,D+0.1L] =  [70923.715 70923.715 70923.715]
in^4

deflection due to creep and live =  0.03 in

deflection due to creep, live, and dead =  0.04 in
```

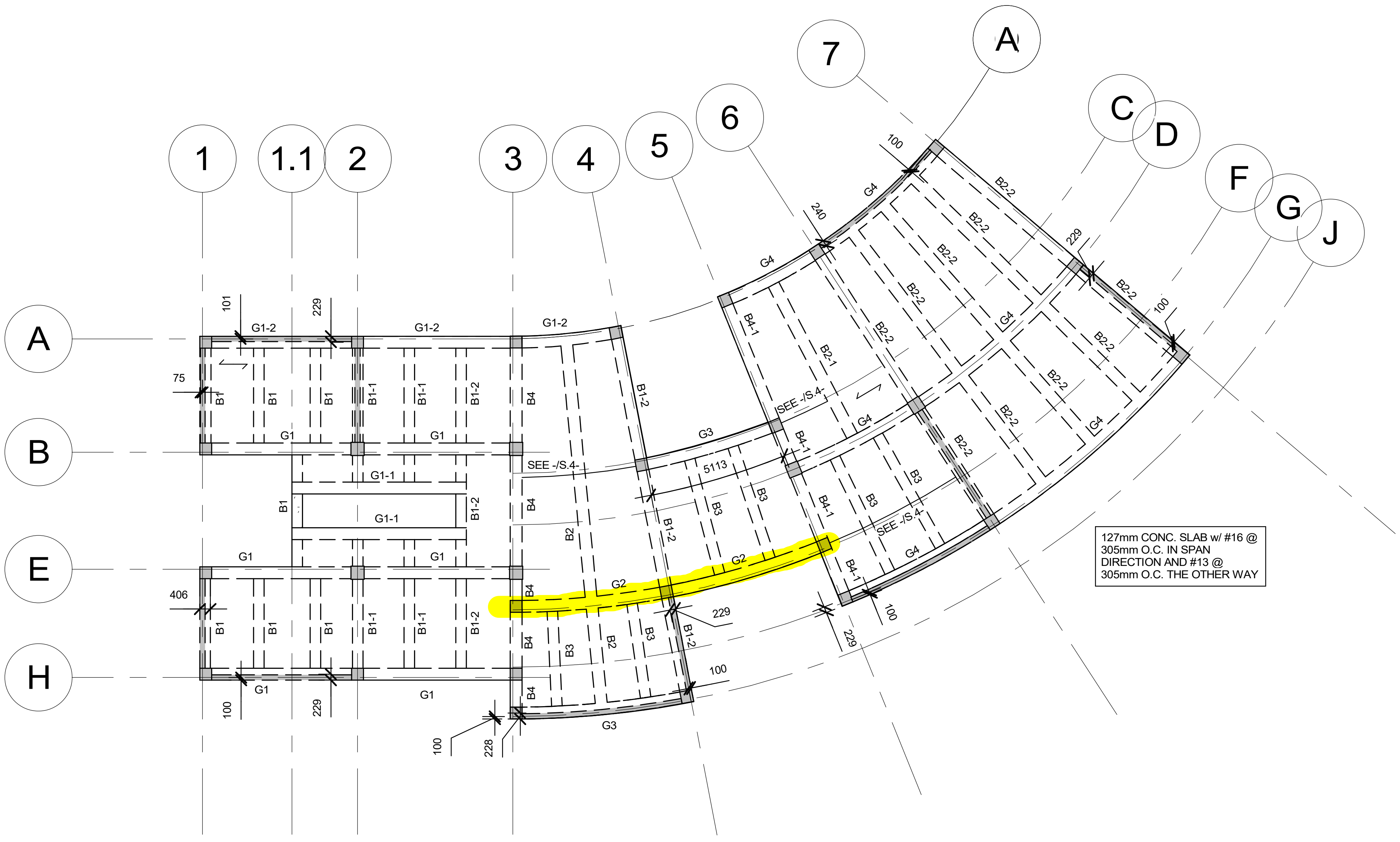
<1"
< L/360 = 0.65"

< L/240 = 0.98"

FF22

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

6/1/2021 12:00:33 AM

SHEET NAME:

FIRST FLOOR FRAMING PLAN

SCALE:

1 : 200

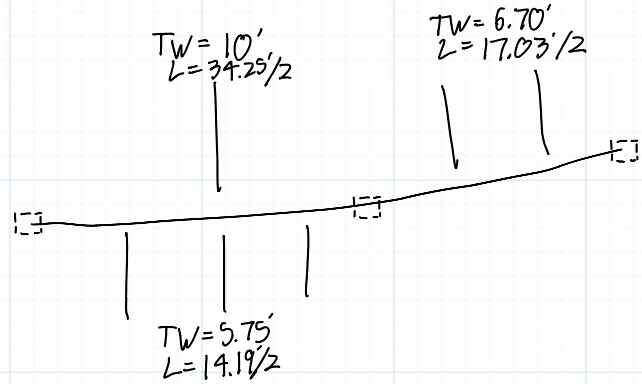
NUMBER:

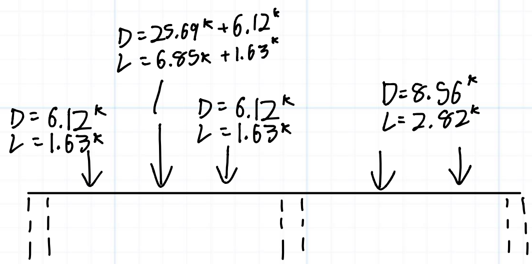
PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF23

G2

DL = 150 PSF

LL = 40 PSF





18" × 30"

- SEE P FOR ETABS RESULTS

$M_u^- = 172.68^{\text{k-ft}}$

$M_u^+ = 224.04^{\text{k-ft}}$

$V_u = 44.4^{\text{k}}$

ESTIMATE STEEL REINFORCEMENT

$$A_s^- \approx \frac{M_u^-}{\emptyset f_y j d} = \frac{172.68^{\text{k-ft}} \times 12}{0.9(60^{\text{ksi}})(0.9 \times 27")} = 1.58 \text{ in}^2$$

USE: (5) - #5 ($A_s = 5 \times 0.31 = 1.55 \text{ in}^2$)

$$\rho = \frac{1.55}{18 \times 27} = 0.32\%$$

$$A_s^+ \approx \frac{M_u^+}{\emptyset f_y j d} = \frac{224.04^{\text{k-ft}} \times 12}{0.9(60^{\text{ksi}})(0.93 \times 27")} = 1.98 \text{ in}^2$$

USE: (6) - #5 ($A_s = 6 \times 0.31 = 1.86 \text{ in}^2$)

$$\rho = \frac{1.86}{18 \times 27} = 0.38\%$$

VERIFY FLEXURAL CAPACITY, $\varnothing M_n$

BM DIMENSIONS: $b = 18''$, $d = 27''$, $h = 30''$

$$b_{eff} = 2[8t_{fl}] + b_w = 2[8(5)] + 18 = 96''$$
$$= 8.5' = 102''$$
$$= \left[\frac{20' \times 12}{8}\right] + 18 = 48'' \leftarrow$$

@ SUPPORT (-M)

USING (5)-#5 = $1.55\ in^2$

$$a = \frac{A_s^- f_y}{0.85 f'_c b} = \frac{(1.55\ in^2)(60^{ksi})}{0.85(3^{ksi})(18'')} = 2.03''$$

ASSUME $\varnothing = 0.9$

$$\varnothing M_n = \varnothing\left[A_s^- f_y\left(d - a/2\right)\right]/12 = 0.9\left[1.55\ in^2 \times 60^{ksi}\left(27'' - \frac{2.03''}{2}\right)\right]/12 = 181.25\ ^{k\text{-}ft}$$

$$\boxed{\varnothing M_n = 181.25^{k\text{-}ft} > M_u = 172.68^{k\text{-}ft}\ \checkmark}$$

@ MIDSPAN (+M)

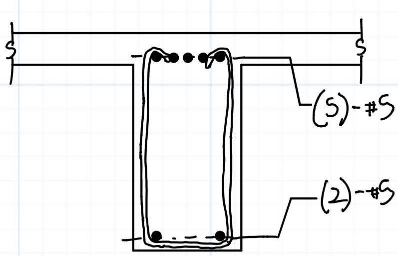
USING (6)-#5 = $1.86\ in^2$

$$a = \frac{A_s^+ f_y}{0.85 f'_c b} = \frac{(1.86\ in^2)(60^{ksi})}{0.85(3^{ksi})(48'')} = 0.91''$$

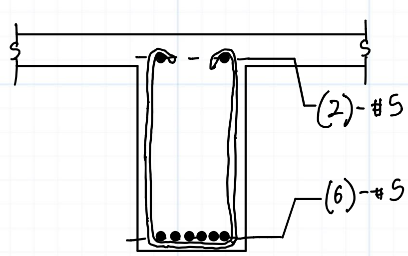
ASSUME $\varnothing = 0.9$

$$\varnothing M_n = \varnothing\left[A_s^- f_y\left(d - a/2\right)\right]/12 = 0.9\left[1.86\ in^2 \times 60^{ksi}\left(27'' - \frac{0.91''}{2}\right)\right]/12 = 222.18^{k\text{-}ft}$$

$$\boxed{\varnothing M_n = 222.18^{k\text{-}ft} \approx M_u = 224.04^{k\text{-}ft}\ \checkmark}$$



SXN@ SUPPORT



SXN@ MIDSPAN

SHEAR CHECK

$V_u = 44.4^K$

2-LEGGED #3 STIRRUPS

$\phi_v V_c = \phi(2\lambda\sqrt{f'_c}\,bd) = 0.75(2\times 1.0\sqrt{3000})(18\times 27) = \underline{39.9^K}$

SPACING $d/2 = 27''/2 = 13.5'' \Rightarrow \underline{12''}$

$\phi_v V_s = \dfrac{\phi A_v f_y d}{s} = \dfrac{0.75(2\times 0.11 in^2)(60^{ksi})(27'')}{12''} = 22.3^K$

$\phi_v V_c + \phi_v V_s = 39.9^K + 22.3^K = \boxed{62.2^K > V_u = 44.4^K}$ ✓

USE #3 STIRRUPS @ 12" O/C

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FF26

See pgs A1-A4 for code

```
In [81]: runfile('/Users/joshuashockey/Documents/ARCE/JI/sxnprops.py',
wdir='/Users/joshuashockey/Documents/ARCE/JI')
b effective =  48 in

flange thickness =  5 in

h =  30 in

b =  18 in

Neutral Axis =  17.717 in

Ixx =  59154.891 in^4

fc =  3000 psi

Mcr+ =  114.296 k-ft

Mcr- =  164.87 k-ft

I cracked midspan =  10170.35 in^4

I cracked support =  8100.081 in^4

dead deflection =  0.039 in

live deflection =  0.01 in

Ma midspan [D,D+L,D+0.1L] =  [138.61 174.68 142.22] k-ft

I effective midspan [D,D+L,D+0.1L] =  [13564.839 12072.578 13341.647]
in^4

Ma support [D,D+L,D+0.1L] =  [104.43 134.04 107.4 ] k-ft

I effective support [D,D+L,D+0.1L] =  [59154.891 19301.134 59154.891]
in^4

deflection due to creep and live =  0.33 in

deflection due to creep, live, and dead =  0.44 in
```

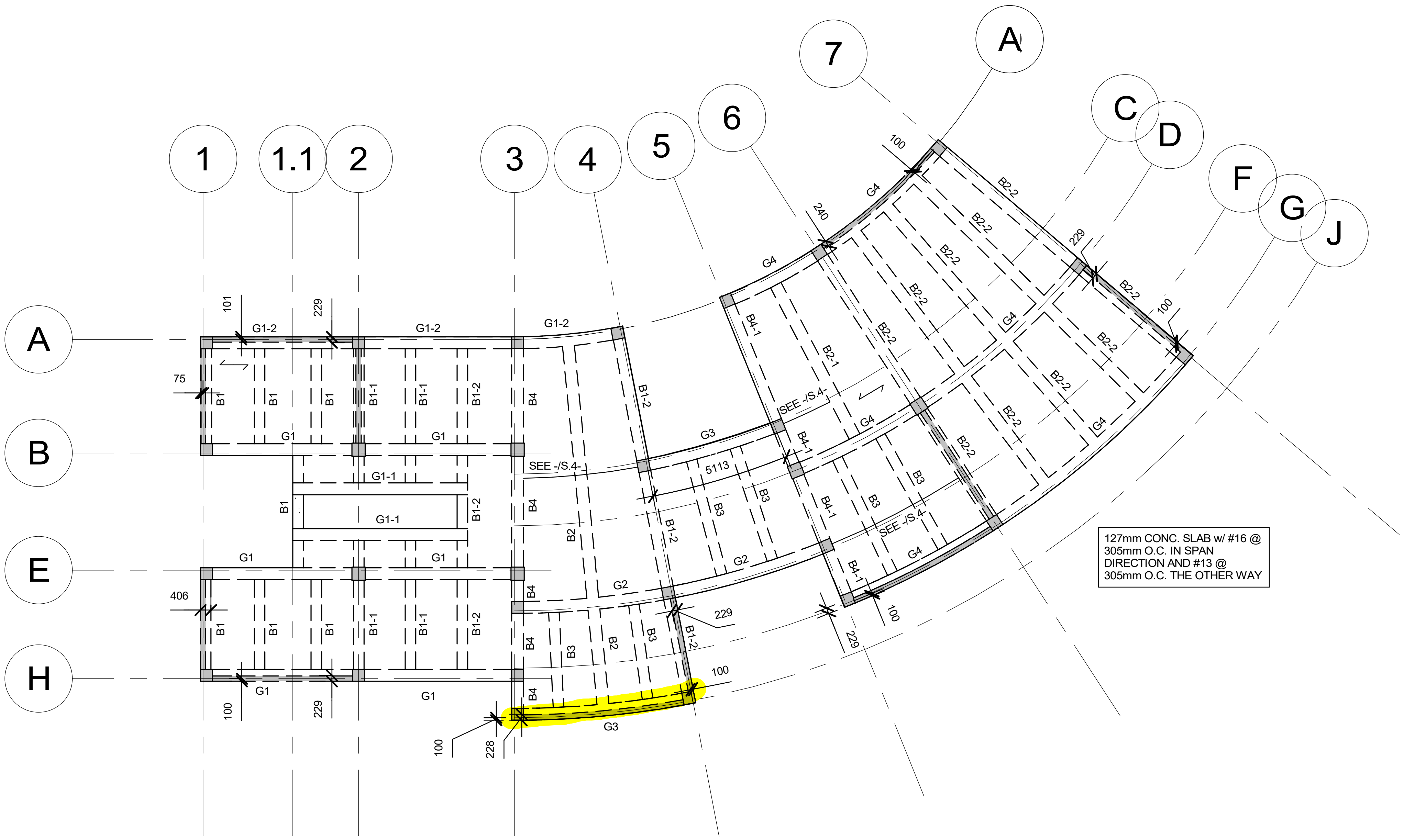
<1"
< L/360 = 0.67"

< L/240 = 1.00"

FF27

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

6/1/2021 12:00:33 AM

SHEET NAME:

FIRST FLOOR FRAMING PLAN

SCALE:

1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

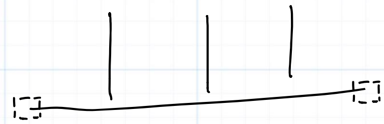
PROJECT NO. DATE

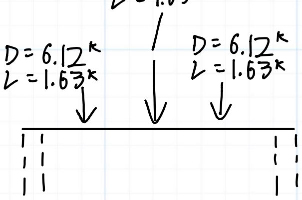
CLIENT JI BY JSS SHEET NO. FF28

G3

DL = 150 PSF

LL = 40 PSF





18" × 30"

- SEE P FOR ETABS RESULTS

$M_u^- = 71.42^{k\text{-}ft}$

$M_u^+ = 114.28^{k\text{-}ft}$

$V_u = 14.93^k$

ESTIMATE STEEL REINFORCEMENT

$$A_s^- \approx \frac{M_u^-}{\phi f_y j d} = \frac{71.42^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.9 \times 27")} = 0.65 \text{ in}^2$$

USE: (2) - #5 ($A_s = 2 \times 0.31 = 0.62 \text{ in}^2$)

$$\rho = \frac{0.62}{18 \times 27} = 0.13\%$$

$$A_s^+ \approx \frac{M_u^+}{\phi f_y j d} = \frac{114.28^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.93 \times 27")} = 1.01 \text{ in}^2$$

USE: (3) - #5 ($A_s = 3 \times 0.31 = 0.93 \text{ in}^2$)

$$\rho = \frac{0.93}{18 \times 27} = 0.19\%$$

PROJECT MBANDAZI VILLAGE

PROJECT NO. ____ DATE ____

CLIENT JI BY JSS SHEET NO. FF29

VERIFY FLEXURAL CAPACITY, ϕM_n

BM DIMENSIONS: $b = 18''$, $d = 27''$, $h = 30''$

$$b_{eff} = 2[8t_{fr}] + b_w = 2[8(5)] + 18 = 96''$$

$$= 7.1' = 85''$$

$$= \left[\frac{23' \times 12}{8}\right] + 18 = 52'' \leftarrow$$

@ SUPPORT (-M)

USING (2)-#5 $= 0.62\ in^2$

$$a = \frac{A_s^- f_y}{0.85 f'_c b} = \frac{(0.62\ in^2)(60^{ksi})}{0.85(3^{ksi})(18'')} = 0.81''$$

ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - a/2\right)\right]/12 = 0.9\left[0.62\ in^2 \times 60^{ksi}\left(27'' - \frac{0.81''}{2}\right)\right]/12 = 74.20^{k\text{-}ft}$$

$$\boxed{\phi M_n = 74.20^{k\text{-}ft} > M_u = 71.42^{k\text{-}ft}\ \checkmark}$$

@ MIDSPAN (+M)

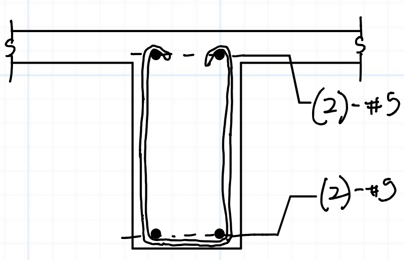
USING (3)-#5 $= 0.93\ in^2$

$$a = \frac{A_s^+ f_y}{0.85 f'_c b} = \frac{(0.93\ in^2)(60^{ksi})}{0.85(3^{ksi})(52'')} = 0.42''$$

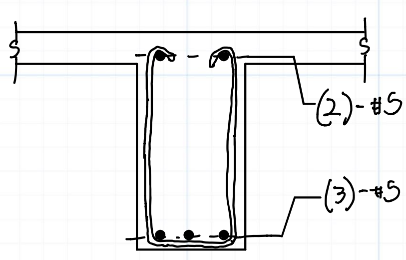
ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y \left(d - a/2\right)\right]/12 = 0.9\left[0.93\ in^2 \times 60^{ksi}\left(27'' - \frac{0.42''}{2}\right)\right]/12 = 112.12^{k\text{-}ft}$$

$$\boxed{\phi M_n = 112.12^{k\text{-}ft} \approx M_u = 114.28^{k\text{-}ft}\ \checkmark}$$



SXN@ SUPPORT



SXN@ MIDSPAN

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. FF30

SHEAR CHECK

$V_u = 14.93^k$

2-LEGGED #3 STIRRUPS

$\phi_v V_c = \phi(2\lambda\sqrt{f'_c}\,bd) = 0.75(2\times1.0\sqrt{3000})(18\times27) = 39.9^k$

SPACING $d/2 = 27''/2 = 13.5'' \Rightarrow 12''$

$\phi_v V_s = \dfrac{\phi A_v f_y d}{s} = \dfrac{0.75(2\times0.11 in^2)(60^{ksi})(27'')}{12''} = 22.3^k$

$\phi_v V_c + \phi_v V_s = 39.9^k + 22.3^k = \boxed{62.2^k > V_u = 14.93^k}$ ✓

USE #3 STIRRUPS @ 12" O/C

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF31

See pgs A1-A4 for code

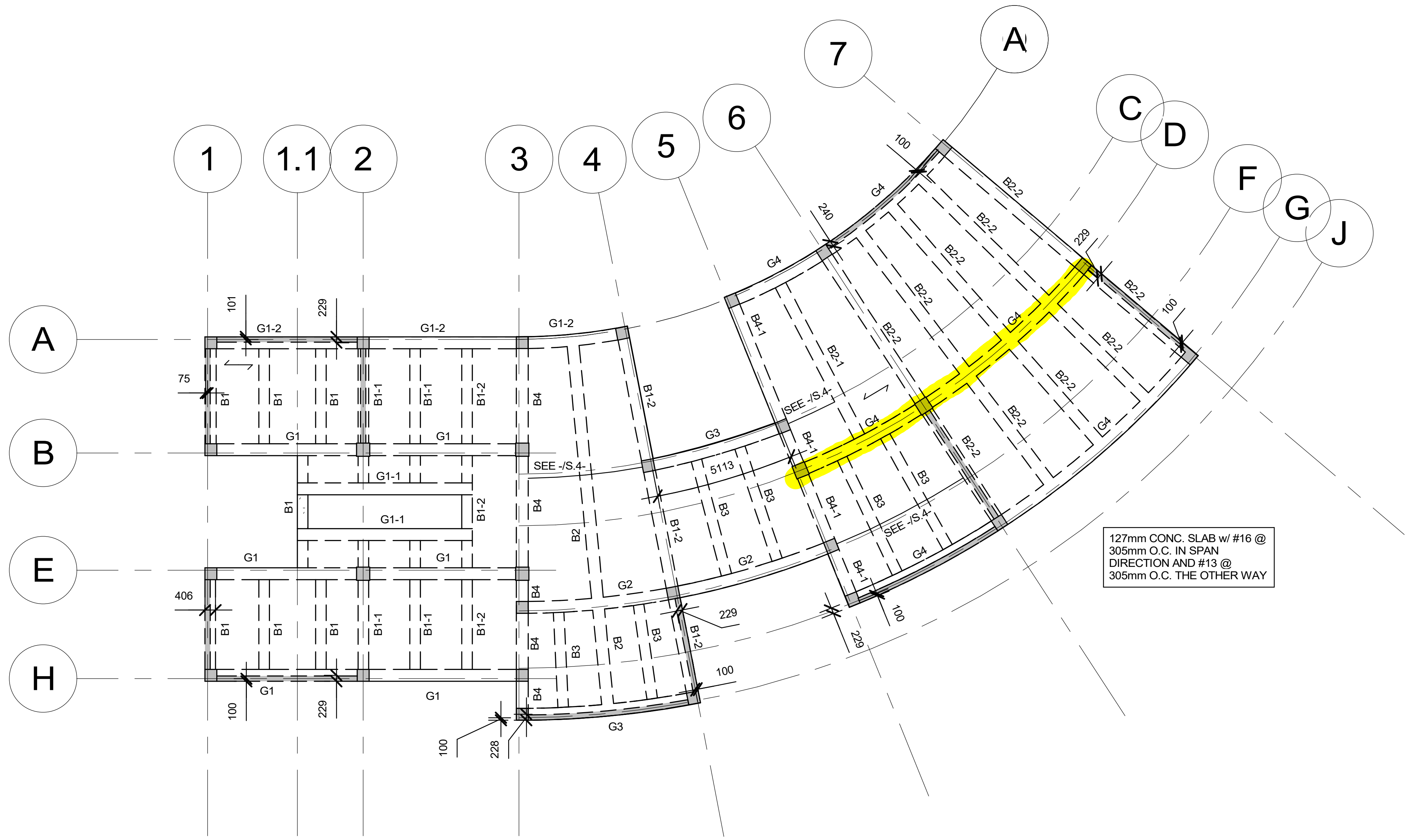
```
In [83]: runfile('/Users/joshuashockey/Documents/ARCE/JI/sxnprops.py',
wdir='/Users/joshuashockey/Documents/ARCE/JI')
b effective =  52 in

flange thickness =  5 in

h =  30 in

b =  18 in

Neutral Axis =  17.993 in

Ixx =  61056.631 in^4

fc =  3000 psi

Mcr+ =  116.164 k-ft

Mcr- =  174.075 k-ft

I cracked midspan =  5440.652 in^4

I cracked support =  3602.809 in^4

dead deflection =  0.033 in

live deflection =  0.009 in

Ma midspan [D,D+L,D+0.1L] =  [70.28 88.99 72.15] k-ft

I effective midspan [D,D+L,D+0.1L] =  [61056.631 17541.015 61056.631]
in^4

Ma support [D,D+L,D+0.1L] =  [43.92 55.62 45.09] k-ft

I effective support [D,D+L,D+0.1L] =  [61056.631 61056.631 61056.631]
in^4

deflection due to creep and live =  0.14 in

deflection due to creep, live, and dead =  0.17 in
```

<1"
< L/360 = 0.75"

< L/240 = 1.13"

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

FF32

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

6/1/2021 12:00:33 AM

SHEET NAME:

FIRST FLOOR FRAMING PLAN

SCALE:

1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

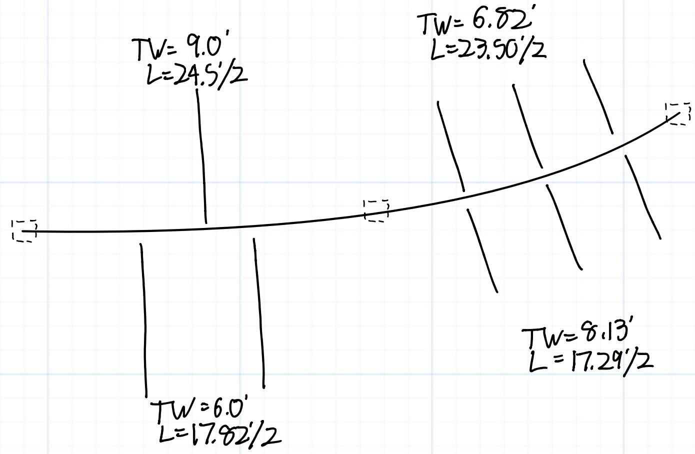
PROJECT NO. DATE

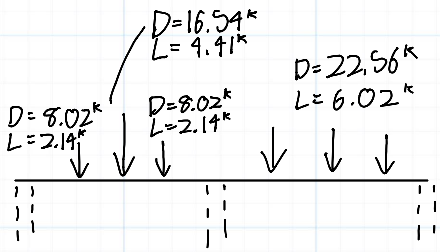
CLIENT JI BY JSS SHEET NO. FF33

G4

DL = 150 PSF

LL = 40 PSF





18" × 30"

-SEE P FOR ETABS RESULTS

$M_u^- = 333.88^{k\text{-}ft}$

$M_u^+ = 340.03^{k\text{-}ft}$

$V_u = 61.89^{k}$

ESTIMATE STEEL REINFORCEMENT

$$A_s^- \approx \frac{M_u^-}{\phi f_y jd} = \frac{333.88^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.9 \times 27'')} = 3.05 \, in^2$$

USE: (10) - #5 $(A_s = 10 \times 0.31 = 3.1 \, in^2)$

$$\rho = \frac{3.1}{18 \times 27} = 0.64\,\%$$

$$A_s^+ \approx \frac{M_u^+}{\phi f_y jd} = \frac{340.03^{k\text{-}ft} \times 12}{0.9(60^{ksi})(0.93 \times 27'')} = 3.01 \, in^2$$

USE: (10) - #5 $(A_s = 10 \times 0.31 = 3.1 \, in^2)$

$$\rho = \frac{3.1}{18 \times 27} = 0.64\,\%$$

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. FF34

VERIFY FLEXURAL CAPACITY, ϕM_n

BM DIMENSIONS: $b = 18''$, $d = 27''$, $h = 30''$

$b_{eff} = 2[8t_{fl}] + b_w = 2[8(5)] + 18 = 96'' \leftarrow$

$= 20.4' = 244.8''$

$= 2\left[\frac{27.25' \times 12}{8}\right] + 18 = 100''$

@ SUPPORT (-M)

USING (10)-#5 = 3.1 in²

$$a = \frac{A_s^- f_y}{0.85 f'_c b} = \frac{(3.1\ in^2)(60^{ksi})}{0.85(3^{ksi})(18'')} = 4.05''$$

ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y\left(d - \frac{a}{2}\right)\right]/12 = 0.9\left[3.1\ in^2 \times 60^{ksi}\left(27'' - \frac{4.05''}{2}\right)\right]/12 = 348.40^{k\text{-}ft}$$

$$\boxed{\phi M_n = 348.40^{k\text{-}ft} > M_u = 327.00^{k\text{-}ft}\ \checkmark}$$

@ MIDSPAN (+M)

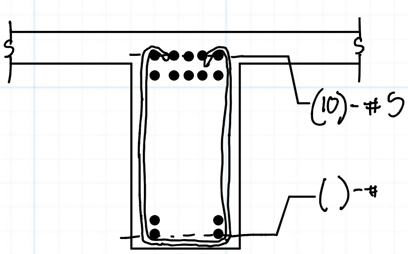
USING (10)-#5 = 3.1 in²

$$a = \frac{A_s^+ f_y}{0.85 f'_c b} = \frac{(3.1\ in^2)(60^{ksi})}{0.85(3^{ksi})(96'')} = 0.76''$$

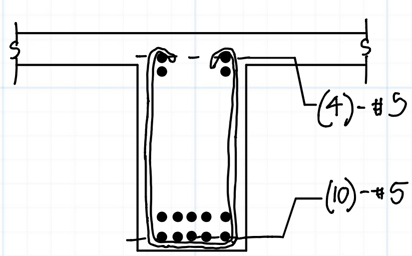
ASSUME $\phi = 0.9$

$$\phi M_n = \phi\left[A_s^- f_y\left(d - \frac{a}{2}\right)\right]/12 = 0.9\left[3.1\ in^2 \times 60^{ksi}\left(27'' - \frac{0.76''}{2}\right)\right]/12 = 371.35^{k\text{-}ft}$$

$$\boxed{\phi M_n = 371.35^{k\text{-}ft} \approx M_u = 335.23^{k\text{-}ft}\ \checkmark}$$



SXN@ SUPPORT



SXN@ MIDSPAN

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. FF35

SHEAR CHECK

$V_u = 60.85^k$

2-LEGGED #3 STIRRUPS

$\phi_v V_c = \phi(2\lambda\sqrt{f'c}\,bd) = 0.75(2\times1.0\sqrt{3000})(18\times27) = \underline{39.9^k}$

SPACING $d/2 = 27''/2 = 13.5'' \Rightarrow \underline{12''}$

$\phi_v V_s = \frac{\phi A_v f_y d}{s} = \frac{0.75(2\times0.11in^2)(60^{ksi})(27'')}{12''} = 22.3^k$

$\phi_v V_c + \phi_v V_s = 39.9^k + 22.3^k = \boxed{62.2^k > V_u = 60.85^k}$ ✓

USE #3 STIRRUPS @ 12" O/C

PROJECT MBANDAZI VILLAGE

PROJECT NO. ____ DATE ____

CLIENT JI BY JSS SHEET NO. FF36

See pgs A1-A4 for code

```
In [89]: runfile('/Users/joshuashockey/Documents/ARCE/JI/sxnprops.py',
wdir='/Users/joshuashockey/Documents/ARCE/JI')
b effective =  96 in

flange thickness =  5 in

h =  30 in

b =  18 in

Neutral Axis =  20.242 in

Ixx =  76695.565 in^4

fc =  3000 psi

Mcr+ =  129.706 k-ft

Mcr- =  269.059 k-ft

I cracked midspan =  15960.359 in^4

I cracked support =  14430.807 in^4

dead deflection =  0.09 in

live deflection =  0.023 in

Ma midspan [D,D+L,D+0.1L] =  [175.92 221.72 180.    50.  ] k-ft

I effective midspan [D,D+L,D+0.1L] =  [19736.468 18145.988 19529.378
76695.565] in^4

