UNIVERSITY OF MINDANAO

Matina, Davao City

FINAL PLATE

In Partial Fulfillment

of the Requirements for

BCES2 (7717) – Earthquake Engineering

Submitted by:

Pangapalan, Peter Gino A.

Submitted to:

Engr. Geffren Bernardo

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ACKNOWLEDGEMENT

In carrying out our ultimate assignment, we had to rely on the guidance and assistance of someone deserving of our profoundest appreciation. We would like to extend our heartfelt thanks to everyone who showed up, believed in our abilities and offered unwavering faith in our potential to successfully complete this project.

Foremost, our sincerest thanks and appreciation go to our Earthquake Engineering professor, Engr. Geffren D. Bernardo, whose support enabled us to complete these Plates. His guidance allowed us to deeply understand the coursework, an asset to us as budding engineers. The knowledge we've gained will surely be utilized in our future work. We are likewise grateful for his patience while he waited for our progress.

Next, we wish to express our heartfelt appreciation to our families for their emotional and financial backing. Their constant encouragement and unwavering faith gave us the courage to see this project through to the end. Additionally, we are thankful for our classmates and friends who joined us in this journey. Their excellent cooperation and steadfast support were invaluable.

Our friends deserve a special mention; their constant support and reminders to take breaks and have fun in stressful times made this challenging task far more manageable. We couldn't be more grateful.

Lastly, we want to express our deepest appreciation to our benevolent Heavenly Father, who guided us, provided us with the necessary strength to accomplish this task, and kept us safe from all harm and peril.

INTRODUCTION

An earthquake is an abrupt shifting of rocky materials below the Earth's crust, leading to anything from mild to severe tremors. While the movement of tectonic plates primarily causes earthquakes, smaller seismic activities can result from volcanic eruptions, collapse of surface or subsurface rock formations, or underground explosions. These sudden ground shakes pose significant threats to man-made structures.

A resource titled "The Constructor" explains that one seismic effect harmful to buildings is the inertia force produced within a structure during an earthquake. When an earthquake occurs, the base of a building shakes, but the roof initially remains still. However, due to its attachment to the walls and columns, the roof is eventually pulled along with the building's base. Ammon (2019) further clarifies that this inertial shearing of the structure can stress weak walls and joints, leading to structural failure or even complete collapse. The shaking frequency and type depend on the structure itself.

To make constructions earthquake-resistant, materials resilient to seismic activities are employed. For instance, wood and concrete possess varying degrees of earthquake resistance. Concrete structures should preferably incorporate concrete slabs or steel, whereas wooden structures need to be firmly anchored to their foundations. Ensuring the safety of our buildings and homes from earthquakes is paramount. We need to prioritize preventing the loss of lives over property damage. Making our structures virtually earthquake-proof can circumvent such issues.

Earthquake engineering is a comprehensive approach to ensure infrastructure resilience in a seismically unpredictable future. It is an interdisciplinary field incorporating structural engineering, structural dynamics, seismology, materials engineering, geotechnical engineering, risk and decision analysis, and probability and reliability theory ("Exponent," n.d.). Heoc (2021) defines earthquake engineering as an interdisciplinary engineering field that considers seismic activities in the design and analysis of structures such as buildings and bridges. The primary aim is to make structures more earthquake-resistant.

Every nation should prioritize earthquake engineering as it can mitigate the impact of earthquakes, including landslides, soil liquefaction, tsunamis, and structural damage to buildings, bridges, and highways. By constructing new structures capable of enduring intense ground shaking, earthquake engineering helps reduce the risk of disasters that populations face.

ARCHITECTURAL AND STRUCTURAL PLANS

A

PERSPECTIVE

DRAWN NOT TO SCALE

SUBJECT AND CODE:	SUBMITTED BY:		RATING:
BCES 2 (7717)	PETER GINO PANGAPALAN	4 STOREY COMMERCIAL BUILDING	
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	PERSPECTIVE	