Ma support [D,D+L,D+0.1L] =  [206.18 260.22 211.58] k-ft

I effective support [D,D+L,D+0.1L] =  [37429.741 23493.265 34647.111]
in^4

deflection due to creep and live =  0.72 in

deflection due to creep, live, and dead =  1.03 in
```

<1"
< L/360 = 0.91"

< L/240 = 1.36"

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF37

TORSION GIRDERS

DL = 150

LL = 40

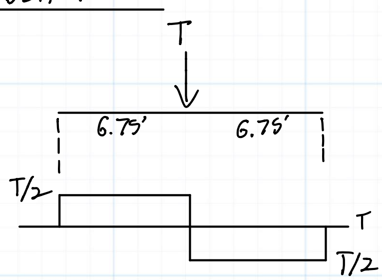
$A_{CP} = 18'' \times 30'' = 540 \text{ in}^2$

$P_{CP} = 2(18'' + 30'') = 96 \text{ in}$

$T_{THRESHOLD} = \lambda\sqrt{f'c}\left[\frac{A_{CP}^2}{P_{CP}}\right]$

$= 1.0\sqrt{3000}\left[\frac{540^2}{96}\right] / (1000 \times 12) = 13.9^{\text{k-ft}}$

GIRDER A 3-4



TW = 6.75'

L = 34.28'/2

T D 150, L 40: $\frac{(6.75)(17.14)^2}{1000 \times 24} = $ 12.39, 3.31

T = 1.2D + 1.6L = 20.16

$T_u = 20.16/2 = 10.08^{\text{k-ft}} < 13.9^{\text{k-ft}}$

TORSIONAL REINFORCEMENT NOT NECESSARY

PROJECT MBANDAZI VILLAGE

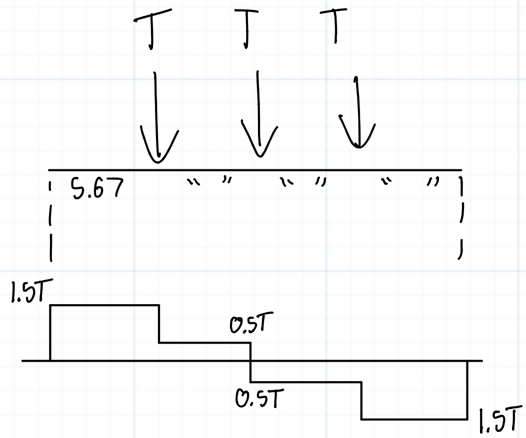
PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF38

GIRDER J 3-4

TW=5.67'

L=13.49/2



T D150 L40 $\frac{(5.67)(6.75)^2}{1000 \times 24} = \frac{1.61}{0.93}$

1.2D+1.6L = 2.63

$T_u = 1.5(2.62) = 3.94^{k\text{-}ft} < 13.9^{k\text{-}ft}$

TORSIONAL REINFORCEMENT NOT NECESSARY

PROJECT MBANDAZI VILLAGE

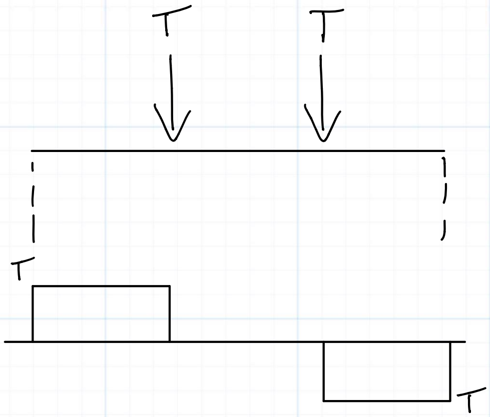
PROJECT NO. DATE

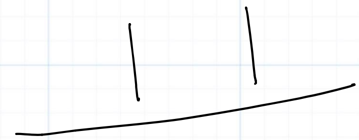
CLIENT JI BY JSS SHEET NO. FF39

GIRDER G 5-6

$TW = 7.14$

$L = 18'/2$





T D 150, L 40: $\frac{(7.14)(9)^2}{1000 \times 24} = \begin{matrix} 3.61 \\ 0.96 \end{matrix}$

$1.2D + 1.6L = 5.87$

$T_u = 1.0(5.87) = 5.87^{k\text{-}ft} < 13.9^{k\text{-}ft}$

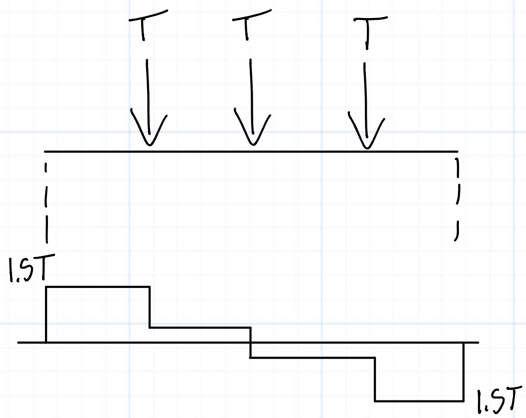
TORSIONAL REINFORCEMENT NOT NECESSARY

PROJECT MBANDAZI VILLAGE

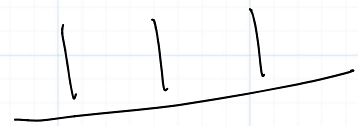
PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FF40

GIRDER G 6-7



TW = 6.82'
L = 18.33'/2



T D150 L40 $\frac{(6.82)(9.17)^2}{1000 \times 24} = \begin{matrix}3.58\\0.96\end{matrix}$

1.2D+1.6L = 5.83

$T_u = 1.5(5.83) = 8.75^{k\text{-}ft} < 13.9^{k\text{-}ft}$

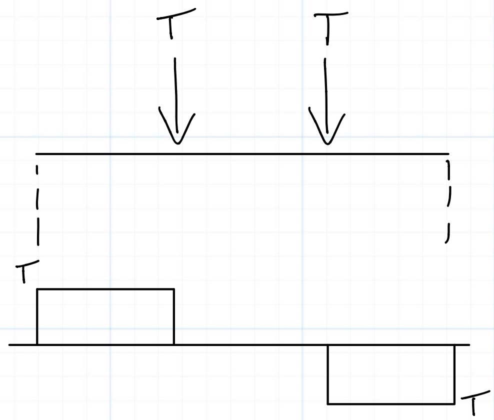
TORSIONAL REINFORCEMENT NOT NECESSARY

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

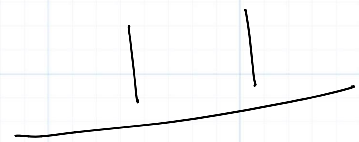
CLIENT JI BY JSS SHEET NO. FF41

GIRDER A 6-7



TW = 9.09'

L = 11.77'/2



T D150 L40 $\frac{(9.09)(11.77)^2}{1000 \times 24}$ = 7.87 / 2.10

1.2D+1.6L = 12.80

$T_u = 1.0(12.80) = 12.80^{k\text{-}ft} < 13.9^{k\text{-}ft}$

TORSIONAL REINFORCEMENT NOT NECESSARY

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. CO1

ESTIMATE COL SIZE

$$\frac{KL}{r} \leq 34 - 12\left(\frac{M_1}{M_2}\right) \rightarrow 0$$

ACI 318-19 6.2.5

$$r \geq \frac{KL}{34} = \frac{1(14.11' \times 12)}{34} = 4.98$$

$$h_{col} = \frac{r}{0.3} = \frac{4.98}{0.3} = 16.6''$$

≈ AREA OF FLOOR

$$P_u = 565\ ft^2 \left[1.2(160+30) + 1.6(40+20)\right] = 183^K$$

$$\phi P_n \sim \phi\left[0.8\left(0.85 f'_c A_g + \rho f_y A_g\right)\right] \qquad \rho \sim 1\%$$

$$= 0.65\left[0.8\left(0.85 \times 3^{ksi} \times A_g + 0.01 \times 60^{ksi} \times A_g\right)\right]$$

$$1.64 A_g = 183^K$$

$$A_g = 112\ in^2$$

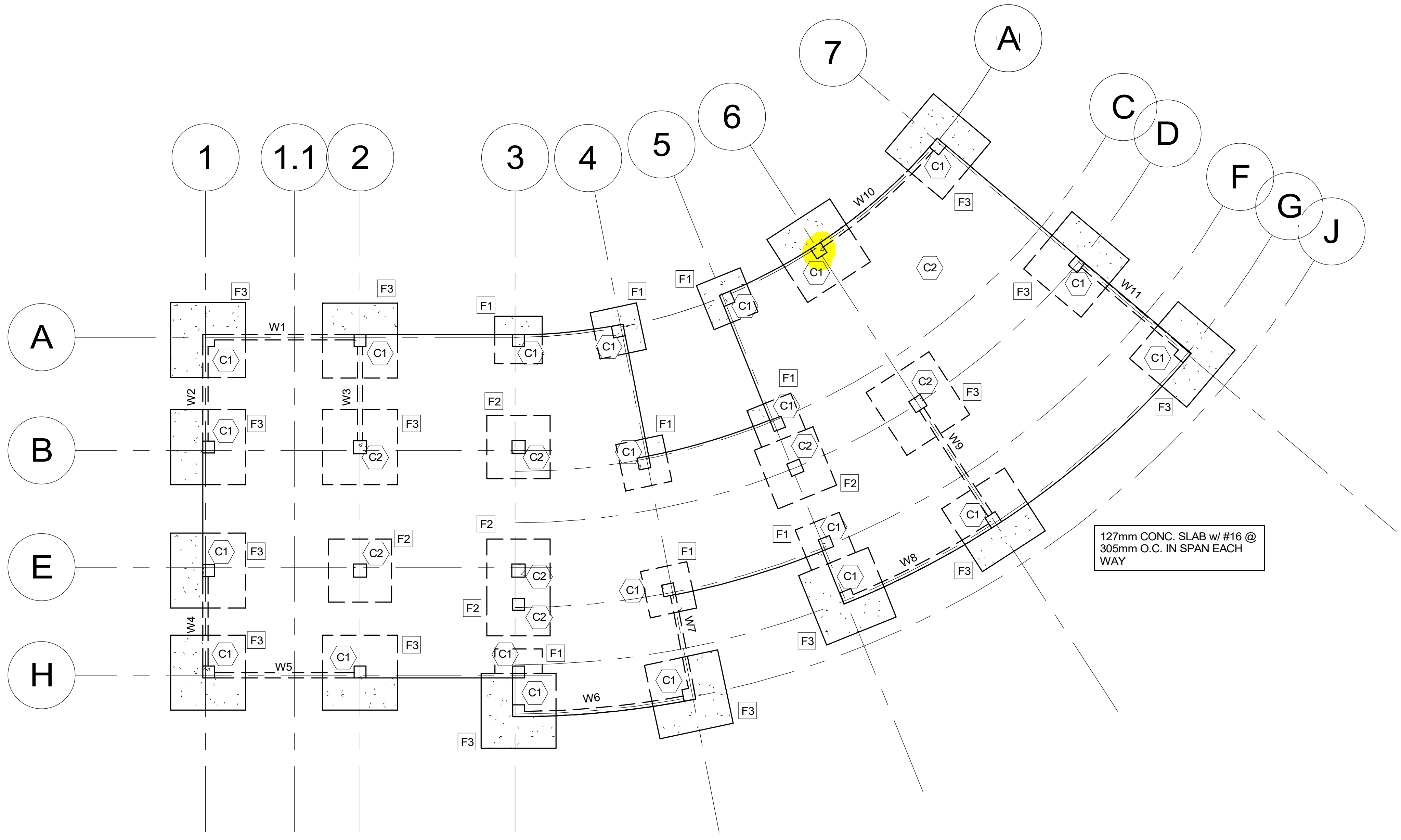
$$\rightarrow h_{col} = 11''$$

USE 16" × 16" COL

CO2

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +0m U.N.O.
2. TOP OF FOOTING TO BE (0.61m) BELOW TOP OF SLAB U.N.O.
3. SEE SHEET S.001 TO S.006 FOR GENERAL NOTES
4. SEE 21/S.414 FOR CONCRETE COLUMN SCHEDULE
5. SEE S.403 & S.404 FOR FOOTING DETAILS
6. SEE 1/S.401 FOR TYPICAL SLAB-ON-GRADE DETAILS
7. SEE S.415 & S.417 FOR WWALL ELEVATIONS



FOUNDATION PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE: 5/31/2021 11:59:16 PM

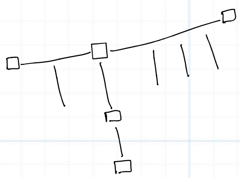
SHEET NAME: FOUNDATION PLAN

SCALE: 1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. CO3

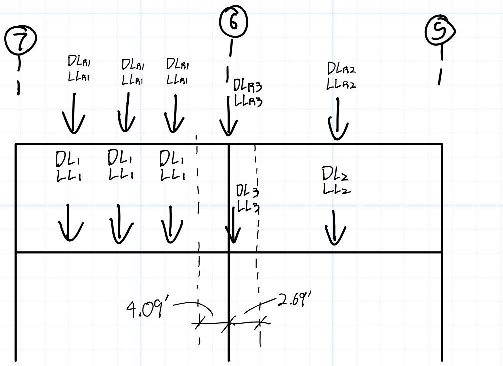
EXT COL



$DL_F = 160^{PSF}$ $DL_R = 25^{PSF}$

$LL_F = 40^{PSF}$ $LL_R = 20^{PSF}$

ALONG GIRDER LINE



$DL_{R1} = 25(6.82' \times 11.77') = 2.01^k$

$DL_{R2} = 25(8.99' \times 11.77') = 2.65^k$

$DL_{R3} = 25((4.50' + 3.41') \times 11.77') = 2.33^k$

$DL_1 = 160(6.82' \times 11.77') = 12.84^k$

$DL_2 = 160(8.99' \times 11.77') = 16.93^k$

$DL_3 = 160((4.50' + 3.41') \times 11.77') = 14.90^k$

$LL_{R1} = 20(6.82' \times 11.77') = 1.61^k$

$LL_{R2} = 20(8.99' \times 11.77') = 2.12^k$

$LL_{R3} = 20((4.50' + 3.41') \times 11.77') = 1.86^k$

$LL_1 = 40(6.82' \times 11.77') = 3.21^k$

$LL_2 = 40(8.99' \times 11.77') = 4.23^k$

$LL_3 = 40((4.50' + 3.41') \times 11.77') = 3.97^k$

AXIAL

$P_{UD} @ 6 = 1.5DL_{R1} + 1.5DL_1 + DL_{R3} + DL_3 + 0.5DL_{R2} + 0.5DL_2 = 49.30^k$

$P_{UL} @ 6 = 1.5LL_{R1} + 1.5LL_1 + LL_{R3} + LL_3 + 0.5LL_{R2} + 0.5LL_2 = 16.24^k$

$P_u = 1.2(49.30) + 1.6(16.24) = \underline{85.14^k}$

MOMENT

SHEAR @ 0.2L LEFT OF 6

$V_{ULR} = 1.2(1.5DL_{R1}) + 1.6(1.5LL_{R1}) = 7.48^k$ $M_{ULR} = 30.59^{k\text{-}ft}$

$V_{ULF} = 1.2(1.5DL_1) + 1.6(1.5LL_1) = 30.82^k$ $M_{ULF} = 126.05^{k\text{-}ft}$

SHEAR @ 0.2L RIGHT OF 6

$V_{URR} = 1.2(0.5DL_{R2}) = 1.59^k$ $M_{URR} = 4.28^{k\text{-}ft}$

$V_{URF} = 1.2(0.5DL_2) = 10.16^k$ $M_{URF} = 27.33^{k\text{-}ft}$

$M_{UR} = 26.31^{k\text{-}ft}$

$M_{UF} = 98.72^{k\text{-}ft}$

MAX

$M = 98.72^{k\text{-}ft}$

$P = 85.14^k$

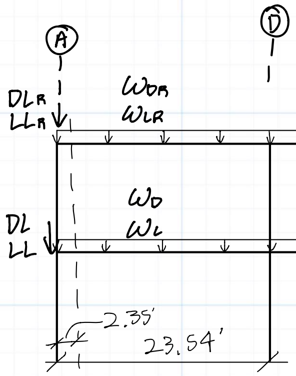
←

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. CO4

ALONG JOIST LINE



$DL_R = 4.34^k$

$LL_R = 3.48^k$

$DL = 27.73^k$

$LL = 6.93^k$

$W_{DR} = 25(3.41' + 3.37') = 0.17^{klf}$

$W_{LR} = 20(3.41' + 3.37') = 0.14^{klf}$

$W_D = 160(3.41' + 3.37') = 1.08^{klf}$

$W_L = 40(3.41' + 3.37') = 0.27^{klf}$

AXIAL

SAME AS ABOVE : $P_u = 85.14^k$

MOMENT

SHEAR @ 0.1L

$V_{UR} = 1.2\left[\frac{W_{DR}(0.7 \times 23.54')}{2}(0.1 \times 23.54')\right] + 1.6\left[\frac{W_{LR}(0.7 \times 23.54')}{2}(0.1 \times 23.54')\right] = 8.3^k$ $M_{UR} = 19.51^{k\text{-}ft}$

$V_{UF} = 1.2\left[\frac{W_D(0.7 \times 23.54')}{2}(0.1 \times 23.54')\right] + 1.6\left[\frac{W_L(0.7 \times 23.54')}{2}(0.1 \times 23.54')\right] = 33.51^k$ $M_{UF} = 78.75^{k\text{-}ft}$

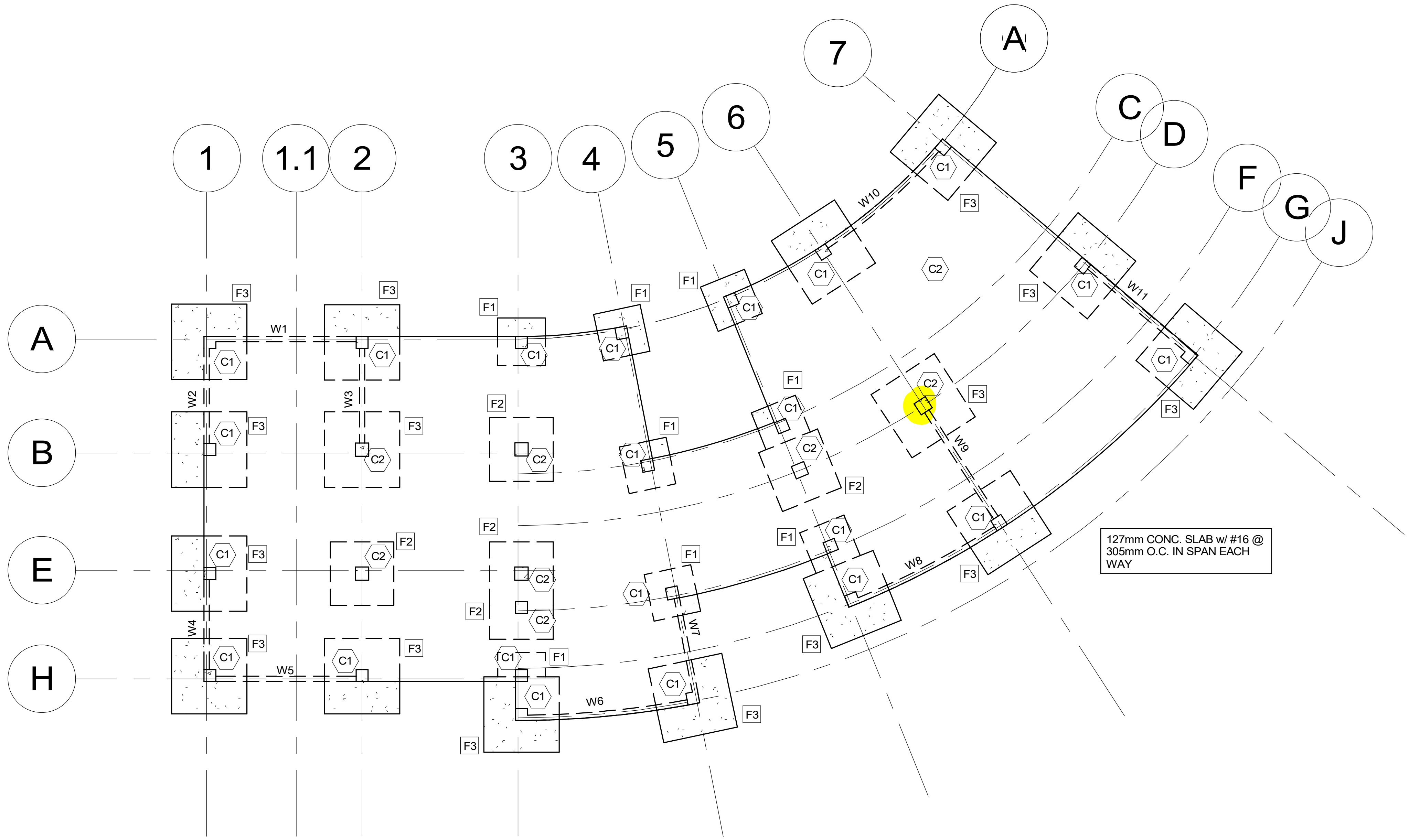
MAX

$M = 98.26^{k\text{-}ft}$

$P = 85.14^k$

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +0m U.N.O.
2. TOP OF FOOTING TO BE (0.61m) BELOW TOP OF SLAB U.N.O.
3. SEE SHEET S.001 TO S.006 FOR GENERAL NOTES
4. SEE 21/S.414 FOR CONCRETE COLUMN SCHEDULE
5. SEE S.403 & S.404 FOR FOOTING DETAILS
6. SEE 1/S.401 FOR TYPICAL SLAB-ON-GRADE DETAILS
7. SEE S.415 & S.417 FOR WWALL ELEVATIONS



FOUNDATION PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

CO5

SEAL:

PROJECT:
MBANDAZI VILLAGE

SITE:
MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:
5/31/2021 11:59:16 PM

SHEET NAME:
FOUNDATION PLAN

SCALE:
1 : 200

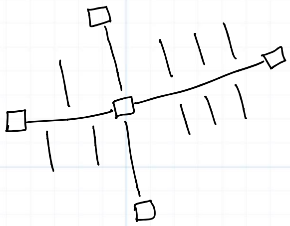
NUMBER:

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. CO6

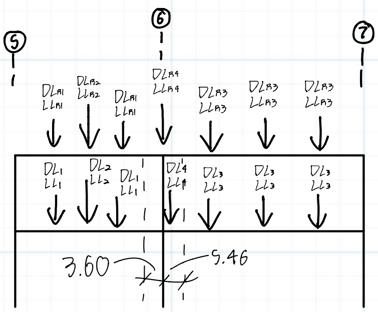
INT COL



$DL_F = 160^{PSF}$ $\quad DL_R = 25^{PSF}$

$LL_F = 40^{PSF}$ $\quad LL_R = 20^{PSF}$

ALONG GIRDER LINE



$DL_{R1} = 25(7.14' \times 9.17') = 1.64^k$ $\quad LL_{R1} = 20(7.14' \times 9.17') = 1.31^k$

$DL_{R2} = 25(8.99' \times 11.77) = 2.65^k$ $\quad LL_{R2} = 20(8.99' \times 11.77) = 2.12^k$

$DL_{R3} = 25(6.82 \times 11.77 + 8.13' \times 9.17') = 3.87^k$ $\quad LL_{R3} = 20(6.82 \times 11.77 + 8.13' \times 9.17') = 3.10^k$

$DL_{R4} = 25(7.91' \times 11.77' + 7.64' \times 9.17') = 4.08^k$ $\quad LL_{R4} = 20(7.91' \times 11.77' + 7.64' \times 9.17') = 3.26^k$

$DL_1 = 160(7.14' \times 9.17') = 10.48^k$ $\quad LL_1 = 40(7.14' \times 9.17') = 2.62^k$

$DL_2 = 160(8.99' \times 11.77) = 16.93^k$ $\quad LL_2 = 40(8.99' \times 11.77) = 4.23^k$

$DL_3 = 160(6.82 \times 11.77 + 8.13' \times 9.17') = 24.77^k$ $\quad LL_3 = 40(6.82 \times 11.77 + 8.13' \times 9.17') = 6.19^k$

$DL_4 = 160(7.91' \times 11.77' + 7.64 \times 9.17') = 26.11^k$ $\quad LL_4 = 40(7.91' \times 11.77' + 7.64 \times 9.17') = 6.53^k$

AXIAL

$P_{uD} @ 6 = 0.5(DL_{R2} + DL_2) + (DL_{R1} + DL_1) + (DL_{R4} + DL_4) + 1.5(DL_{R3} + DL_3) = 95.06^k$

$P_{uL} @ 6 = 0.5(LL_{R2} + LL_2) + (LL_{R1} + LL_1) + (LL_{R4} + LL_4) + 1.5(LL_{R3} + LL_3) = 30.83^k$

$P_u = 1.2(95.06) + 1.6(30.83) = \underline{163.4^k}$

MOMENT

SHEAR @ 0.2L LEFT OF 6

$V_{uLR} = 1.2(0.5DL_{R2} + DL_{R1}) = 3.56^k$ $\quad M_{uLR} = 12.82^{k\text{-}ft}$

$V_{uLF} = 1.2(0.5DL_2 + DL_1) = 22.73^k$ $\quad M_{uLF} = 81.83^{k\text{-}ft}$

SHEAR @ 0.2L RIGHT OF 6

$V_{uRR} = 1.2(1.5DL_{R3}) + 1.6(1.5LL_{R3}) = 14.41^k$ $\quad M_{uRR} = 78.68^{k\text{-}ft}$

$V_{uRF} = 1.2(1.5DL_3) + 1.6(1.5LL_3) = 59.44^k$ $\quad M_{uRF} = 324.54^{k\text{-}ft}$

$M_{uR} = 65.86^{k\text{-}ft}$

$M_{uF} = 242.71^{k\text{-}ft}$

MAX
$P = 163.4^k$
$M = 242.71^{k\text{-}ft}$

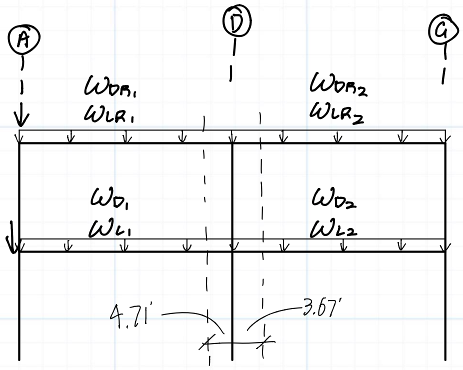
←

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. CO7

ALONG JOIST LINE



$W_{DR1} = 25(7.91') = 0.20^{klf}$ $W_{LR1} = 20(7.91') = 0.16^{klf}$

$W_{DR2} = 25(7.64') = 0.19^{klf}$ $W_{LR2} = 20(7.64') = 0.15^{klf}$

$W_{D1} = 160(7.91') = 1.27^{klf}$ $W_{L1} = 40(7.91') = 0.32^{klf}$

$W_{D2} = 160(7.64') = 1.22^{klf}$ $W_{L2} = 40(7.64') = 0.31^{klf}$

AXIAL

SAME AS ABOVE: 163.4^k

MOMENT

SHEAR @ 0.2L LEFT

$V_{ULR} = 1.2\left[\frac{W_{DR1}(0.7\times 23.54')}{2}(0.2\times 23.54')\right] + 1.6\left[\frac{W_{LR1}(0.7\times 18.33')}{2}(0.2\times 18.33')\right] = 15.33^k$ $M_{ULR} = 72.20^{k\text{-}ft}$

$V_{ULF} = 1.2\left[\frac{W_{D1}(0.7\times 23.54')}{2}(0.2\times 23.54')\right] + 1.6\left[\frac{W_{L1}(0.7\times 18.33')}{2}(0.2\times 18.33')\right] = 71.15^k$ $M_{ULF} = 335.12^{k\text{-}ft}$

SHEAR @ 0.2L RIGHT

$V_{URR} = 1.2\left[\frac{W_{DR2}(0.7\times 23.54')}{2}(0.2\times 23.54')\right] + 1.6\left[\frac{W_{LR2}(0.7\times 18.33')}{2}(0.2\times 18.33')\right] = 8.84^k$ $M_{URR} = 32.44^{k\text{-}ft}$

$V_{URF} = 1.2\left[\frac{W_{D2}(0.7\times 23.54')}{2}(0.2\times 23.54')\right] + 1.6\left[\frac{W_{L2}(0.7\times 18.33')}{2}(0.2\times 18.33')\right] =$ $M_{URF} = 208.42^{k\text{-}ft}$

$M_{UR} = 39.76^{k\text{-}ft}$

$M_{UF} = 126.70^{k\text{-}ft}$

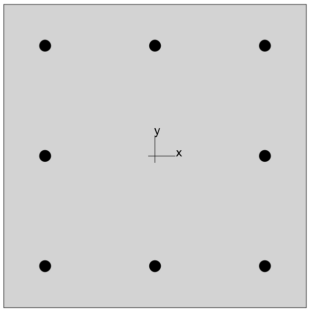
MAX

$P = 163.4^k$

$M = 126.70^{k\text{-}ft}$

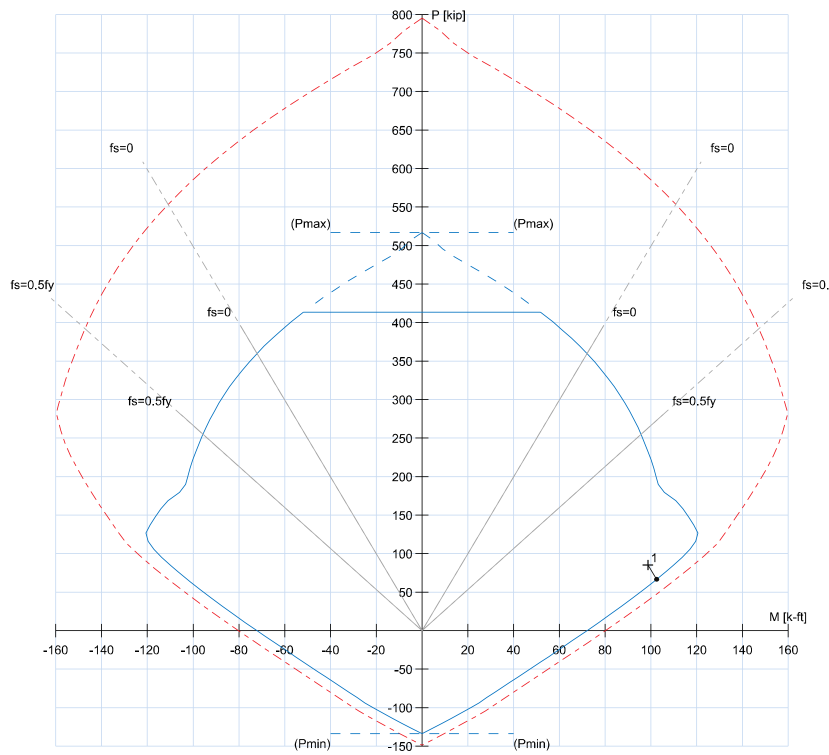
6. Diagrams

6.1. PM at θ=0 [deg]



16 x 16 in

changed to 18x18



PM at 0.0 [deg]

General Information

Project	exterior column
Column	---
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

f'_c	3 ksi
E_c	3122.02 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	16 in
Depth	16 in
A_g	256 in^2
I_x	5461.33 in^4
I_y	5461.33 in^4

Reinforcement

Pattern	All sides equal
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	1.5 in
Bars	8 #5
Confinement type	Tied
Total steel area, A_s	2.48 in^2
Rho	0.97 %
Min. clear spacing	5.19 in

No.	P_u	M_{ux}	ϕP_n	ϕM_{nx}	Capacity
	kip	k-ft	kip	k-ft	Ratio
1	85.1	98.7	66.58	102.57	0.94

Max. Capacity Ratio: 0.94

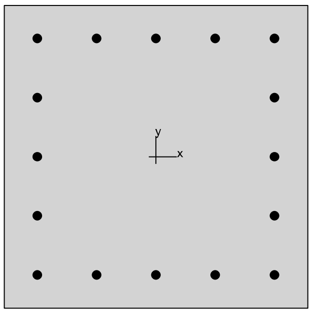
PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

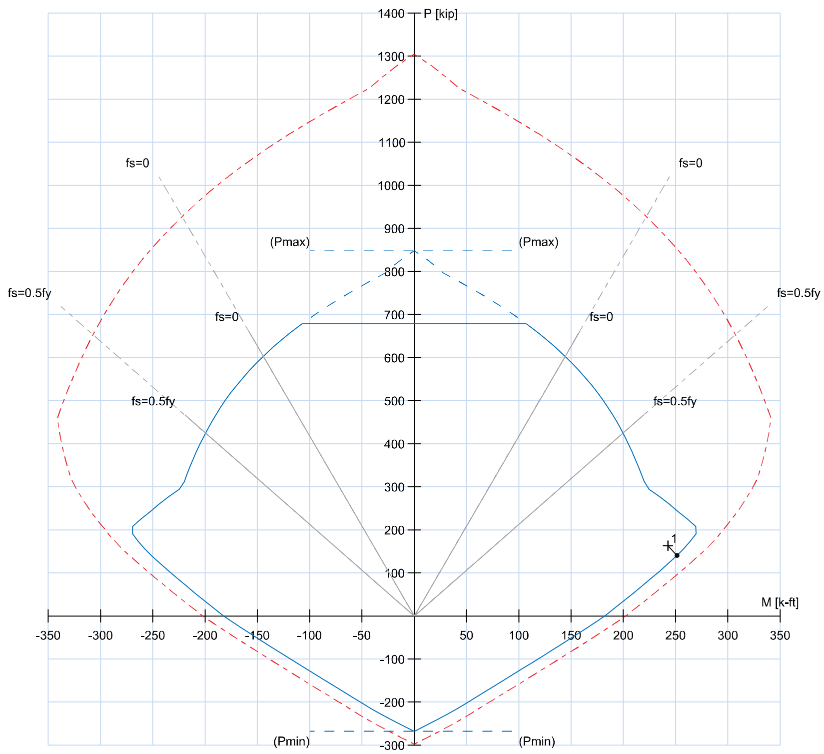
CLIENT JI BY JSS SHEET NO. CO9

6. Diagrams

6.1. PM at θ=0 [deg]



20 x 20 in



PM at 0.0 [deg]

General Information

Project	interior column
Column	---
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

f'_c	3 ksi
E_c	3122.02 ksi
f_y	60 ksi
E_s	29000 ksi

Section

Type	Rectangular
Width	20 in
Depth	20 in
A_g	400 in^2
I_x	13333.3 in^4
I_y	13333.3 in^4

Reinforcement

Pattern	Equal spacing
Bar layout	Rectangular
Cover to	Transverse bars
Clear cover	1.5 in
Bars	16 #5
Confinement type	Tied
Total steel area, A_s	4.96 in^2
Rho	1.24 %
Min. clear spacing	3.28 in

No.	P_u	M_{ux}	ϕP_n	ϕM_{nx}	Capacity
	kip	k-ft	kip	k-ft	Ratio
1	163.4	242.7	140.39	251.41	0.95

Max. Capacity Ratio: 0.95

TRANSVERSE REBAR

$l_{u_1} = 9.84' - 2.5' = 7.34'$

$l_{u_2} = 7.55' - 2.5' = 5.05'$

$l_{o_1} = \begin{cases} b = 18'' \leftarrow \\ 1/6\, l_{u_1} = 14.7'' \\ 18'' \end{cases}$

$l_{o_1} = \begin{cases} b = 20'' \leftarrow \\ 1/6\, l_{u_1} = 10.1'' \\ 18'' \end{cases}$

EXT
$S = \text{LEAST} \begin{cases} b/4 = 4.5'' \\ 6d_b = 3.75'' \\ S_o = 4 + \left(\frac{14 - h_x}{3}\right) = 7.29'' > 6'' \therefore 6'' \leftarrow \end{cases}$

$h_x = 4.125''$

INT
$S = \text{LEAST} \begin{cases} b/4 = 5'' \\ 6d_b = 3.75'' \\ S_o = 4 + \left(\frac{14 - h_x}{3}\right) = 7.07'' > 6'' \therefore 6'' \leftarrow \end{cases}$

$h_x = 4.79''$

1ST STORY

$A_{ch} = \left(\underbrace{18'' - 2\left(1.5'' - 0.375''/2\right)}_{15.38''}\right)^2 = 236.4\ in^2$

$K_f = 1.0$

$K_n = \frac{8}{8-2} = 1.33$

$A_g = 324\ in^2$

$A_{sh}/sb_c = \text{GREATEST} \begin{cases} 0.3\left(\frac{A_g}{A_{ch}} - 1\right)\frac{f'_c}{f_y} = 0.0056 \leftarrow \\ 0.09\frac{f'_c}{f_y} = 0.0045 \\ 0.2 k_f k_n \frac{P_u}{f_y A_{ch}} = 0.0031 \end{cases}$

$S = \frac{A_{sh}}{0.0056 b_c} = \frac{3(0.11)}{0.0056 \times 15.38} = 3.5''$

USE #3 STIRRUPS @ 3.5"

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. CO11

2ND STORY

$A_{ch} = \left(18'' - 2\left(1.5'' - 0.375''/2\right)\right)^2 = 236.4\ in^2$ (15.38")

$A_g = 324\ in^2$

$A_{sh}/sb_c = \text{GREATEST} \begin{cases} 0.3\left(\frac{A_g}{A_{ch}} - 1\right)\frac{f'_c}{f_y} = 0.0056 \leftarrow \\ 0.09\frac{f'_c}{f_y} = 0.0045 \end{cases}$

$s = \frac{A_{sh}}{0.0056 b_c} = \frac{3(0.11)}{0.0056 \times 15.38} = 3.5''$

USE #3 STIRRUPS @ 3.5" o/c

BEYOND l_o

$s = \text{LEAST} \begin{cases} 6'' \\ 6d_b = 3.75'' \leftarrow \end{cases}$

#3 STIRRUPS WHOLE WAY @ 3.5" o/c

	Roof			Floor	
Dead	35	psf	Dead	180	psf

Area 4493.71 ft^2

	Weight =	966147.65	Site Clas	D	Risk Cat	II
	Height =	22.97	Ct =	0.02	x =	0.75
	Ss =	1.58	S1 =	0.645		
					Eq. 11.4-2	
	Sms =	1.58	Sm1 =	1.097	Fa =	1
					Fv =	1.7
	Sds =	1.05333333	Sd1 =	0.731	Ts =	0.694
	Table 12.2- R =	5				
	I =	1				
Eq 12.8-7	T =	0.210	1.5Ts =	1.041		
Actual	12.8-2 Cs =	0.211				
Max	12.8-3 Cs =	0.697				
Min	12.8-5/6 Cs =	0.065				
	V =	203.535				
	11.6 Design Cat	D				

E/W

Level	Height (ft)	Weight (k)	Wh^k (k=1)	C_{vx}	F_x	a = Fx/W
Roof	22.97	157.280	3612.718	0.312	63.532	0.404
2	9.8425	808.868	7961.281	0.688	140.003	0.173
Σ	-	966.14765	11573.999	1	203.535	

Level	w_i (k)	F_i (k)	Σw_i (k)	ΣF_i (k)	F_{px} (k)	$F_{px\,max}$ (k)	$F_{px\,min}$ (k)	$F_{px\,design}$ (k)
Roof	157.280	63.532	157.280	63.532	63.532	66.267	33.134	63.532
2	808.868	140.003	966.148	203.535	170.401	340.803	170.401	170.401
Σ	966.148	203.535	-	-	-	-	-	-

N/S

Level	Height (ft)	Weight (k)	Wh^k (k=1)	C_{vx}	F_x	a = Fx/W
Roof	22.97	157.280	3612.718	0.312	63.532	0.40394
2	9.8425	808.868	7961.281	0.688	140.003	0.17309
Σ	-	966.14765	11573.999	1	203.535	

Level	w_i (k)	F_i (k)	Σw_i (k)	ΣF_i (k)	F_{px} (k)	$F_{px\,max}$ (k)	$F_{px\,min}$ (k)	$F_{px\,design}$ (k)
Roof	157.280	63.532	157.280	63.532	63.532	66.267	33.134	63.532
2	808.868	140.003	966.148	203.535	170.401	340.803	170.401	170.401
Σ	966.148	203.535	-	-	-	-	-	-

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA3

$PGA \approx 60\% = 0.6g \times 1.1 = 0.66g$

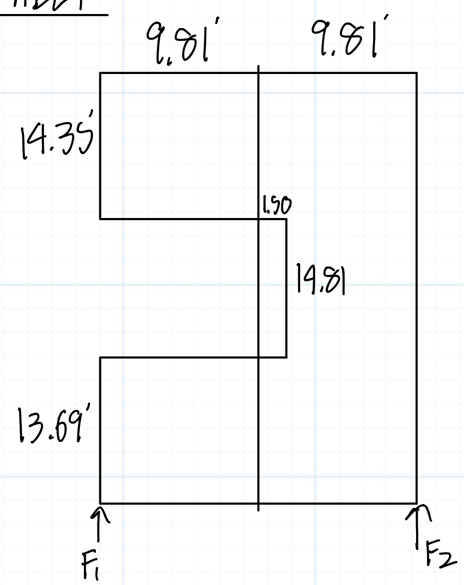
$S_S/PGA = 0.3386PGA + 2.1696 \Rightarrow \underline{S_S = 1.579}$

$S_1/PGA = 0.5776PGA + 0.5967 \Rightarrow \underline{S_1 = 0.645}$

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. LA4

N/S

WALL1



$TA_1 = (14.35 \times 9.81) + (13.69 \times 9.81) = 275.07\ ft^2$

WEIGHT = 35 PSF

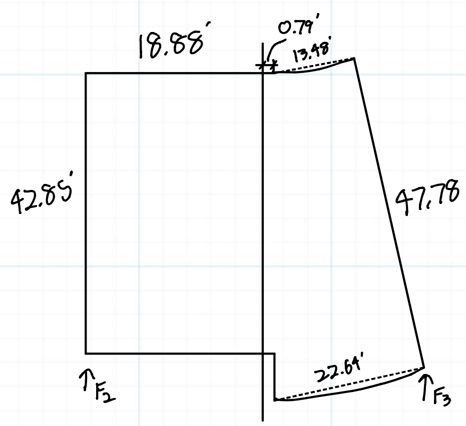
$q = 0.404$

$F_1 = 3.89^k$

$TA_2 = 275.07 + ((9.81 - 1.50) \times 14.81) = 398.14\ ft^2$

$F_2 = 5.63^k$

WALL 2



$TA_2 = 42.85 \times 18.88' = 809.01\ ft^2$

WEIGHT = 35 PSF

$q = 0.404$

$F_2 = 11.44^k$

$TA_3 = (0.79' \times 42.85') + (13.48' + 22.64')\left(\frac{47.78'}{2}\right) = 896.76\ ft^2$

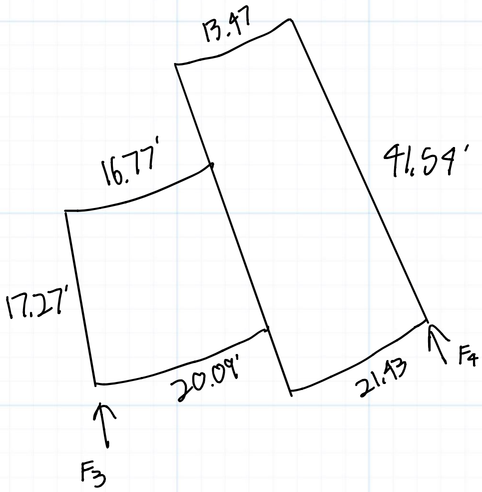
$F_3 = 12.68^k$

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA5

WALL 3



$TA_3 = (16.77' + 20.09')\frac{17.27'}{2} = 318.29\ ft^2$

WEIGHT = 35 PSF

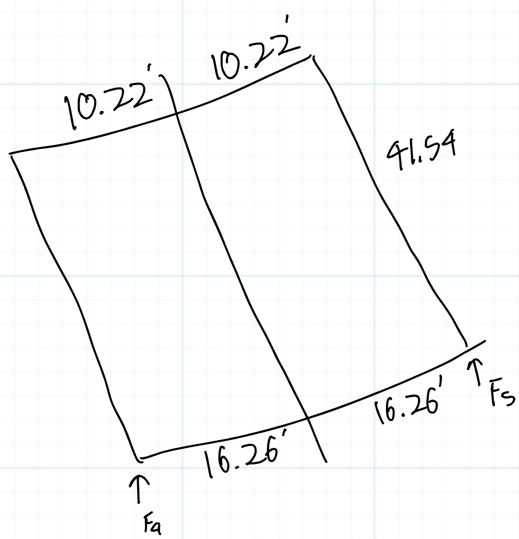
$q = 0.404$

$F_3 = 4.50^k$

$TA_4 = (13.47' + 21.43')\left(\frac{41.54'}{2}\right) = 724.87\ ft^2$

$F_4 = 10.25^k$

WALL 4 & 5



$TA_4 = TA_5 = (10.22' + 16.26')\left(\frac{41.54'}{2}\right) = 550.00\ ft^2$

WEIGHT = 35 PSF

$q = 0.404$

$F_4 = F_5 = 7.78^k$

$\Sigma F_1 = 3.89$

$\Sigma F_2 = 17.07$

$\Sigma F_3 = 17.18$

$\Sigma F_4 = 18.03$

$\Sigma F_5 = 7.78$

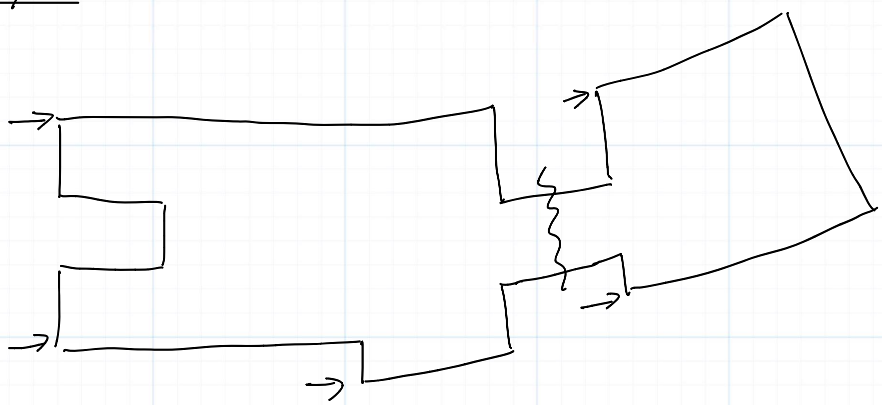
$63.94^k \approx 63.53^k$ ✓

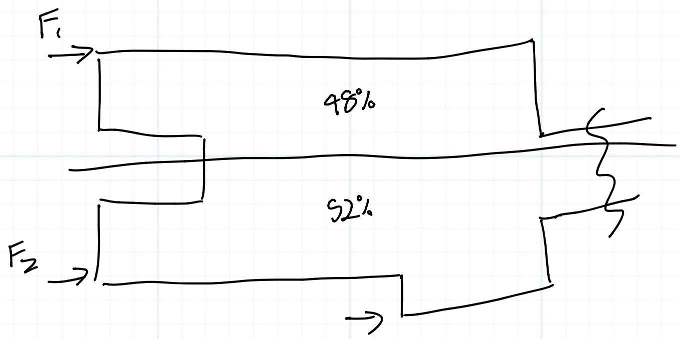
PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA6

E/W





TOTAL AREA ≈ 2560 SF

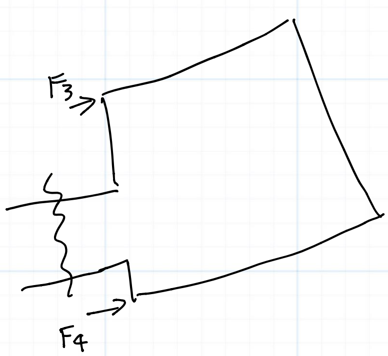
WEIGHT = 35 PSF

q = 0.404

$F_1 = 17.38^k$

$F_2 = 18.82^k$

I'M ASSUMING THIS WILL TAKE VERY LITTLE LOAD



TOTAL AREA ≈ 1963 SF

WEIGHT = 35 PSF

q = 0.404

$F_3 = F_4 = 13.88^k$

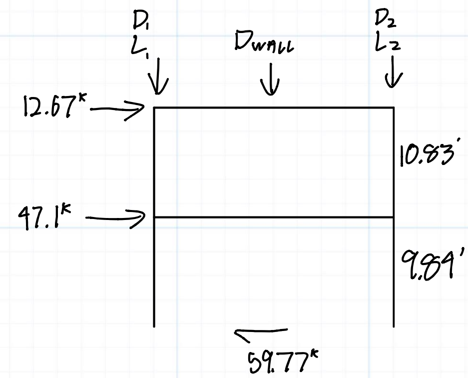
PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA7

N/S WALLS

P4:



FROM P : $D_1 = 95.06^k$

$L_1 = 30.83^k$

$D_2 = 220.83^{SF}(160^{PSF} + 25^{PSF}) = 40.85^k$

$L_2 = 220.83^{SF}(40^{PSF} + 20^{PSF}) = 13.25^k$

$D_{WALL} = 150\left(\frac{8''}{12} \times 18' \times 20.67'\right) = 37.21^k$

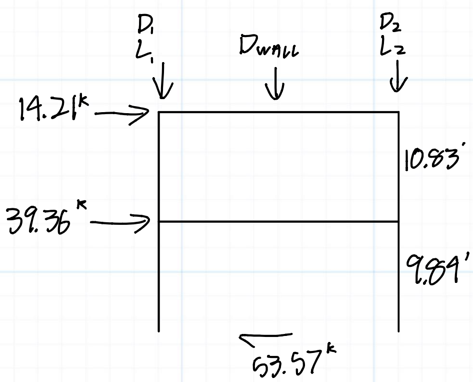
$P_u = [1.2 + 0.2(\overset{S_{DS}}{1.05})]D + 0.5L + \rho Q_E$

$P_u = \underline{266.139^k}$

$M_u = 12.67(20.67') + 47.1(9.84') = \underline{725.35^{k\text{-}ft}}$

GOVERNING WALL

P6 :



$D_1 = 240.18^{SF}(160^{PSF} + 25^{PSF}) = 44.43^k$

$L_1 = 240.18^{SF}(40^{PSF} + 20^{PSF}) = 14.41^k$

$D_2 = 71.68^{SF}(160^{PSF} + 25^{PSF}) = 13.26^k$

$L_2 = 71.68^{SF}(40^{PSF} + 20^{PSF}) = 4.30^k$

$D_{WALL} = 150\left(\frac{8''}{12} \times 13.50' \times 20.67'\right) = 27.90^k$

$P_u = [1.2 + 0.2(\overset{S_{DS}}{1.05})]D + 0.5L + \rho Q_E$

$P_u = \underline{130.04^k}$

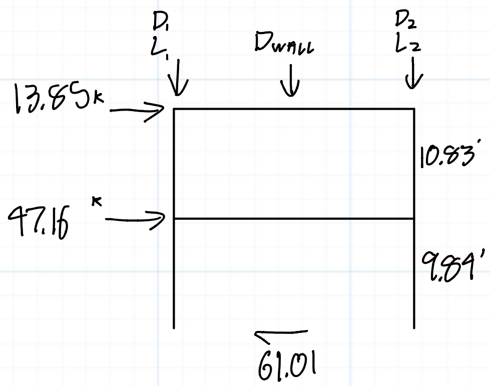
$M_u = 14.21(20.67') + 39.36(9.84') = \underline{681.02^{k\text{-}ft}}$

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA8

P13:



$D_1 = 197.09\,SF(160^{PSF} + 25^{PSF}) = 36.46^k$