A

VICINITY MAP

DRAWN NOT TO SCALE

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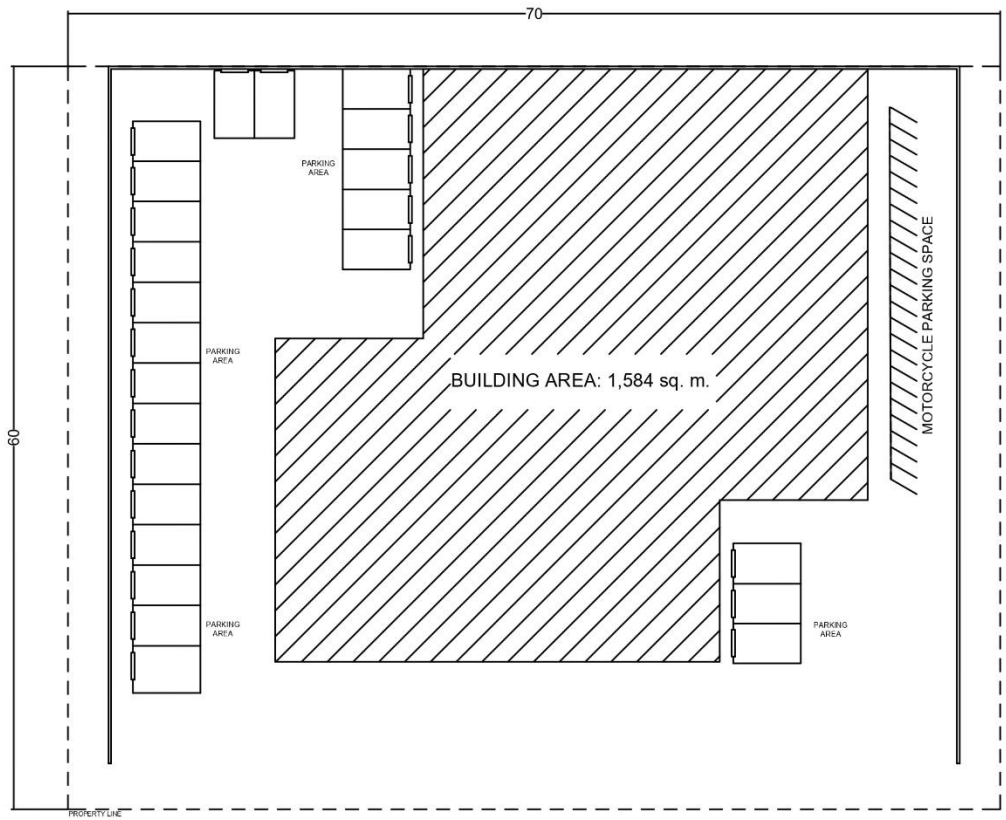
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	VICINITY MAP	

A

VICINITY MAP

DRAWN NOT TO SCALE

SUBJECT AND CODE:	SUBMITTED BY:		RATING:
BCES 2 (7717)	PETER GINO PANGAPALAN	4 STOREY COMMERCIAL BUILDING	
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	VICINITY MAP	