$L_1 = 197.09\,SF(40^{PSF} + 20^{PSF}) = 11.83^k$

$D_2 = 134.49\,SF(160^{PSF} + 25^{PSF}) = 24.88^k$

$L_2 = 134.49\,SF(40^{PSF} + 20^{PSF}) = 8.07^k$

$D_{wall} = 150\left(\frac{8''}{12} \times 14.35' \times 20.67'\right) = 29.66^k$

$P_u = [1.2 + 0.2(\overset{S_{DS}}{1.05})]D + 0.5L + \rho Q_E$

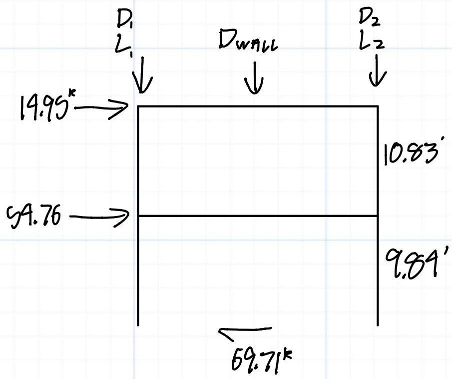
$P_u = \underline{129.31^k}$

$M_u = 13.85(20.67') + 47.16(9.84') = \underline{750.63^{k\text{-}ft}}$

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. LA9

E/W WALLS

P5:



$: D_1 = 220.83\ SF(160^{PSF} + 25^{PSF}) = 40.85^k$

$L_1 = 220.83\ SF(40^{PSF} + 20^{PSF}) = 13.25^k$

$D_2 = 38.84\ SF(160^{PSF} + 25^{PSF}) = 7.19^k$

$L_2 = 38.84\ SF(40^{PSF} + 20^{PSF}) = 2.33^k$

$D_{wall} = 150\left(\frac{8''}{12} \times 21.4' \times 20.67'\right) = 44.23^k$

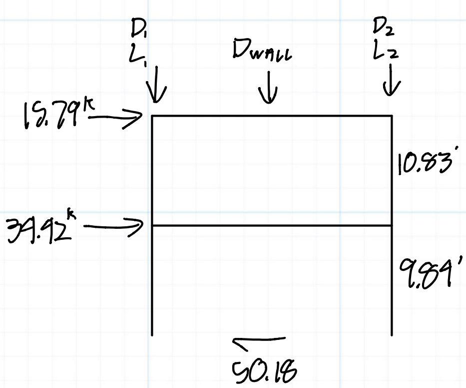
$P_u = [1.2 + 0.2(\overset{S_{DS}}{1.05})]D + 0.5L + \rho Q_E$

$P_u = \underline{137.89^k}$

$M_u = 14.95(20.67') + 54.76(9.84') = \underline{847.86\ k\text{-}ft}$

GOVERNING WALL

P8:



$: D_1 = 128.31\ SF(160^{PSF} + 25^{PSF}) = 23.74^k$

$L_1 = 128.31\ SF(40^{PSF} + 20^{PSF}) = 7.70^k$

$D_2 = 73.34\ SF(160^{PSF} + 25^{PSF}) = 13.57^k$

$L_2 = 73.34\ SF(40^{PSF} + 20^{PSF}) = 4.40^k$

$D_{wall} = 150\left(\frac{8''}{12} \times 19.62' \times 20.67'\right) = 40.55^k$

$P_u = [1.2 + 0.2(\overset{S_{DS}}{1.05})]D + 0.5L + \rho Q_E$

$P_u = \underline{115.83^k}$

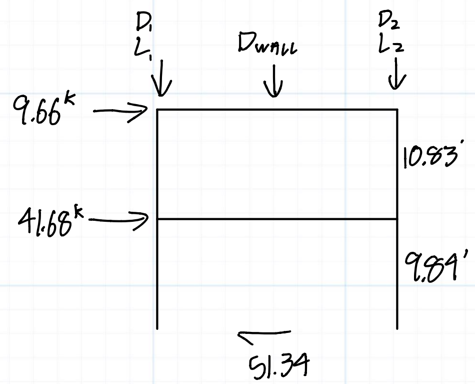
$M_u = 15.79(20.67') + 34.92(9.84') = \underline{664.45\ k\text{-}ft}$

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. LA10

P11:



$D_1 = 134.49\ SF(160^{PSF} + 25^{PSF}) = 24.88^k$

$L_1 = 134.49\ SF(40^{PSF} + 20^{PSF}) = 8.07^k$

$D_2 = 76.88\ SF(160^{PSF} + 25^{PSF}) = 14.22^k$

$L_2 = 76.88\ SF(40^{PSF} + 20^{PSF}) = 4.61^k$

$D_{wall} = 150\left(\frac{8''}{12} \times 19.62' \times 20.67'\right) = 40.55^k$

$P_u = [1.2 + 0.2(\overset{S_{DS}}{1.05})]D + 0.5L + \rho Q_E$

$P_u = \underline{118.65^k}$

$M_u = 9.66(20.67') + 41.68(9.84') = \underline{609.80\ k\text{-}ft}$

Walls 2,10 & 12 were deleted after analysis. Considering the small amounts of shear added and the already way stronger walls, it was not rechecked.

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA11

DESIGN FORCES

$h/L_{P4} = 20.67/18 = 1.15 \leq 1.5 \quad \therefore \Omega_v = 1.0 \quad \& \quad \alpha_c = 3.0$

$h/L_{P5} = 20.67/21.4 = 0.97 \leq 2.0 \quad \therefore \omega_v = 1.0$

$V_e = V_u$

REINFORCEMENT

$\rho_t = 0.0025$

$A_t = 0.0025(8'')(12''/ft) = 0.24\,in^2/ft$

$\#5 @ 12''\ O.C. \quad \therefore \rho_t = \frac{(12/12)(0.31)}{8 \times 12} = 0.0032$

$A_{cv\,P4} = 8'' \times (18' \times 12) = 1728\,in^2$

$A_{cv\,P5} = 8'' \times (21.4' \times 12) = 2054.4\,in^2$

$\phi V_n = \phi A_{cv}(\alpha_c \sqrt{f'_c} + \rho_t f_y)$

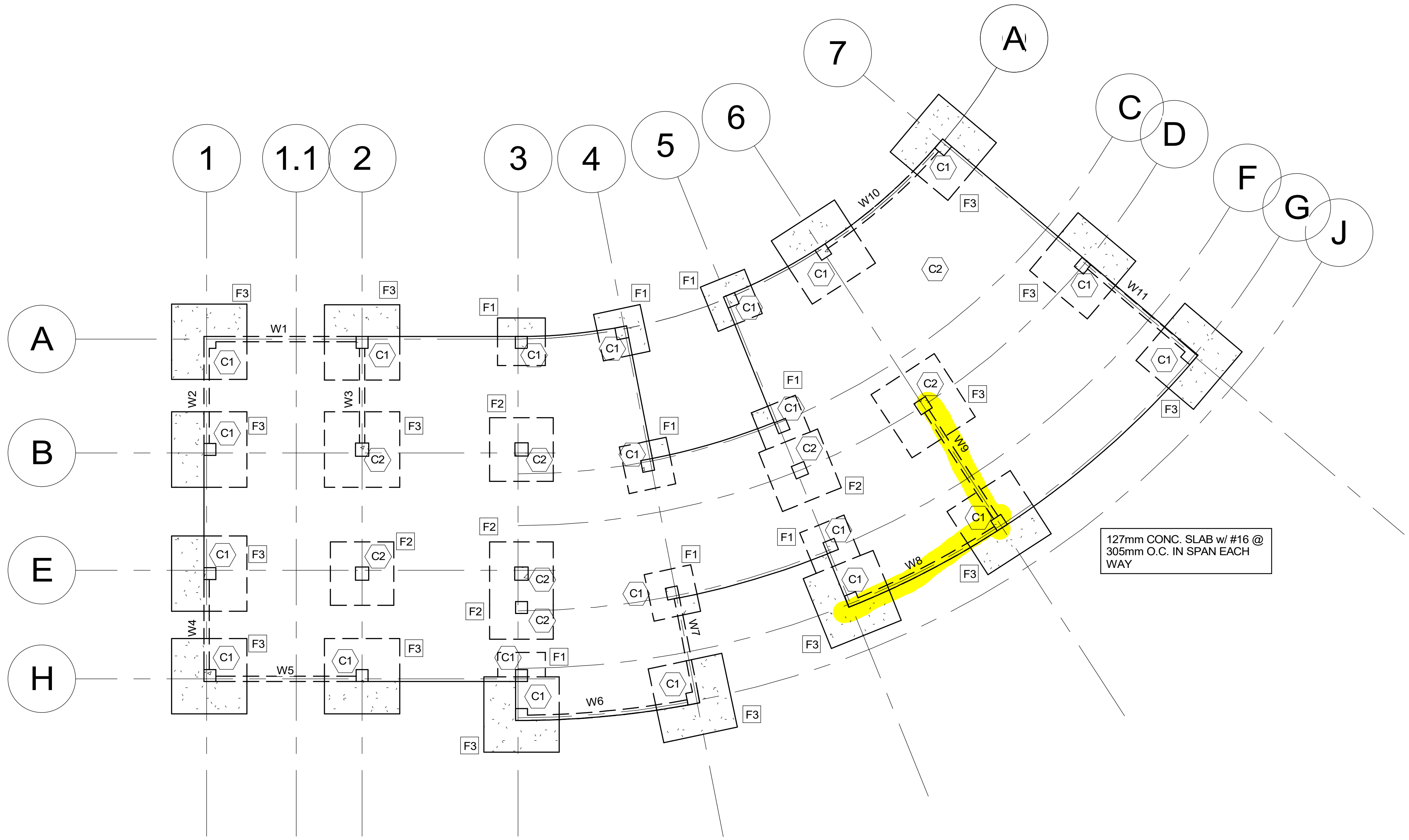
$\phi V_{nP4} = 0.6[1728(3\sqrt{3000}/1000 + 0.0032 \times 60)] = 369.42^k >> V_u = 61.1^k$ ✓

$\phi V_{nP5} = 0.6[2054(3\sqrt{3000}/1000 + 0.0032 \times 60)] = 439^k >> V_u = 69.71^k$ ✓

LA12

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +0m U.N.O.
2. TOP OF FOOTING TO BE (0.61m) BELOW TOP OF SLAB U.N.O.
3. SEE SHEET S.001 TO S.006 FOR GENERAL NOTES
4. SEE 21/S.414 FOR CONCRETE COLUMN SCHEDULE
5. SEE S.403 & S.404 FOR FOOTING DETAILS
6. SEE 1/S.401 FOR TYPICAL SLAB-ON-GRADE DETAILS
7. SEE S.415 & S.417 FOR WWALL ELEVATIONS



FOUNDATION PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 11:59:16 PM

SHEET NAME:

FOUNDATION PLAN

SCALE:

1 : 200

NUMBER:

BOUNDARY ELEMENTS

P4

FROM ETABS P $\Delta_{RF} = 0.0094"$

$\Delta_u = 5(0.0094") = 0.047$

$\Delta_u / h_{wcs} = 0.047 / 20.67 = 0.0023 < 0.005$ ↑ USE THIS

$$C = \frac{L}{600} \times \frac{1}{1.5(0.005)} = \frac{18' \times 12}{600 \times 1.5 \times 0.005} = 48"$$

FROM spColumn: $C = 20.26" < 48"$ ∴ SPECIAL BE NOT REQ'D

$V_{u\,LIMIT} = \sqrt{f'c}\, A_{cv}$

$$= \frac{\sqrt{3000}}{1000} 1728 = 94.65 > 66.83 \text{ IN WALL}$$

∴ NO BE NEEDED

P5

FROM ETABS P $\Delta_{RF} = 0.0077"$

$\Delta_u = 5(0.0077") = 0.0385$

$\Delta_u / h_{wcs} = 0.0385 / 20.67 = 0.0019 < 0.005$ ↑ USE THIS

$$C = \frac{L}{600} \times \frac{1}{1.5(0.005)} = \frac{21.9' \times 12}{600 \times 1.5 \times 0.005} = 57.07"$$

FROM spColumn: $C = 12.21" < 57.07"$ ∴ SPECIAL BE NOT REQ'D

$V_{u\,LIMIT} = \sqrt{f'c}\, A_{cv}$

$$= \frac{\sqrt{3000}}{1000} \times 2054 = 112.50^k > 70.47 \text{ IN WALL}$$

∴ NO BE NEEDED

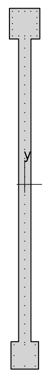
PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

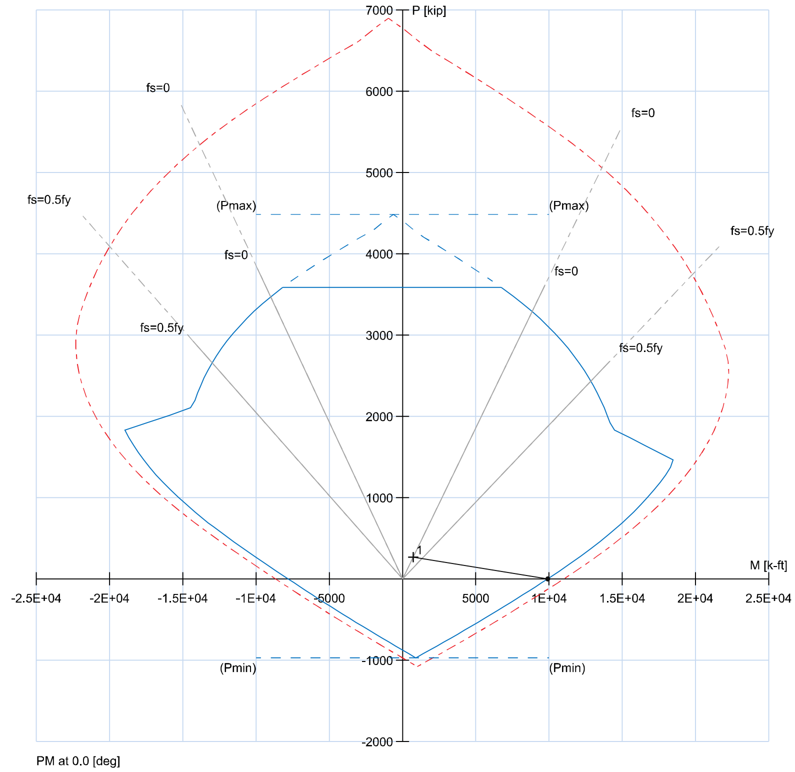
CLIENT JI BY JSS SHEET NO. LA14

6. Diagrams

6.1. PM at θ=0 [deg]



20 x 235 in



General Information

Project	P4
Column	---
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

f'_c	3	ksi
E_c	3122.02	ksi
f_y	60	ksi
E_s	29000	ksi

Section

Type	Irregular	
A_g	2300	in²
I_x	1.35402e+007	in⁴
I_y	30486.7	in⁴

Reinforcement

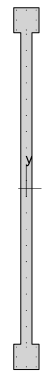
Pattern	Irregular	
Bar layout	---	
Cover to	---	
Clear cover	---	
Bars	---	
Confinement type	Tied	
Total steel area, A_s	17.98	in²
Rho	0.78	%
Min. clear spacing	0.87	in

No.	P_u	M_{ux}	ϕP_n	ϕM_{nx}	Capacity
	kip	k-ft	kip	k-ft	Ratio
1	266.1	725.3	0.00	9911.86	0.51

Max. Capacity Ratio: 0.51

6. Diagrams

6.1. PM at θ=0 [deg]



18 x 256.8 in

General Information

Project	P5
Column	---
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

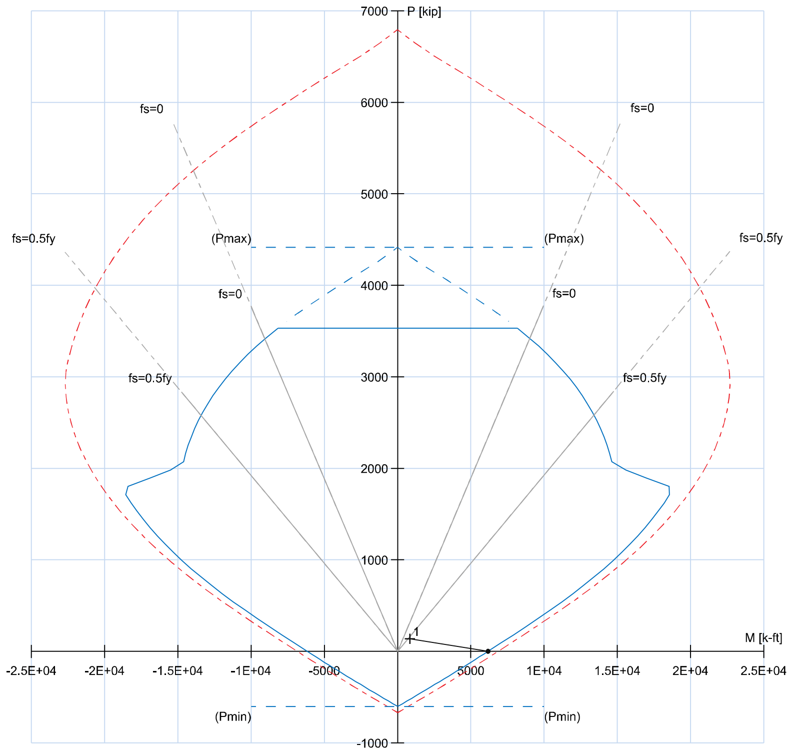
f'_c	3	ksi
E_c	3122.02	ksi
f_y	60	ksi
E_s	29000	ksi

Section

Type	Irregular	
A_g	2412.4	in²
I_x	1.64076e+007	in⁴
I_y	26828.1	in⁴

Reinforcement

Pattern	Irregular	
Bar layout	---	
Cover to	---	
Clear cover	---	
Bars	---	
Confinement type	Tied	
Total steel area, A_s	11.16	in²
Rho	0.46	%
Min. clear spacing	2.37	in



PM at 0.0 [deg]

No.	P_u	M_{ux}	ϕP_n	ϕM_{nx}	Capacity
	kip	k-ft	kip	k-ft	Ratio
1	137.9	847.9	0.00	6176.00	0.71

Max. Capacity Ratio: 0.71

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA16

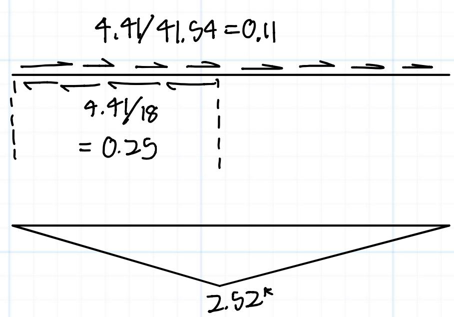
AXIAL ON FRAMING

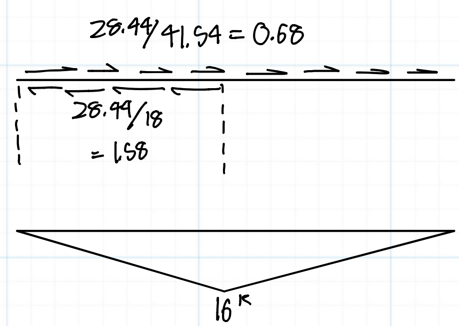
ALONG WALL	FLOOR	ROOF
P1	28.44	4.41
P3	21.75	13.36
P4	67.61	12.58
P5	70.70	14.91
P6	56.76	14.22
P7	43.00	1.219
P8	53.39	15.78
P9	23.58	4.14
P11	50.60	14.74
P13	70.72.	14.50

ROOF FLOOR

P_1

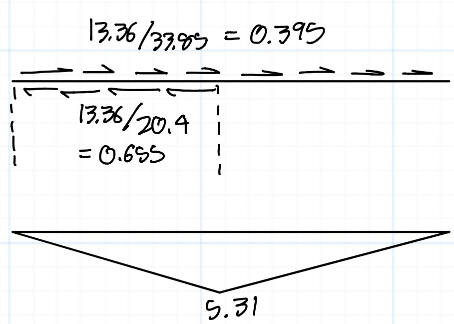
$L_{TOT} = 41.54'$

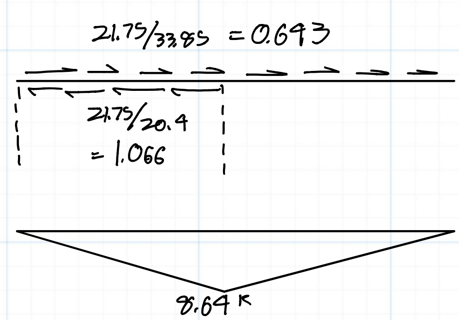




P3

$L_{TOT} = 33.85'$





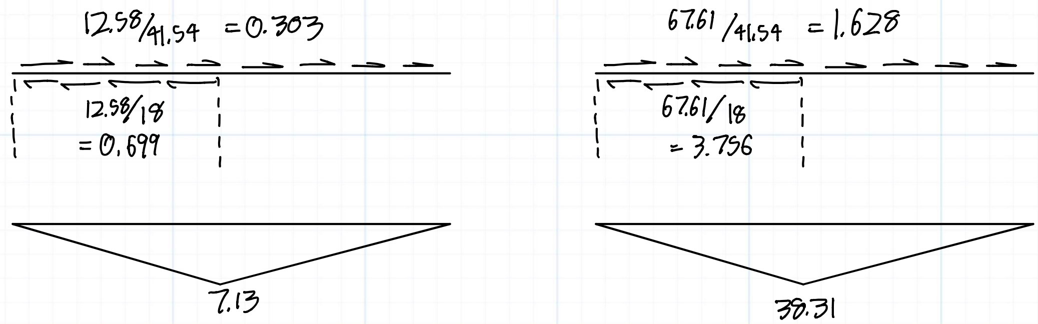
PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. LA17

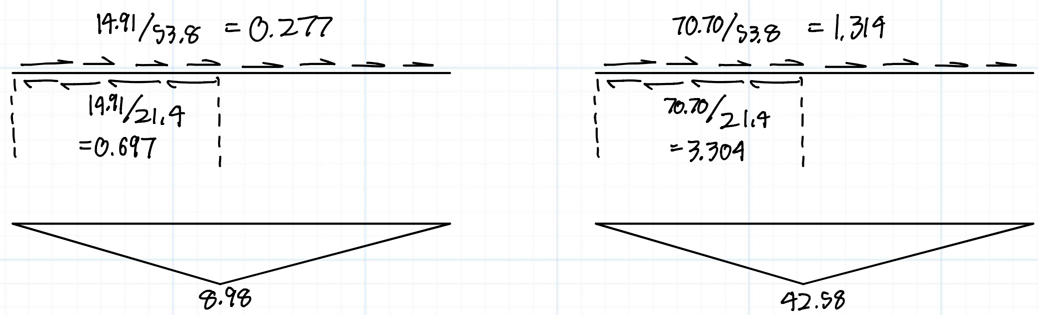
P4

LTOT = 41.54'



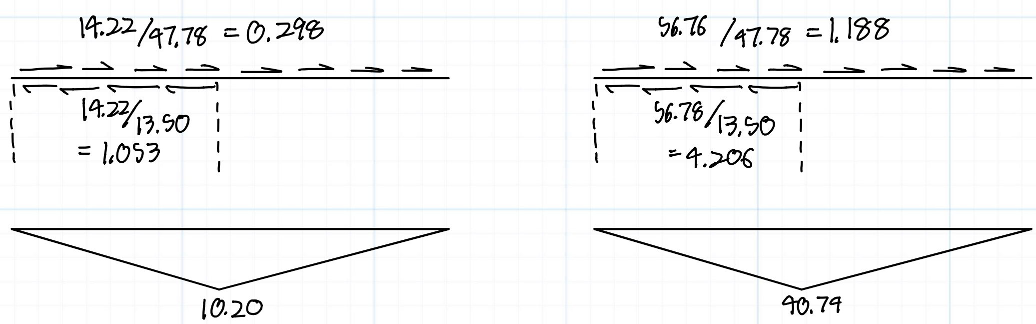
P5

LTOT = 53.8'



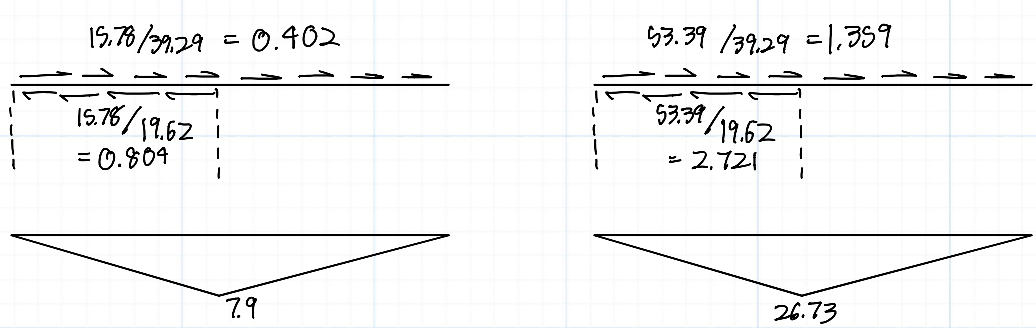
P6

LTOT = 47.78'



P8

LTOT = 39.29'



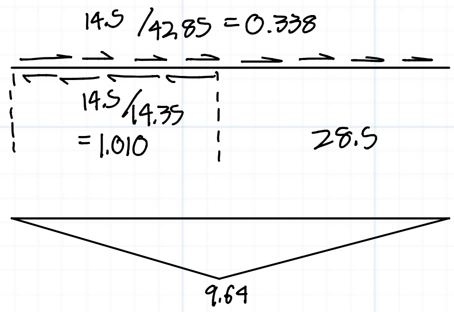
PROJECT MBANDAZI VILLAGE

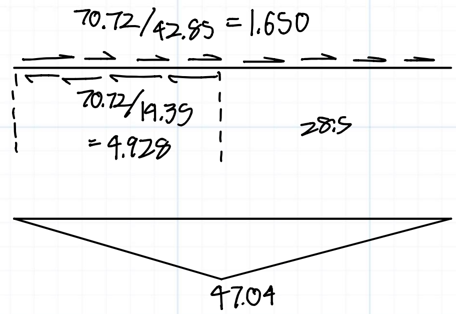
PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA18

P13

$L_{TOT} = 42.85'$





A W8x13 HAS A ϕP_n OF 173^k, WORST CASE 21.8^k @ $L_c = 14'$

∴ ALL STEEL MEMBERS WILL WORK

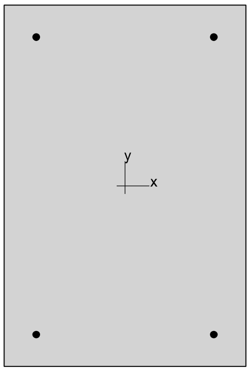
PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. LA19

6. Diagrams

6.1. PM at θ=0 [deg]



16 x 24 in

General Information

Project	---
Column	---
Engineer	---
Code	ACI 318-19
Bar Set	ASTM A615
Units	English
Run Option	Investigation
Run Axis	X - axis
Slenderness	Not Considered
Column Type	Structural
Capacity Method	Critical capacity

Materials

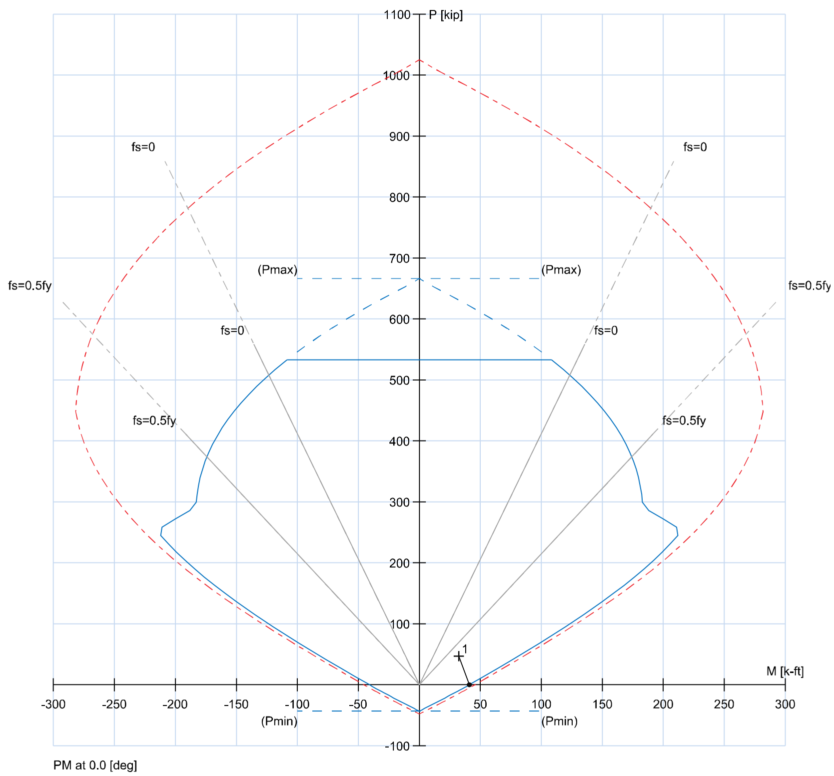
f'_c	3	ksi
E_c	3122.02	ksi
f_y	60	ksi
E_s	29000	ksi

Section

Type	Rectangular	
Width	16	in
Depth	24	in
A_g	384	in^2
I_x	18432	in^4
I_y	8192	in^4

Reinforcement

Pattern	Sides different	
Bar layout	Rectangular	
Cover to	Transverse bars	
Clear cover	---	
Bars	---	
Confinement type	Tied	
Total steel area, A_s	0.80	in^2
Rho	0.21	%
Min. clear spacing	11.25	in



No.	P_u	M_{ux}	ϕP_n	ϕM_{nx}	Capacity
	kip	k-ft	kip	k-ft	Ratio
1	47.0	32.3	0.06	40.95	0.90

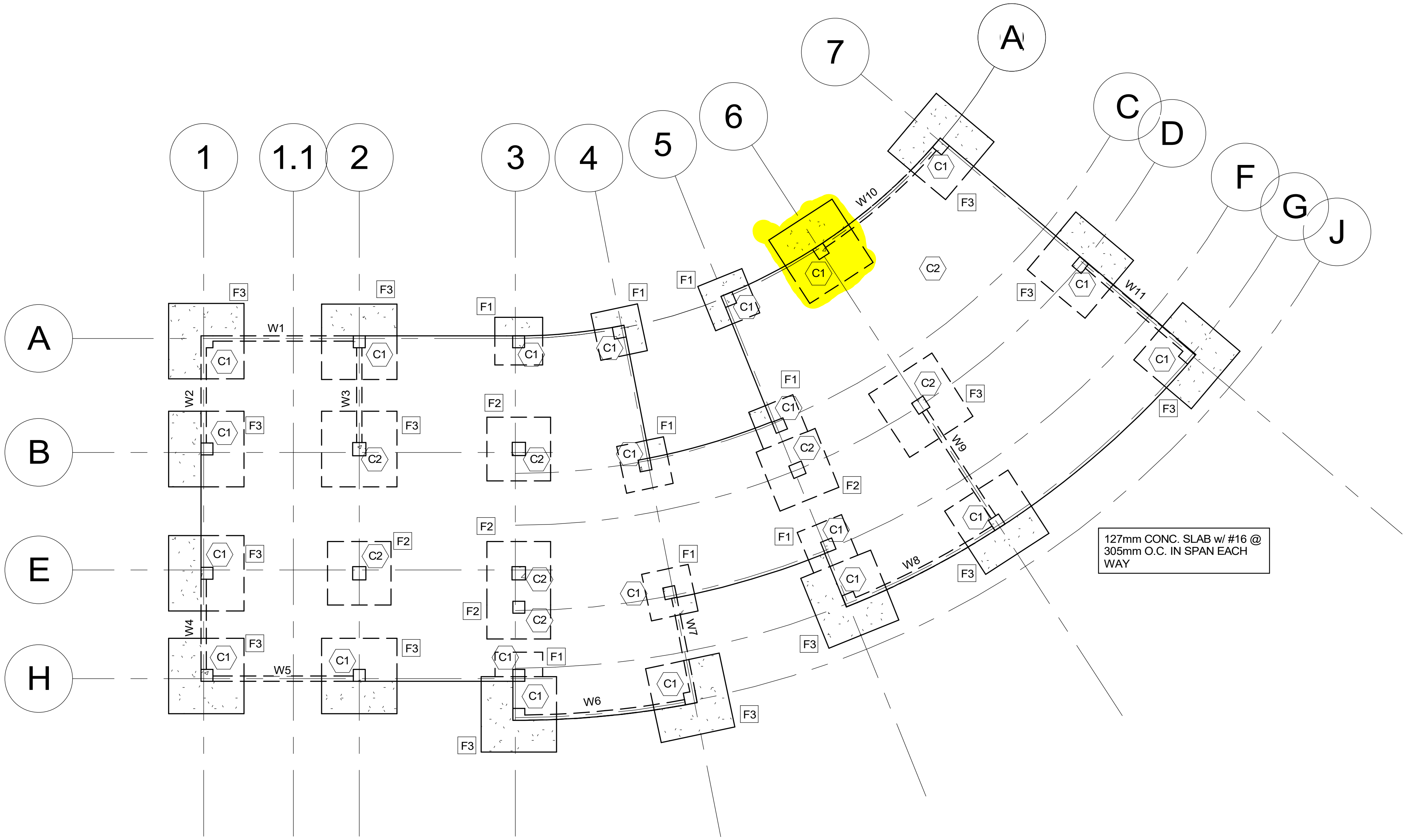
Max. Capacity Ratio: 0.90

This was my worst case axial load on the smallest concrete framing member. It is adequate and as are all other concrete framing members

FO1

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +0m U.N.O.
2. TOP OF FOOTING TO BE (0.61m) BELOW TOP OF SLAB U.N.O.
3. SEE SHEET S.001 TO S.006 FOR GENERAL NOTES
4. SEE 21/S.414 FOR CONCRETE COLUMN SCHEDULE
5. SEE S.403 & S.404 FOR FOOTING DETAILS
6. SEE 1/S.401 FOR TYPICAL SLAB-ON-GRADE DETAILS
7. SEE S.415 & S.417 FOR WWALL ELEVATIONS



FOUNDATION PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 11:59:16 PM

SHEET NAME:

FOUNDATION PLAN

SCALE:

1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. FO2

EXT COL FOUNDATION

18 × 18 COL

ALLOWABLE BEARING PRESSURE $f_b = 2^{ksf}$

$P_{u\ D+L} = 49.30 + 16.24 = 65.54^k$ FROM P

$A_{REQ'D} = 65.54^k / 2^{ksf} = 33^{SF} \Rightarrow$ 6' SQ

$c = (1/2)(6' - 18/12) = 2.25'$

$d = 2.2\sqrt{P_u/A_{FTG} \times c^2} = 6.7'' \Rightarrow 8''$

$\therefore h = d + 4 = 12''$

$A_s = 0.0018bh = 0.0018(6' \times 12)(12'') = 1.56\ in^2$

USE (5)-#5
$1.55\ in^2$ OR $0.26\ in^2/ft$

FROM P

$f_{bu} = 85.14^k / 36ft^2 = 2.4^{ksf}$

↑ FACTORED P_u

BEAM SHEAR

$V_u = f_{bu} \times c = 2.4^{ksf} \times 2.25' = 5.4^{k/ft}$

$\phi V_n = \phi 2\sqrt{f'_c}\,bd$

$= 0.75[2\sqrt{3000}(12'' \times 8'')/1000 = 7.89\ klf > V_u$ ✓

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. FO3

PUNCHING SHEAR

BASE VALUE: $4\sqrt{f'_c} = 4\sqrt{3000} = 219.09$ ←

COL SHAPE: $\left[\left(2+4/\beta_c\right)\sqrt{f'_c}\right] = \left[\left(2+4\right)\sqrt{3000}\right] = 328.63$

$\beta_c = b_{col}/h_{col} = 1$

$\alpha_s \rightarrow 40$ ACI 22.6.5.3

COL LOCATION: $\left[\left(\alpha_s d/b_o + 2\right)\sqrt{f'_c}\right] = \left(\frac{40\times 8}{104} + 2\right)\sqrt{3000} = 278.1$

$b_o \rightarrow 2\left[\left(b_{col}+d\right)+\left(h_{col}+d\right)\right] = 104''$

$18+8=26$ $18+8=26$

$\phi V_n = \phi 4\lambda_s\sqrt{f'_c}\left(b_o \times d\right) = 0.75\left[4\times 1.0\times\sqrt{3000}\left(104\times 8\right)\right]/1000 = 136.7^k$

$\phi = 0.75$

$\lambda_s \rightarrow \sqrt{\frac{2}{1+d/10}} = 1.05 \leq 1$ ✗

$V_u = P_u - \left(f_{bu} \times A_{bo}\right) = 85.14 - \left(2.4 \times \left(\frac{26\times 26}{144}\right)\right) = 74^k < \phi V_n$ ✓

FLEXURE

$M_u = \left(\frac{1}{2}\right)\left(2.4^{ksf}\right)\left(2.25^{ft}\right)^2 = 6.08^{k\text{-}ft}/ft$

$a = \left(0.26^{in^2/ft} \times 60^{ksi}\right)/\left(0.85 \times 3^{ksi} \times 12''\right) = 0.51''$

$\phi M_n = 0.9\left[0.26 \times 60\left(8'' - 0.51''/2\right)\right]/12 = 9.06^{k\text{-}ft/ft} > M_u$ ✓

DEVELOPMENT LENGTH

$f_y = 60^{ksi}$ $f'_c = 3^{ksi}$ $\lambda = 1.0$ NWC

$\psi_t = 1.0$ OTHER $d_b = 0.625$

$\psi_e = 1.0$ UNCOATED/ZINC-COATED (GALVANIZED)

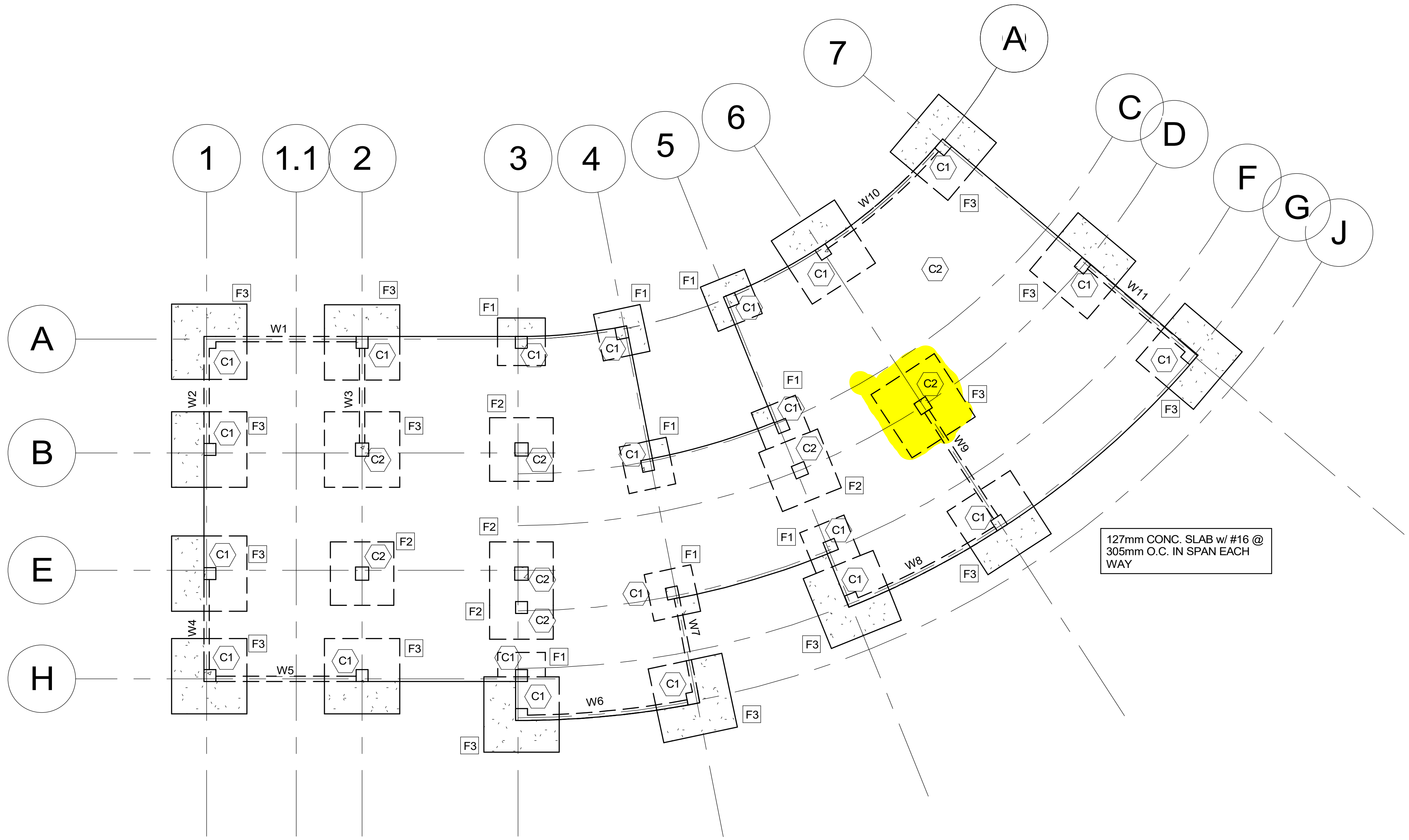
$\psi_g = 1.0$ GRADE 60

$l_d = 27.39'' < C = 2.25' \times 12 = 27''$ ✓

EXT COL FTGS: 6' SQ × 12" (5)-#5 E.W. E.F.

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +0m U.N.O.
2. TOP OF FOOTING TO BE (0.61m) BELOW TOP OF SLAB U.N.O.
3. SEE SHEET S.001 TO S.006 FOR GENERAL NOTES
4. SEE 21/S.414 FOR CONCRETE COLUMN SCHEDULE
5. SEE S.403 & S.404 FOR FOOTING DETAILS
6. SEE 1/S.401 FOR TYPICAL SLAB-ON-GRADE DETAILS
7. SEE S.415 & S.417 FOR WWALL ELEVATIONS



FOUNDATION PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 11:59:16 PM

SHEET NAME:

FOUNDATION PLAN

SCALE:

1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. FO5

INT COL FOUNDATION

20×20 COL

ALLOWABLE BEARING PRESSURE $f_b = 2^{ksf}$

$P_{u\ D+L} = 95.06 + 30.83 = 125.89^k$ FROM P

$A_{REQ'D} = 125.89^k / 2^{ksf} = 63^{SF} \Rightarrow$ 8' SQ

$c = (1/2)(8' - 20/12) = 3.17'$

$d = 2.2\sqrt{P_u/A_{FTG} \times c^2} = 9.8'' \Rightarrow 16''$

$\therefore h = d + 4 = 20''$

$A_s = 0.0018bh = 0.0018(8' \times 12)(20'') = 3.46\ in^2$

USE (12)-#5
3.72 in² OR 0.47 in²/ft

FROM P

$f_{bu} = 163.4^k / 36^{ft^2} = 4.54^{ksf}$

↑ FACTORED P_u

BEAM SHEAR

$V_u = f_{bu} \times c = 4.54^{ksf} \times 3.17' = 14.4^{k/ft}$

$\phi V_n = \phi 2\sqrt{f'c}\, bd$

$= 0.75[2\sqrt{3000}(12'' \times 16'')]/1000 = 15.77\ klf > V_u$ ✓

PUNCHING SHEAR

BASE VALUE: $4\sqrt{f'c} = 4\sqrt{3000} = 219.09$ ←

COL SHAPE: $\left[\left(2+4/\beta_c\right)\sqrt{f'c}\right] = \left[(2+4)\sqrt{3000}\right] = 328.63$

$\beta_c = b_{col}/h_{col} = 1$

ACI 22.6.5.3

COL LOCATION: $\left[\left(\alpha_s d/b_o + 2\right)\sqrt{f'c}\right] = \left(\frac{40\times16}{144}+2\right)\sqrt{3000} = 353$ ($\alpha_s \rightarrow 40$)

$b_o \rightarrow 2\left[(b_{col}+d)+(h_{col}+d)\right] = 144$

$b_{col}+d = 20+16=36$, $h_{col}+d = 20+16=36$

$\phi V_n = \phi 4\lambda_s\sqrt{f'c}\,(b_o \times d) = 0.75\left[4\times0.88\times\sqrt{3000}\,(144\times16)\right]/1000 = 333.16^k$ ($\phi = 0.75$)

$\lambda_s \rightarrow \sqrt{\frac{2}{1+16/10}} = 0.88 \leq 1$

$V_u = P_u - (f_{bu}\times A_{bo}) = 163.4 - \left(4.54\times\left(\frac{36\times36}{144}\right)\right) = 123^k < \phi V_n$ ✓

FLEXURE

$M_u = \left(\frac{1}{2}\right)(4.54^{ksf})(3.17\ ft)^2 = 22.8\ k\text{-}ft/ft$

$a = (0.47\ in^2/ft \times 60^{ksi})/(0.85\times3^{ksi}\times12") = 0.92"$

$\phi M_n = 0.9\left[0.47\times60\left(16"-0.92"/2\right)\right]/12 = 32.9\ k\text{-}ft/ft > M_u$ ✓

DEVELOPMENT LENGTH

$f_y = 60^{ksi}$ $f'c = 3^{ksi}$ $\lambda = 1.0$ NWC

$\psi_t = 1.0$ OTHER $d_b = 0.625$

$\psi_e = 1.0$ UNCOATED/ZINC-COATED (GALVANIZED)

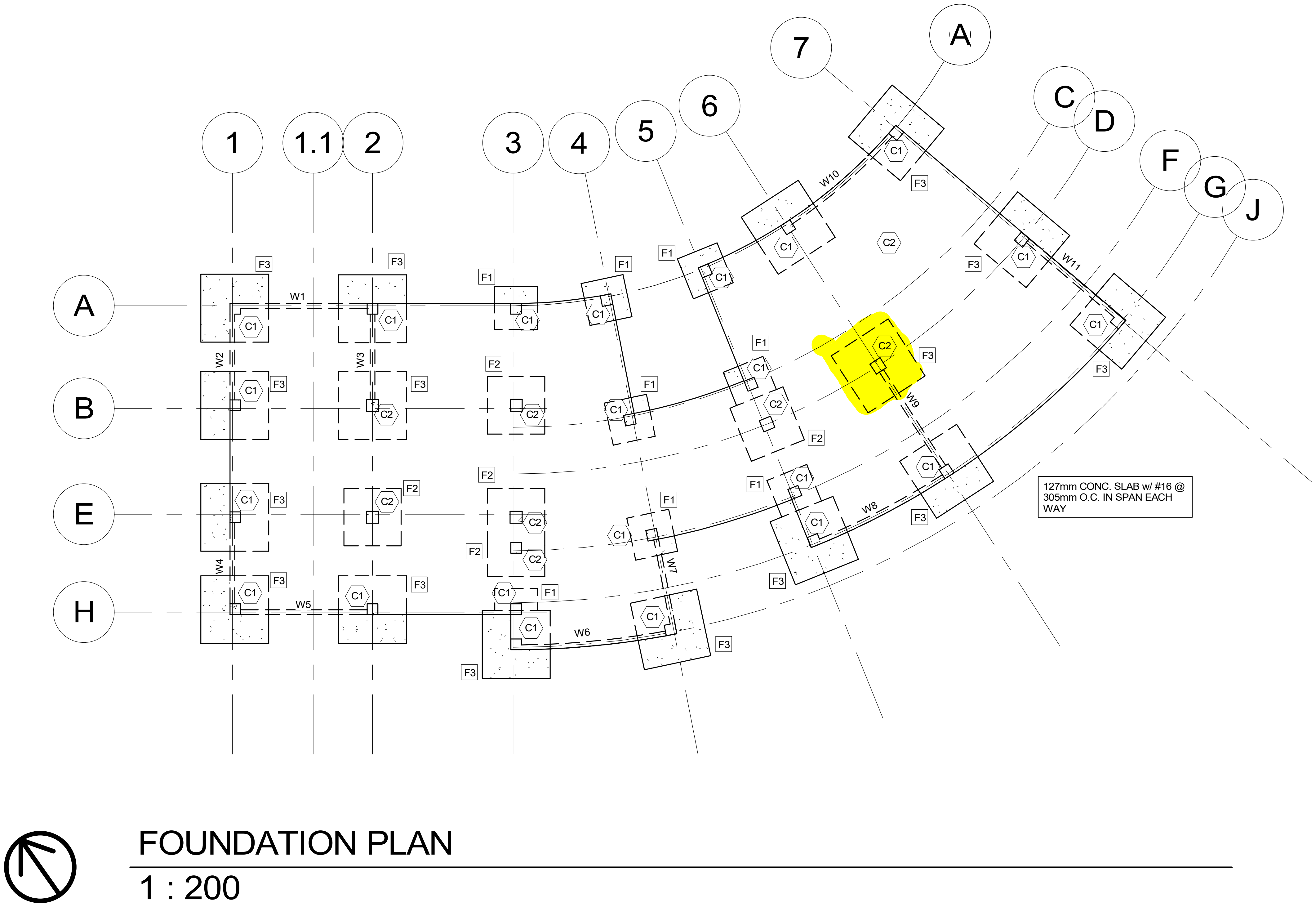
$\psi_g = 1.0$ GRADE 60

$l_d = 27.39" < c = 3.17'\times12 = 38"$ ✓

INT COL FTGS: 8'SQ × 20" (12)-#5 E.W. E.F.

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +0m U.N.O.
2. TOP OF FOOTING TO BE (0.61m) BELOW TOP OF SLAB U.N.O.
3. SEE SHEET S.001 TO S.006 FOR GENERAL NOTES
4. SEE 21/S.414 FOR CONCRETE COLUMN SCHEDULE
5. SEE S.403 & S.404 FOR FOOTING DETAILS
6. SEE 1/S.401 FOR TYPICAL SLAB-ON-GRADE DETAILS
7. SEE S.415 & S.417 FOR WWALL ELEVATIONS



FOUNDATION PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE: 5/31/2021 11:59:16 PM

SHEET NAME: FOUNDATION PLAN

SCALE: 1 : 200

NUMBER:

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. FO8

FINDING AXIAL ON COLS W/ WALLS

WALL		COL 1 (k)	COL 2 (k)	½ WALL	T/C (k) (WORST CASE)	WORST COMP. (k)	WORSE TENS. (k)	FACTORED
P1	D L	50.16 16.27	24.55 7.69	18.60	20.60	99.36	5.13	133.82
P3	D L	42.63 13.82	25.61 8.31	21.05	23.45	166.34	4.72	120.75
P4	D L	95.06 30.83	40.85 13.25	18.61	51.37	176.29	-9.02	211.69
P5	D L	40.85 13.25	7.19 2.33	22.12	46.88	105.04	-19.54	117.67
P6	D L	44.43 14.41	13.26 4.30	13.95	63.10	111.13	-31.84	123.88
P7	D L	13.26 4.30	3.32 1.08	23.39	19.79	55.89	-1.75	69.82
P8	D L	23.74 7.70	13.57 4.40	20.28	43.37	80.85	-15.03	88.00
P9	D L	18.09 5.87	18.09 5.87	14.15	23.19	53.57	-1.49	78.20
P11	D L	24.88 8.07	14.22 4.61	20.28	40.88	80.41	-12.99	89.98
P13	D L	36.46 11.83	24.88 8.07	14.83	69.33	107.36	-30.54	110.06

COMP: $(1+0.14S_{DS})D+0.7\rho Q_E$

$(1+0.105S_{DS})D+0.75L+0.525\rho Q_E$

TENS: $(0.6-0.14S_{DS})D+0.7\rho Q_E$

FACTORED: $(1.2+0.2S_{DS})D+L+\rho Q_E$

DESIGN FTG FOR WALLS USING $A=176.29^k$

$U=-31.84^k$

$A_{REQ'D}=176.29^k/2^{ksf}=9.4' \Rightarrow 9.5'$

$C=\frac{1}{2}\left(9.5'-18/12\right)=4'$

$d=2.2\sqrt{\frac{176.29}{9.5^2}\times 4^2}=12.3'' \Rightarrow 13''$

$h=13+4=17''$

$150\left(\frac{17}{12}\times 9.5\times 9.5\right)=19.18^k<31.84$ X

$h=\frac{31.84}{150\times 9.5\times 9.5/1000}=2.4' \Rightarrow 2.5'$

$h=2.5'=30''$

$d=26''$

$A_s = 0.0018bh = 0.0018(9.5' \times 12)(30") = 6.16\ in^2$

USE (20)-#5
6.2 in^2 OR 0.65 in^2/ft

FROM P

$f_{bu} = 211.69\ k / 90.25\ SF = 2.35\ ksf$

↑ FACTORED P_u

BEAM SHEAR

$V_u = f_{bu} \times C = 2.35^{ksf} \times 4' = 9.4^{klf}$

$\phi V_n = \phi 2\sqrt{f'c}\, bd$
$= 0.75[2\sqrt{3000}(12" \times 26")]/1000 = 25.63\ klf > V_u$ ✓

PUNCHING SHEAR

BASE VALUE: $4\sqrt{f'c} = 4\sqrt{3000} = 219.09$ ←

COL SHAPE: $[(2 + 4/\beta_c)\sqrt{f'c}] = [(2+4)\sqrt{3000}] = 328.63$
$\beta_c = b_{col}/h_{col} = 1$

$\alpha_s \to 40$ ACI 22.6.5.3

COL LOCATION: $[(\alpha_s d/b_o + 2)\sqrt{f'c}] = \left(\frac{40 \times 26}{176} + 2\right)\sqrt{3000} = 433.20$
$b_o \to 2[(b_{col}+d)+(h_{col}+d)] = 176$
$18+26 = 44$ $18+26 = 44$

$\phi V_n = \phi 4 \lambda_s \sqrt{f'c}(b_o \times d) = 0.75[4 \times 0.75 \times \sqrt{3000}(176 \times 26)]/1000 = 564^k$
$\phi \to 0.75$
$\lambda_s \to \sqrt{\frac{2}{1+26/10}} = 0.75 \leq 1$

$V_u = P_u - (f_{bu} \times A_{bo}) = 211.69 - \left(2.35 \times \left(\frac{44 \times 44}{144}\right)\right) = 180^k < \phi V_n$ ✓

FLEXURE

$M_u = \left(\frac{1}{2}\right)\left(2.35^{ksf}\right)\left(4\ ft\right)^2 = 18.8\ k\text{-}ft/ft$

$a = \left(0.65\ in^2/ft \times 60^{ksi}\right) / \left(0.85 \times 3^{ksi} \times 12''\right) = 1.27''$

$\phi M_n = 0.9\left[0.65 \times 60\left(26'' - 1.27''/2\right)\right]/12 = 74.19^{k\text{-}ft/ft} > M_u$ ✓

DEVELOPMENT LENGTH

$f_y = 60^{ksi}$ $f'_c = 3^{ksi}$ $\lambda = 1.0$ NWC

$\psi_t = 1.0$ OTHER $d_b = 0.625$

$\psi_e = 1.0$ UNCOATED/ZINC-COATED (GALVANIZED)

$\psi_g = 1.0$ GRADE 60

$l_d = 27.39'' < c = 4' \times 12 = 48''$ ✓

WALL FTGS : 9.5' SQ × 30" (20)-#5 E.W. E.F.

PROJECT MBANDAZI VILLAGE
PROJECT NO. DATE
CLIENT JI BY JSS SHEET NO. IR1

IRREGULARITIES

E/W

TORSIONAL/EXTREME TORSIONAL

$\delta_1 = 0.013$ $1.2(\delta_1 + \delta_2)/2 = 0.0081 > \delta_2$

$\delta_2 = 0.0005$ $1.4(\delta_1 + \delta_2)/2 = 0.0095 > \delta_2$

EXTREME TORSIONAL IRREGULARITY

N/S

$\delta_1 = 0.0023$ $1.2(\delta_1 + \delta_2)/2 = 0.0050 < \delta_2$

$\delta_2 = 0.0061$ $1.4(\delta_1 + \delta_2)/2 = - > \delta_2$

NO TORSIONAL IRREGULARITY

RE-ENTRANT CORNERS IRREGULARITY

NO DIAPHRAGM IRREGULARITY

NO OUT OF PLANE OFFSET IRREGULARITY

NON PARALLEL IRREGULARITY

NO STIFFNESS IRREGULARITY - SOFT STORY

NO WEIGHT IRREGULARITY

NO VERTICAL GEOMETRIC IRREGULARITY

NO IN-PLANE DISCONTINUITY IN VERT. LAT.-FORCE RESISTING ELEMENT

NO DISCONTINUITY IN LATERAL WEAK STORY

FLOOR ETABS OUTPUT