A SITE DEVELOPMENT PLAN

SCALE 1:100

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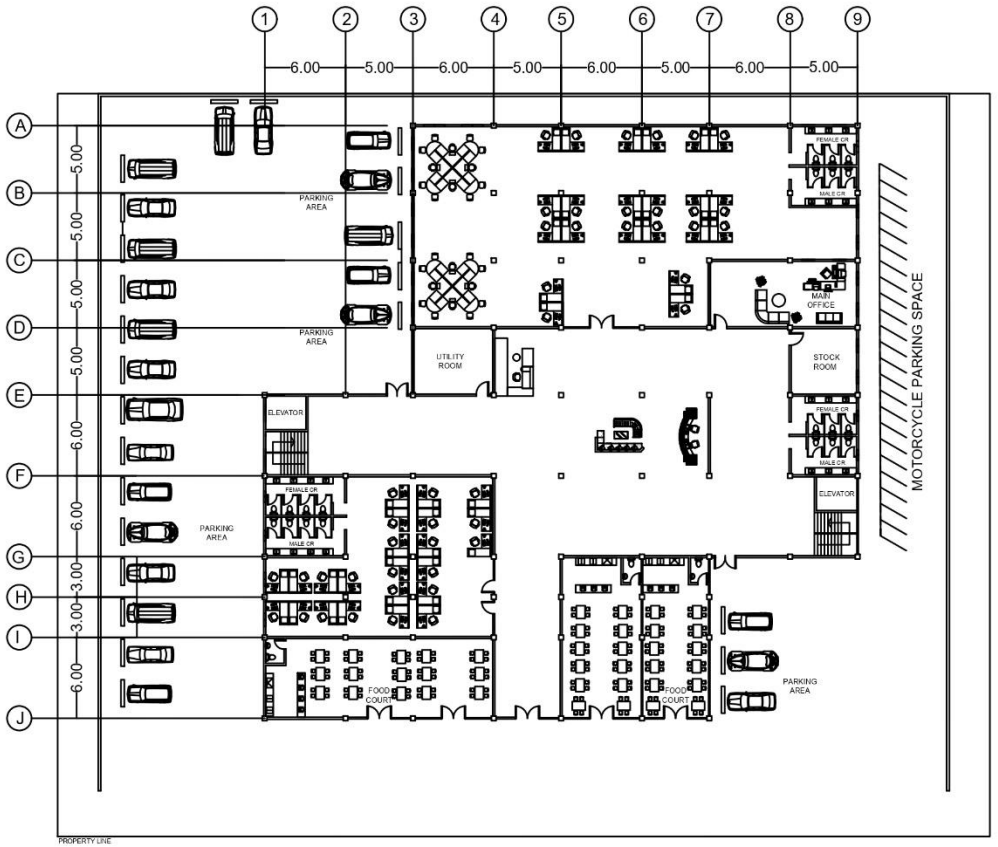
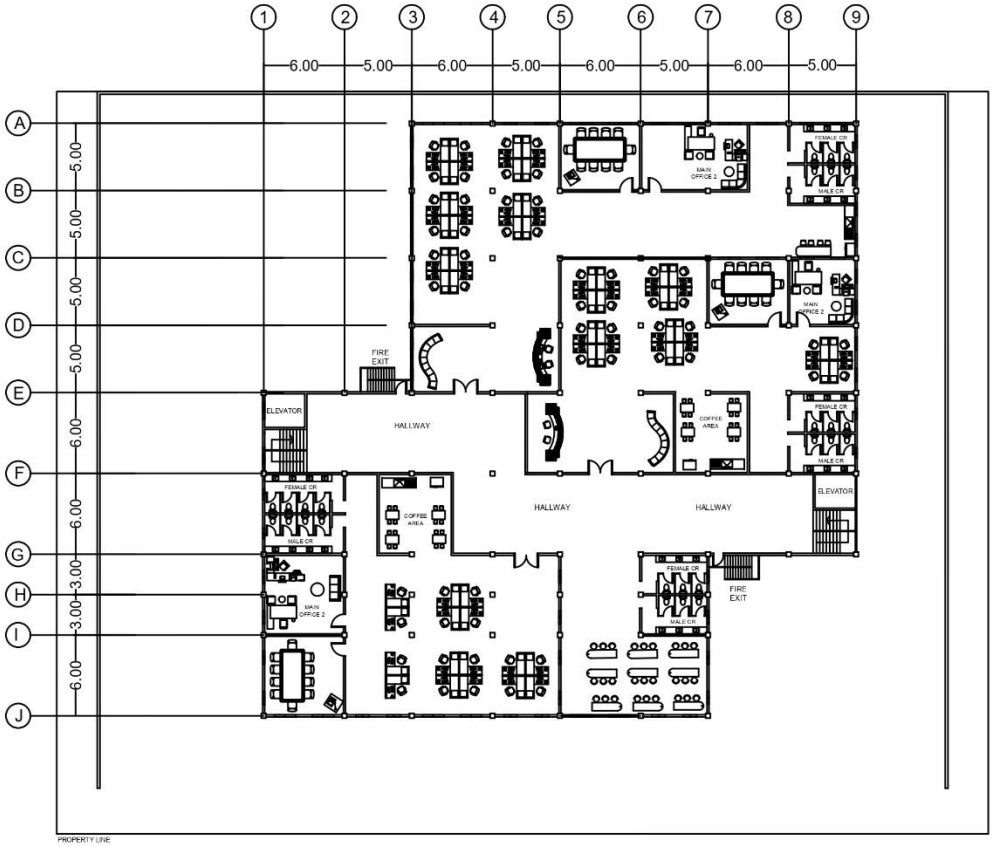
BCES 2 (7717)	PETER GINO PANGAPALAN		
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	SITE DEVELOMENT PLAN	