```
import numpy as np

#Beam Section Properties
beff =60  #in
t_flange = 5    #in
h = 24  #in
b = 16  #in
h_pri = h-t_flange #in
print('b effective = ',beff,'in \n')
print('flange thickness = ',t_flange,'in \n')
print('h = ',h,'in \n')
print('b = ',b,'in \n')

#Steel Properties
d = h-3    #in
d_pri = 3    #in
As_pos_bot = 0.4   #in^2 ; + moment rebar at bottom
As_pos_top = 0.4   #in^2 ; + moment rebar at top
As_neg_bot = 0.4   #in^2 ; - moment rebar at bottom
As_neg_top = 0.4   #in^2 ; - moment rebar at top


        #Finding Neutral Axis
#Flange
A_flange = t_flange*beff    #in^2
y_flange = h-t_flange/2     #in
Ay_flange = A_flange*y_flange   #in^3

#Web
A_web = b*h_pri     #in^2
y_web = (h-t_flange)/2  #in
Ay_web = A_web*y_web    #in^3

A_total = A_flange+A_web
Ay_tot = Ay_flange+Ay_web

y_NA = Ay_tot/A_total
print('Neutral Axis = ',np.round(y_NA,3),'in \n')


#         #Moment of Inertia
# #Flange
```

```
d_flange = y_flange-y_NA
Ad2_flange = A_flange*(h_pri+t_flange/2-y_NA)**2
Io_flange = beff*(t_flange**3)/12

# #Web
d_web = y_NA-y_web
Ad2_web = A_web*(y_NA-h_pri/2)**2
Io_web = b*(h_pri**3)/12

Ixx_tot = Io_flange+Ad2_flange+Ad2_web+Io_web #in^4
print('Ixx = ',np.round(Ixx_tot,3),'in^4 \n')


        #Cracked Moment
#Modulus of Rupture
fc = 3000   #psi
fr = 7.5*1*np.sqrt(fc)/1000     #ksi ; 1 is lambda for NWC
Mcr_pos = fr*Ixx_tot/(y_NA*12)  #k-ft
Mcr_neg = fr*Ixx_tot/((h-y_NA)*12)  #k-ft
print('fc = ',fc,'psi \n')
print('Mcr+ = ',np.round(Mcr_pos,3),'k-ft \n')
print('Mcr- = ',np.round(Mcr_neg,3),'k-ft \n')


        #Cracked Section
Ec = 57000*np.sqrt(fc)/1000 #ksi
Es = 29000  #ksi
n = Es/Ec

    #Midspan
#PNA & I cracked
a_mid = beff/2
b_mid = n*As_pos_bot+(n-1)*As_pos_top
c_mid = -(n*As_pos_bot*d)-((n-1)*As_pos_top*d_pri)
discrimant_mid = b_mid**2-4*a_mid*c_mid
y_mid = (-b+np.sqrt(discrimant_mid))/(2*a_mid)
Icr_mid = beff*(y_mid**3)/3 + (n*As_pos_bot*(d-y_mid)**2) + \
    ((n-1)*As_pos_top*(y_mid-d_pri)**2)
print('I cracked midspan = ',np.round(Icr_mid,3),'in^4 \n')

    #Support
#PNA & I cracked
a_sup = b/2
b_sup = n*As_neg_top+(n-1)*As_neg_bot
c_mid = -(n*As_neg_top*d)-((n-1)*As_neg_bot*d_pri)
discrimant_mid = b_mid**2-4*a_mid*c_mid
y_sup = (-b+np.sqrt(discrimant_mid))/(2*a_mid)
Icr_sup = b*(y_sup**3)/3 + (n*As_neg_top*(d-y_sup)**2) + \
    ((n-1)*As_neg_bot*(y_sup-d_pri)**2)
print('I cracked support = ',np.round(Icr_sup,3),'in^4 \n')
```

```
        #Deflection
    #Ieff
defl_dead = 0.005    #etabs
defl_live = 0.002    #etabs
print('dead deflection = ',defl_dead,'in \n')
print('live deflection = ',defl_live,'in \n')

#Midspan
Ma_mid = np.array([13.05,17.40,13.49])  #Ma for D,D+L,D+0.1L @ midspan
Ma_Mcr_mid = ((2/3)*(Mcr_pos/Ma_mid))**2
Icr_Ig_mid = 1-(Icr_mid/Ixx_tot)
Ieff_mid = Icr_mid/(1-(Ma_Mcr_mid*Icr_Ig_mid))
for i in range(0,len(Ma_mid)):
    if Ma_mid[i]<=2*Mcr_pos/3:
        Ieff_mid[i] = Ixx_tot
print('Ma midspan [D,D+L,D+0.1L] = ',Ma_mid,'k-ft \n')
print('I effective midspan [D,D+L,D+0.1L] = ',np.round(Ieff_mid,3),'in^4 \n')

#Support
Ma_sup = np.array([18.00,24.00,18.60])  #Ma for D,D+L,D+0.1L @ support
Ma_Mcr_sup = ((2/3)*(Mcr_neg/Ma_sup))**2
Icr_Ig_sup = 1-(Icr_sup/Ixx_tot)
Ieff_sup = Icr_sup/(1-(Ma_Mcr_sup*Icr_Ig_sup))
for i in range(0,len(Ma_sup)):
    if Ma_sup[i]<=2*Mcr_neg/3:
        Ieff_sup[i] = Ixx_tot
print('Ma support [D,D+L,D+0.1L] = ',Ma_sup,'k-ft \n')
print('I effective support [D,D+L,D+0.1L] = ',np.round(Ieff_sup,3),'in^4 \n')

#Immediate D Deflection
I_d = 0.85*Ieff_mid[0]+0.15*Ieff_sup[0]
delta_d = defl_dead*Ixx_tot/I_d

#Immediate Live Deflection
I_dl = 0.85*Ieff_mid[1]+0.15*Ieff_sup[1]
delta_l = (defl_dead+defl_live)*(Ixx_tot/I_dl)-delta_d

#Longterm Deflection
I_d1l = 0.85*Ieff_mid[2]+0.15*Ieff_sup[2]
delta_d1l_def = defl_dead+0.1*defl_live
delta_d1l_I = Ixx_tot/I_d1l
delta_d1l = delta_d1l_def*delta_d1l_I

#Creep
epsilon = 2
rho_prime = As_pos_top/(b*d)
lam = epsilon/(1+50*rho_prime)
delta_creep = lam*delta_d1l

delta_l_creep = np.round(delta_l+delta_creep,3)
```

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. A3