A GROUND FLOOR PLAN

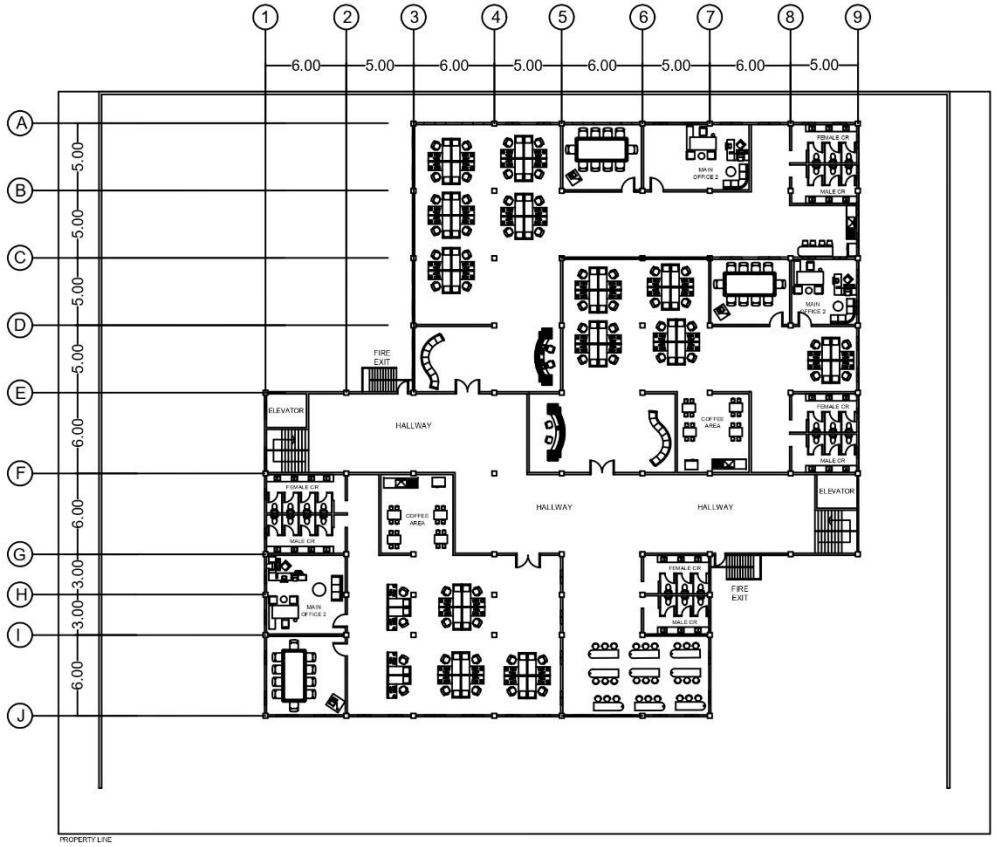
SCALE 1:100

SUBJECT AND CODE:	SUBMITTED BY:	4 STOREY COMMERCIAL BUILDING	RATING:
BCES 2 (7717)	PETER GINO PANGAPALAN		
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	GROUND FLOOR PLAN	



A SECOND FLOOR PLAN

SUBJECT AND CODE:	SUBMITTED BY:	4 STOREY COMMERCIAL BUILDING	RATING:
BCES 2 (7717)	PETER GINO PANGAPALAN		
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	2ND FLOOR PLAN	



A

THIRD FLOOR PLAN

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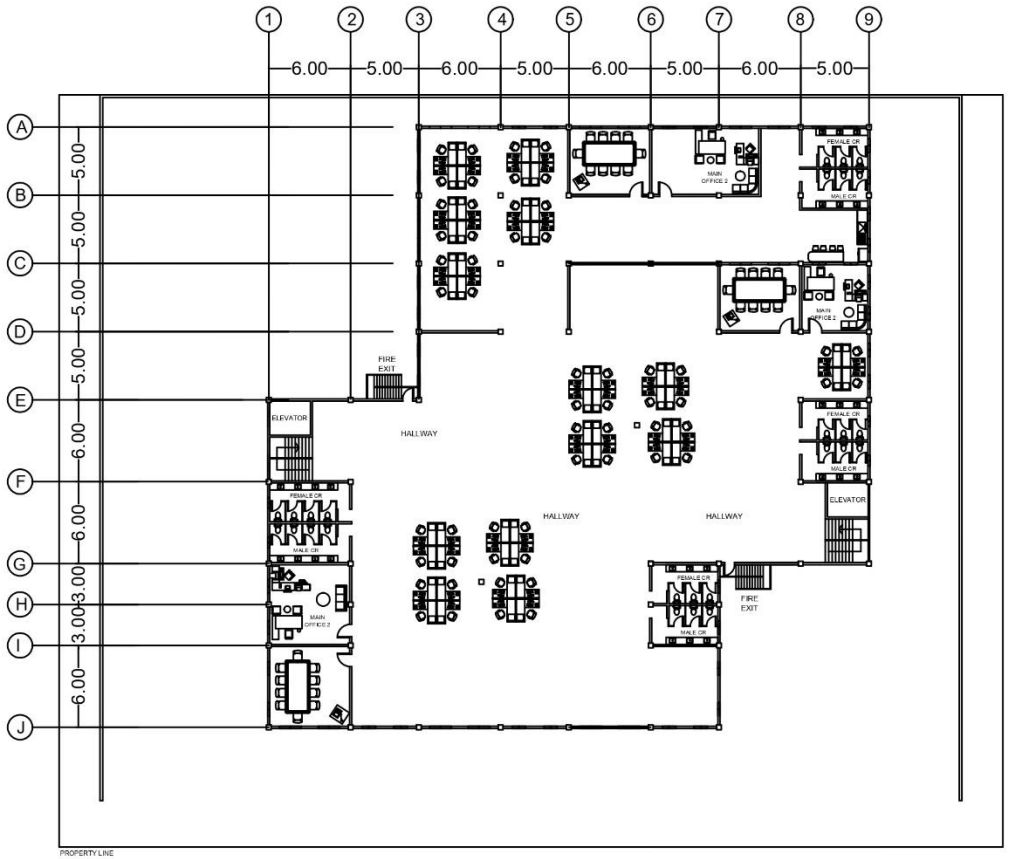
BCES 2 (7717)	PETER GINO PANGAPALAN	4 STOREY COMMERCIAL BUILDING	
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	3RD FLOOR PLAN	