```
delta_d_l_creep = np.round(delta_l_creep+delta_d,3)
print('deflection due to creep and live = ',delta_l_creep,'in \n')
print('deflection due to creep, live, and dead = ',delta_d_l_creep,'in \n')
```

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. A4

Beam B1

Fig 1: Max Positive Moment Diagram

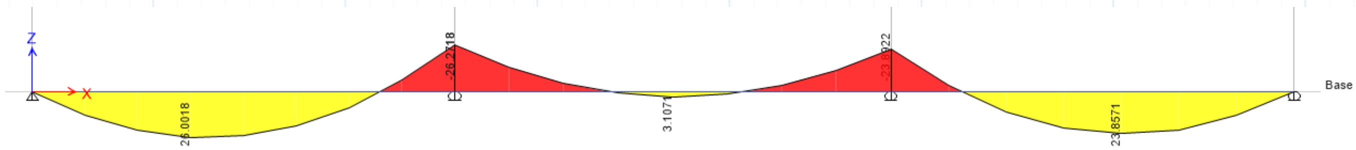


Fig 1.1: Max Negative Moment Diagram

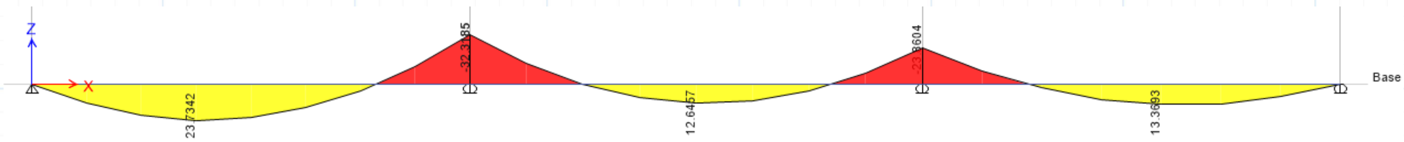
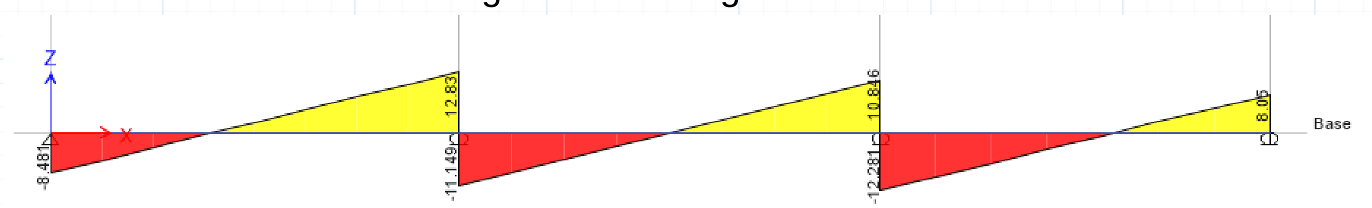


Fig 2: Shear Diagram



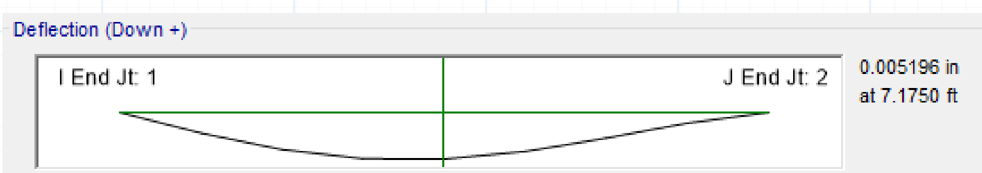


Figure 3: Dead Deflection

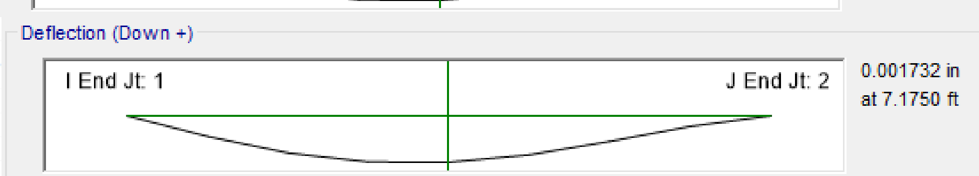


Figure 4: Live Deflection

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. A5

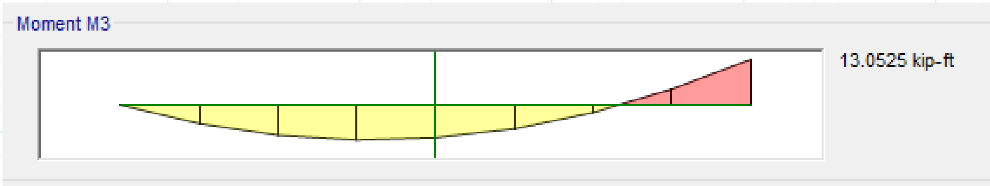


Figure 5: Md @ midspan

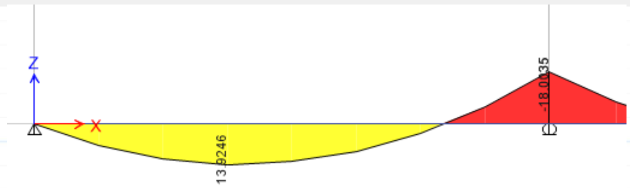


Figure 6: Md @ support

Figure 7: Md+l @ midspan

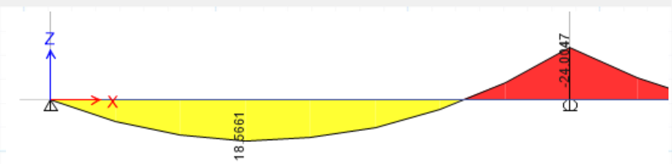


Figure 8: Md+l @ support

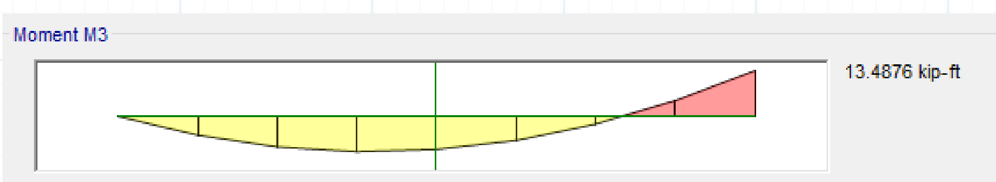


Figure 9: Md+0.1l @ midspan

Figure 10: Md+0.1l @ support

Beam 4

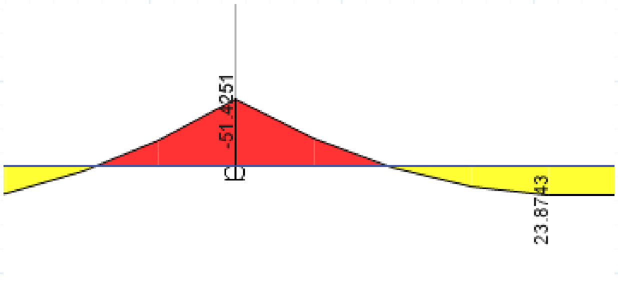


Figure 10.1: Max Negative Moment

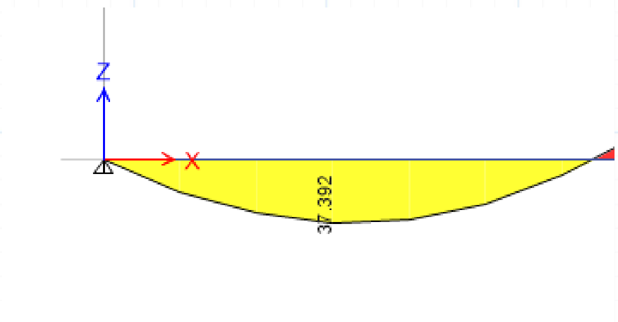


Figure 10.2: Max Positive Moment

This can follow B3 design, but an extra bar is needed at the top

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<u>Beam B2</u>

Fig 11: Moment Diagram

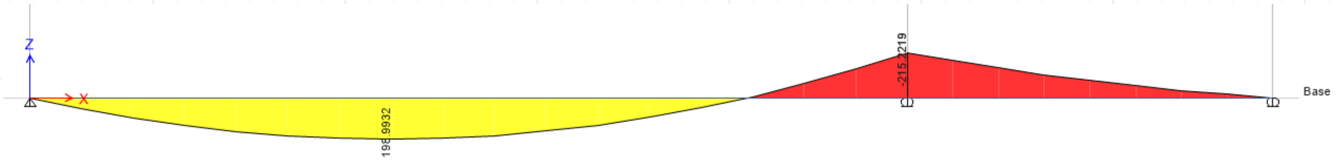
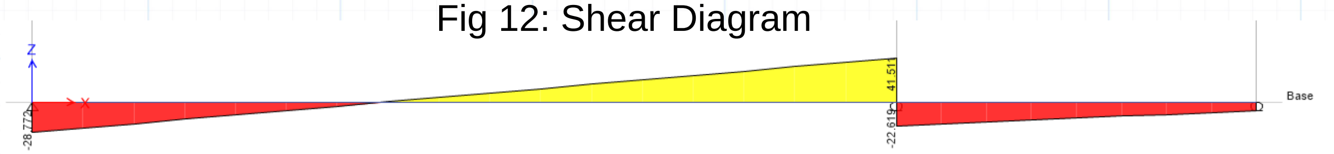


Fig 12: Shear Diagram



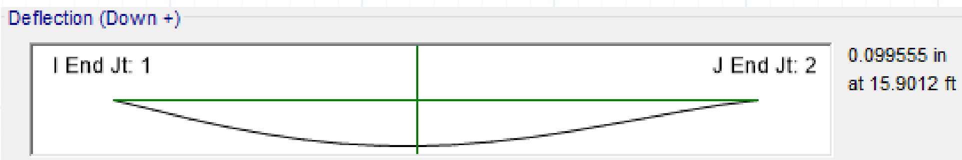


Figure 13: Dead Deflection

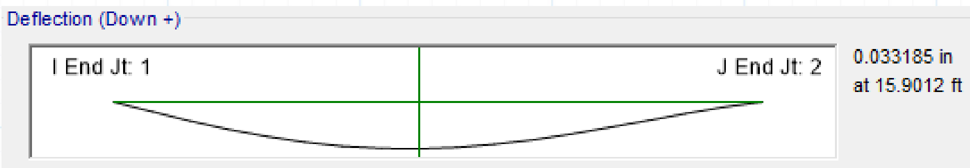


Figure 14: Live Deflection

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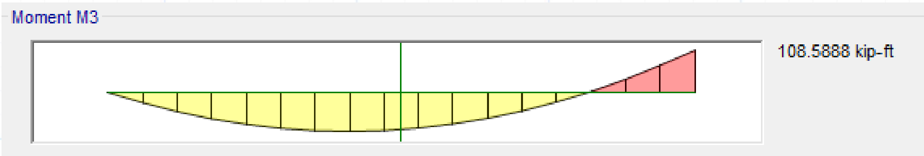


Figure 15: Md @ midspan

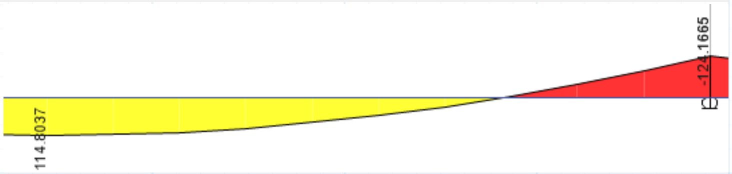


Figure 16: Md @ support

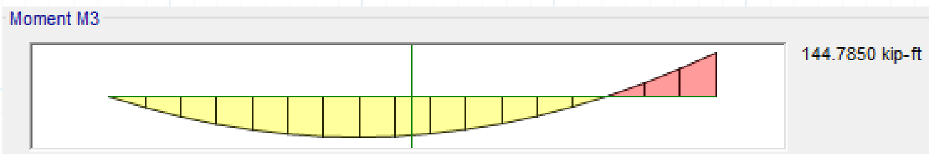


Figure 17: Md+l @ midspan

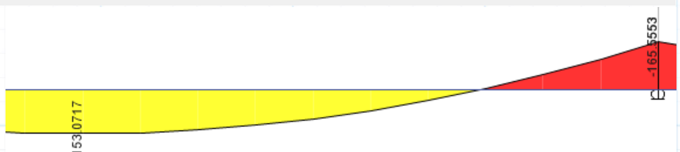


Figure 18: Md+l @ support

Figure 19: Md+0.1l @ midspan

Figure 20: Md+0.1l @ support

Beam B3

Fig 21: Moment Diagram Pin-Pin

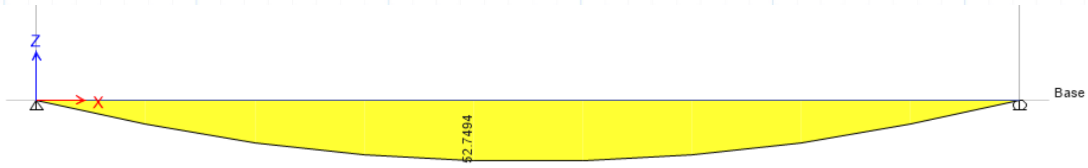


Fig 22: Moment Diagram Pin-Pin

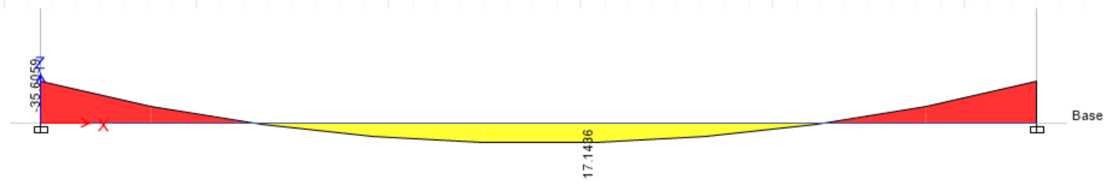
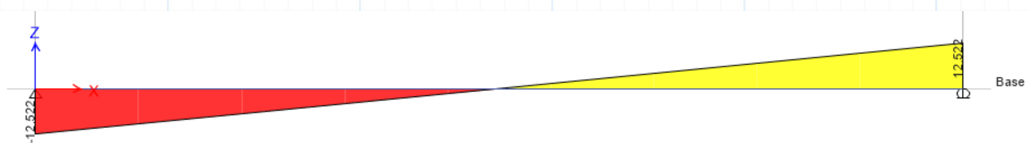


Fig 23: Shear Diagram



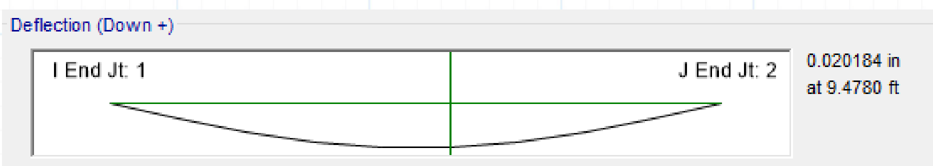


Figure 24: Dead Deflection

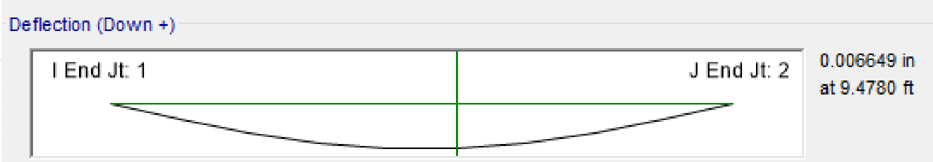


Figure 25: Live Deflection

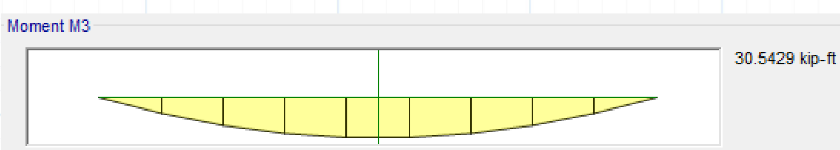


Figure 26: Md @ midspan

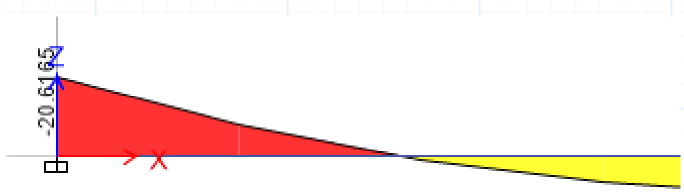


Figure 27: Md @ support

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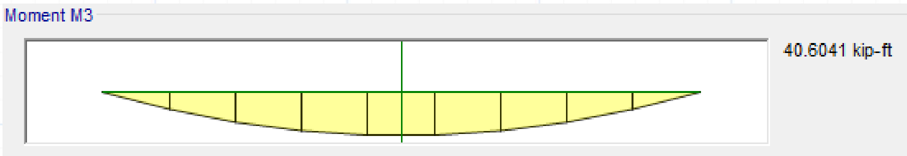

Figure 28: Md+l @ midspan

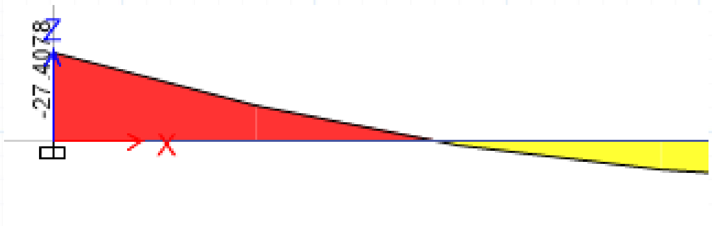

Figure 29: Md+l @ support

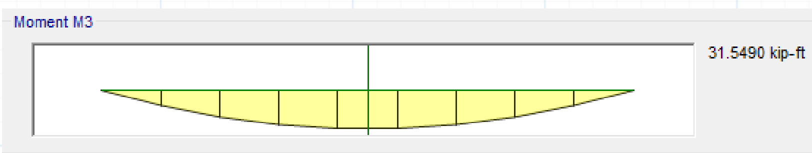

Figure 30: Md+0.1l @ midspan

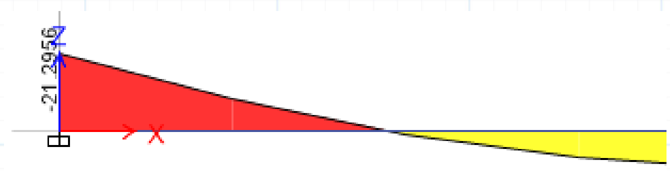

Figure 31: Md+0.1l @ support

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<u>Girder G1</u>

Fig 32: Moment Diagram

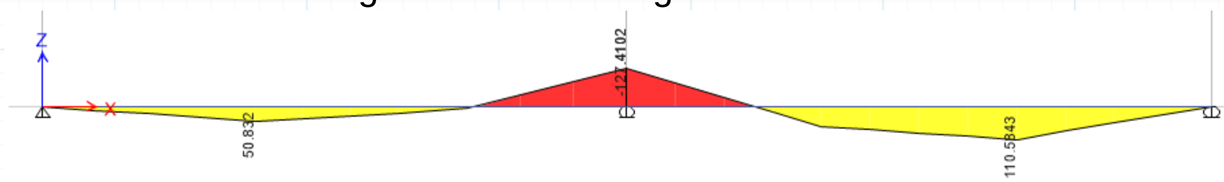
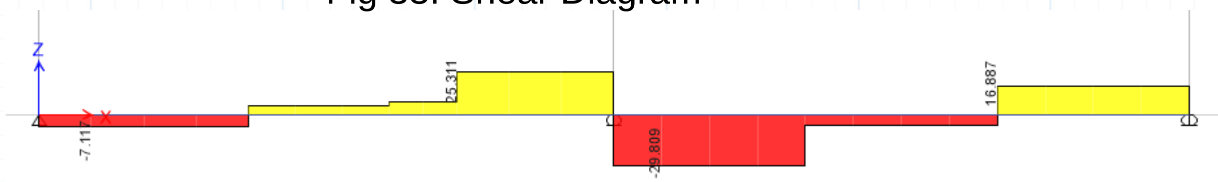


Fig 33: Shear Diagram



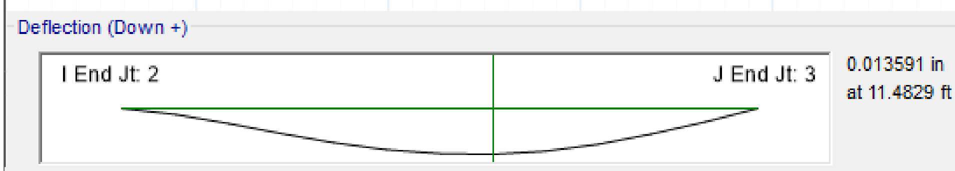


Figure 34: Dead Deflection

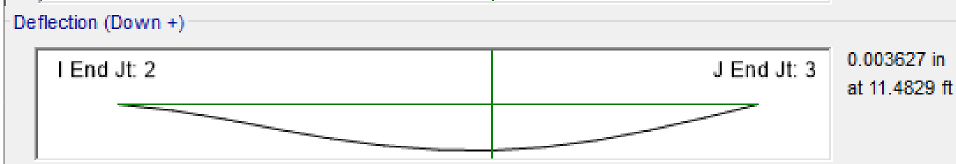


Figure 35: Live Deflection

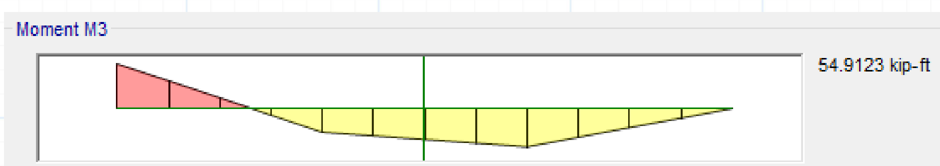


Figure 36: Md @ midspan

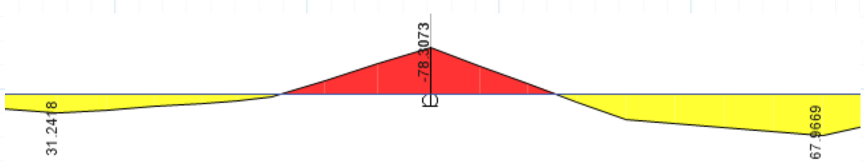


Figure 37: Md @ support

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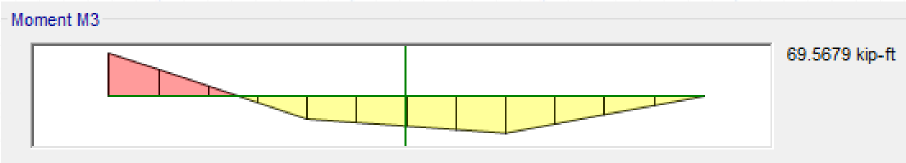


Figure 38: Md+l @ midspan

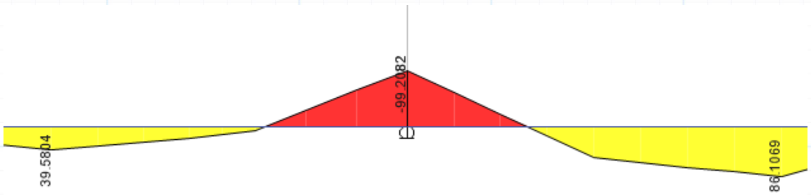


Figure 39: Md+l @ support

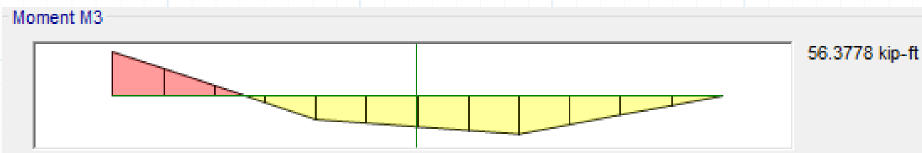


Figure 40: Md+0.1l @ midspan

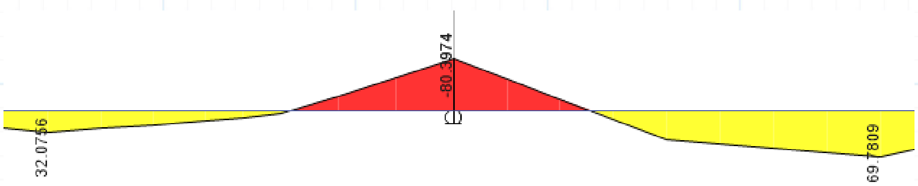
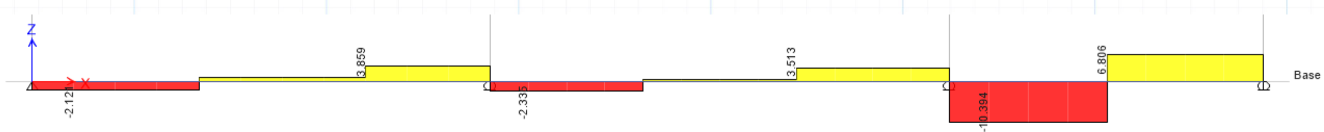


Figure 41: Md+0.1l @ support

Figure 41.1: Torsion



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Girder G2

Fig 42: Moment Diagram

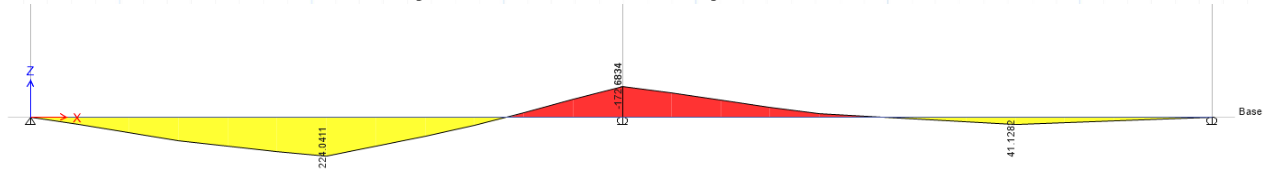
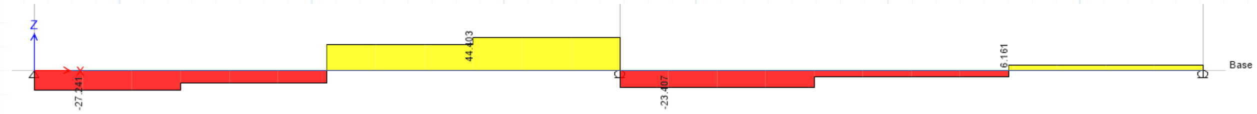


Fig 43: Shear Diagram



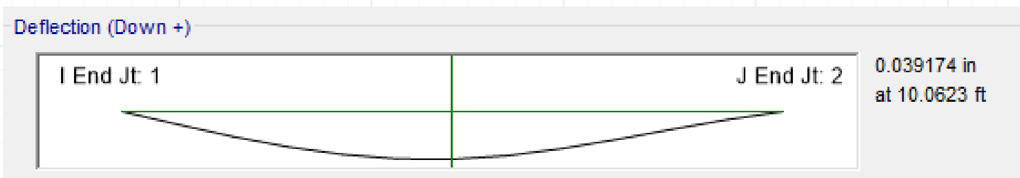


Figure 44: Dead Deflection

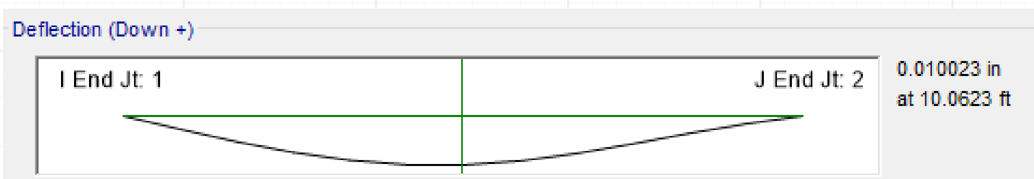


Figure 45: Live Deflection

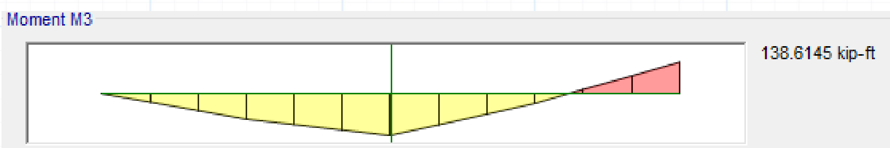


Figure 46: Md @ midspan

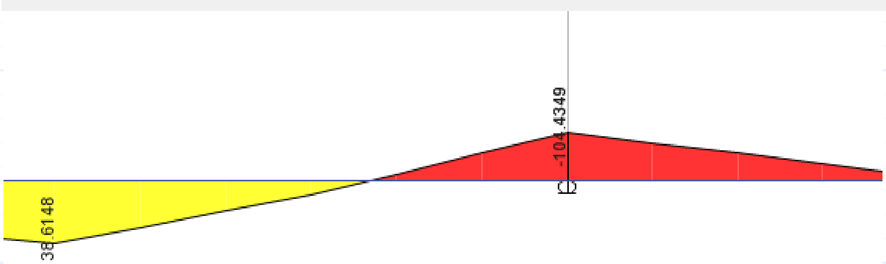


Figure 47: Md @ support

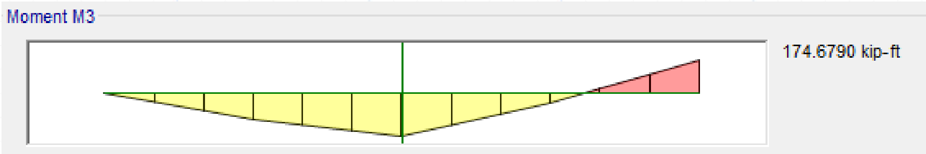


Figure 48: Md+l @ midspan

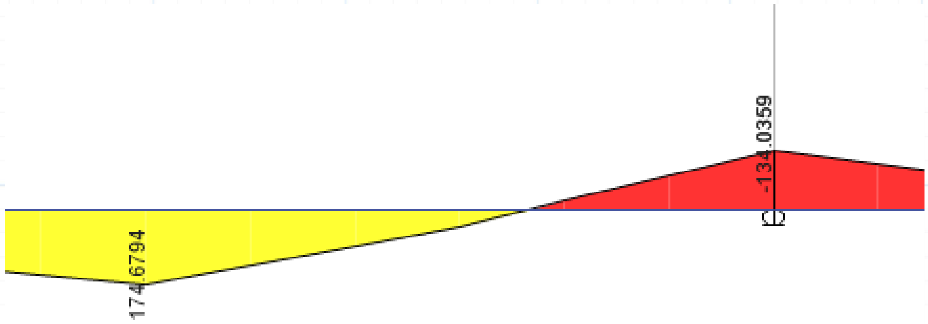


Figure 49: Md+l @ support

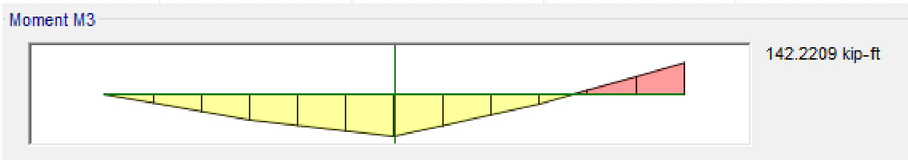


Figure 50: Md+0.1l @ midspan

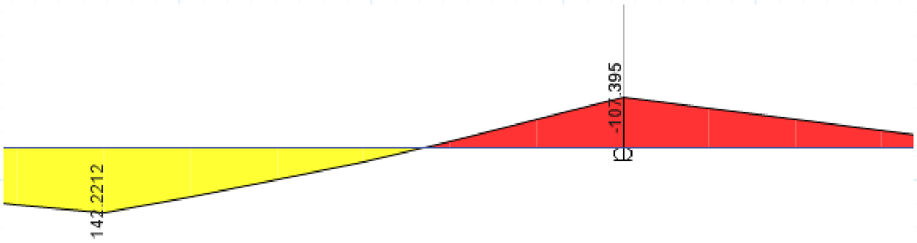
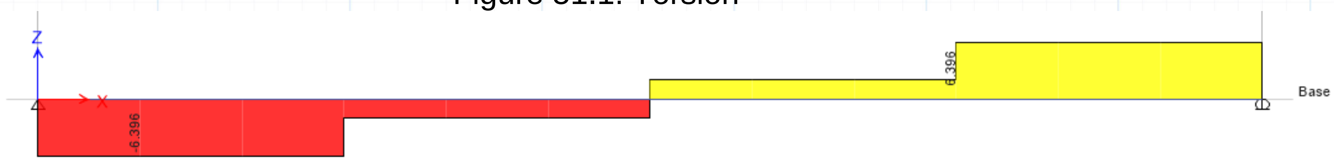


Figure 51: Md+0.1l @ support

Figure 51.1: Torsion



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Girder G3

Fig 52: Moment Diagram Pinned Rxn

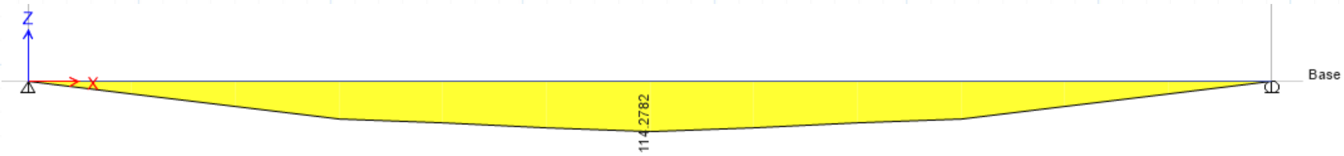


Fig 52: Moment Diagram Fixed Rxn

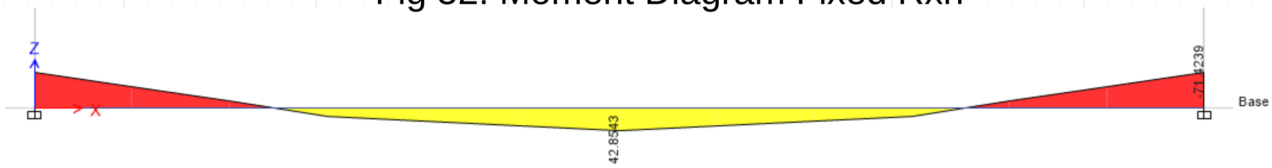
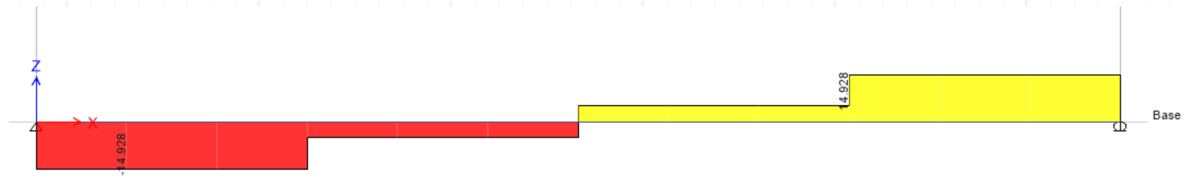


Fig 54: Shear Diagram



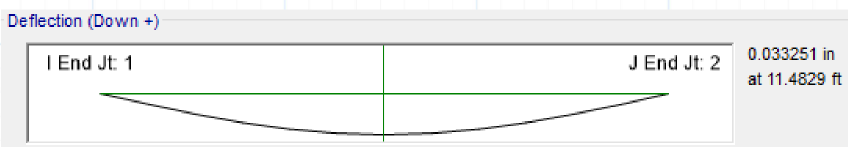


Figure 55: Dead Deflection

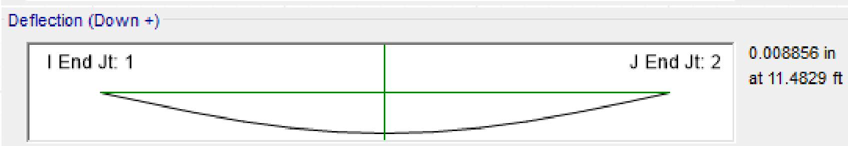


Figure 56: Live Deflection

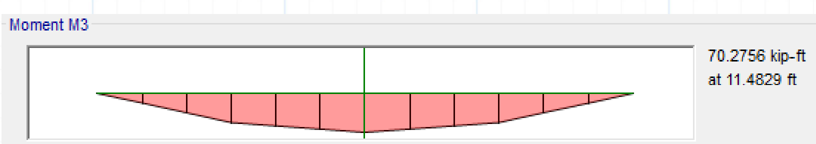


Figure 57: Md @ midspan

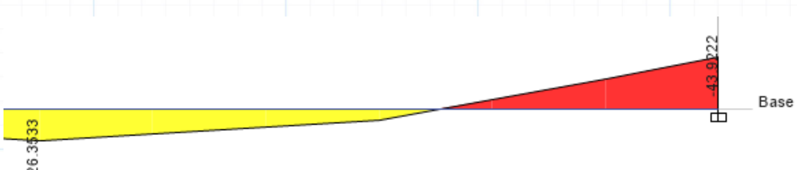


Figure 58: Md @ support

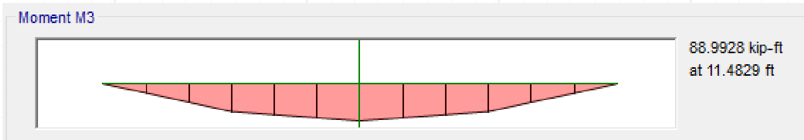


Figure 59: Md+l @ midspan

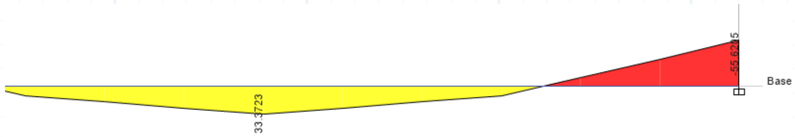


Figure 60: Md+l @ support

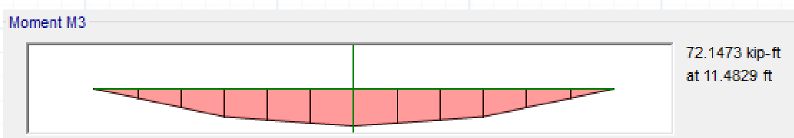


Figure 61: Md+0.1l @ midspan

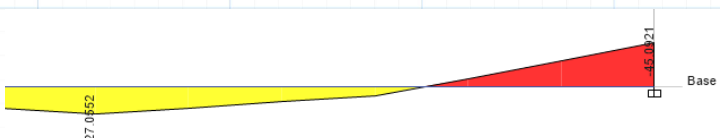
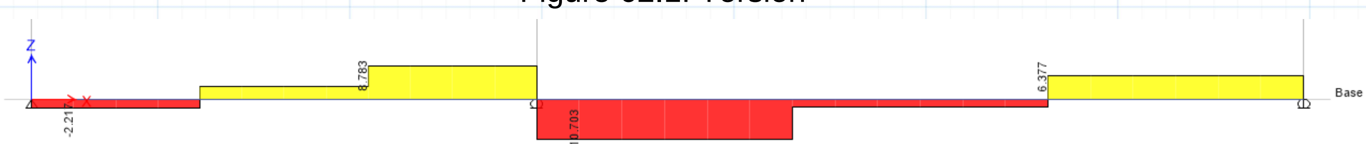


Figure 62: Md+0.1l @ support

Figure 62.1: Torsion



Girder G4

Fig 63: Moment Diagram Pinned Rxn

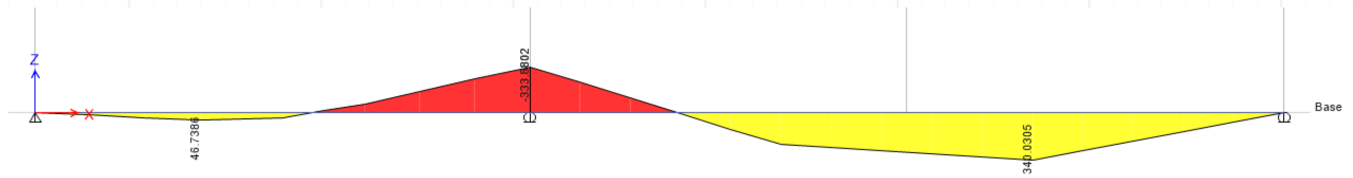
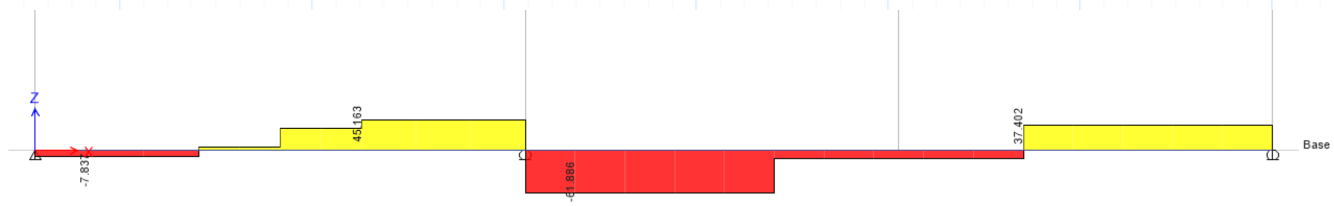


Fig 64: Shear Diagram



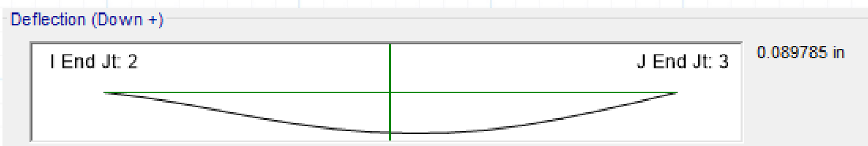


Figure 65: Dead Deflection

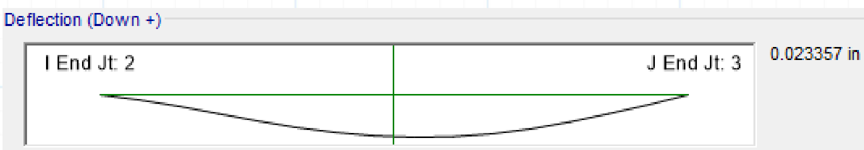


Figure 66: Live Deflection

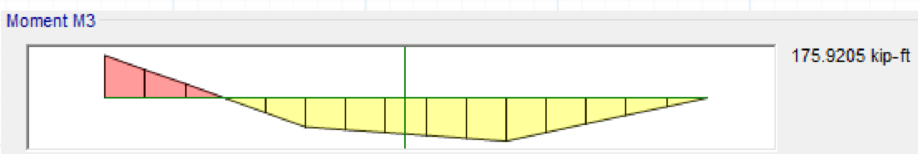


Figure 67: Md @ midspan

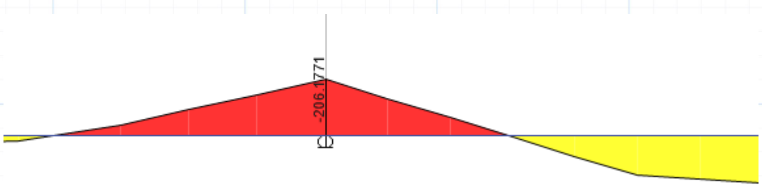


Figure 68: Md @ support

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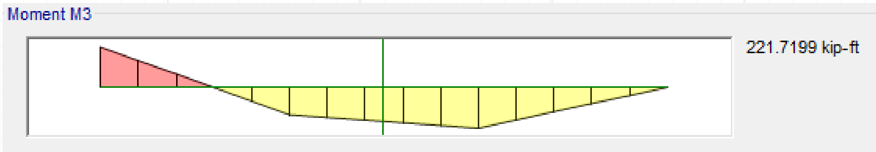


Figure 69: Md+l @ midspan

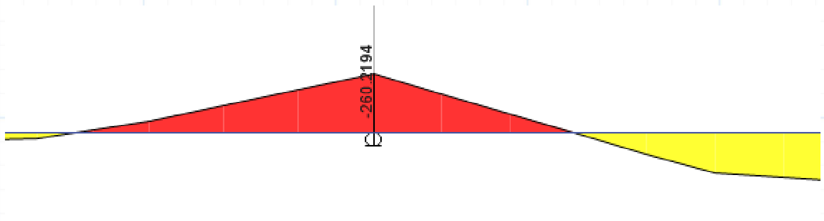


Figure 70: Md+l @ support

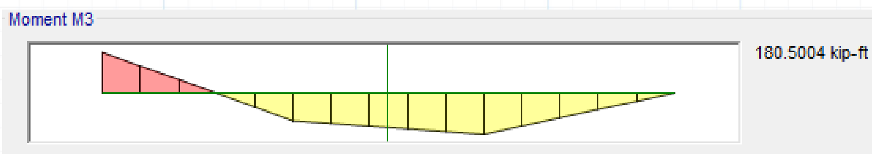


Figure 71: Md+0.1l @ midspan

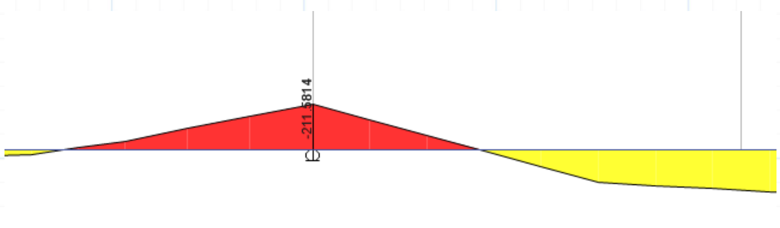


Figure 72: Md+0.1l @ support

ROOF ETABS OUTPUT

Girder G1

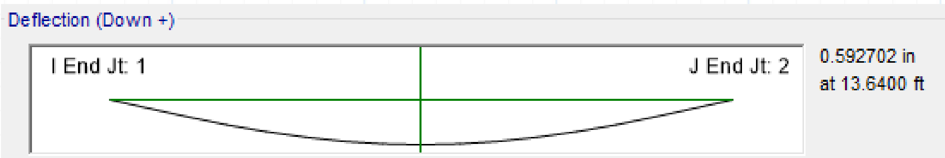


Figure 73: Live Deflection

Girder G2

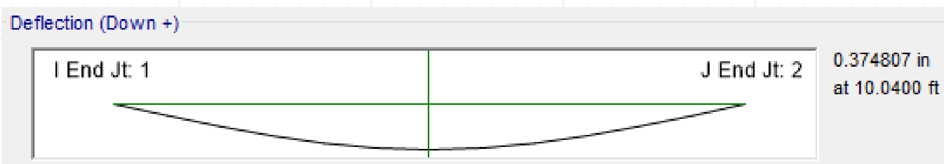


Figure 74: Live Deflection

Girder G3

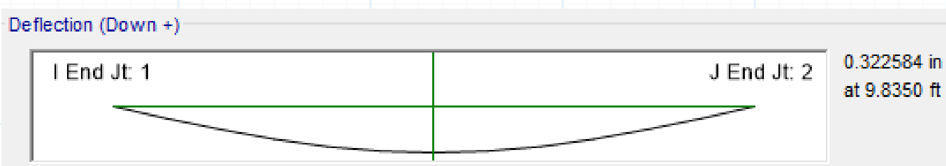


Figure 75: Live Deflection

Beam B2

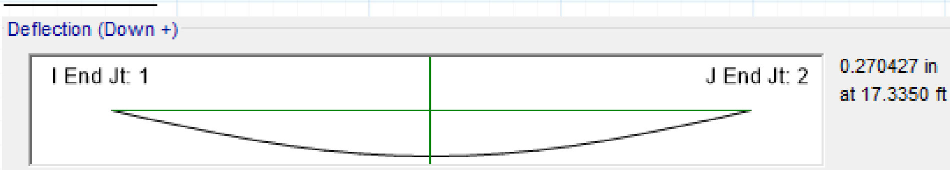


Figure 76: Live Deflection

PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. A20

LALTERAL ETABS OUTPUT

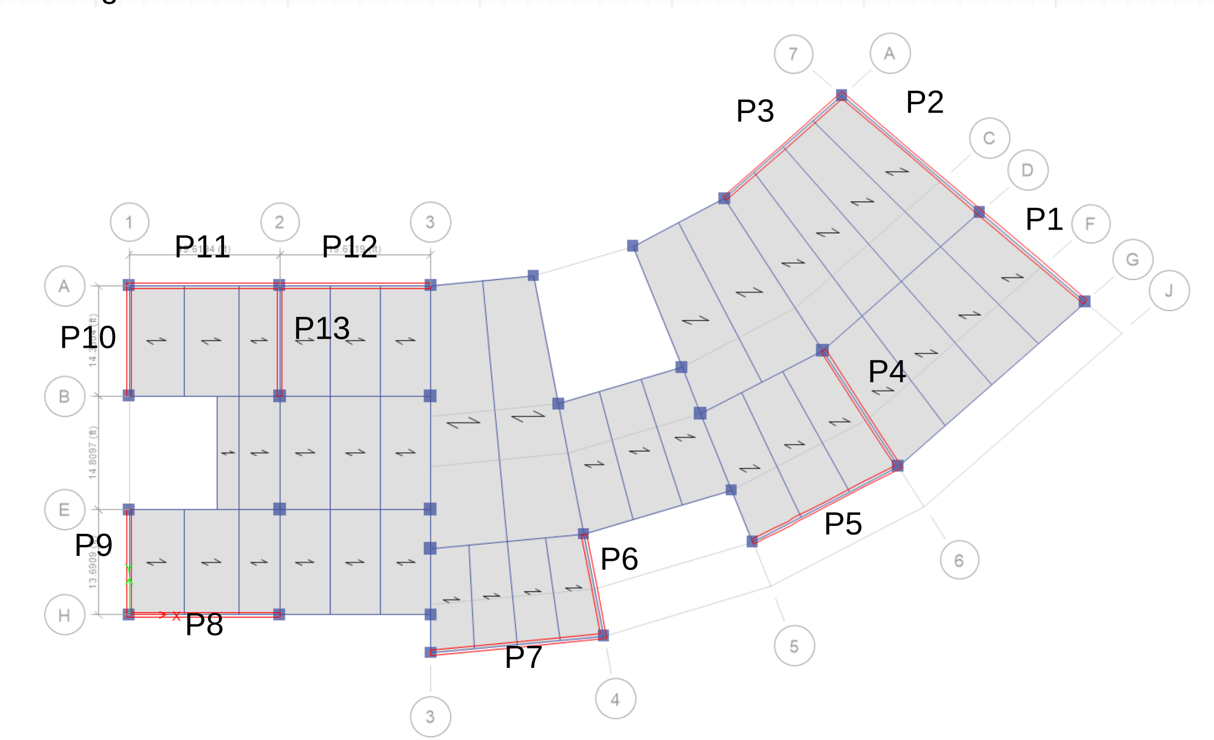
Table 1: N/S EQ wall forces

TABLE: Pier Forces					
Story	Pier	Output Case	Step Type	Location	V2
					kip
Story2	P1	N/S	Max	Top	-2.901
Story2	P3	N/S	Max	Top	0.545
Story2	P4	N/S	Max	Top	-12.583
Story2	P5	N/S	Max	Top	3.886
Story2	P6	N/S	Max	Top	-14.22
Story2	P7	N/S	Max	Top	0.249
Story2	P8	N/S	Max	Top	-0.525
Story2	P9	N/S	Max	Top	4.144
Story2	P11	N/S	Max	Top	-0.573
Story2	P13	N/S	Max	Top	14.501
Story1	P1	N/S	Max	Top	-25.148
Story1	P3	N/S	Max	Top	21.75
Story1	P4	N/S	Max	Top	-67.606
Story1	P5	N/S	Max	Top	35.703
Story1	P6	N/S	Max	Top	-56.755
Story1	P7	N/S	Max	Top	4.566
Story1	P8	N/S	Max	Top	7.032
Story1	P9	N/S	Max	Top	23.576
Story1	P11	N/S	Max	Top	-7.398
Story1	P13	N/S	Max	Top	70.723

Table 2: E/W EQ wall forces

TABLE: Pier Forces					
Story	Pier	Output Case	Step Type	Location	V2
					kip
Story2	P1	E/W	Max	Top	4.411
Story2	P3	E/W	Max	Top	13.355
Story2	P4	E/W	Max	Top	2.923
Story2	P5	E/W	Max	Top	14.913
Story2	P6	E/W	Max	Top	0.274
Story2	P7	E/W	Max	Top	1.219
Story2	P8	E/W	Max	Top	15.779
Story2	P9	E/W	Max	Top	0.406
Story2	P11	E/W	Max	Top	14.742
Story2	P13	E/W	Max	Top	0.149
Story1	P1	E/W	Max	Top	28.439
Story1	P3	E/W	Max	Top	20.636
Story1	P4	E/W	Max	Top	18.478
Story1	P5	E/W	Max	Top	70.701
Story1	P6	E/W	Max	Top	10.151
Story1	P7	E/W	Max	Top	42.997
Story1	P8	E/W	Max	Top	53.39
Story1	P9	E/W	Max	Top	7.532
Story1	P11	E/W	Max	Top	50.595
Story1	P13	E/W	Max	Top	6.869

Figure 77: Wall Callouts



PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. A21

Figure 78: P4 Forces

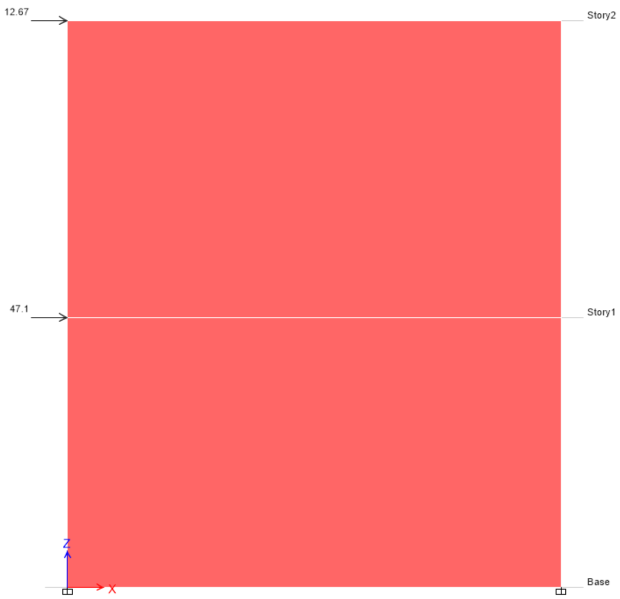
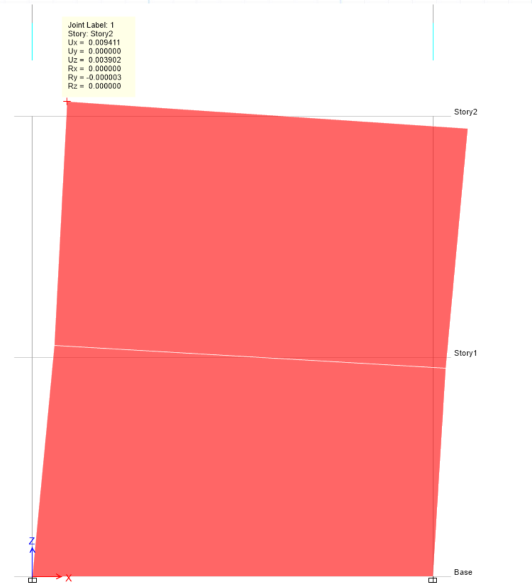


Figure 79: P4 Deflection



*Based off of before deleted walls

Figure 80: P5 Forces

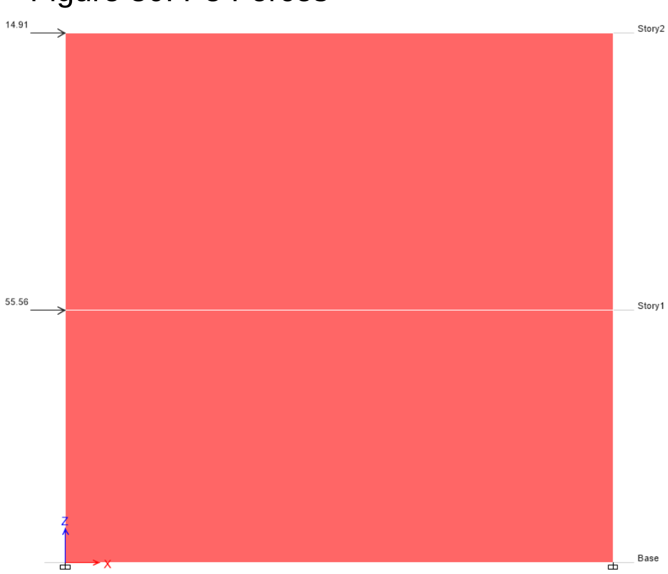
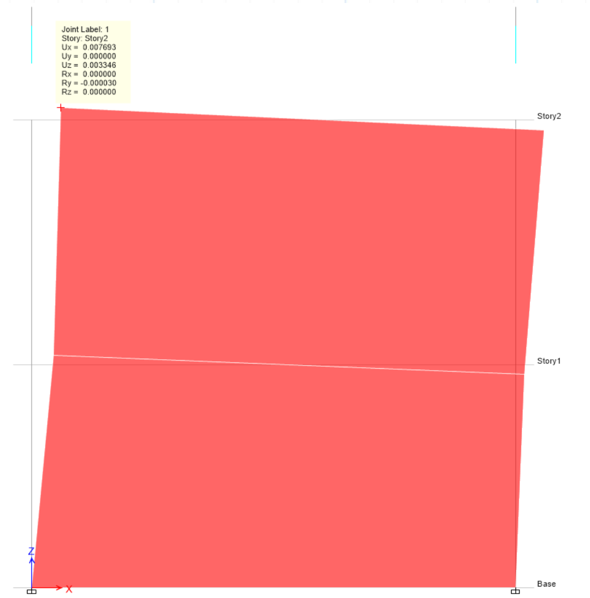


Figure 81: P5 Deflection



*Based off of before deleted walls

PROJECT MBANDAZI VILLAGE

PROJECT NO. ______ DATE ______

CLIENT JI BY JSS SHEET NO. A22

Figure 82: Delta u 1 E/W

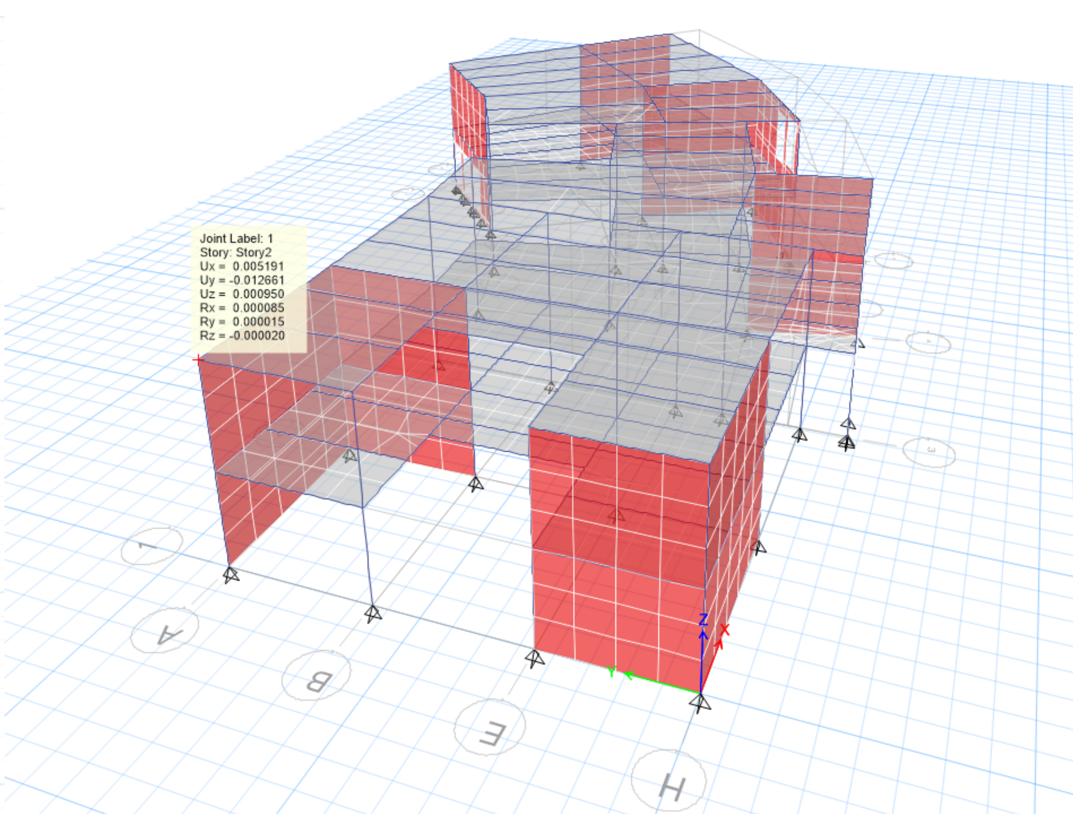
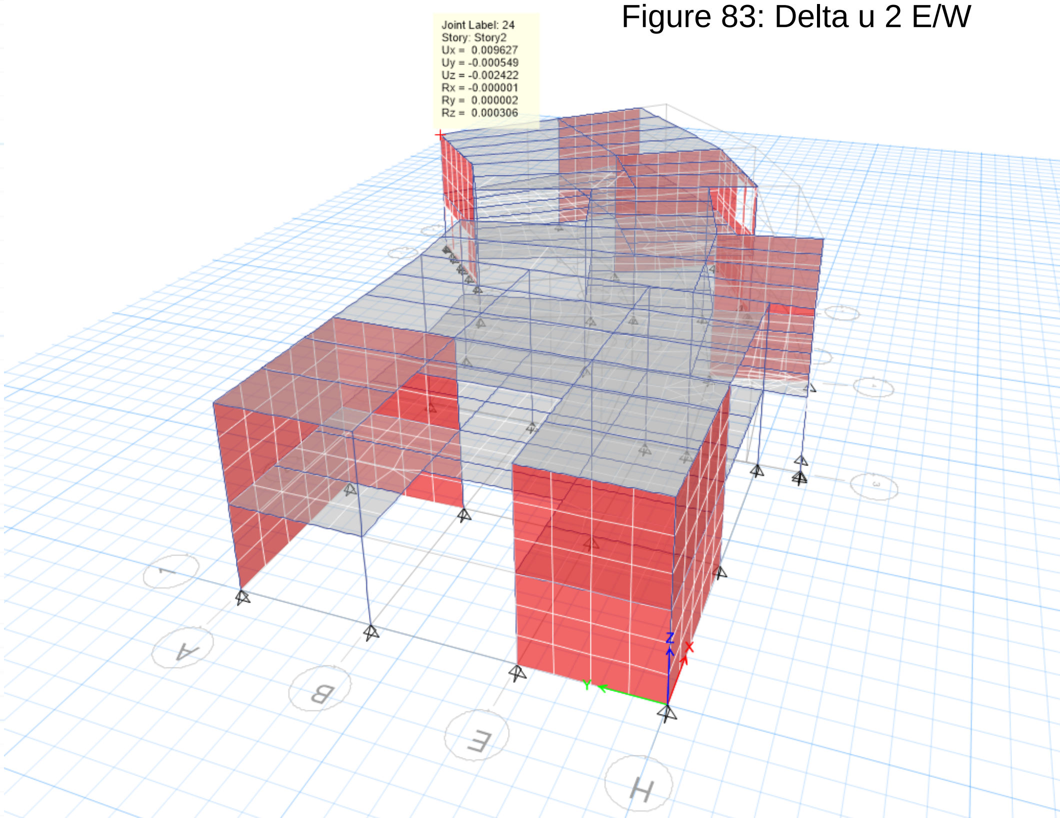


Figure 83: Delta u 2 E/W



PROJECT MBANDAZI VILLAGE

PROJECT NO. DATE

CLIENT JI BY JSS SHEET NO. A23

Figure 84: Delta u 1 N/S

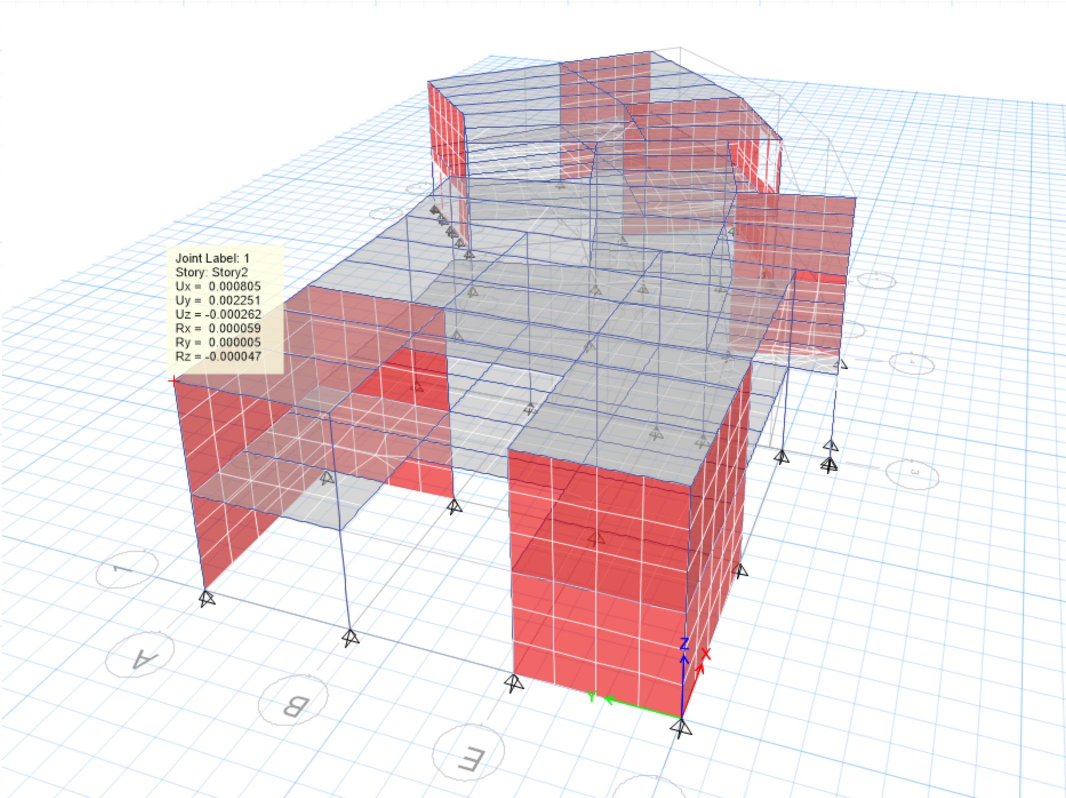
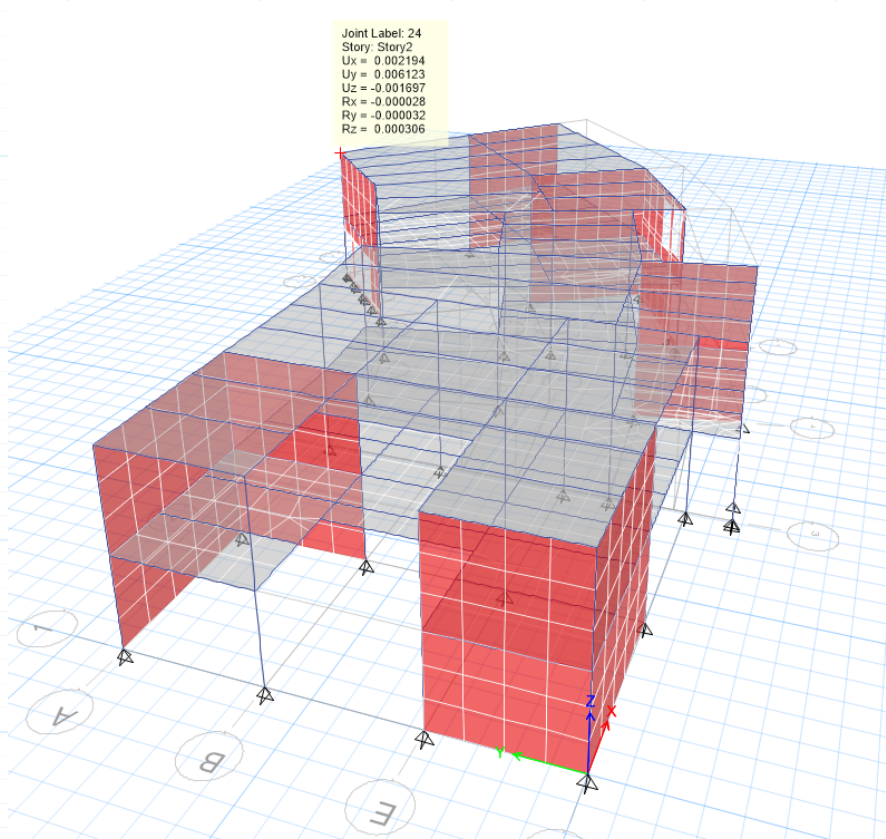


Figure 85: Delta u 2 N/S



GENERAL CRITERIA

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. IN THE EVENT OF CONFLICT BETWEEN THE SPECIFICATION AND THE DRAWINGS CONSULT WITH THE ARCHITECT

2. THE STRUCTURAL DRAWINGS SHOW THE STRUCTURAL CONSTRUCTION REQUIREMENTS FOR THE BUILDING. ITEMS REQUIRING COORDINATION WITH THE ARCHITECTURAL DRAWING INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

A. SIZE AND LOCATION OF CONCRETE SLAB DEPRESSIONS, STEPS, AND CURBS

B. ELEVATIONS, SLOPES, AND DETAILS OF TOPPING SLABS OVER STRUCTURAL DECKS.

C. EXPOSED CONCRETE FLOOR SLAB FINISHED, SLOPES, AND SCORED JOINT LOCATIONS.

3. ITEMS REQUIRING COORDINATION WITH MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

A. WALL AND SLAB OPENINGS FOR PIPE RUNS, SLEEVES, HANGARS, TRENCHES ETC.

B. WALL AND SLAB OPENING FOR ELECTRICAL CONDUIT, BOXES OR OUTLETS.

C. CONCRETE INSERTS FOR ELECTRICAL, MECHANICAL OR PLUMBING FIXTURES.

D. SIZE AND LOCATION OF MACHINE OR EQUIPMENT BASES, PADS, AND ANCHORS BOLTS.

4. TYPICAL DETAILS ARE INTENDED TO APPLY TO APPLICABLE SITUATIONS UNLESS NOTED OTHERWISE. IN GENERAL, TYPICAL DETAILS ARE NOT SPECIFICALLY REFERENCED.

5. WHERE MEMBER LOCATIONS ARE NOT SPECIFICALLY DIMENSIONED MEMBERS ARE LOCATED EITHER ON COLUMN LINES OR EQUALLY SPACED BETWEEN COLUMN LINES OR BETWEEN MEMBERS OTHERWISE LOCATED.

6. ELEVATOR SUPPORT FRAMING IS NOT SHOWN ON THE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SUPPORT FRAMING WITH MANUFACTURER'S SPECIFIED REQUIREMENTS. THIS COORDINATION SHALL INCLUDE THE ENTIRE RUN OF THE ELEVATORS INCLUDING, BUT NOT LIMITED TO, PITS AND MACHINE ROOMS.

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SHEET NAME: GENERAL CRITERIA

SCALE:

NUMBER: S.001

DESIGN CRITERIA

1. APPLICABLE CODE:

A. INTERNATIONAL BUILDING CODE, (IBC), 2018

2. DESIGN LOADS:

A. DEAD LOADS - ACTUAL IN PLACE WEIGHTS OF ALL MATERIALS SHOWN ON THE CONTRACT DOCUMENTS
B. LIVE LOAD - UNIFORM AS FOLLOWS:
(1) ROOF TYPICAL 1.197 psf
(2) TYPICAL FLOOR 1.915 psf
C. WIND LOAD - BASED ON ASCE 7-16 CHAPTER 27 WITH EXPOSURE C CONDITION AND BASIC WIND SPEED OF 92 MPH
D. MINIMUM SEISMIC LOAD - DESIGN BASE SHEAR SHALL BE BASED ON IBC CHAPTER 12, EARTHQUAKE DESIGN AS FOLLOWS:

V = TOTAL DESIGN BASE SHEAR
V = [SDS*Ie/R]*W ≤ [SD1*Ie/(R*T)]*W for T≤TL
≤ [SD1*Ie*TL/(R*T2)]*W for T>TL
WHERE:
≥ [0.044*SDS*Ie]*W OR 0.5[S1*Ie/R]*W for S1≥0.6g

SDS = 1.05
SD1 = 0.731
T = 0.210
W = SEISMIC DEAD LOAD
Ie = 1
R = 5 (CONCRETE SHEAR WALL)

E. SEISMIC LOAD FOR STRUCTURAL ELEMENTS, NONSTRUCTURAL COMPONENTS, AND EQUIPMENT SUPPORTED BY THE PRIMARY STRUCTURAL FRAME:

Fp = (0.2*SDS*Ie)*W, BUT NO MORE THAN
Fp = (0.4*SDS*Ie)*W

WHERE:

SDS = 1.05
Ie = 1
F. FOUNDATION DESIGN: BASED ON THE GEOTECHNICAL INVESTIGATION REPORT AS PREPARED BY STEPPING ON PEBBLES, INC., REPORT #1009-8436-C234 DATED JANUARY 2021.

ALLOWABLE BEARING PRESSURES
DL+LL = 2000 psf

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SHEET NAME: DESIGN CRITERIA

SCALE:

NUMBER: S.002

MATERIAL CRITERIA

1.STRUCTURAL STEEL:

A. SHAPES, BARS, PLATES:

(1) ASTM A36: PLATES .

(2) ASTM A992 GRADE 50: W SHAPES

B. ASTM A992 GRADE 65: WHERE DENOTED BY “**”

C. HIGH STRENGTH BOLTS:

(1) ASTM A325: TYPICAL

D. MACHINE BOLTS: ASTM A307 TYPICAL.

E. ANCHOR BOLTS:

(1) ASTM F1554: TYPICAL

F. HEADED STUDS: ASTM A108.

G. WELDING ELECTRODES: E70XX

2. METAL DECK:

A. METAL DECKING & ACCESSORIES:

B. WELDING ELECTRODES: E60XX.

3. REINFORCED CONCRETE:

A. CONCRETE FOR FOUNDATION, SLAB-ON-GRADE AND CURBS: NORMAL WEIGHT CONCRETE WITH MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS

B. CONCRETE FOR WALLS, CONCRETE SHEAR WALLS SHOWN ON S. THROUGH S.
NORMAL WEIGHT CONCRETE WITH MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

C. REINFORCEMENT:
ASTM A615, GRADE 60, DEFORMED BARS, TYPICAL. ASTM A706
FOR REINFORCEMENT REQUIRING WELDING OR TRIM/BOUNDARY REINFORCEMENT NOTED ON CONCRETE WALL ELEVATIONS (DWGS S. THROUGH S.).

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MATERIAL CRITERIA

SCALE:

NUMBER:

S.003

TESTING & INSPECTION

1. TESTING AND INSPECTION SHALL INCLUDE, BUT IS NOT LIMITED TO THE FOLLOWING ITEMS:
    - A. SHOP AND FIELD WELDING.
    - B. BOLTS.
    - C. STRUCTURAL STEEL.
    - D. CONCRETE.
    - E. CONCRETE REINFORCEMENT.
    - F. EMBEDDED ANCHOR BOLTS.
    - G. EXPANSION ANCHORS.

2. SEE PROJECT SPECIFICATIONS AND THE CALIFORNIA BUILDING CODE FOR ADDITIONAL INFORMATION / REQUIREMENTS.

3. PROVIDE STRUCTURAL OBSERVATION PER IBC,2018.

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SHEET NAME:

TESTING & INSPECTION

SCALE:

NUMBER:

S.004

ABBREVIATIONS

ABT	ABOUT
A.B.	ANCHOR BOLT
ARCH	ARCHITECTURAL
BAR	FLAT BAR
BM	BEAM
BOT	BOTTOM
BTWN	BETWEEN
C.J	CONSTRUCTION JOINT
℄	CENTER LINE
CLG	CEILING
CLR.	CLEAR
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTED
CONT	CONTINUOUS
C.P	COMPLETE PENETRATION
C.W.	CONCRETE WALL
d	BOLT DIAMETER
db	REINF. BAR DIAMETER
D.B.A	DEFORMED BAR ANCHOR
DBL	DOUBLE
DET	DETAIL
DIA.	DIAMETER
DIM	DIMENSION
DO	DITTO
DWG	DRAWING
(E)	EXISTING
EA.	EACH
E.B.	EXPANSION BOLT
E.F	EACH FACE
E.J	EXPANSION JOINT
ELEV	ELEVATION
EMBED	EMBEDMENT
EQ	EQUAL
E.W	EACH WAY
EXT.	EXTERIOR
FDNT	FOUNDATION
FIN. FL.	FINISH FLOOR
FIN. GR.	FINISH GRADE
F.O.C	FACE OF CONCRETE
F.O.S	FACE OF STEEL OR STUDS
FLG	FLANGE
F.P	FULL PENETRATION
F.S	FAR SIDE
FTG	FOOTING
GA	GAUGE

GALV	GALVANIZED
G.B.	GRADE BEAM
HORIZ	HORIZONTAL
H.S.B.	HIGH STRENGTH BOLT
I.F.	INSIDE FACE
ID	INSIDE DIAMETER
INT	INTERIOR
JT	JOINT
L.L.H	LONG LEG HORIZONTAL
LLV.	LONG LEG VERTICAL
LSH	LONG SLOTTED HOLE
LT.WT.	LIGHT WEIGHT
MAX.	MAXIMUM
M.B	MACHINE BOLT
MECH.	MECHANICAL
MET.	METAL
MFR.	MANUFACTURER
MIN.	MINIMUM
MISC	MISCELLANEOUS
(N)	NEW
NO.	NUMBER
NOM	NOMINAL
N.S	NEAR SIDE
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
O.H	OPP. HAND.
OPNG	OPENING
OPP	OPPOSITE
PL.	PLATE
P.P	PARTIAL PENETRATION
PEN	PENETRATION
RAD	RADIUS
REQ'D REQ	REQUIRED
REINF.	REINFORCING STEEL
RW	RETAINING WALL
S.A.D	SEE ARCH DRAWINGS
SCHED.	SCHEDULE
SECT.	SECTION
SHT	SHEET
SIM	SIMILAR
S.O.G	SLAB ON GRADE
SPECS.	SPECIFICATIONS
SQ.	SQUARE

SSH	SHORT SLOTTED HOLE
STL	STEEL
STIFF	STIFFENER
STD	STANDARD
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
THK	THICK
THRD	THREADED
T.O.C	TOP OF CONCRETE
T.O.P	TOP OF PAVEMENT
T.O.S	TOP OF STEEL
T.O.W	TOP OF WALL
T.W	WEB THICKNESS
TYP	TYP.
U.N.O.	UNLESS NOTED
OTHERWISE	
VERT.	VERTICAL
V.I.F.	VERIFY IN FIELD
W/	WITH
WF	WIDE FLANGE
WP	WORK POINT
W.W.F	WELDED WIRE FABRIC

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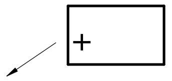
SHEET NAME:
ABBREVIATIONS

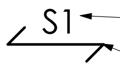
SCALE:

NUMBER:
S.005

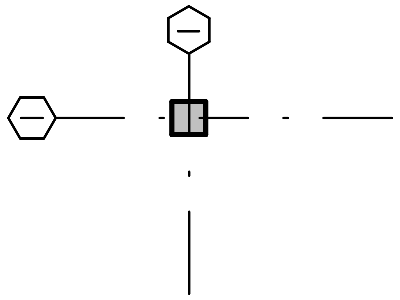
LEGEND



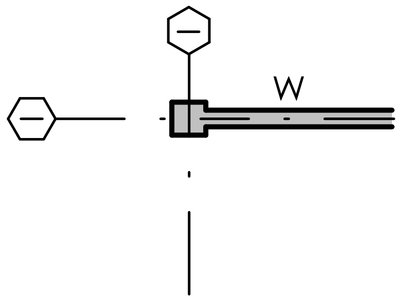
INDICATES T.O.C. ELEVATION ABOVE
OR BELOW FLOOR DATUM



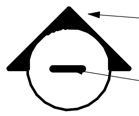
INDICATES CONCRETE SLAB TYPE,
SEE SCHEDULE ON S___
DIRECTION OF SPAN



INDICATES COLUMN MARK
SEE SCHEDULE ON S__

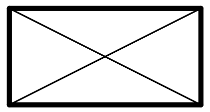


INDICATES CONTINUOUS WALL AND COLUMN MARK
SEE SCHEDULE ON S__



INDICATES REFERENCE ORIENTATION

INDICATES ELEVATION



OPEN TO BELOW

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SHEET NAME:

LEGEND

SCALE:

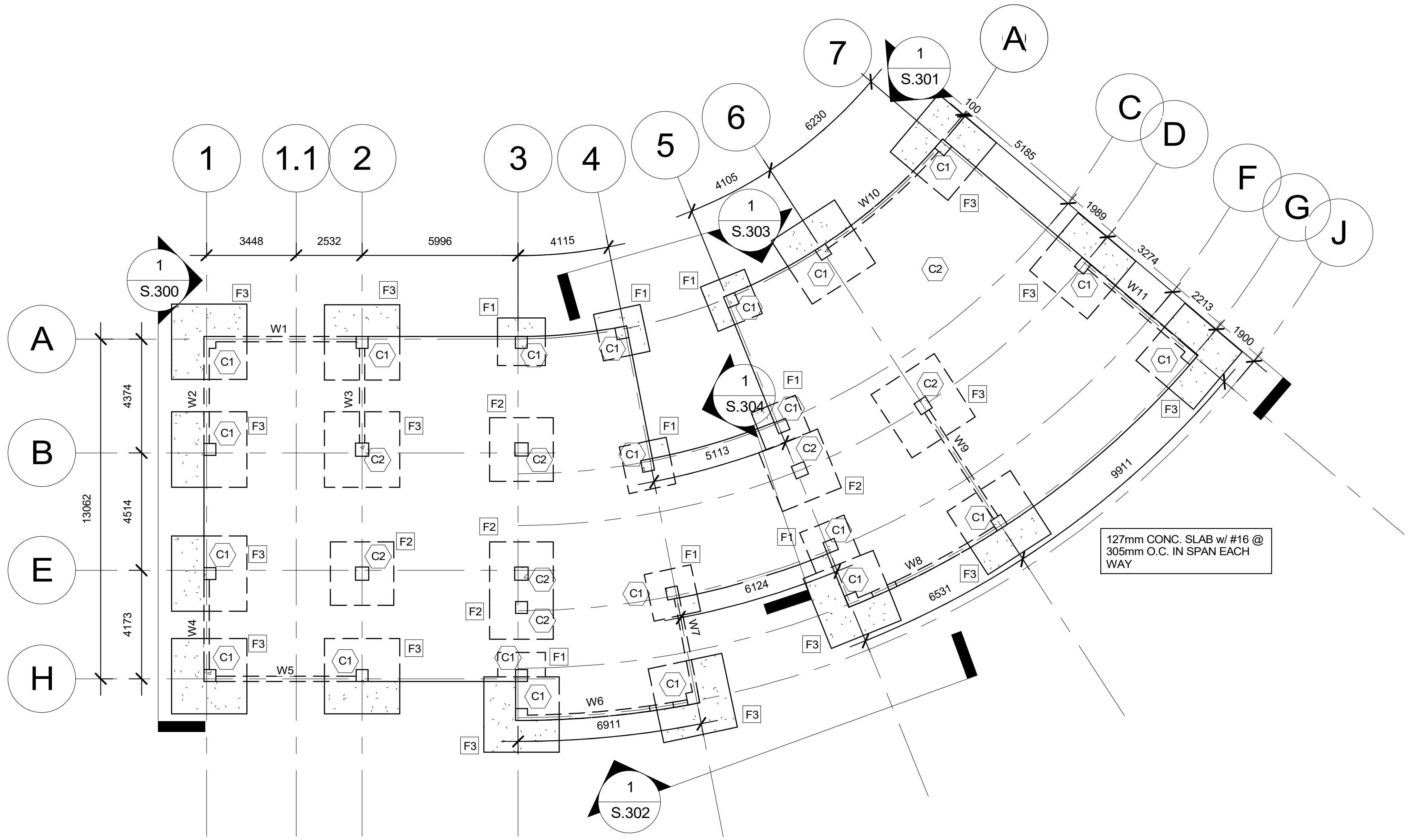
1 : 1

NUMBER:

S.006

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +0m U.N.O.
2. TOP OF FOOTING TO BE (0.61m) BELOW TOP OF SLAB U.N.O.
3. SEE SHEET S.001 TO S.006 FOR GENERAL NOTES
4. SEE 21/S.414 FOR CONCRETE COLUMN SCHEDULE
5. SEE S.403 & S.404 FOR FOOTING DETAILS
6. SEE 1/S.401 FOR TYPICAL SLAB-ON-GRADE DETAILS
7. SEE S.415 & S.417 FOR WWALL ELEVATIONS



FOUNDATION PLAN

1 : 200

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6/1/2021 10:21:59 PM

SHEET NAME:

FOUNDATION PLAN

SCALE:

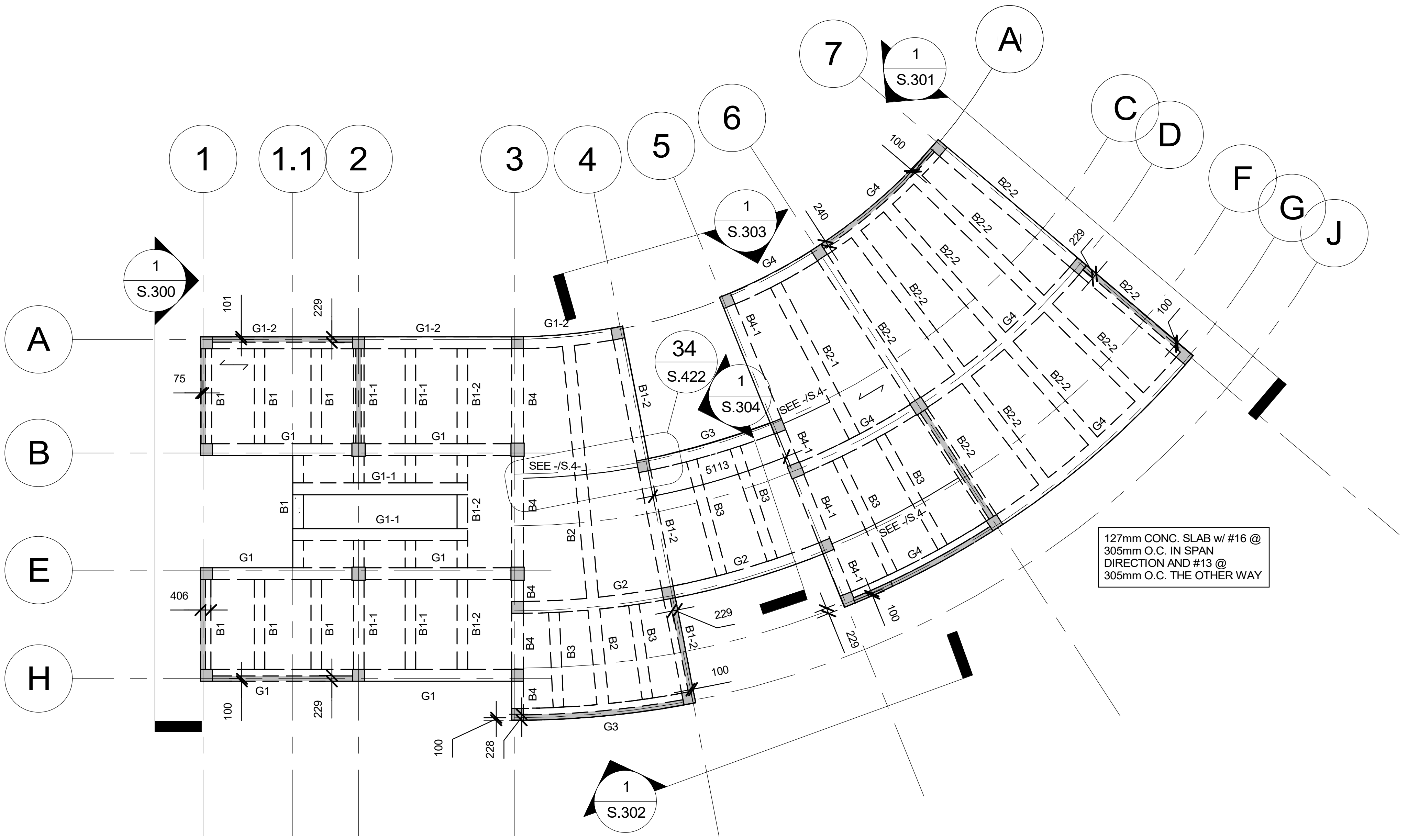
1 : 200

NUMBER:

S.101

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = +3m U.N.O.
2. SEE SHEET S.405 FOR TYPICAL SUSPENDED SLAB DETAILS
3. SEE S.406, S.408, & S.409 FOR SPAN JOIST DETAILS
4. SEE S.410, S.411, & S.412 FOR GIRDER DETAILS
5. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



FIRST FLOOR FRAMING PLAN

1 : 200

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PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

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NO.	DESC.	DATE

DRAWN BY: JS

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SHEET NAME:

FIRST FLOOR FRAMING PLAN

SCALE:

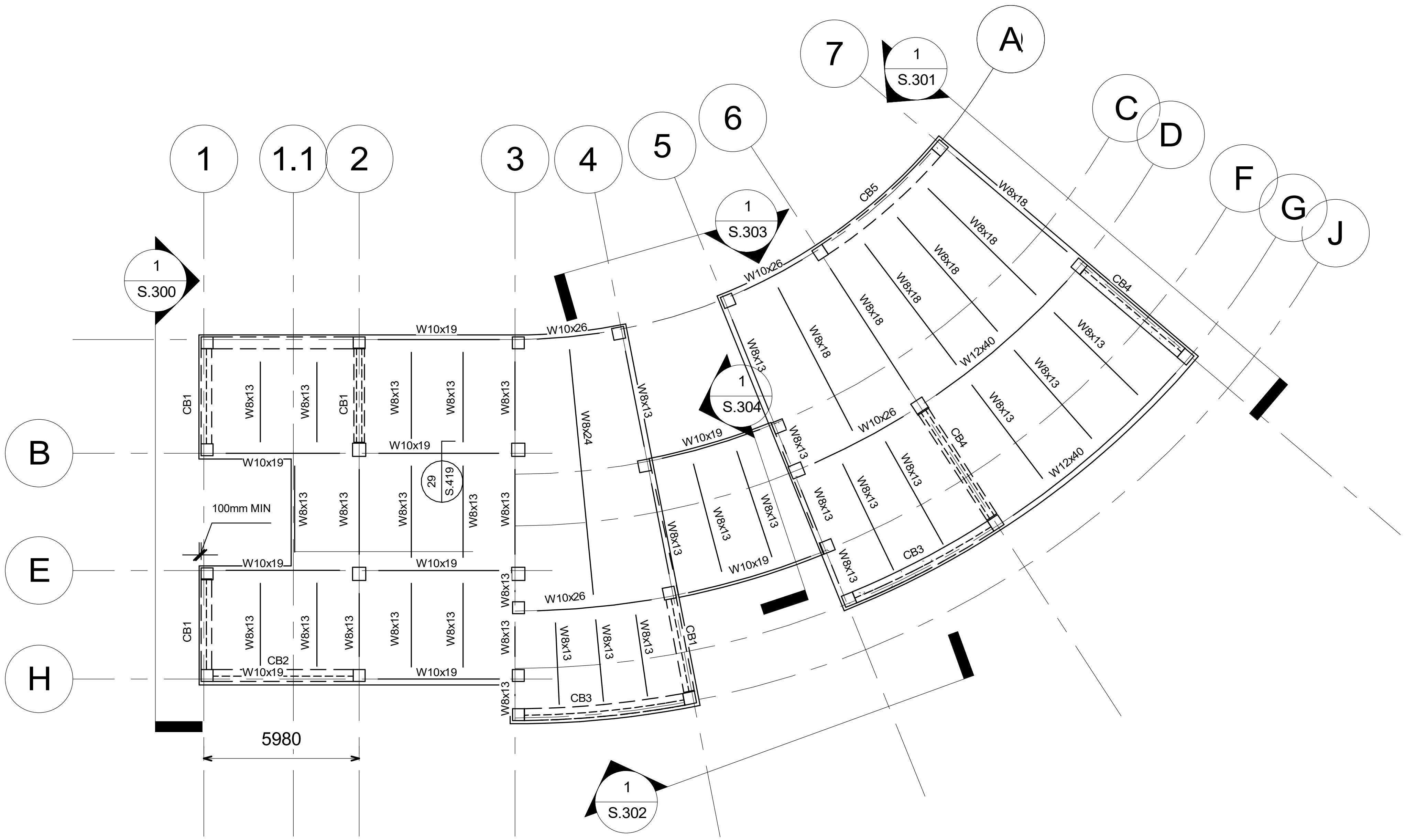
1 : 200

NUMBER:

S.102

SHEET NOTES

1. TOP OF CONCRETE ELEVATION = VARIES. SEE ELEVATIONS FOR HEIGHTS
2. SEE S.407, S.408, S.409, S.411, & S.412 FOR JOIST AND GIRDER DETAILS
3. SEE SHEET NOTES FOR ADDITIONAL INFORMATION



ROOF FRAMING PLAN

1 : 200

JOURNEYMAN INTERNATIONAL
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PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

6/1/2021 1:03:02 PM

SHEET NAME:

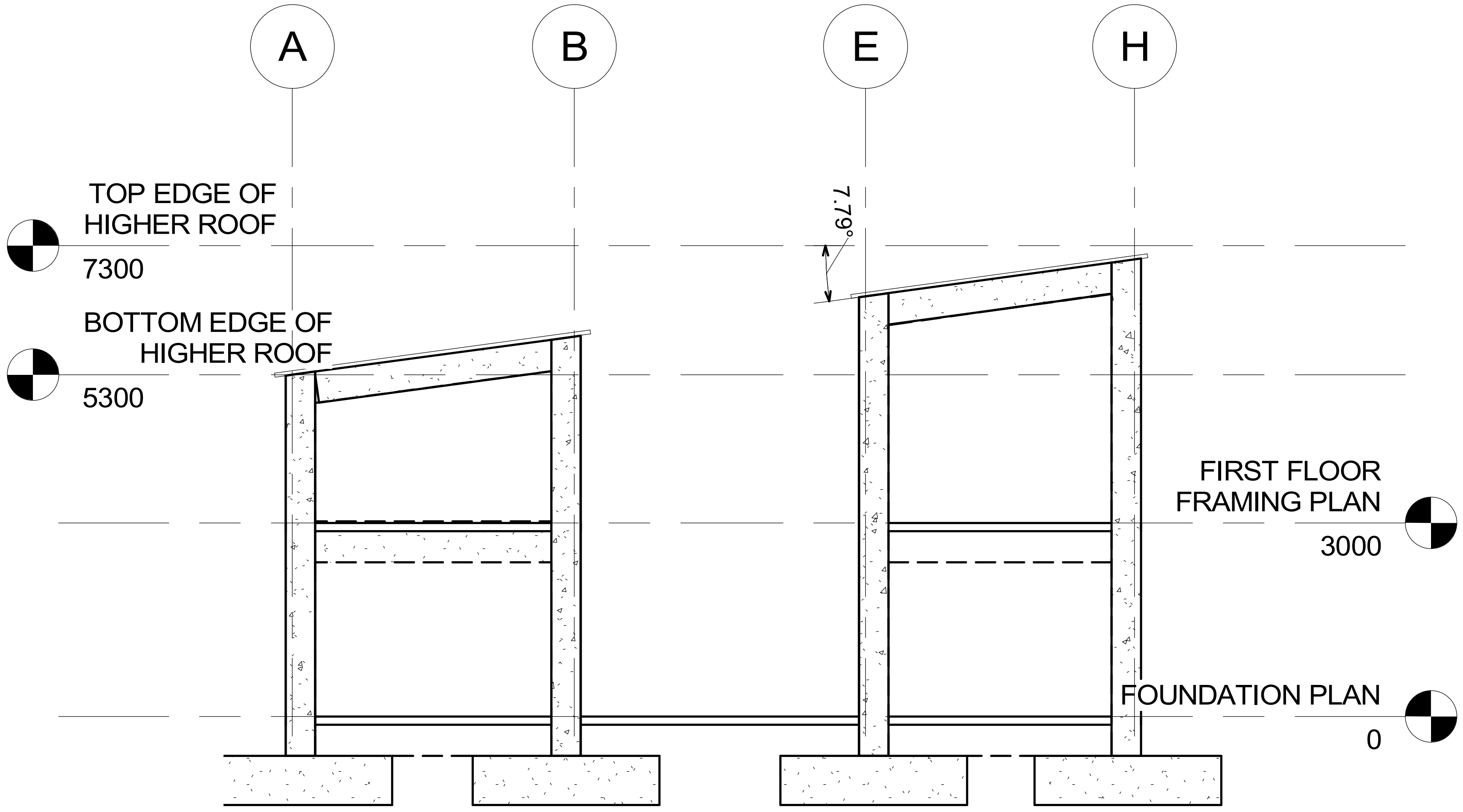
ROOF FRAMING PLAN

SCALE:

1 : 200

NUMBER:

S.103



SECTION 1

1 : 100

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:40:51 AM

SHEET NAME:

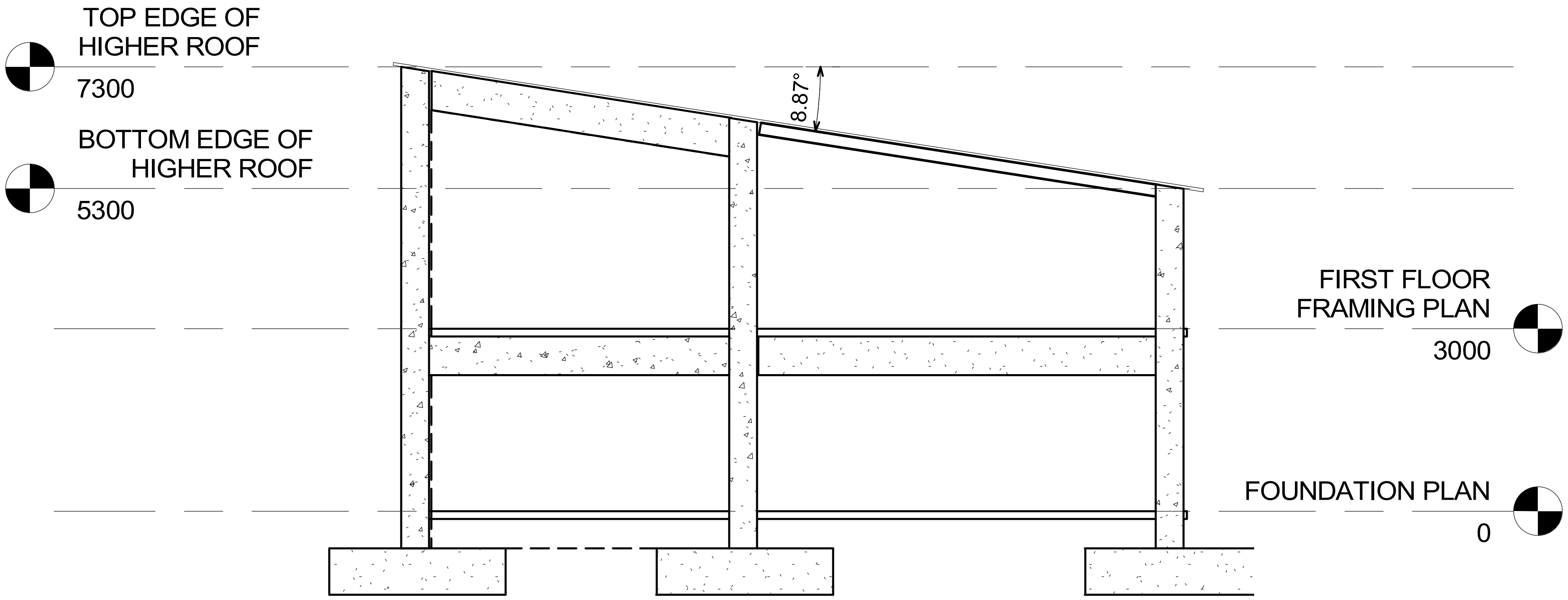
ELEVATIONS

SCALE:

1 : 100

NUMBER:

S.300



SECTION 2

1 : 100

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:40:52 AM

SHEET NAME:

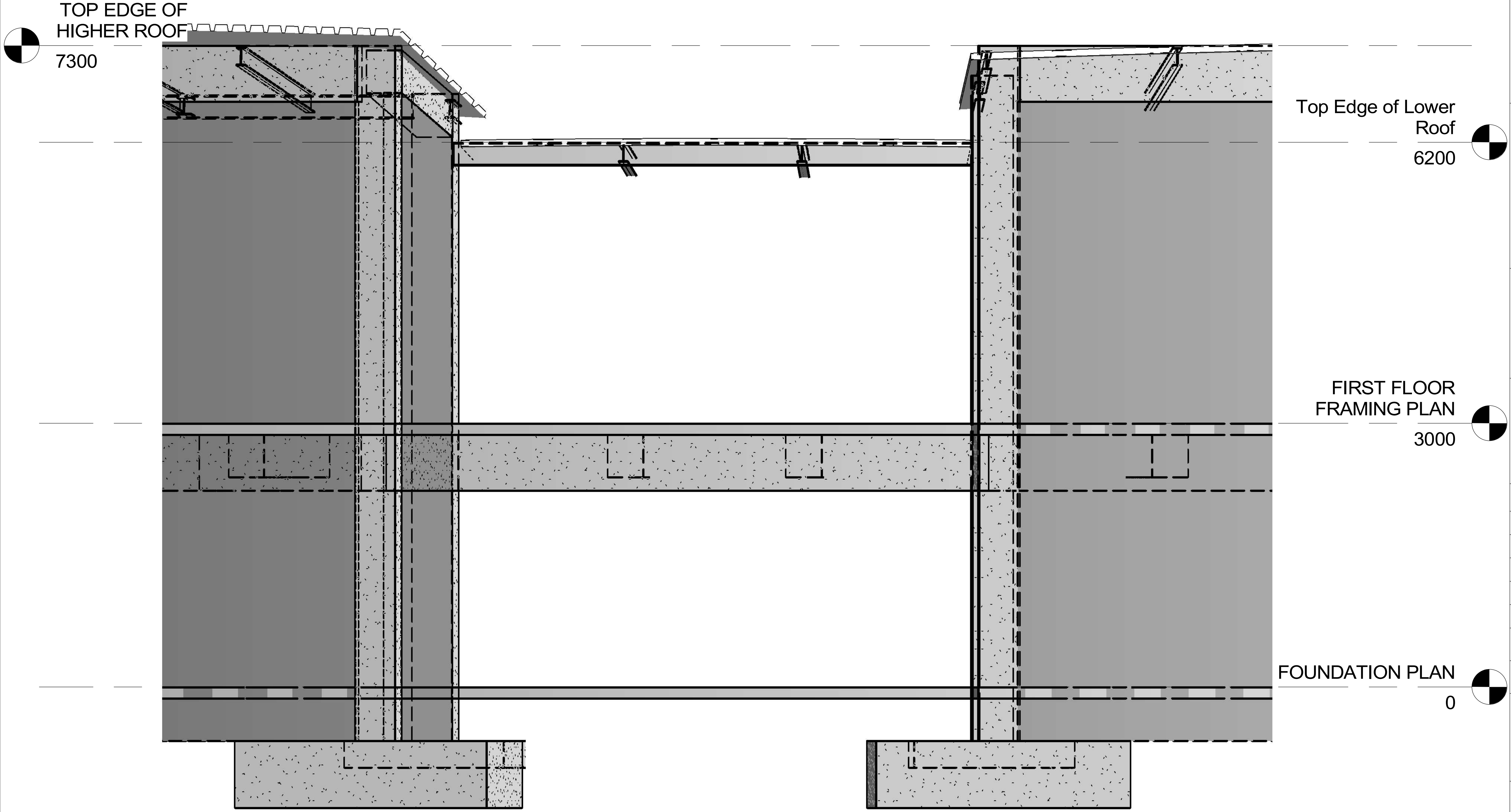
ELEVATIONS

SCALE:

1 : 100

NUMBER:

S.301



SECTION 3

1 : 50

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:40:54 AM

SHEET NAME:

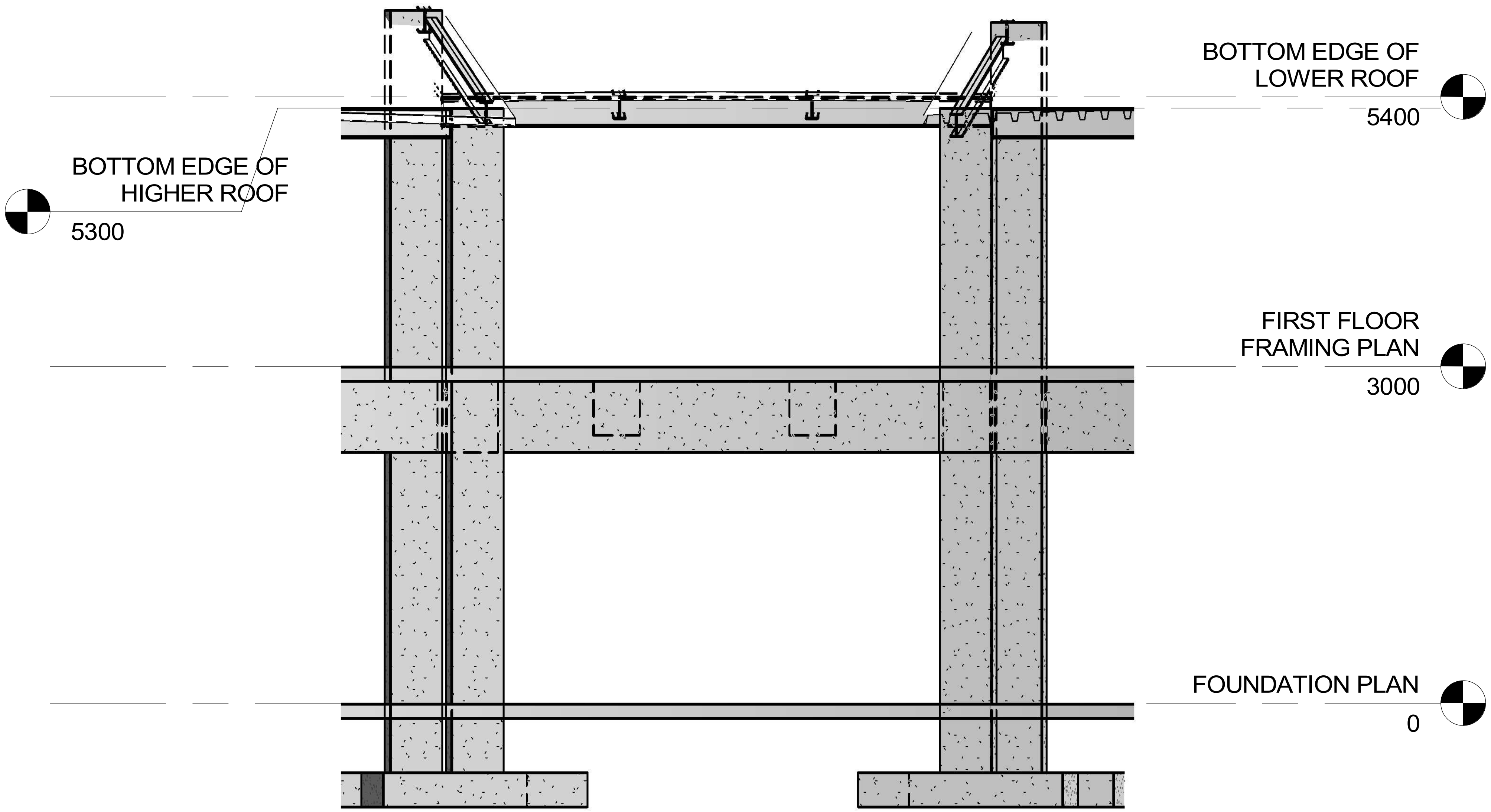
ELEAVTIONS

SCALE:

1 : 50

NUMBER:

S.302



SECTION 4

1 : 50

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:40:56 AM

SHEET NAME:

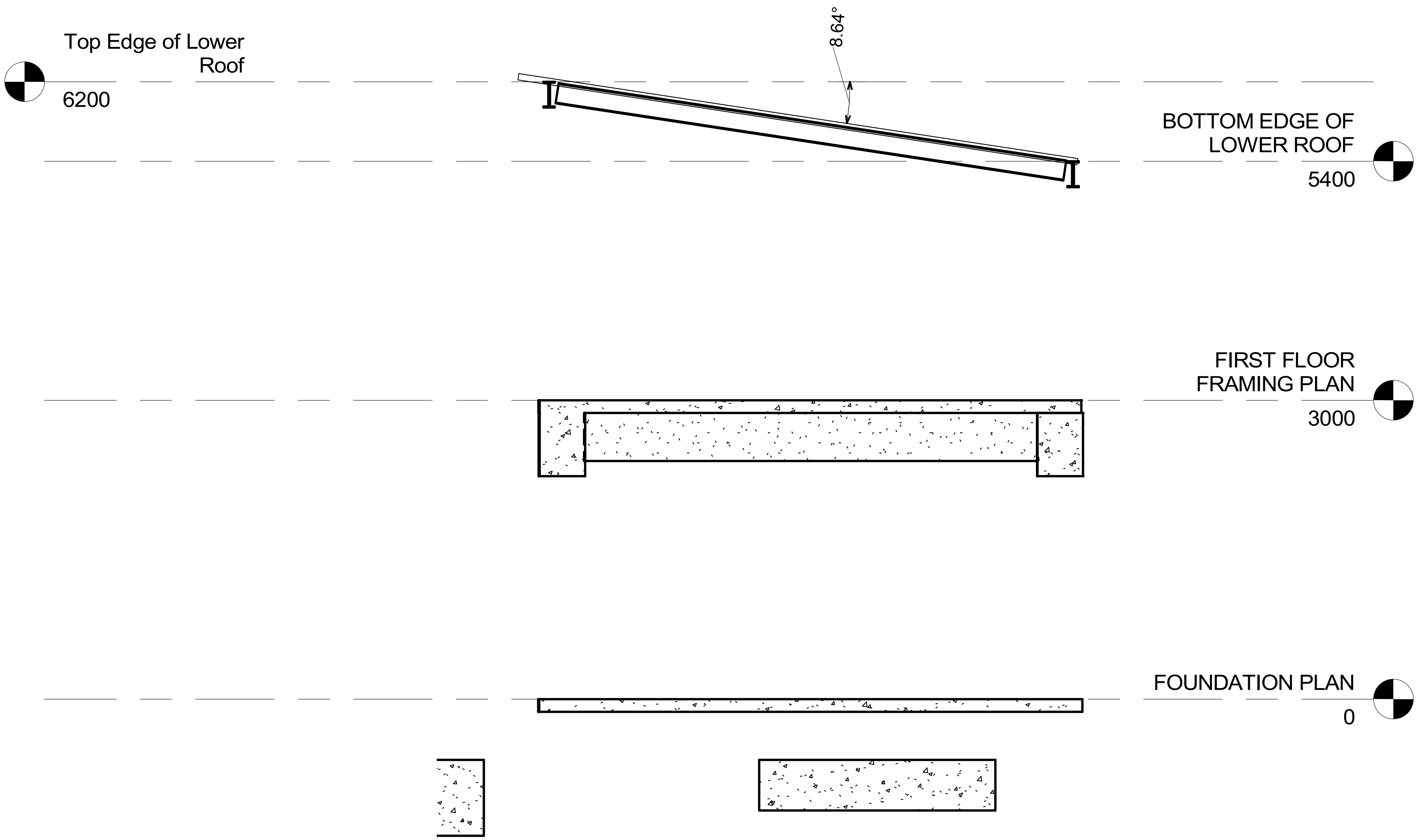
ELEVATIONS

SCALE:

1 : 50

NUMBER:

S.303



SECTION 5

1 : 50

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:40:57 AM

SHEET NAME:

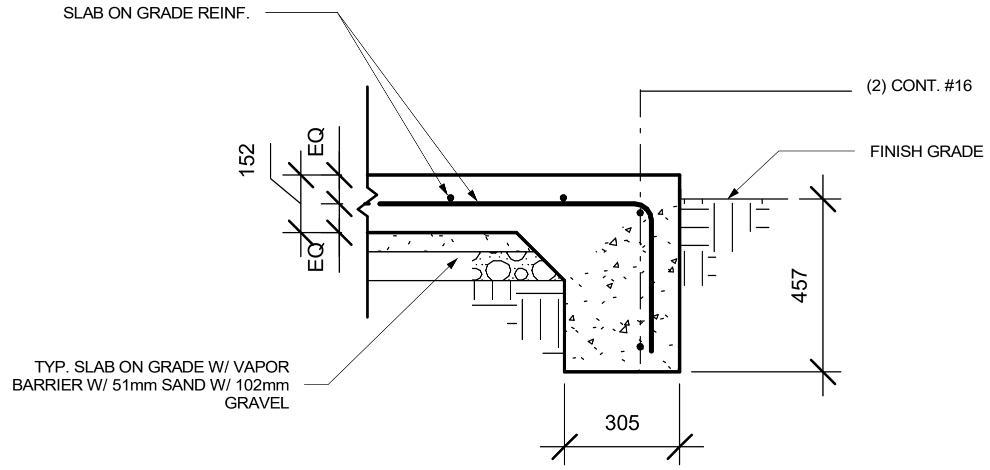
ELEVATIONS

SCALE:

1 : 50

NUMBER:

S.304



1 TYPICAL SLAB ON GRADE EDGE

1 : 20

USE		CLEAR COVERAGE mm
BEAMS BARS	INTERIOR FACES EXPOSED TO GROUND	38 51
COLUMN BARS	INTERIOR FACES EXPOSED TO GROUND	38 51
SLAB BARS		51
WALL BARS	INTERIOR FACES EXPOSED TO GROUND	19 38
FOOTING BARS	CAST AGAINST GROUND FROM TOP	76 51
GRADE BEAM BARS	INTERIOR FACES EXPOSED TO GROUND	76 51
SLAB ON GRADE BARS	FROM TOP	51

2 CONCRETE COVER SCHEDULE

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:40:58 AM

SHEET NAME:

DETAILS

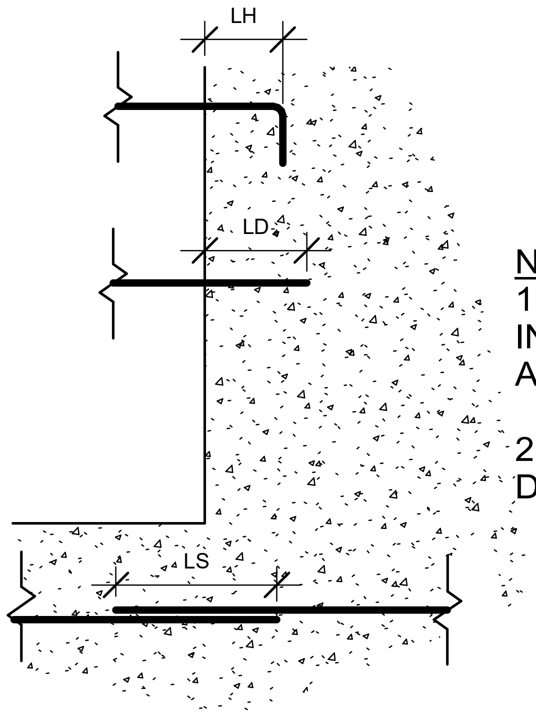
SCALE:

1 : 20

NUMBER:

S.401

BAR SIZE	HOOK DEVELOPMENT LENGTH (LH)	DEVELOPMENT LENGTH (LD)	LAP SPLICE LENGTH (LS)
	f'c = 3000 psi	f'c = 3000 psi	f'c = 3000 psi
#10	186 mm	417 mm	542 mm
#13	286 mm	557 mm	724 mm
#16	375 mm	696 mm	905 mm



NOTES

1. USE THE EMBEDMENT AND LAP SPLICE LENGTHS SHOWN IN THE SCHEDULE MULTIPLIED BY ALL APPLICABLE FACTORS AS DEFINED IN NOTES BELOW, UNO ON DRAWINGS.

2. USE THIS TABLE UNLESS NOTED OTHERWISE ON DRAWINGS.

3 REINFORCEMENT SCHEDULE

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE: 5/31/2021 12:40:59 AM

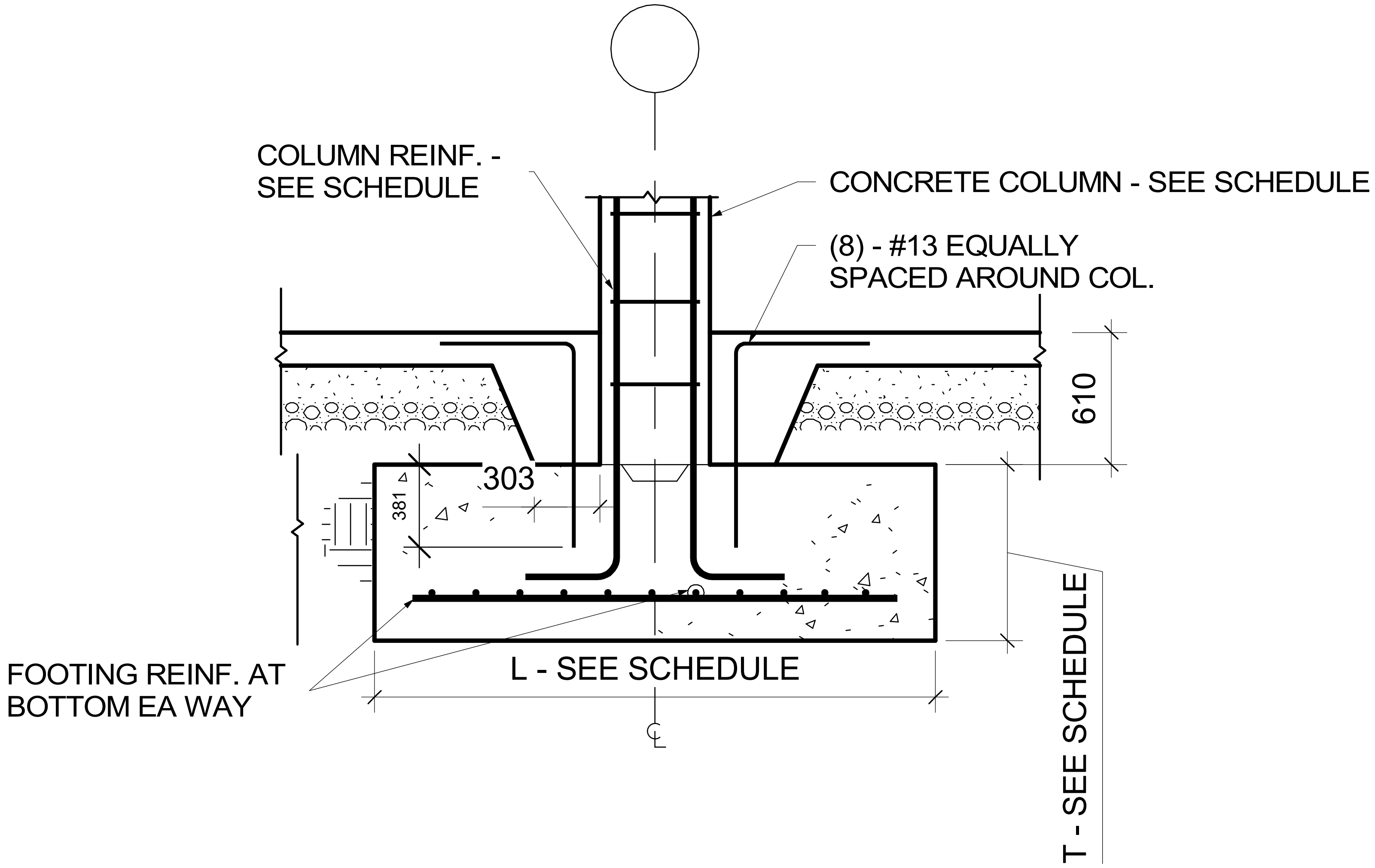
SHEET NAME: REINFORCEMENT SCHEDULE

SCALE: 1 : 2

NUMBER: S.402

FOOTING MARK	B	L	T	LONG BARS	SHORT BARS	COMMENTS
F1	1.83m	1.83m	0.31m	(5) - #16	(5) - #16	SEE DET.
F2	2.44m	2.44m	0.51m	(12) - #16	(12) - #16	SEE DET.
F3	2.90m	2.90m	0.77m	(20) - #16	(20) - #16	SEE DET.

4 SPREAD FOOTING SCHEDULE



5 SPREAD FOOTING SECTION

1 : 30

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:01 AM

SHEET NAME:

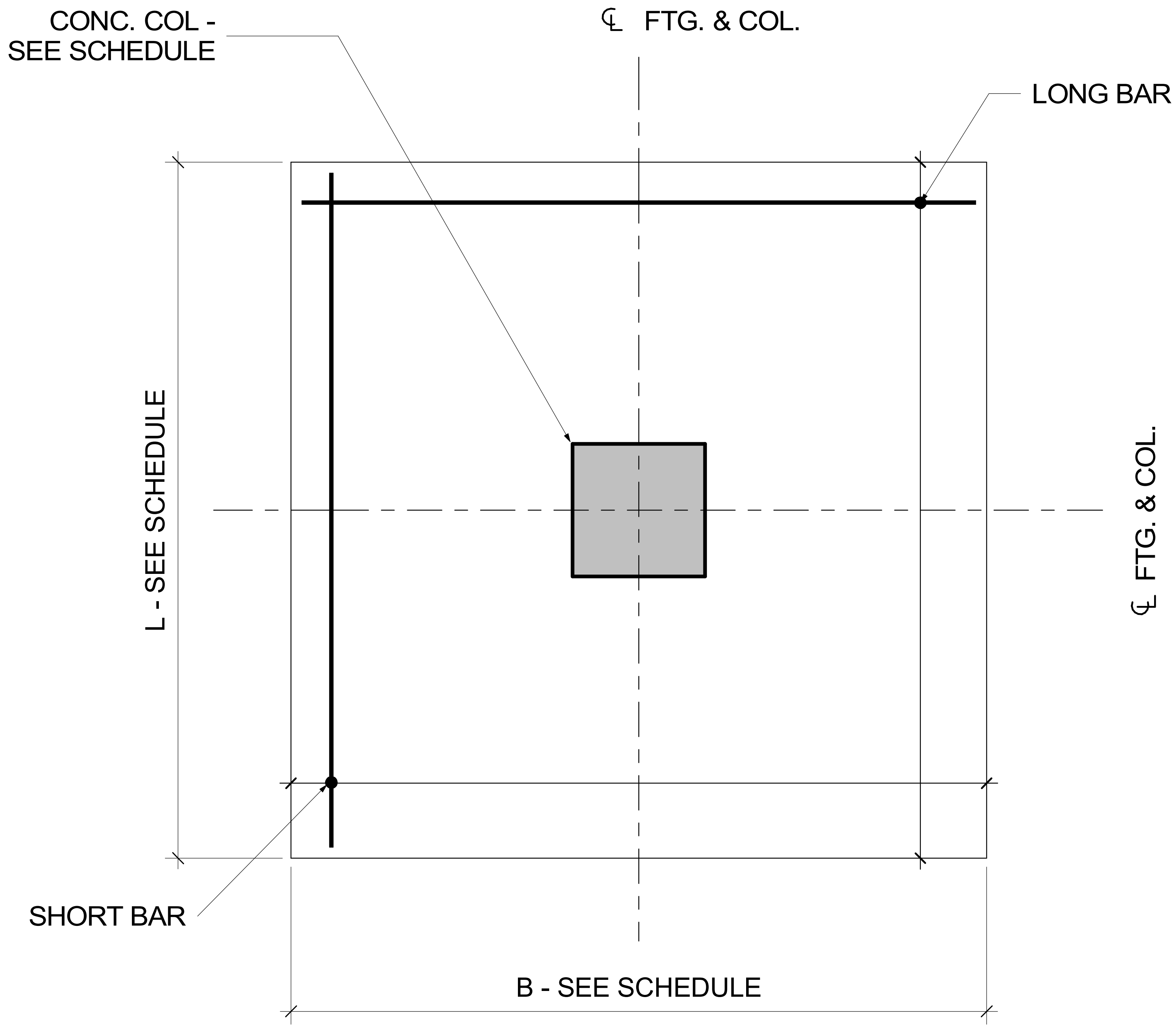
FOOTING DETAILS

SCALE:

As indicated

NUMBER:

S.403



5 SPREAD FOOTING PLAN VIEW

1 : 30

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

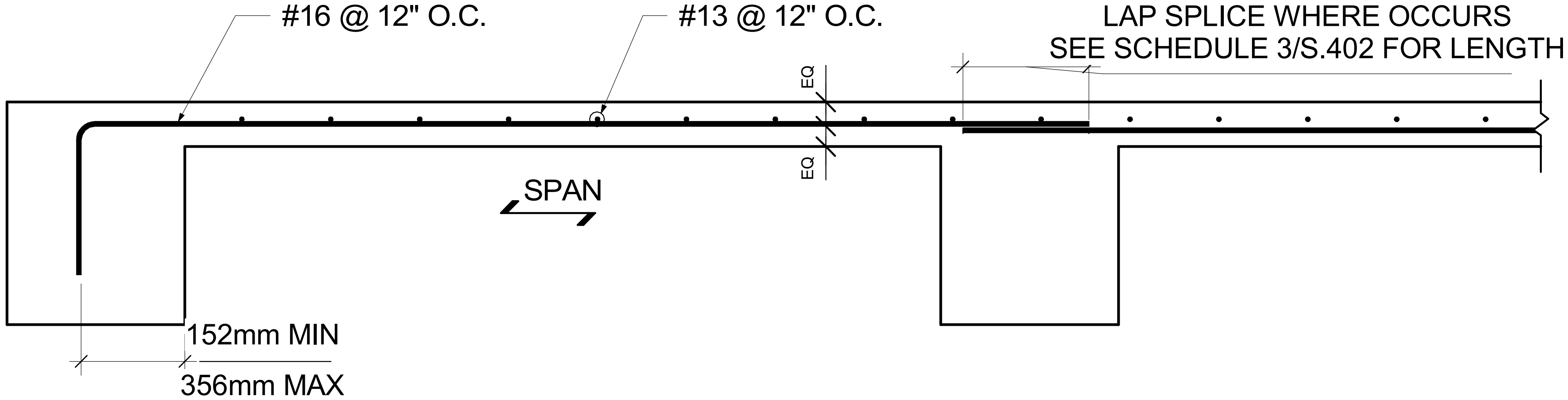
CHECKED BY:

PLOT DATE: 5/31/2021 12:41:02 AM

SHEET NAME: FOOTING DETAILS

SCALE: 1 : 25

NUMBER: S.404



6

SLAB ELEVATION

1 : 20

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:03 AM

SHEET NAME:

SLAB ELEVATION

SCALE:

1 : 20

NUMBER:

S.405

7 CONCRETE BEAM SCHEDULE

NAME	WIDTH	HEIGHT		CONT. BARS	STIRRUPS
B1	406mm	610mm	℄ ℄	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.
B1-1	406mm	610mm	℄ ℄ ℄	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.
B1-2	406mm	610mm	℄ ℄ ℄ ℄	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.
B2	457mm	762mm	℄ (4)-#16 x 3.0m ℄ (4)-#16 x 5.64m ℄ 1.52m 0.76m (4)-#16 x 8.79m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
B2-1	457mm	762mm	℄ (4)-#16 x 1.0m (4)-#16 x 1.0m ℄ (4)-#16 x 7.26m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
B2-2	457mm	762mm	℄ (4)-#16 x 2.0m ℄ (4)-#16 x 2.0m (4)-#16 x 2.0m ℄ 1.0m 1.52m (4)-#16 x 4.22m 1.0m (4)-#16 x 2.5m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
B3	406mm	610mm	℄ ℄ (1)-#13 x WHOLE LENGTH	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.
B4	406mm	610mm	℄ (1)-#13 x 1.5m ℄ (1)-#13 x 3m ℄ ℄ ℄ ℄ 1.5m 1.13m (1)-#13 x 2.0m 1.14m (1)-#13 x 2.5m	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.
B4-1	406mm	610mm	℄ (1)-#13 x 1.5m ℄ ℄ (1)-#13 x 8.69m ℄ ℄ 1.5m CAN SPLICE HERE 1.13m (1)-#13 x 2.0m	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.

* IF NO REBAR IS SHOWN IN THE SCHEUDLE, THE ONLY NEEDED REBAR ARE THE CONT. BARS. FOLLOW MIN. DISTANCES FROM ELEVATION
** SPANS ARE NOT DRAWN TO SCALE
*** DISTANCES SHOWN BETWEEN BOTTOM REBAR AND COL. CENTER LINE IS DISTANCE FROM COL. FACE
**** DISTANCES SHOWN BETWEEN COL. CENTER LINE AND END OF TOP REBAR IS DISTANCE FROM COL. CENTER LINE

SEE S.410 FOR SECTIONS

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS
CHECKED BY:
PLOT DATE: 5/31/2021 12:41:04 AM
SHEET NAME: CONCRETE BM SCHEDULE FLOOR
SCALE: 1 : 20
NUMBER: S.406

THESE BEAMS FOLLOW THE BEAM (9/S.408) AND GIRDER ELEVATIONS (13/S.411)

(8) CONCRETE ROOF BEAM SCHEDULE

NAME	WIDTH	HEIGHT		CONT. BARS	STIRRUPS
CB1	406mm	610mm	℄ ℄	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.
CB2	457mm	762mm	℄ ℄	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
CB3	457mm	762mm	℄ ℄ 1.0m (2)-#16 x 3.98m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
CB4	406mm	610mm	℄ ℄	TOP: (2) -#13 BOT: (2) -#13	#10 @ 254mm O.C.
CB5	457mm	762mm	℄ ℄ 1.0m (2)-#16 x 4.23m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.

* IF NO REBAR IS SHOWN IN THE SCHEUDLE, THE ONLY NEEDED REBAR ARE THE CONT. BARS. FOLLOW MIN. DISTANCES FROM ELEVATION
** SPANS ARE NOT DRAWN TO SCALE
*** DISTANCES SHOWN BETWEEN BOTTOM REBAR AND COL. CENTER LINE IS DISTANCE FROM COL. FACE
**** DISTANCES SHOWN BETWEEN COL. CENTER LINE AND END OF TOP REBAR IS DISTANCE FROM COL. CENTER LINE

SEE S.410 FOR SECTIONS

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

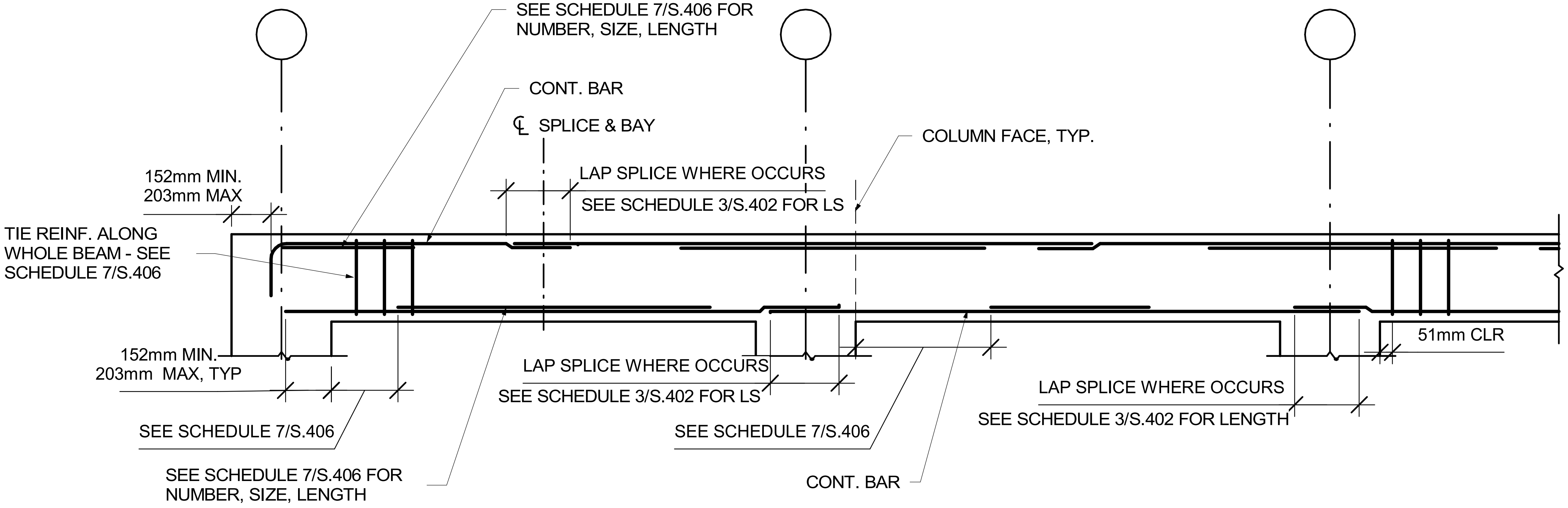
PLOT DATE: 5/31/2021 12:41:05 AM

SHEET NAME: CONCRETE BM SCHEDULE ROOF

SCALE: 1 : 20

NUMBER: S.407

SCHEDULE 8/S.407 ALSO APPLIES WHERE 7/S.406 DOES



9 BEAM ELEVATION

1 : 30

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:06 AM

SHEET NAME:

BEAM ELEVATION

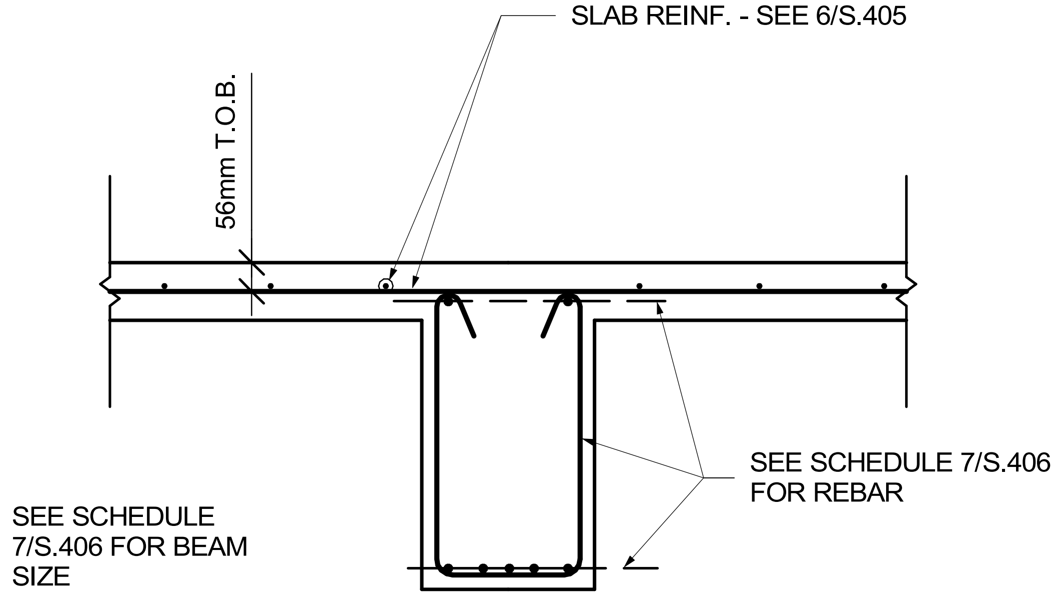
SCALE:

1 : 30

NUMBER:

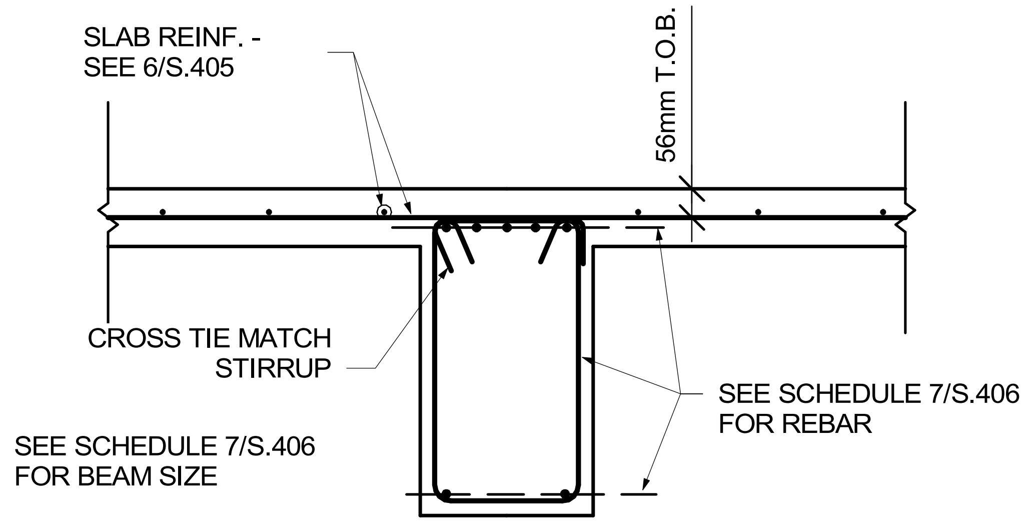
S.408

SCHEDULE 8/S.407 ALSO APPLIES WHERE 7/S.406 DOES



10 JOIST SECTION FOR BOTTOM REBAR

1 : 20



11 JOIST SECTION FOR TOP REBAR

1 : 20

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:07 AM

SHEET NAME:

BEAM SECTIONS

SCALE:

1 : 20

NUMBER:

S.409

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

(12) CONCRETE GIRDER SCHEDULE

NAME	WIDTH	HEIGHT		CONT. BARS	STIRRUPS
G1	457mm	762mm	℄ (2)-#16 x 1.0m ℄ (2)-#16 x 2.0m (2)-#16 x 1.0m ℄ 1.0m 1.5m (1)-#16 x 3.12m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
G1-1	457mm	762mm	℄ ℄ (1)-#16 x 3.33m 1.5m	TOP: (2) -#13 BOT: (2) -#13	#10 @ 305mm O.C.
G1-2	457mm	762mm	℄ (2)-#16 x 1.0m ℄ (2)-#16 x 3.0m ℄ (2)-#16 x 3.0m (2)-#16 x 1.0m ℄ 1.5m 1.5m (1)-#16 x 3.85m (1)-#16 x 3.12m 1.0m 1.5m	TOP: (2) -#13 BOT: (2) -#13	#10 @ 305mm O.C.
G2	457mm	762mm	℄ (3)-#16 x 1.0m ℄ (3)-#16 x 3.0m (3)-#16 x 1.0m ℄ 1.50m (4)-#16 x 4.86m 0.5m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
G3	457mm	762mm	℄ ℄ (1)-#16 x 3.86m 1.0m	TOP: (2) -#16 BOT: (2) -#16	#10 @ 305mm O.C.
G4	457mm	762mm	℄ ℄ (6)-#16 x 4.0m ℄ 2.0m (6)-#16 x 6.19m 1.0m	TOP: (4) -#16 BOT: (4) -#16	#10 @ 305mm O.C.

* IF NO REBAR IS SHOWN IN THE SCHEUDLE, THE ONLY NEEDED REBAR ARE THE CONT. BARS. FOLLOW MIN. DISTANCES FROM ELEVATION
** SPANS ARE NOT DRAWN TO SCALE
*** DISTANCES SHOWN BETWEEN BOTTOM REBAR AND COL. CENTER LINE IS DISTANCE FROM COL. FACE
**** DISTANCES SHOWN BETWEEN COL. CENTER LINE AND END OF TOP REBAR IS DISTANCE FROM COL. CENTER LINE

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:08 AM

SHEET NAME:

CONCRETE GIRDER SCHEDULE

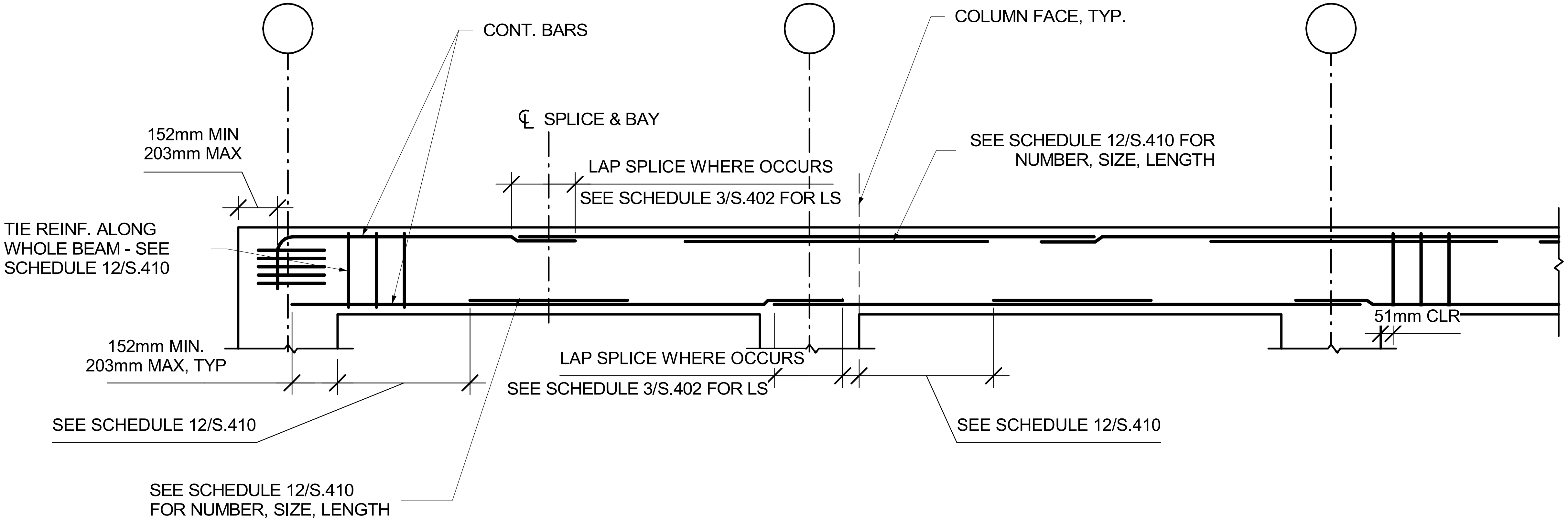
SCALE:

1 : 20

NUMBER:

S.410

SCHEDULE 8/S.407 ALSO APPLIES WHERE 12/S.410 DOES



13 GIRDER ELEVATION

1 : 30

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:
MBANDAZI VILLAGE

SITE:
MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

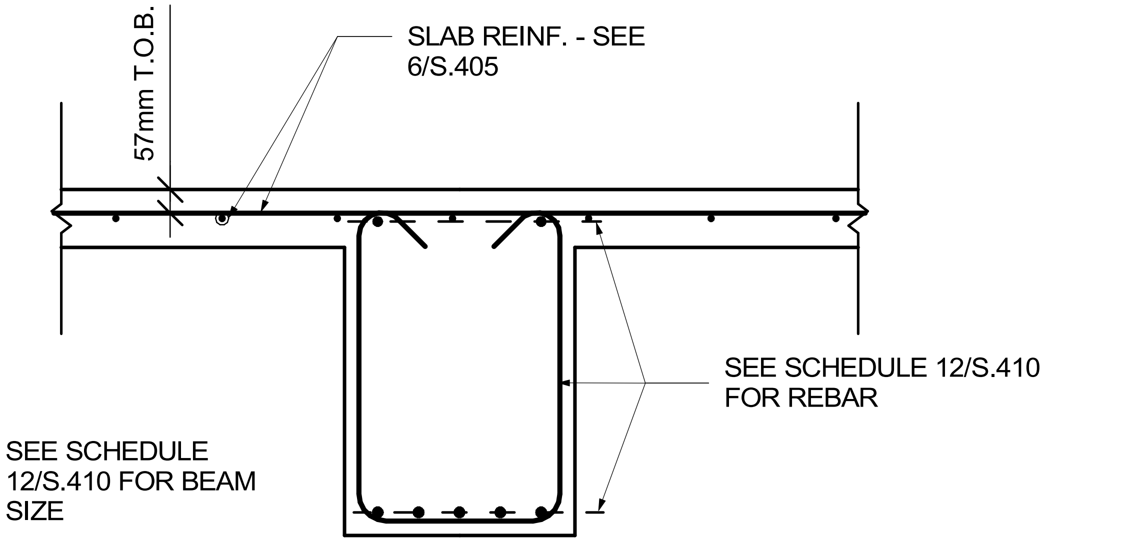
PLOT DATE:
5/31/2021 12:41:09 AM

SHEET NAME:
GIRDER ELEVATION

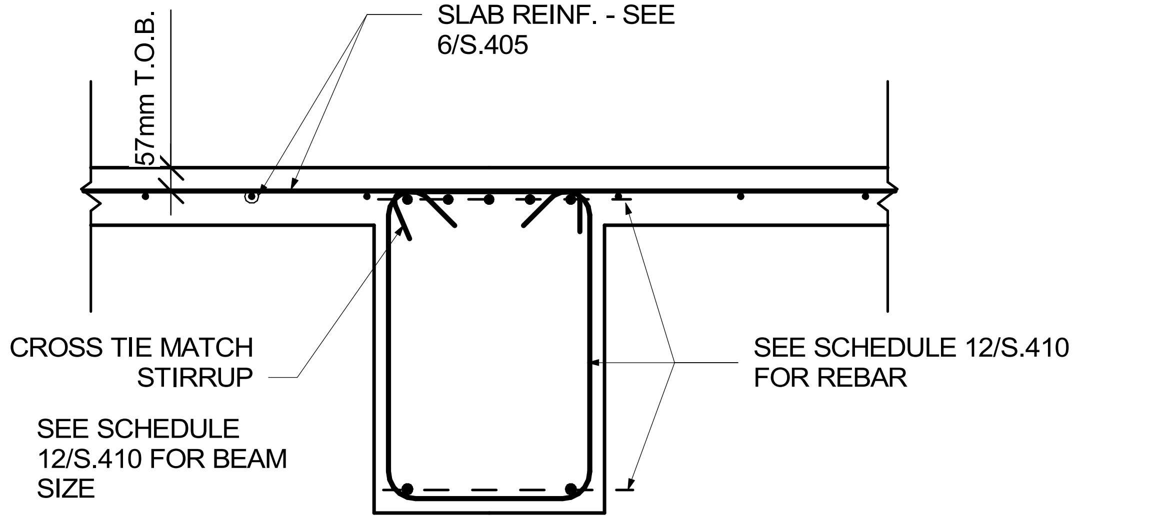
SCALE:
1 : 30

NUMBER:
S.411

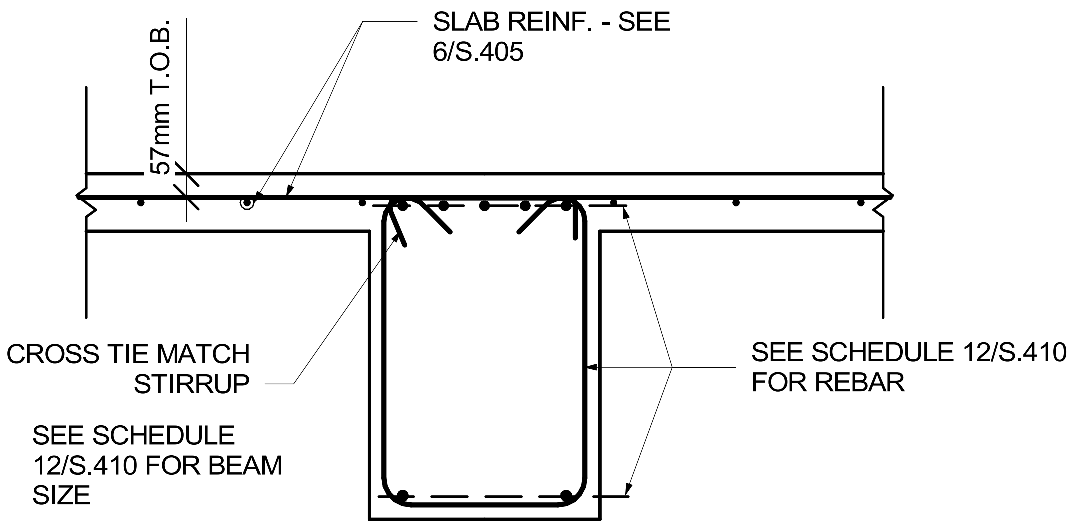
SCHEDULE 8/S.407 ALSO APPLIES WHERE 12/S.410 DOES



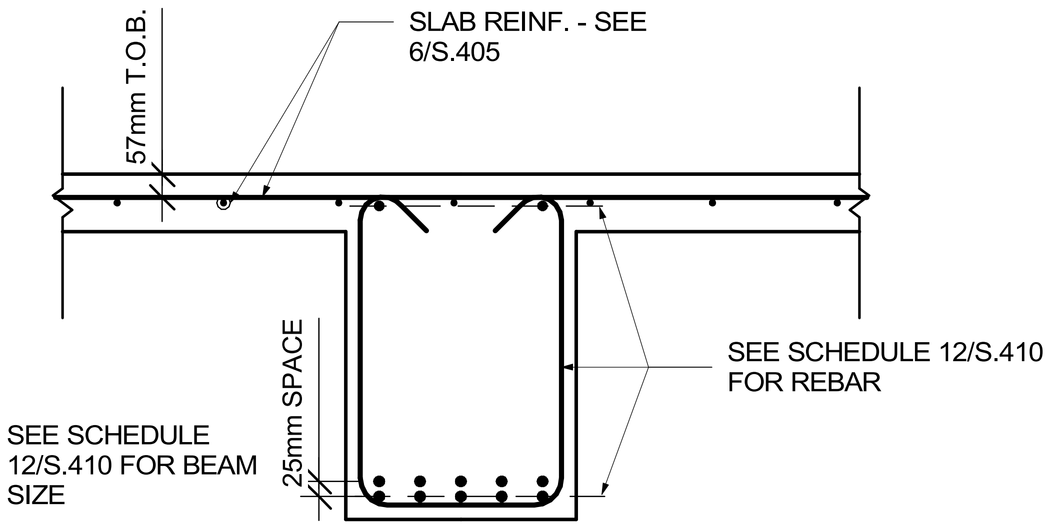
14 TYP. GIRDER SECTION FOR TOP REBAR
1 : 30



15 TYP. GIRDER SECTION FOR BOTTOM REBAR
1 : 30



16 GIRDER SECTION FOR TOP REBAR G4
1 : 30



17 GIRDER SECTION FOR BOTTOM REBAR G4
1 : 30

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:
MBANDAZI VILLAGE

SITE:
MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

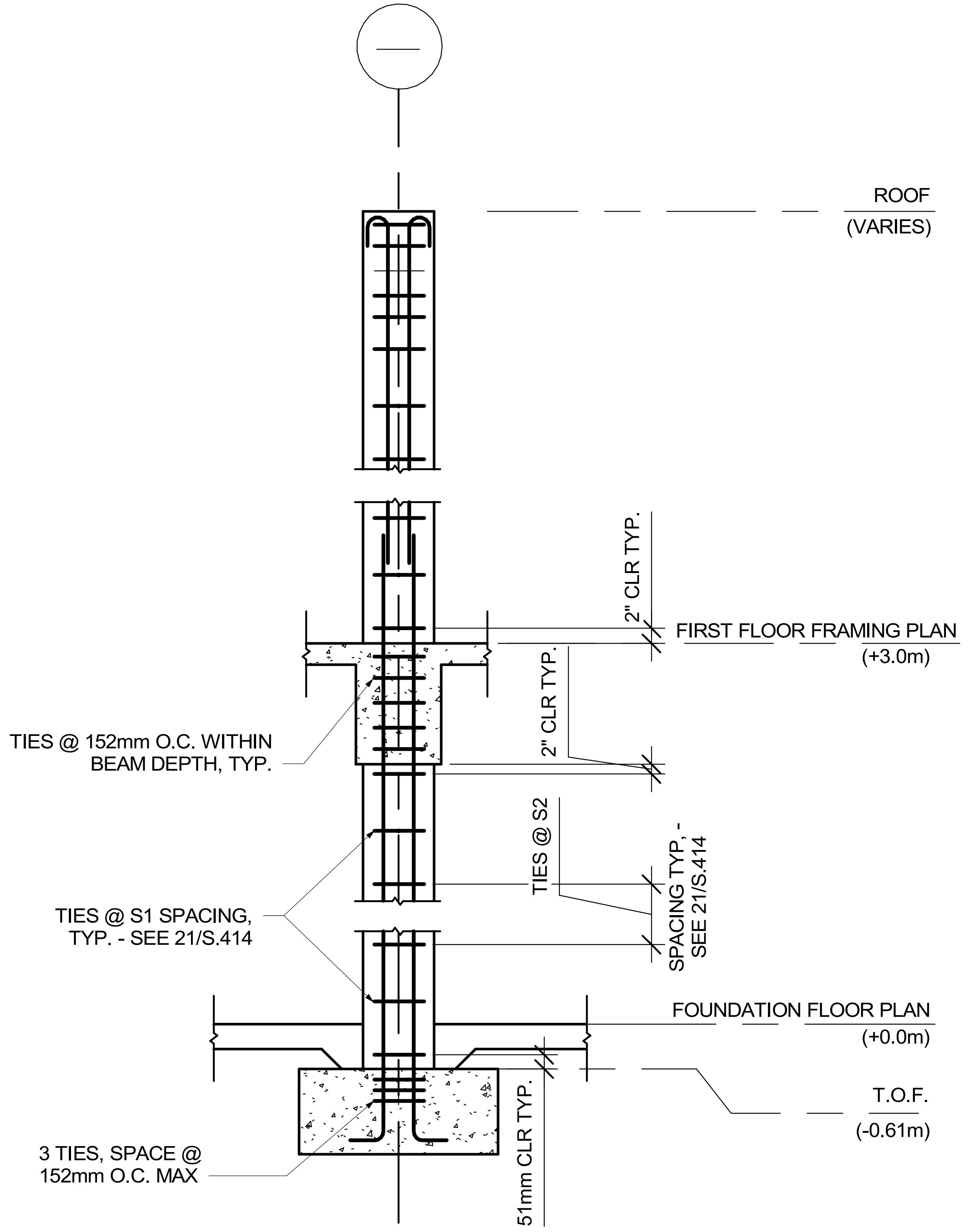
CHECKED BY:

PLOT DATE:
5/31/2021 12:41:11 AM

SHEET NAME:
GIRDER SECTIONS

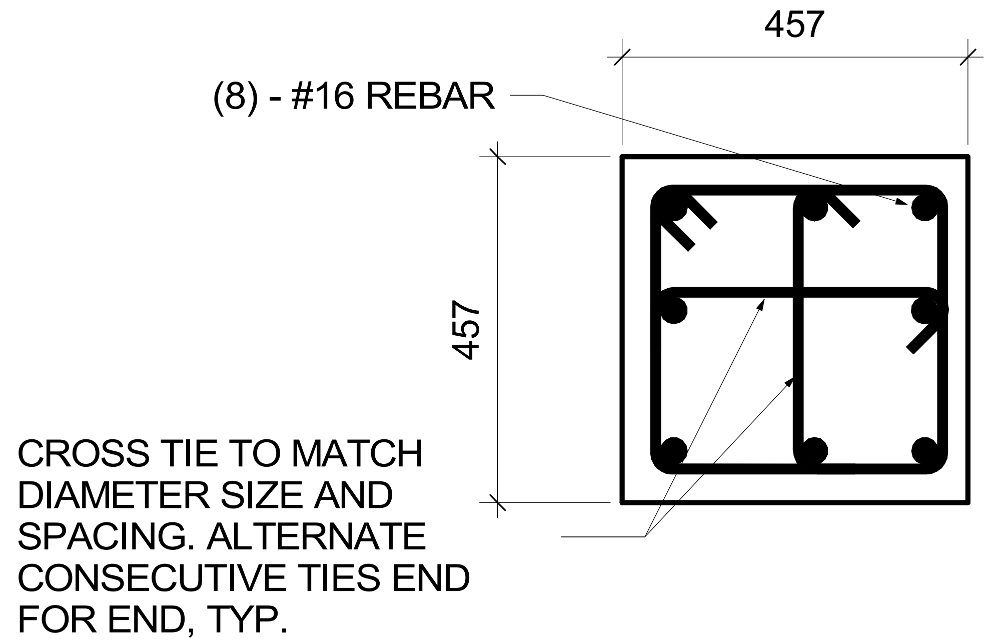
SCALE:
1 : 20

NUMBER:
S.412



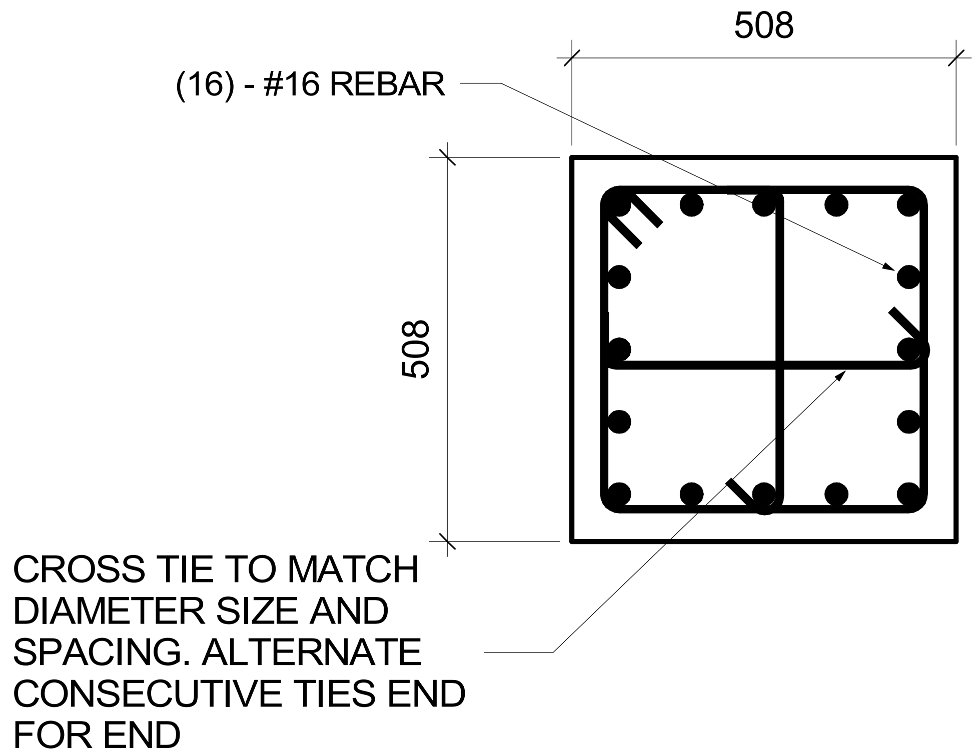
18 COLUMN ELEVATION

1 : 40



19 EXTERIOR COLUMN ELEVATION

1 : 10



20 INTERIOR COLUMN ELEVATION

1 : 10

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:12 AM

SHEET NAME:

COLUMN DETAILS

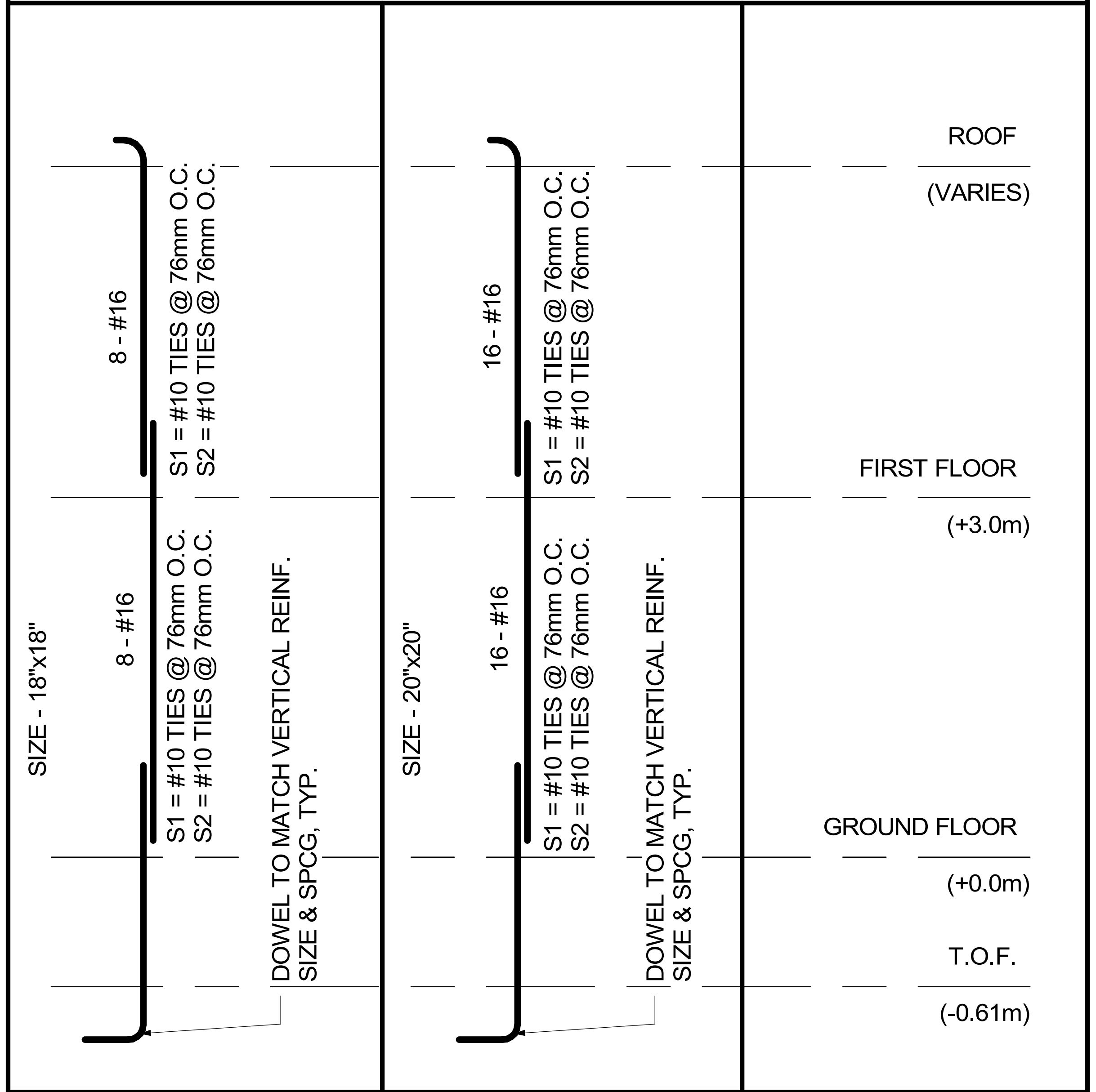
SCALE:

As indicated

NUMBER:

S.413

(21) COLUMN SCHEDULE



18 / S.412	19 / S.412	COLUMN TYPE
A/1 A/2 A/3 A/4 A/5 A/6 A/7 B/1 C/4 C/5 D/7 E/1 F/4 F/5 G/5 G/6 G/7 H/1 H/2 H/3 J/3 J/4	B/2 B/3 D/5 D/6 E/2 E/3 F/3	LOCATION
C1	C2	COLUMN MARK

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:
MBANDAZI VILLAGE

SITE:
MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

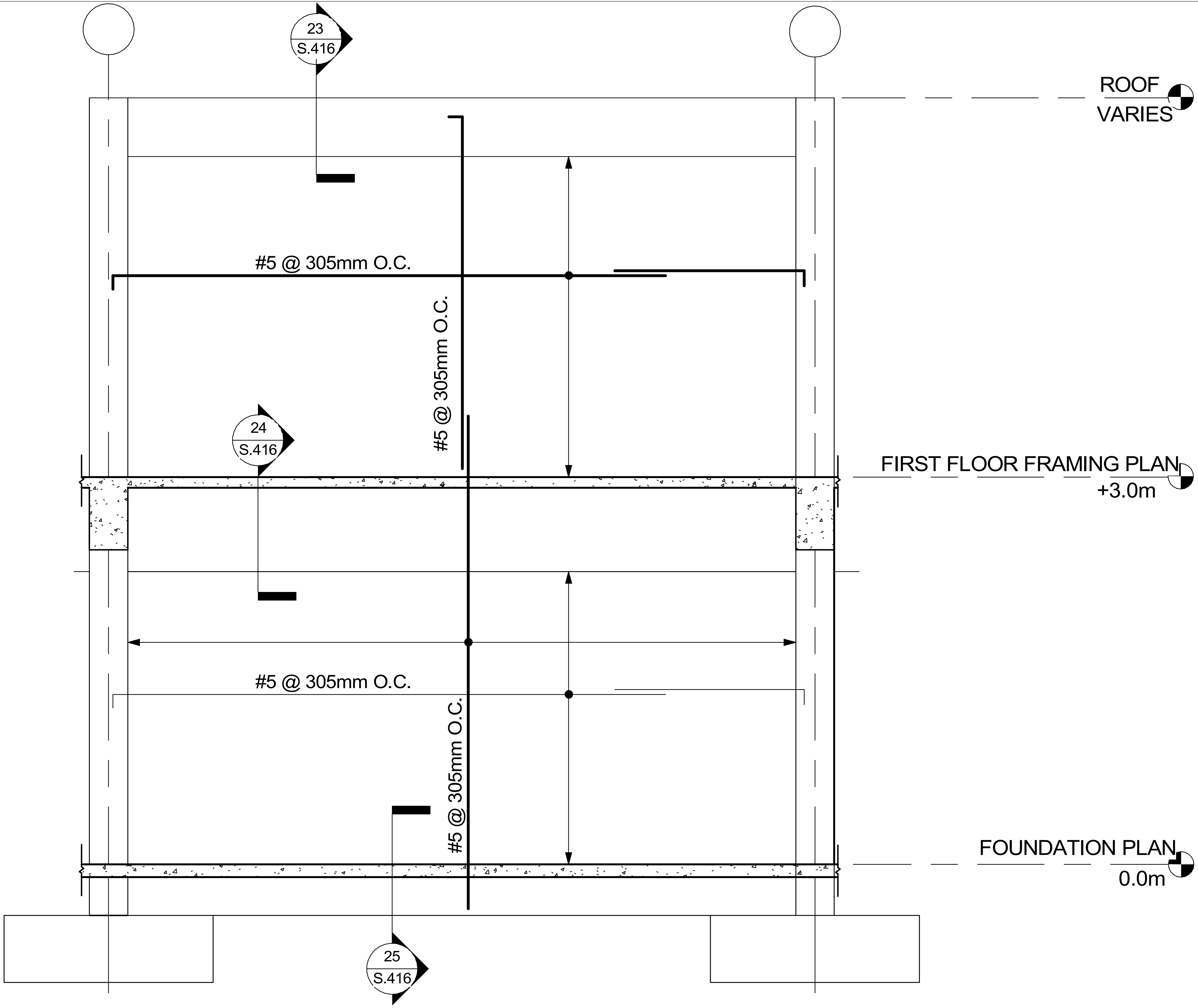
CHECKED BY:

PLOT DATE:
5/31/2021 12:41:13 AM

SHEET NAME:
COLUMN SCHEDULE

SCALE:
1 : 12

NUMBER:
S.414



22 TYPICAL WALL ELEVATION

1 : 50

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

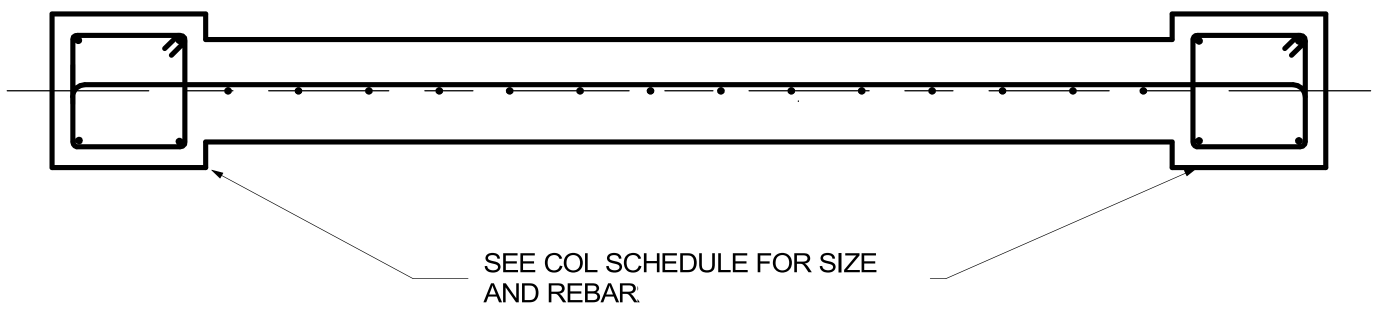
CHECKED BY:

PLOT DATE: 5/31/2021 12:41:14 AM

SHEET NAME: TYPICAL WALL ELEVATION

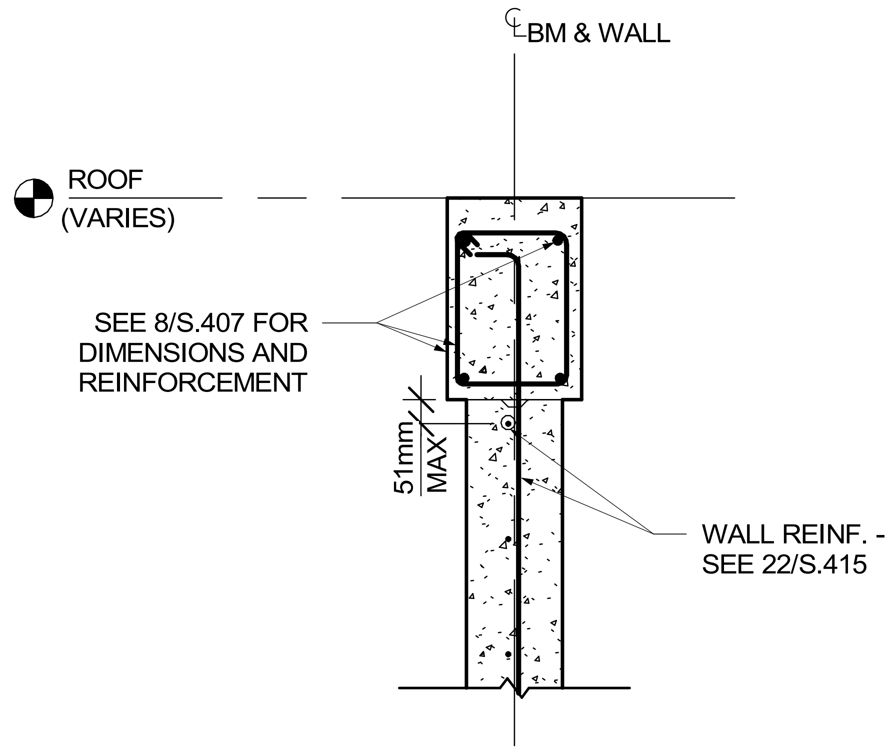
SCALE: 1 : 50

NUMBER: S.415



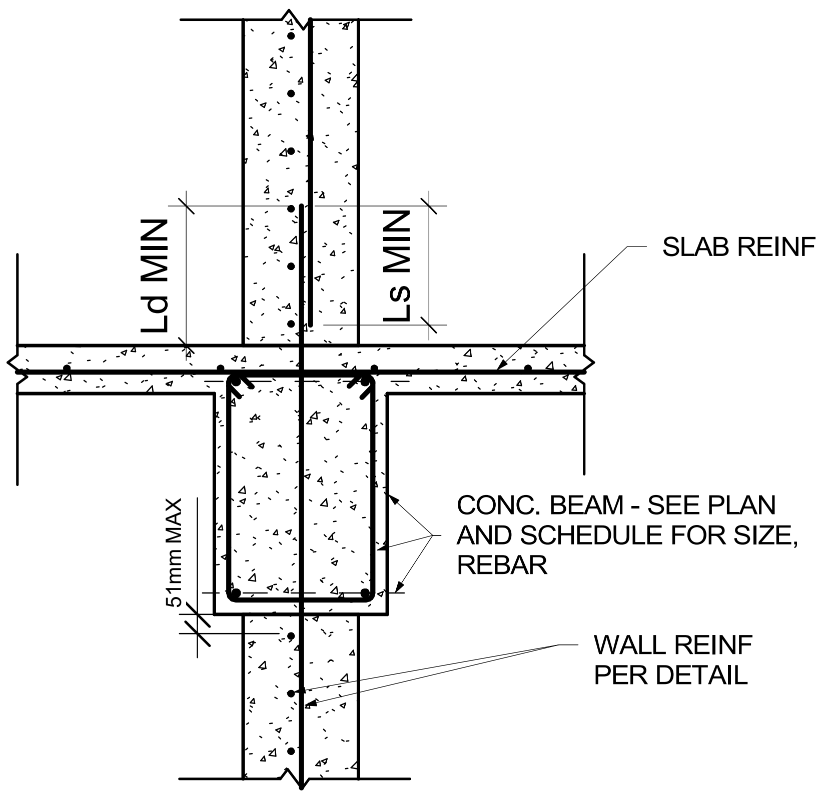
22 TYPICAL WALL SECTION

1 : 30



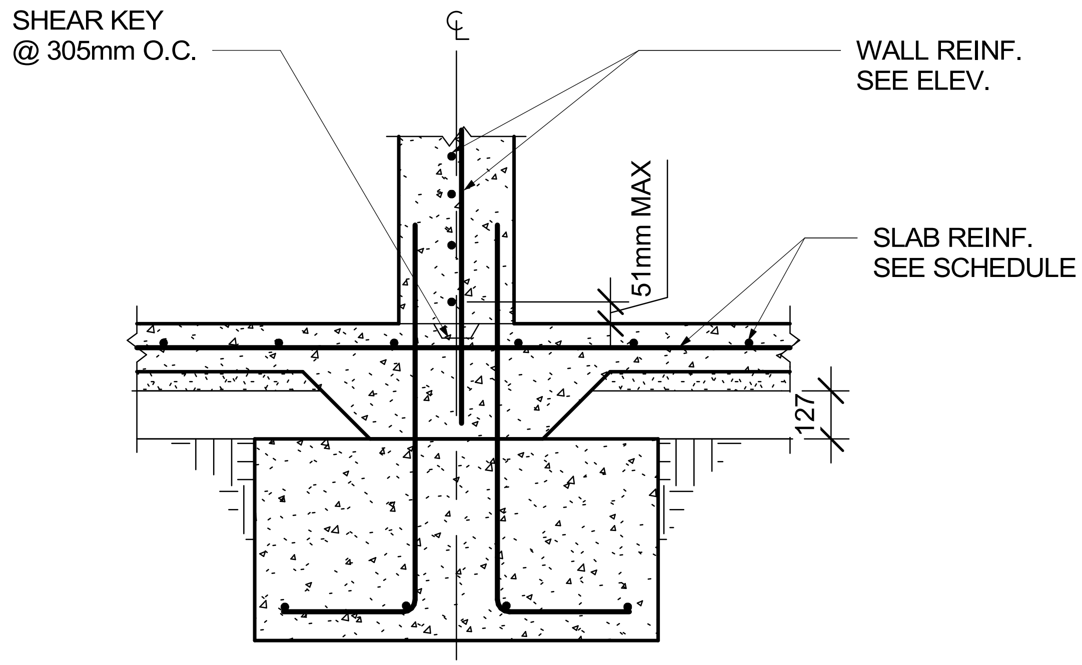
23 WALL TO ROOF CONNECTION

1 : 20



24 WALL TO FLOOR CONNECTION

1 : 20



25 WALL TO FTG CONNECTION

1 : 20

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:15 AM

SHEET NAME:

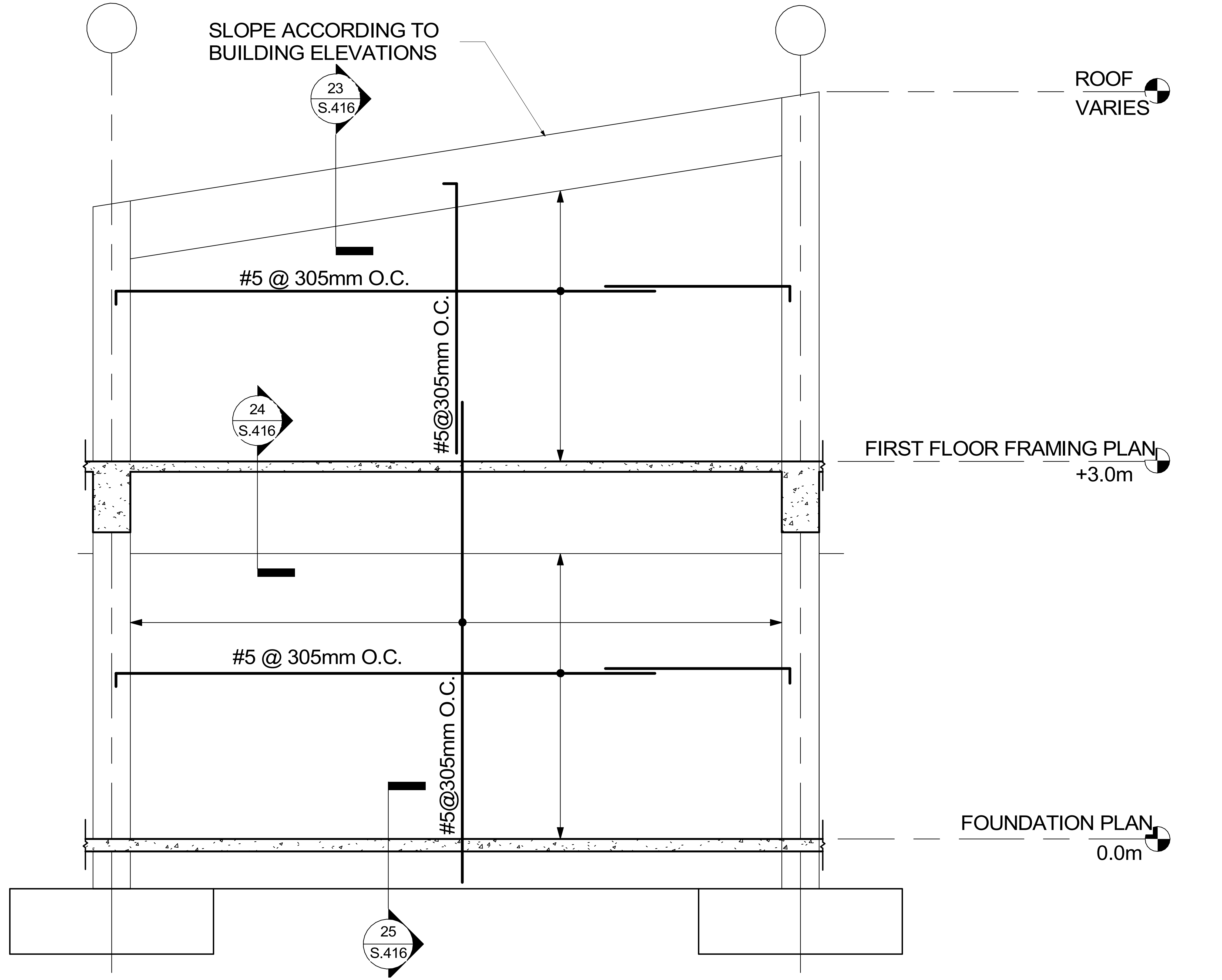
WALL DETAILS

SCALE:

As indicated

NUMBER:

S.416



26 WALL TO FLOOR CONNECTION

1 : 50

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:17 AM

SHEET NAME:

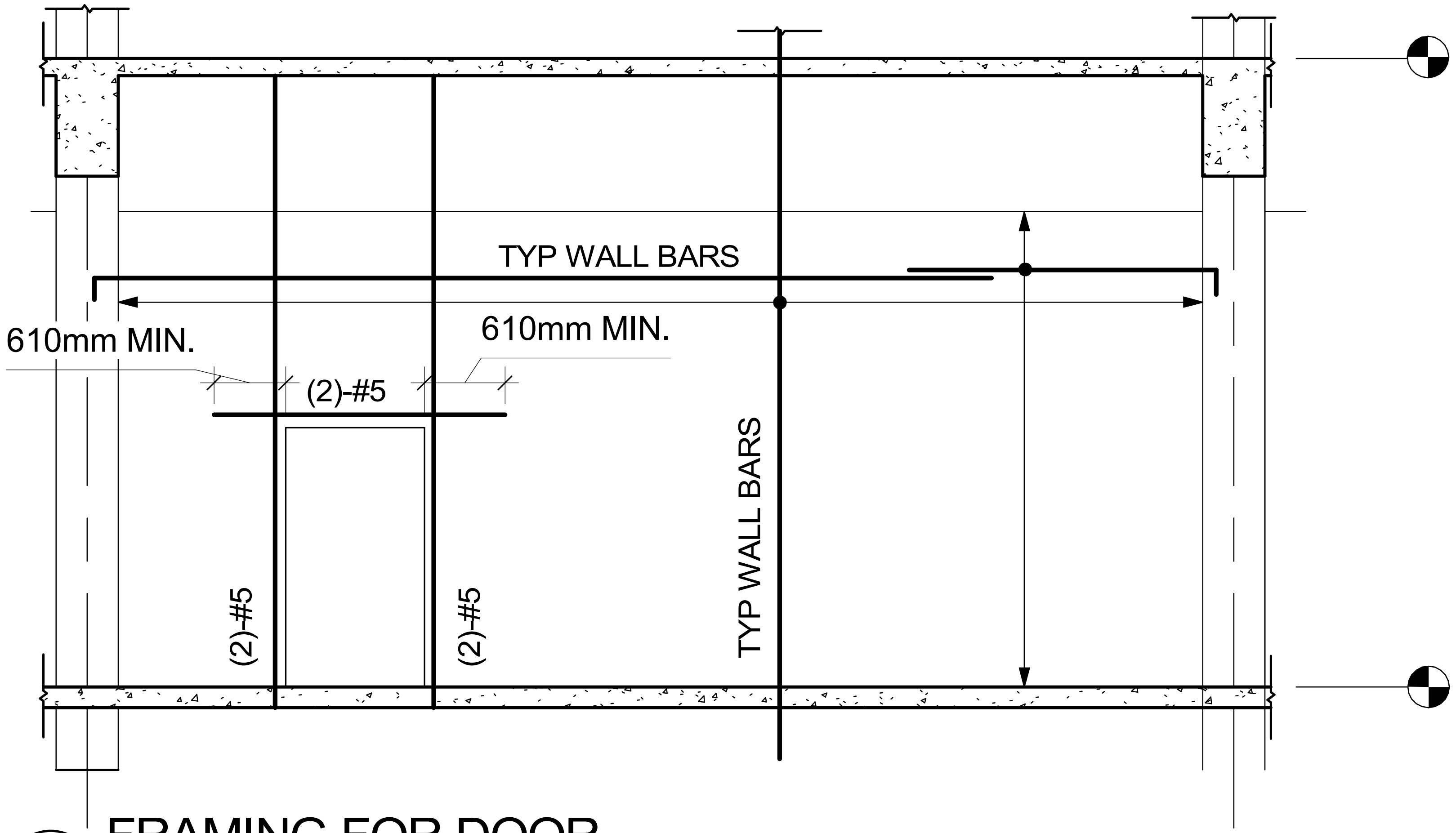
SLOPED WALL

SCALE:

1 : 50

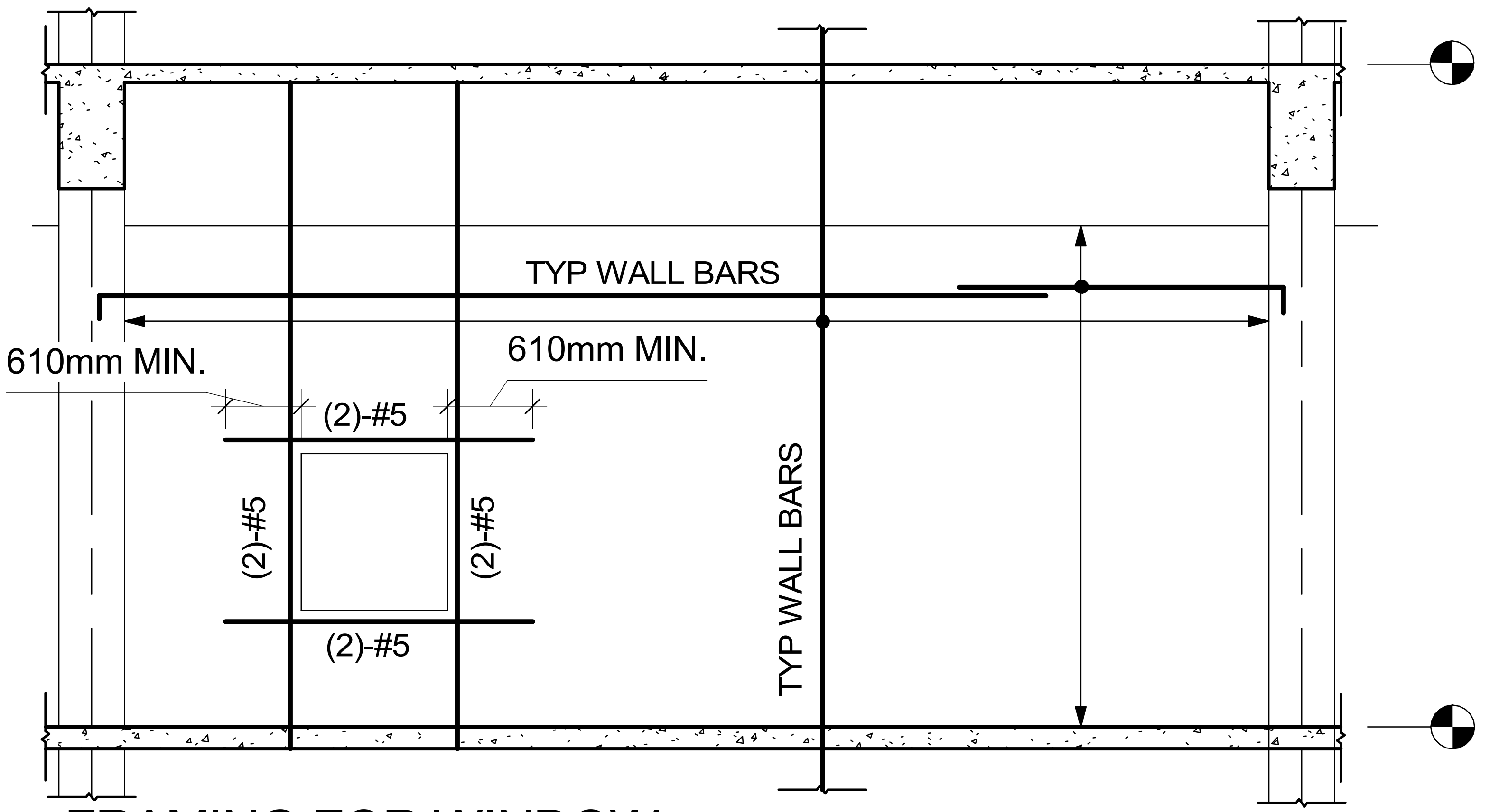
NUMBER:

S.417



27 FRAMING FOR DOOR

1 : 50



28 FRAMING FOR WINDOW

1 : 50

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:18 AM

SHEET NAME:

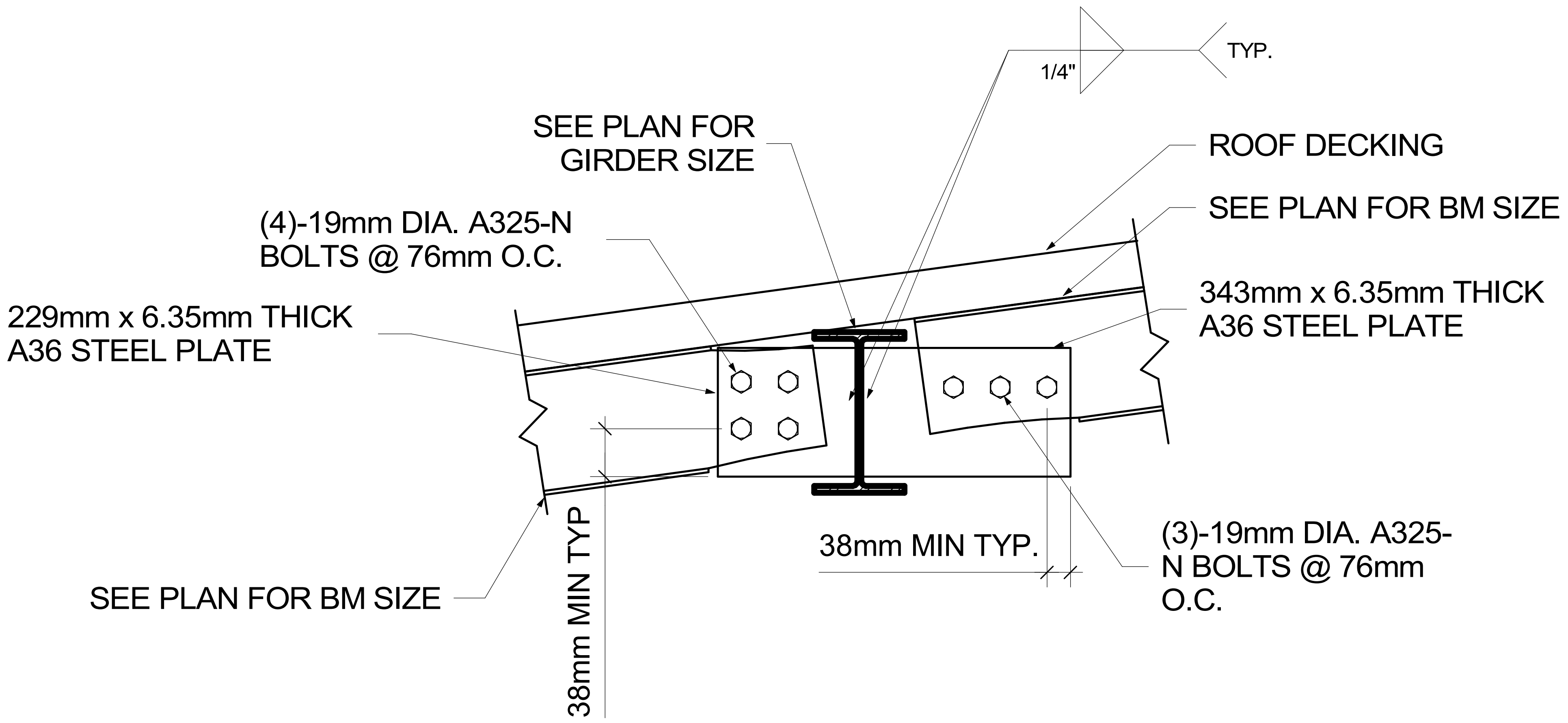
WALL OPENINGS

SCALE:

1 : 50

NUMBER:

S.418



29

STEEL BEAM TO STEEL GIRDER

1 : 10

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:19 AM

SHEET NAME:

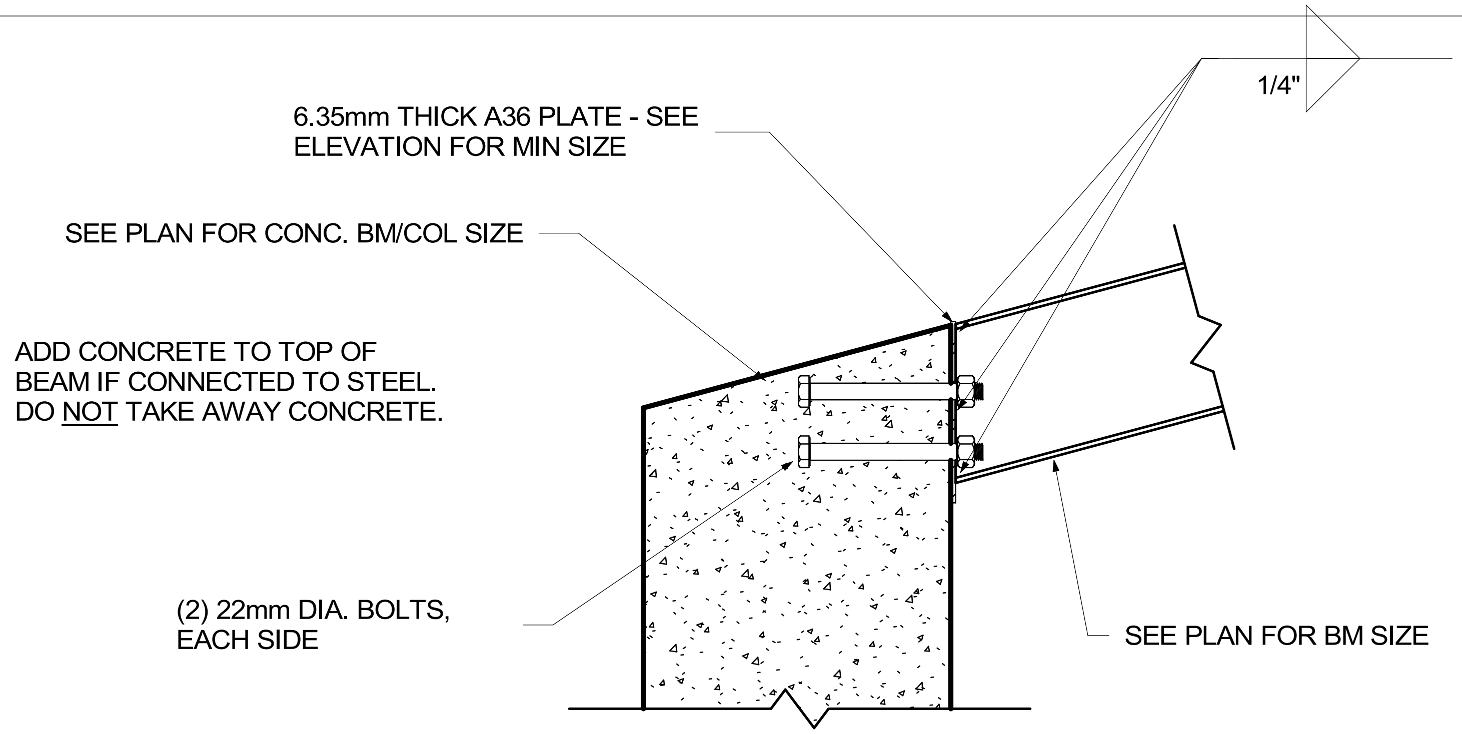
STEEL BEAM TO
STEEL GIRDER

SCALE:

1 : 10

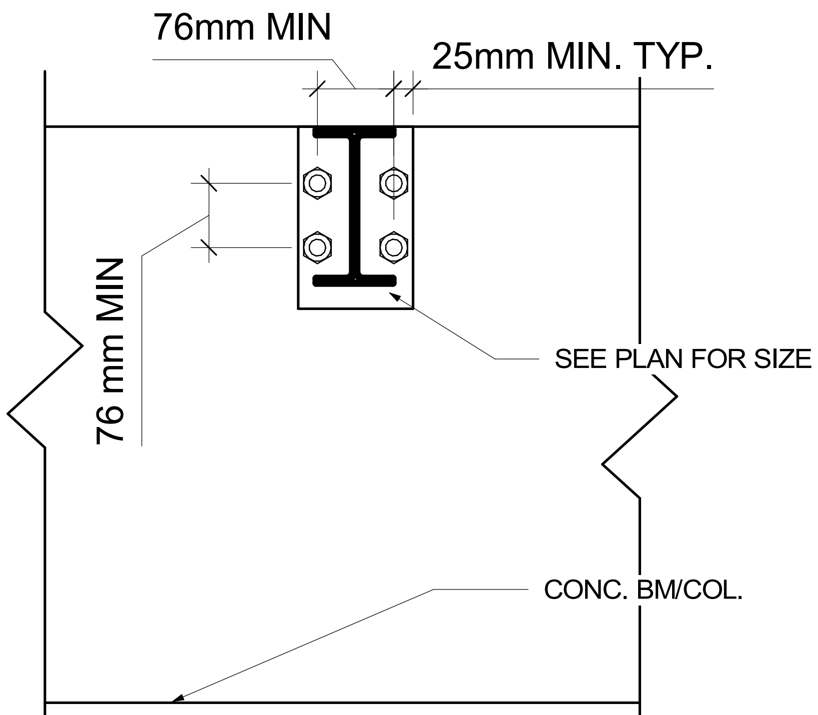
NUMBER:

S.419



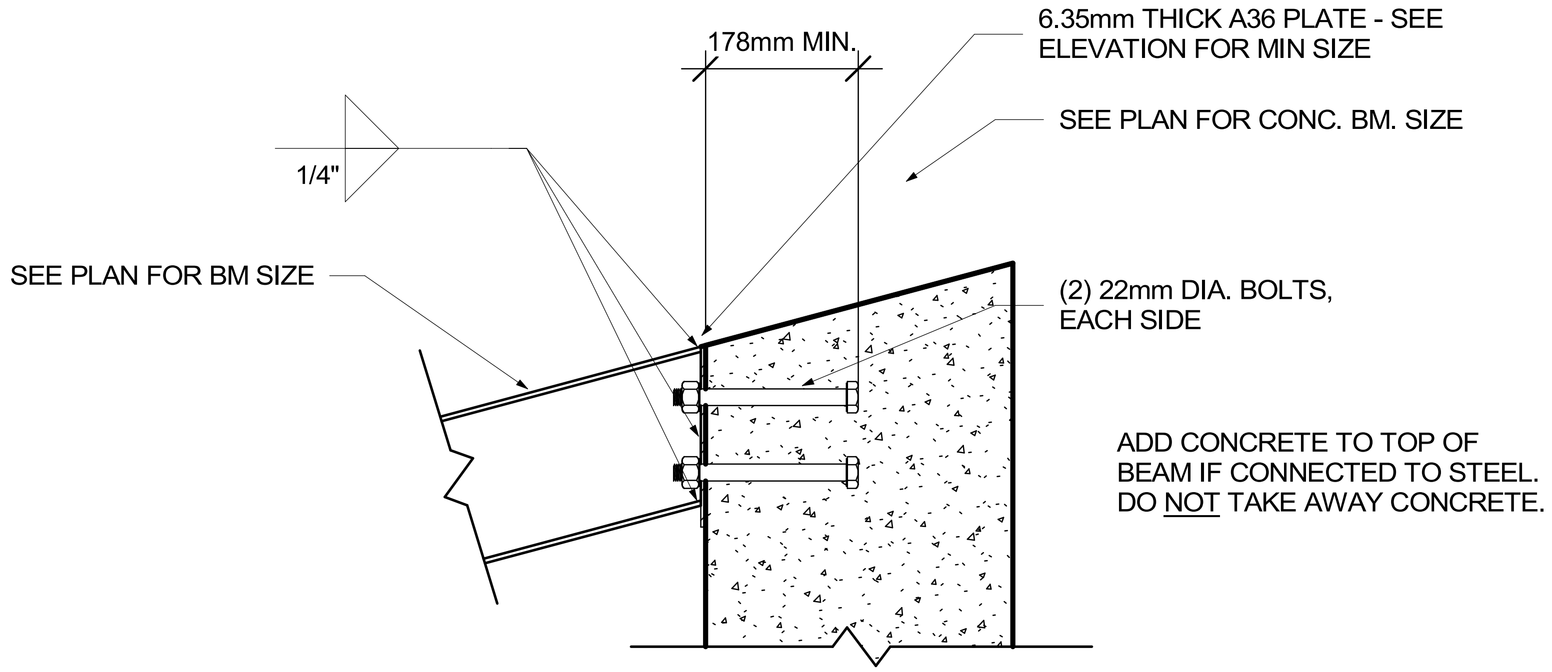
30 STEEL BEAM TO CONCRETE BEAM/COL SECTION

1 : 10



31 STEEL BEAM TO CONCRETE BEAM/COL ELEVATION

1 : 10



30 STEEL BEAM TO CONCRETE BEAM/COL SECTION

1 : 10

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:20 AM

SHEET NAME:

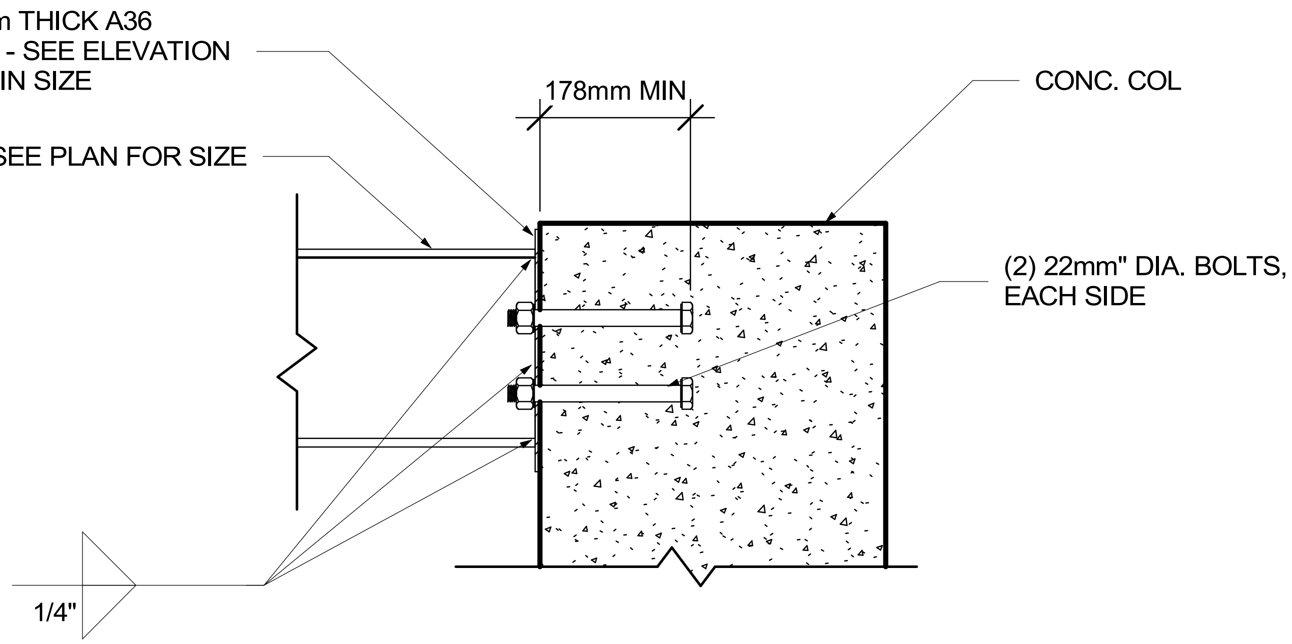
STEEL TO CONCRETE

SCALE:

1 : 10

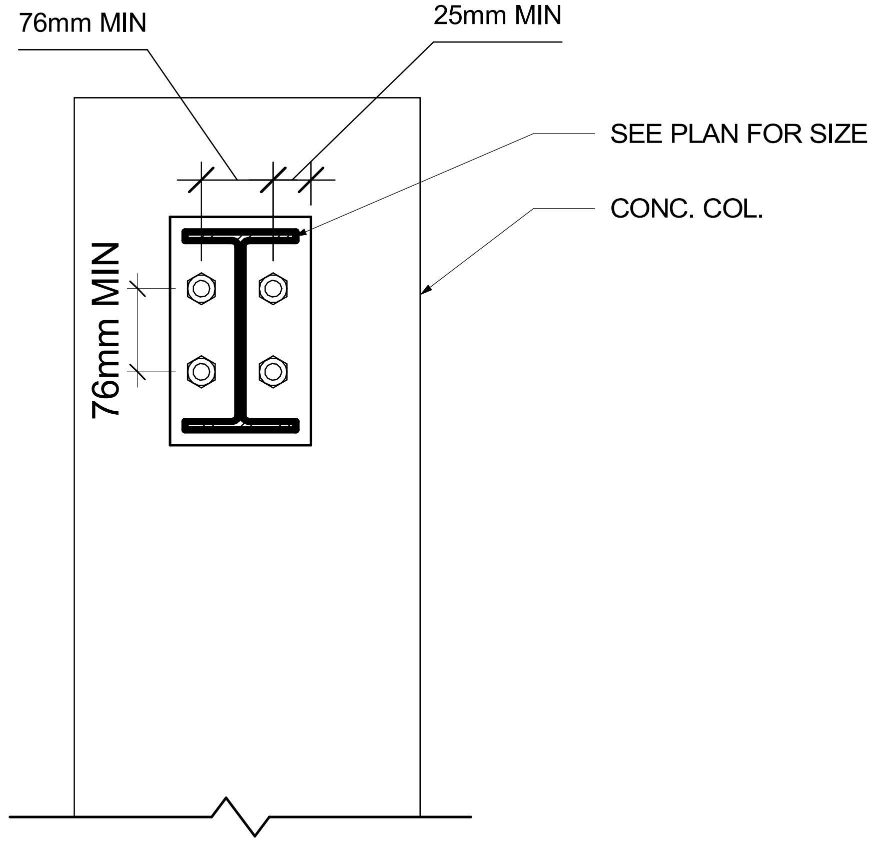
NUMBER:

S.420



(32) STEEL GIRDER TO CONCRETE COL SECTION

1 : 10



(33) STEEL GIRDER TO CONCRETE COL SECTION

1 : 10

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:21 AM

SHEET NAME:

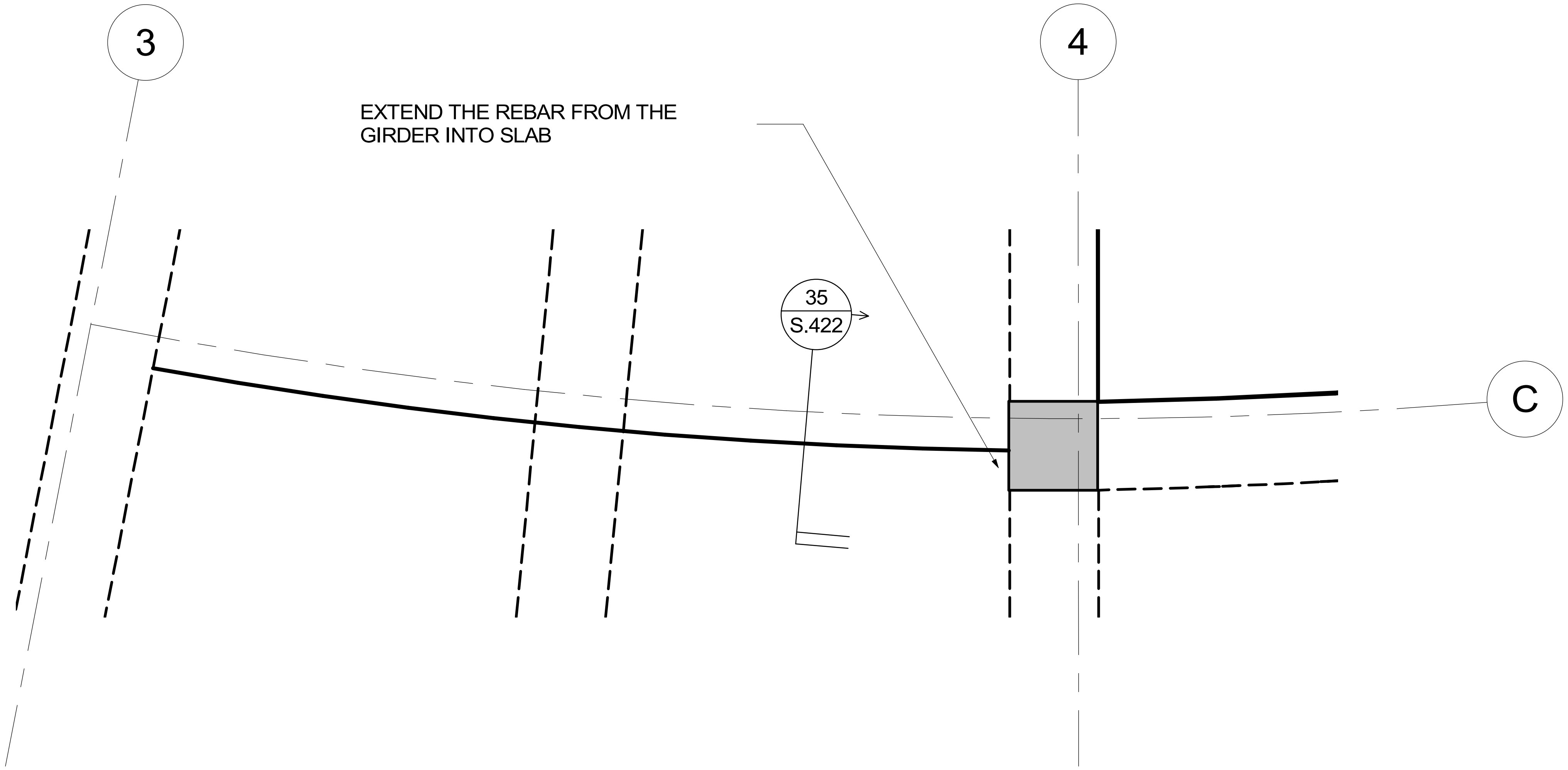
STEEL TO
CONCRETE

SCALE:

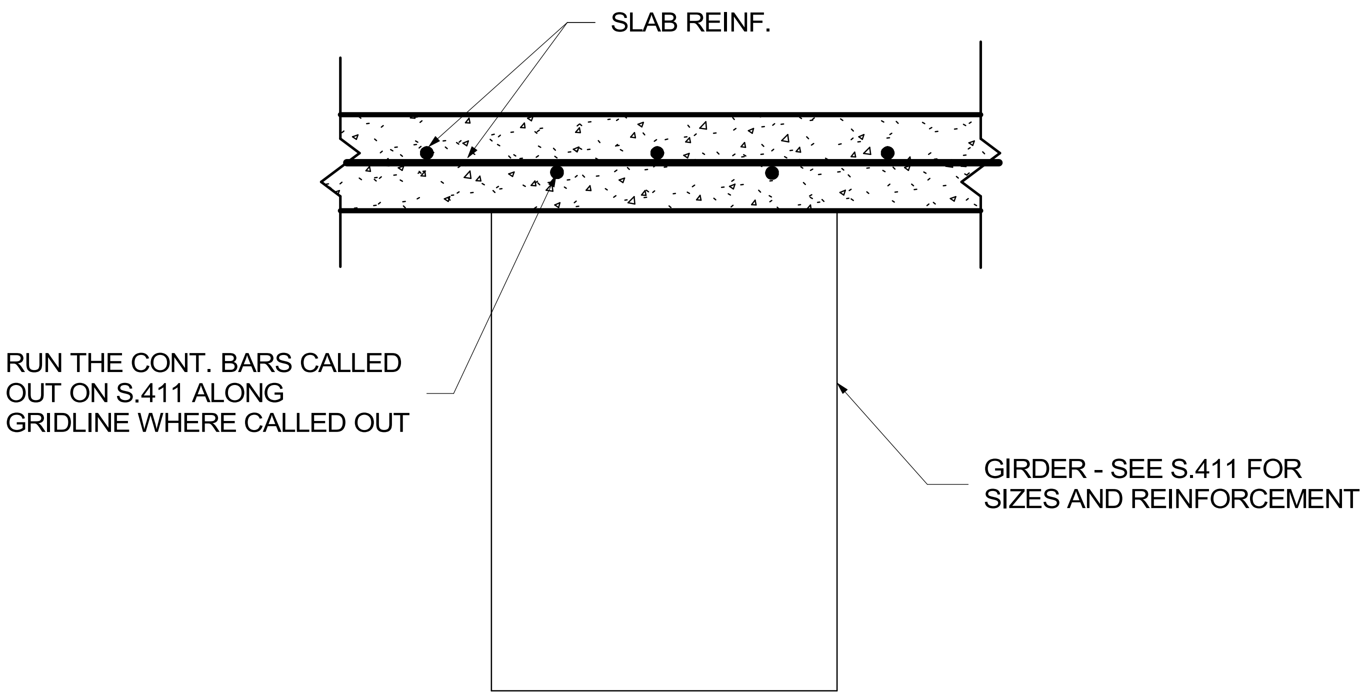
1 : 10

NUMBER:

S.421



34 EXTENDED REBAR IN SLAB



35 EXTENDED REBAR

1 : 10

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:22 AM

SHEET NAME:

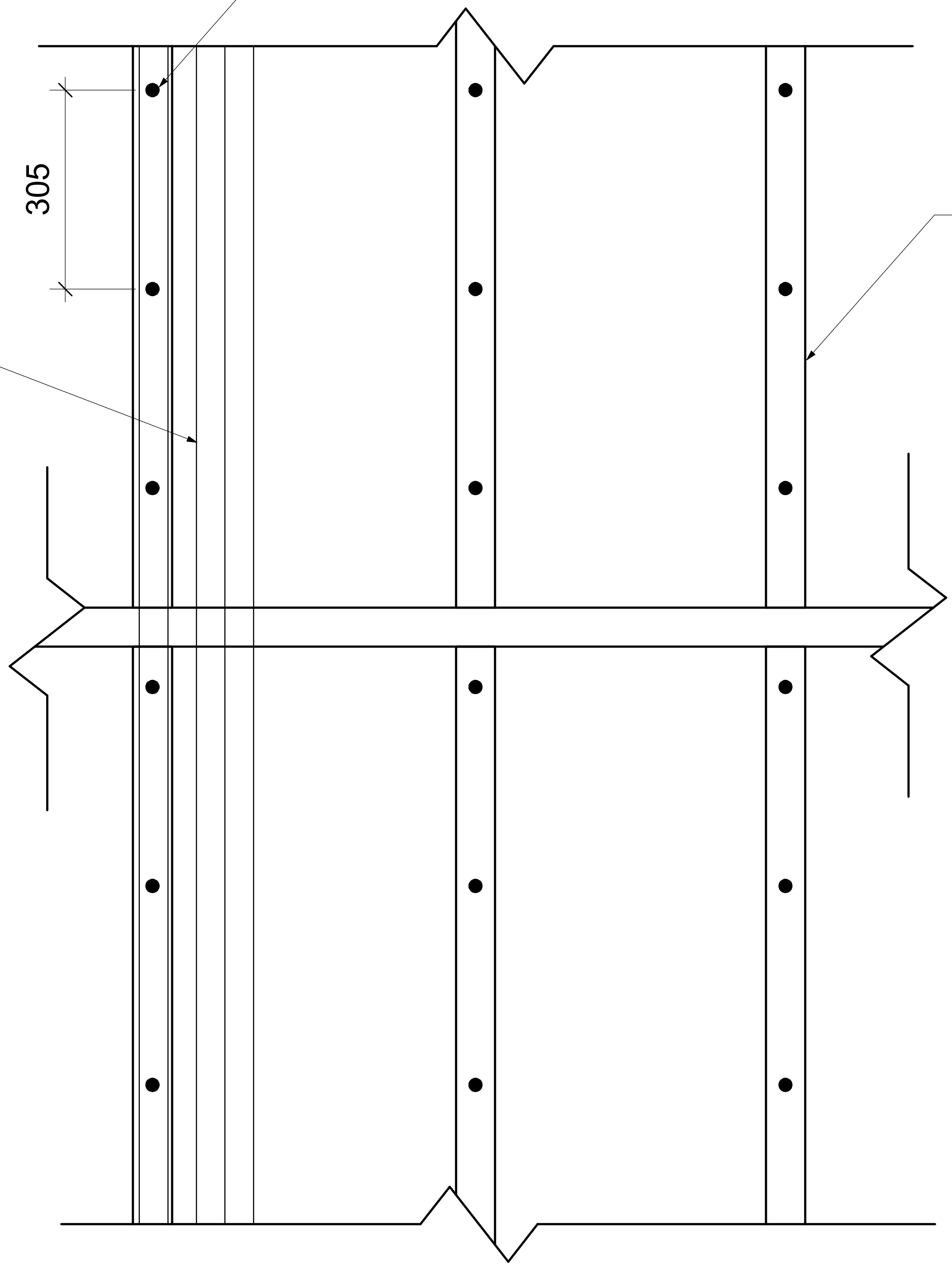
EXTENDED REBAR

SCALE:

As indicated

NUMBER:

S.422



36 STEEL TO DECKING CONNECTION

1 : 10

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT: MBANDAZI VILLAGE

SITE: MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

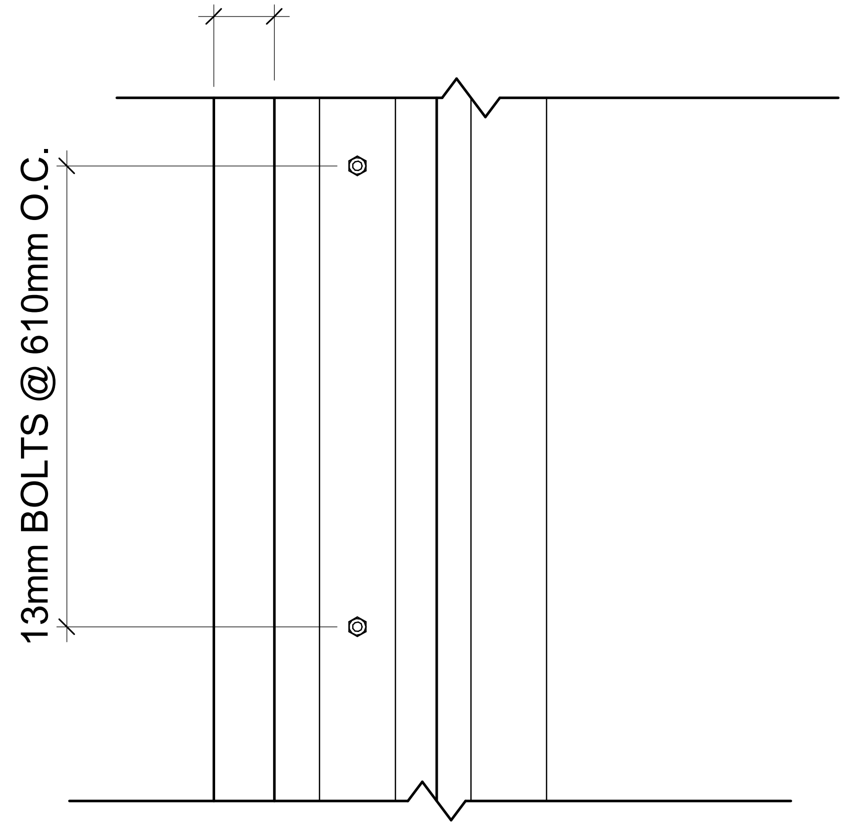
CHECKED BY:

PLOT DATE: 5/31/2021 12:41:23 AM

SHEET NAME: DECKING CONNECTION

SCALE: 1 : 10

NUMBER: S.423



37

CONCRETE TO DECKING CONNECTION

1 : 10

JOURNEYMAN INTERNATIONAL
3471 N. MAIN ST.
PRINEVILLE, OR

SEAL:

PROJECT:

MBANDAZI VILLAGE

SITE:

MBANDAZI VILLAGE

REVISIONS:

NO.	DESC.	DATE

DRAWN BY: JS

CHECKED BY:

PLOT DATE:

5/31/2021 12:41:24 AM

SHEET NAME:

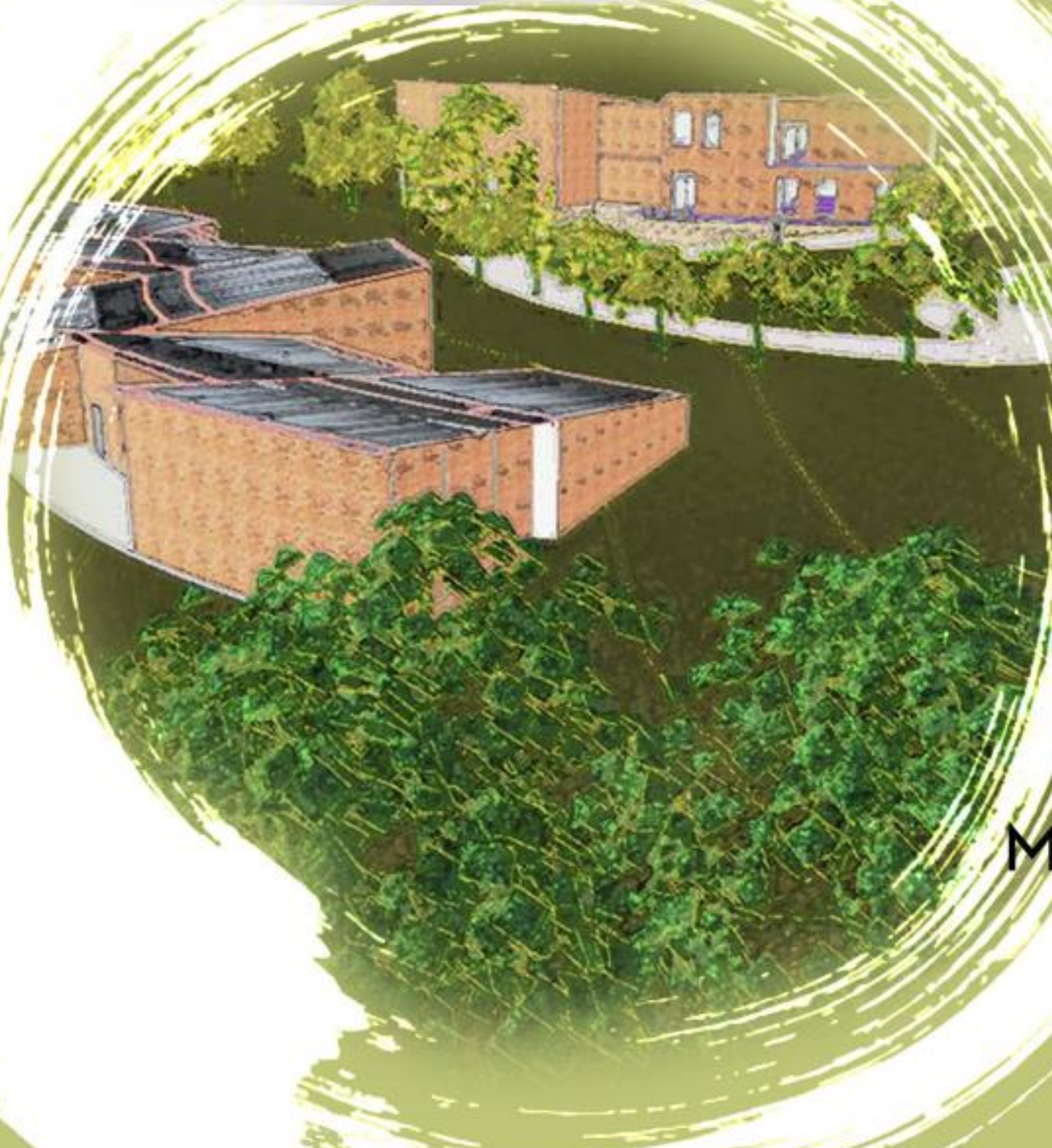
DECKING
COONNECTION

SCALE:

1 : 10

NUMBER:

S.424



MBANDAZI VILLAGE

PROJECT BRIEF

Journeyman International Inc.

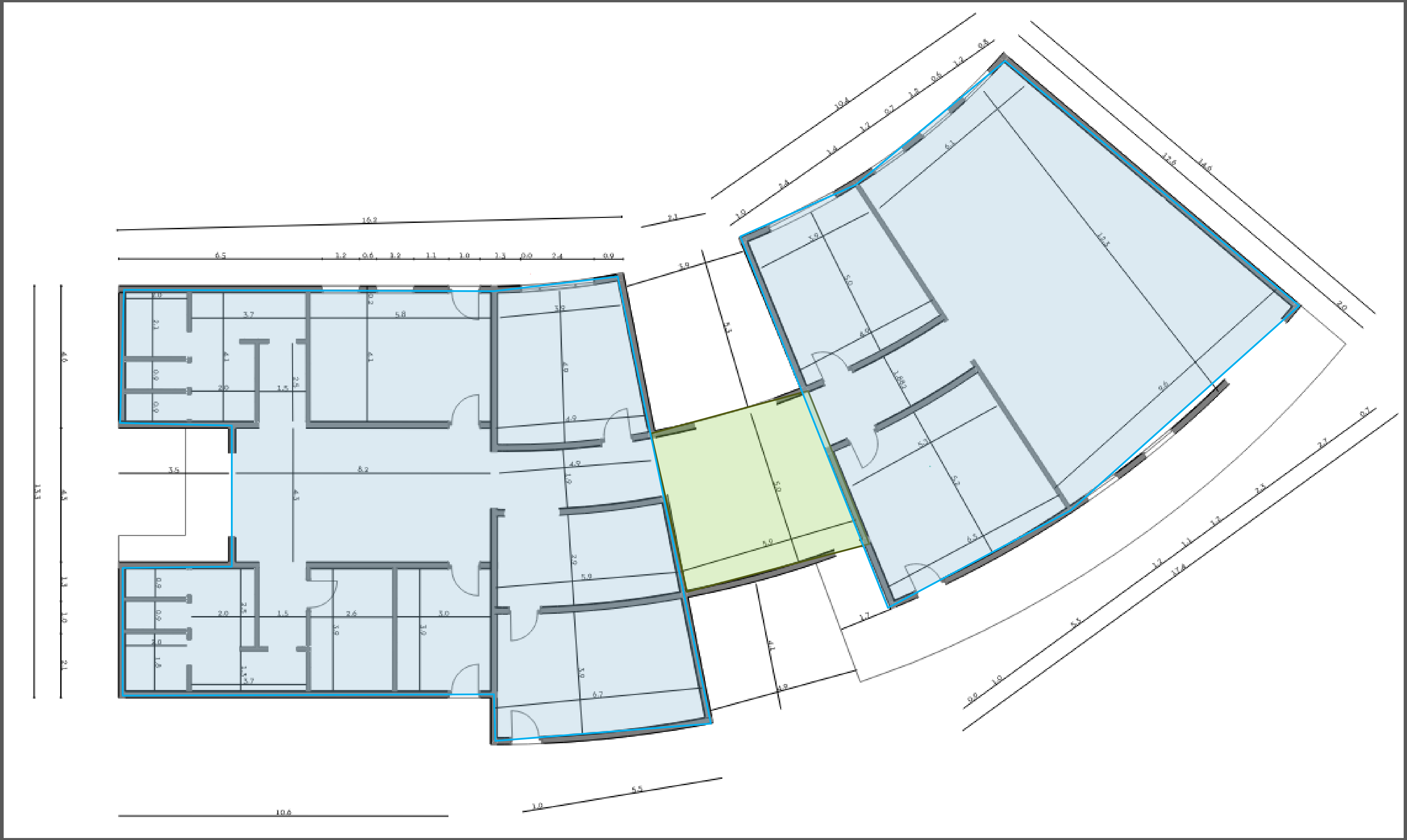
PRESENTED BY: JOSHUA SHOCKEY

PROJECT ADVISOR: JAMES MWANGI

CARLY@JOURNEYMANINTERNATIONAL.ORG

SITE

FLOOR PLAN



MATERIALS

STRUCTURAL

CONCRETE FLOORING

CONCRETE WALLS

METAL ROOF STRUCTURE

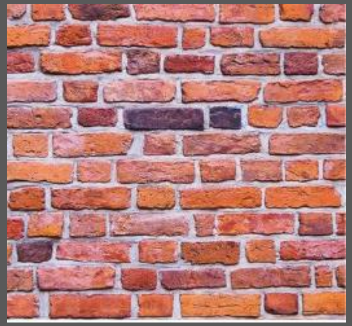
FINISHES

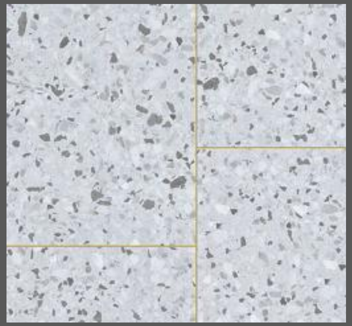
BRICK VENEER

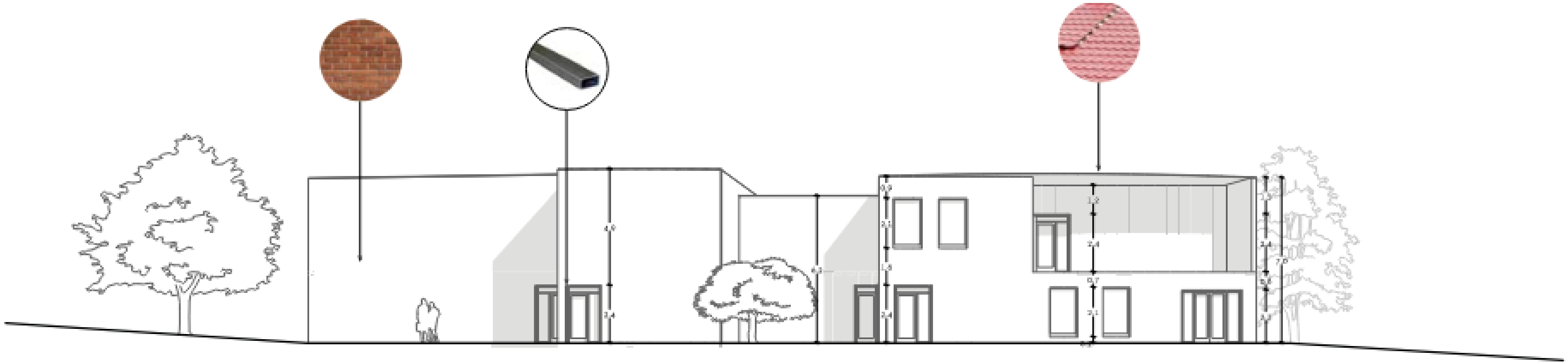
WOOD CEILING

TERRAZO FLOORING

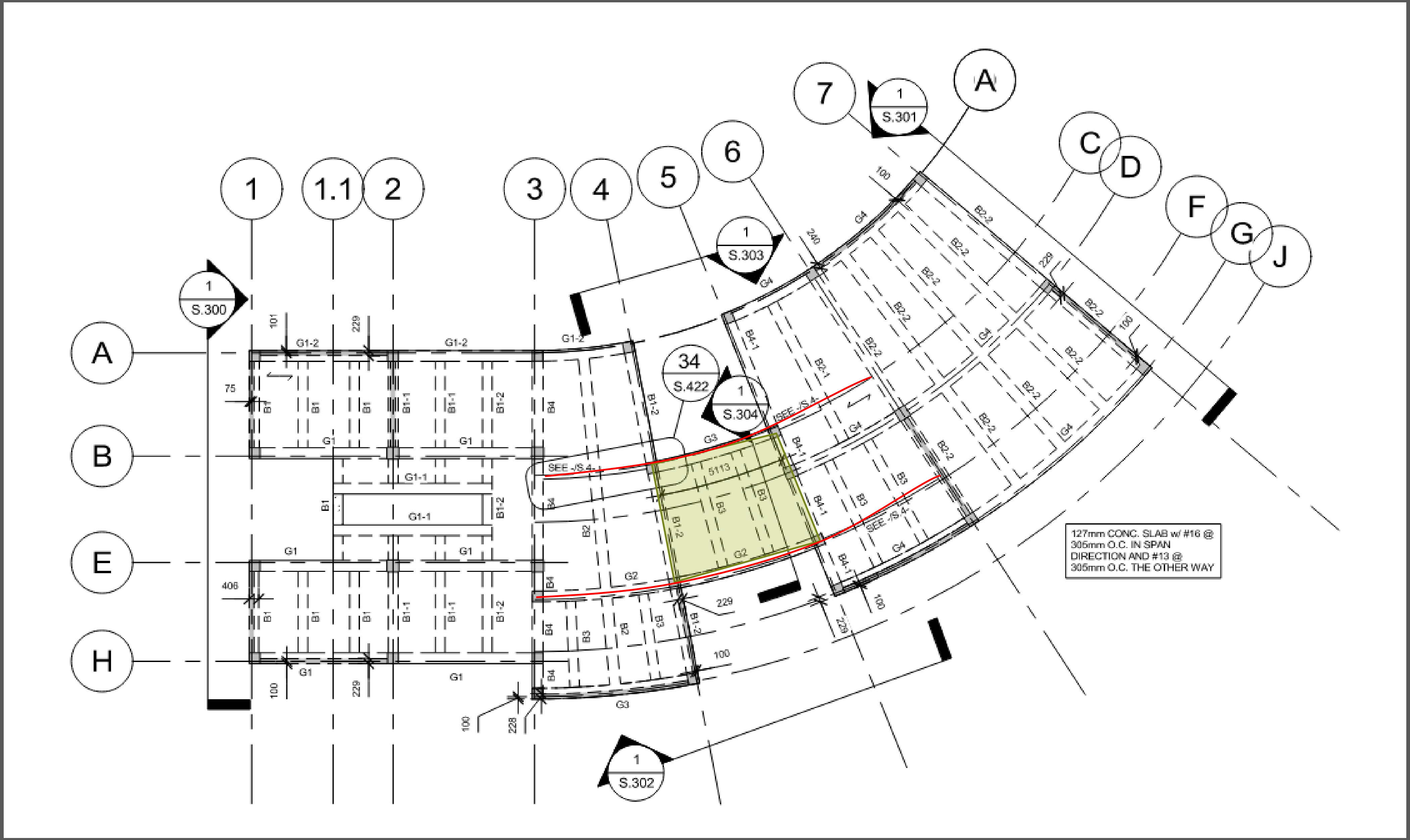
STUCCO







MATERIALS



1
S.300
1
S.301
1
S.303
1
S.304
34
S.422
1
S.302
SEE -/S.4-
127mm CONC. SLAB w/ #16 @ 305mm O.C. IN SPAN DIRECTION AND #13 @ 305mm O.C. THE OTHER WAY

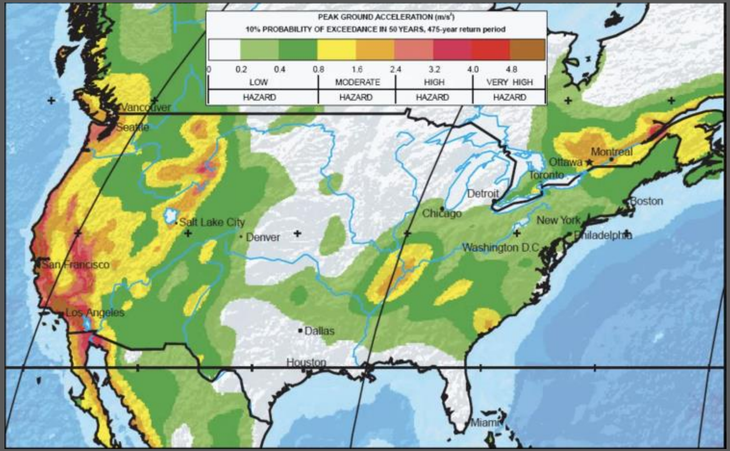
CHALLENGES

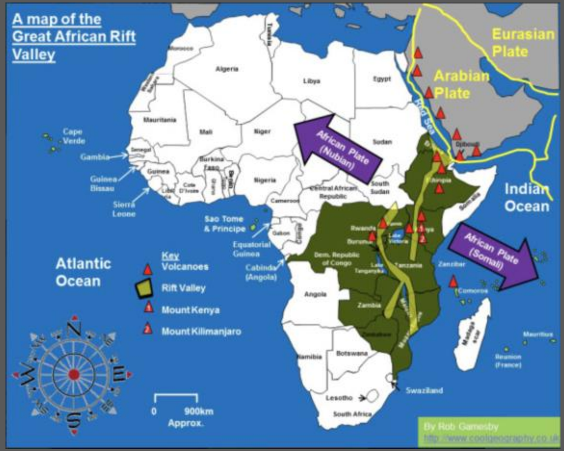
CURVED DIAPHRAGM

ETABS

SEISMIC DESIGN VALUES

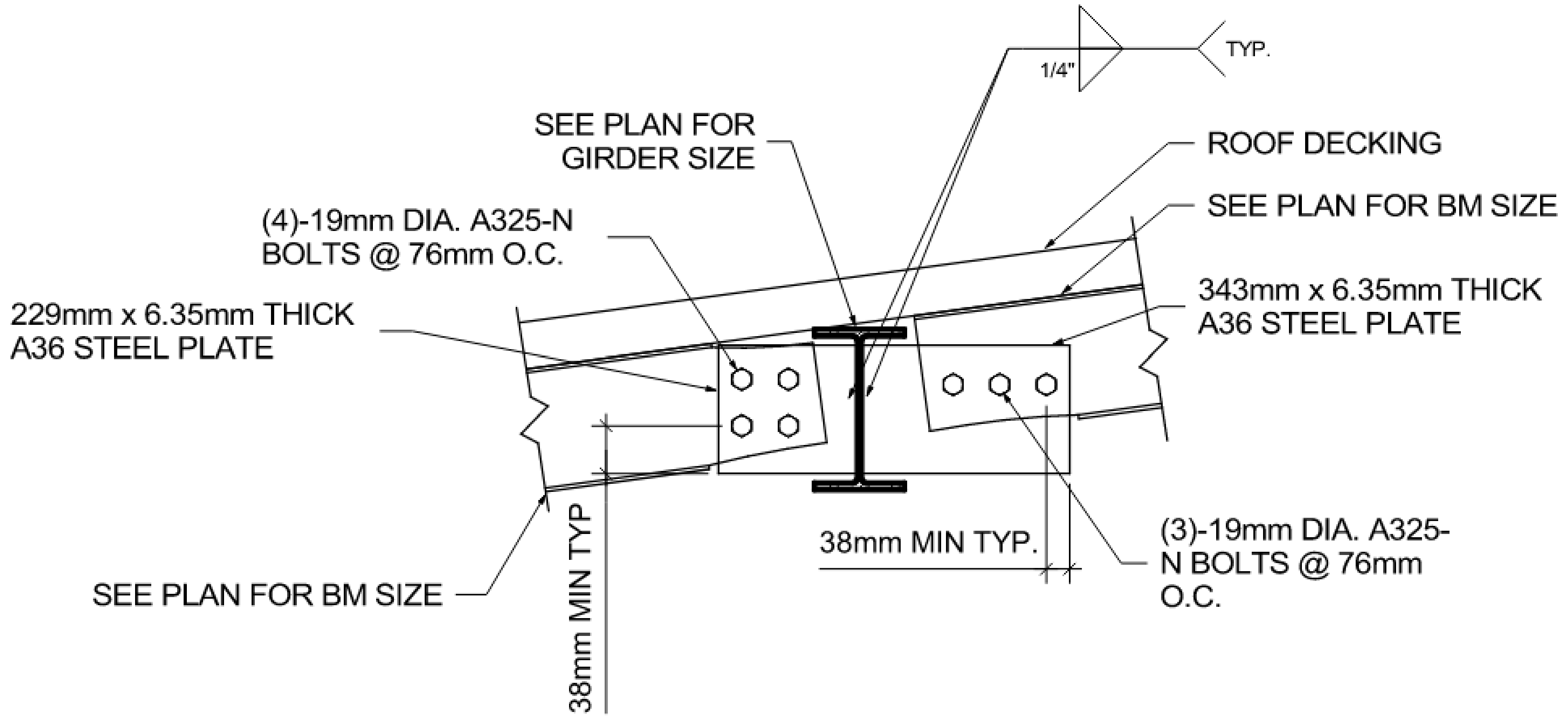
AVAILABLE MATERIALS



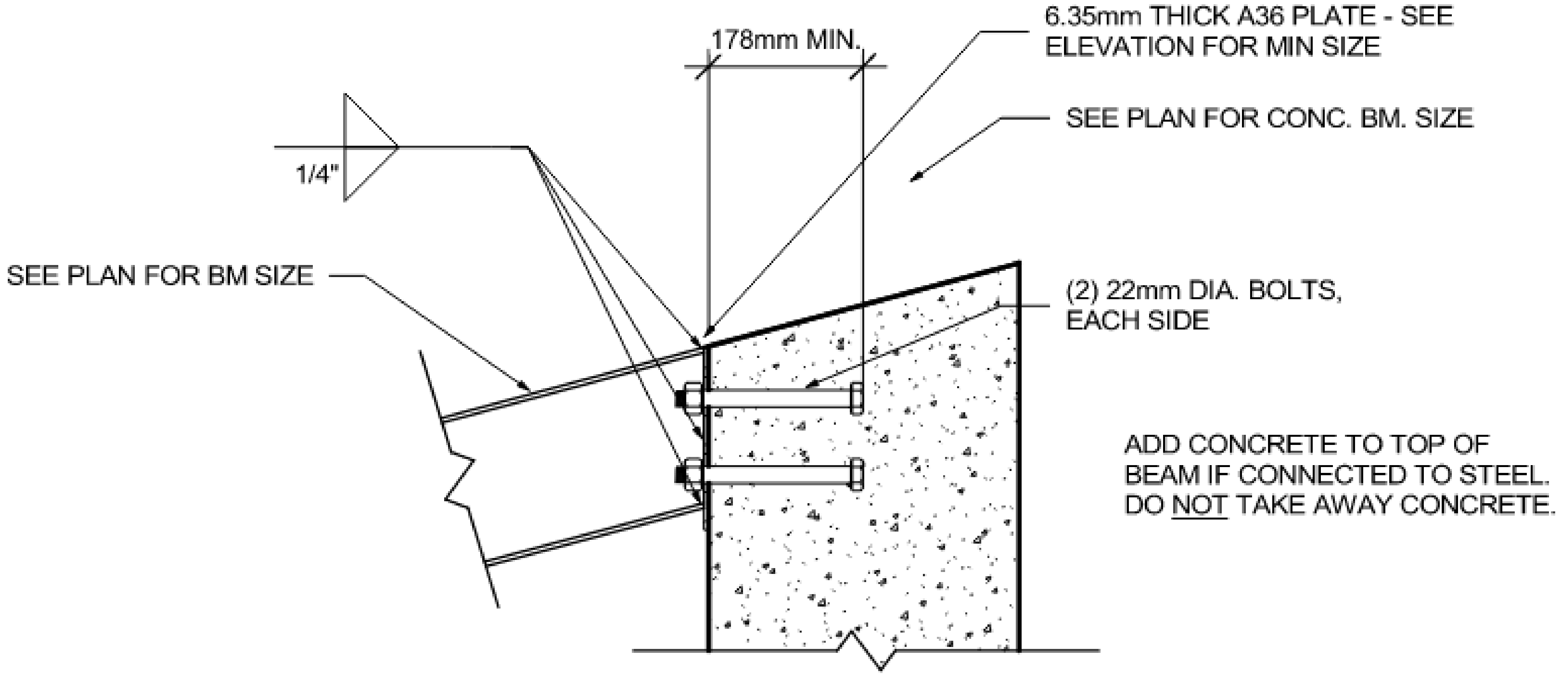


STEEL REINFORCING BARS FOR CONCRETE							
DIMENSIONS							
U.S. "Imperial" Bar Size	Metric Size	Weight per foot (lb/ft)	Mass per meter (kg/m)	Nominal Diameter (inches)	Nominal Diameter (mm)	Nominal Area (in2)	Nominal Area (mm2)
#3	#10	0.376	0.561	0.375	9.525	0.110	71
#4	#13	0.668	0.996	0.500	12.700	0.200	129
#5	#16	1.043	1.556	0.625	15.875	0.310	200
#6	#19	1.502	2.240	0.750	19.050	0.440	284
#7	#22	2.044	3.049	0.875	22.225	0.600	387
#8	#25	2.670	3.982	1.000	25.400	0.790	509
#9	#29	3.400	5.071	1.128	28.650	1.000	645
#10	#32	4.303	6.418	1.270	32.260	1.270	819
#11	#36	5.313	7.924	1.410	35.810	1.560	1006
#14	#43	7.650	11.410	1.693	43.000	2.250	1452
#18	#57	13.600	20.284	2.257	57.330	4.000	2581
Source: www.harrissupplysolutions.com							

CONNECTIONS



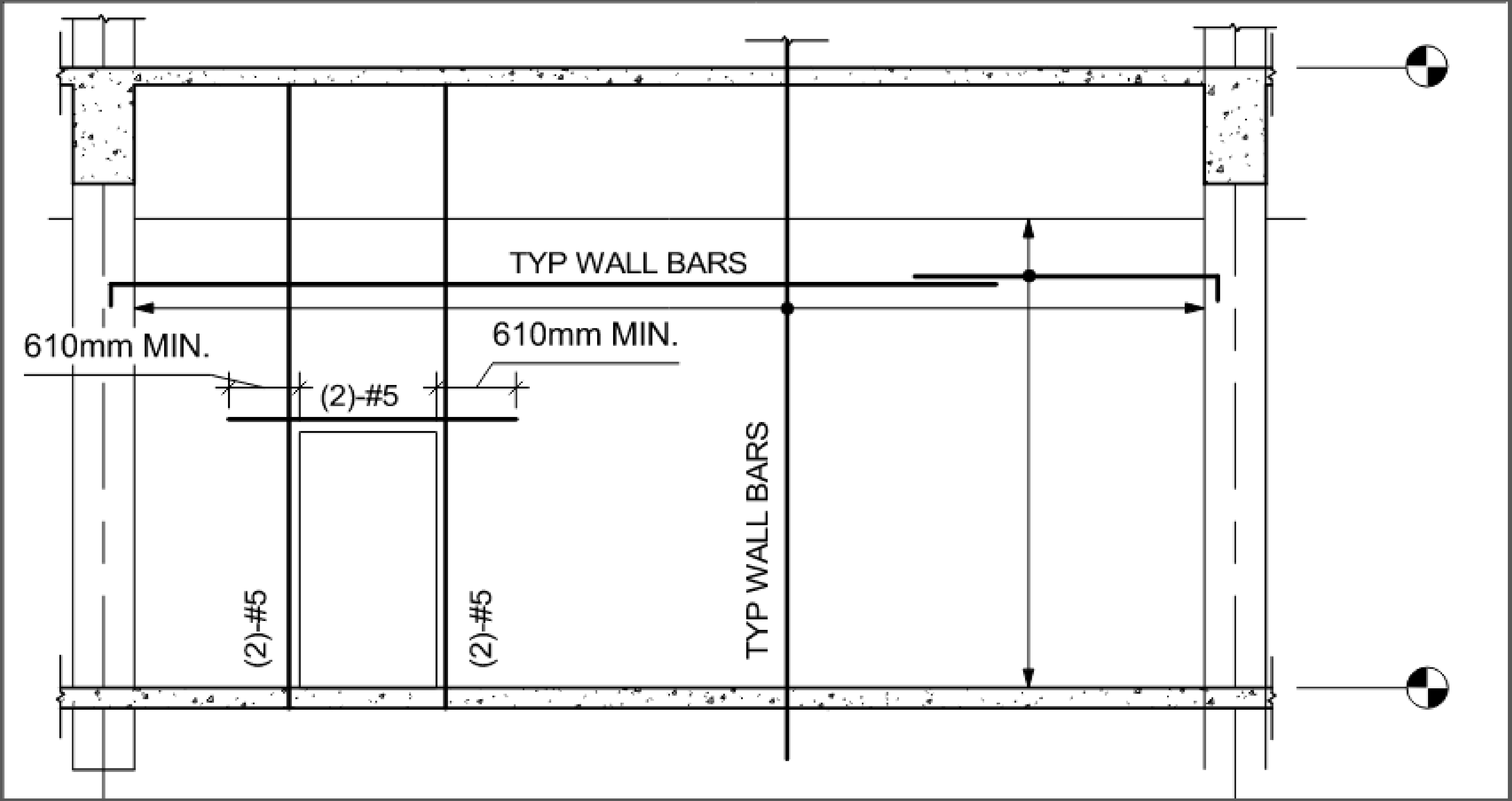
CONNECTIONS



30 STEEL BEAM TO CONCRETE BEAM/COL SECTION

1 : 10

WALL OPENINGS



REFLECTIONS/CONSIDERATIONS

THANK YOU

JAMES MWANGI

JOURNEYMAN INTERNATIONAL

EVERYONE ELSE THAT HELPED ME