A

FOURTH FLOOR PLAN

SCALE 1:100

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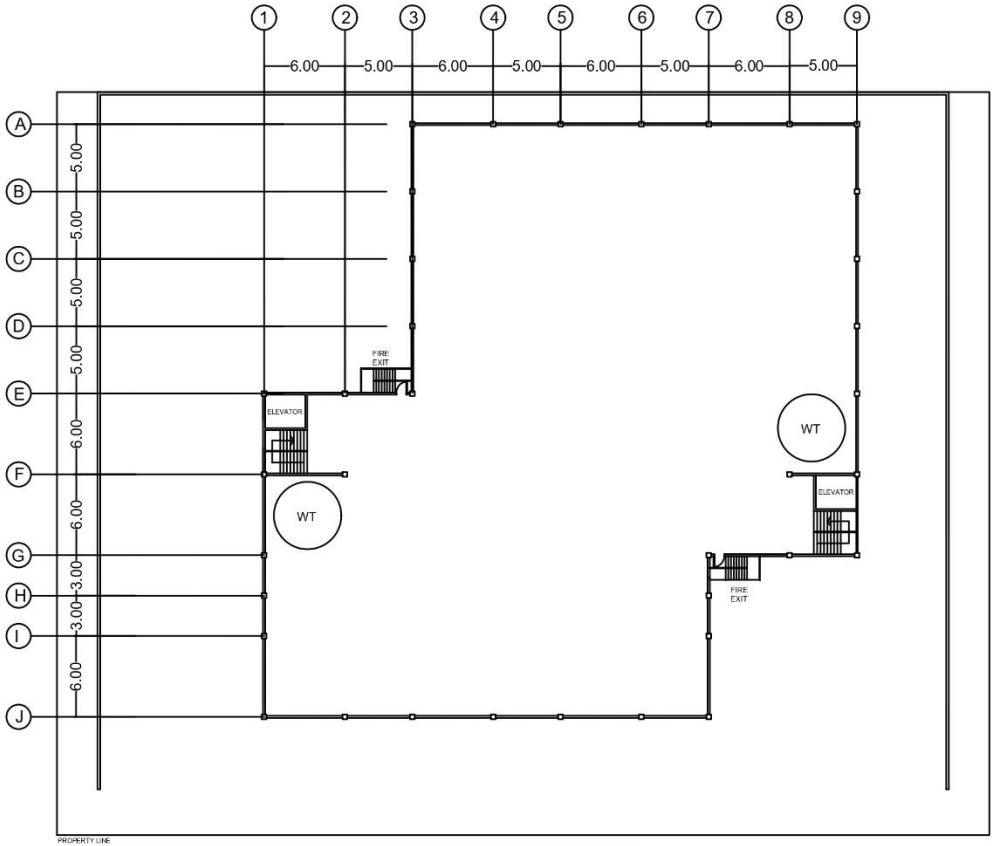
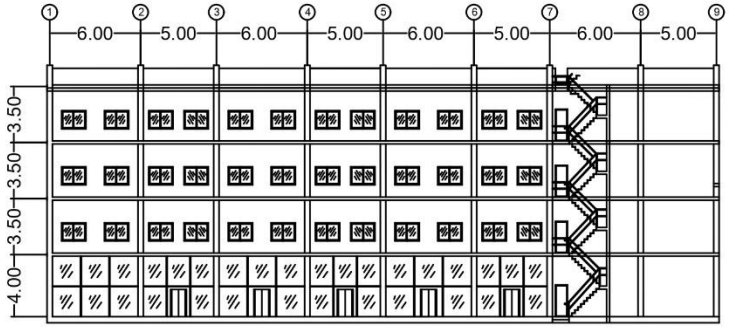
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	4TH FLOOR PLAN	

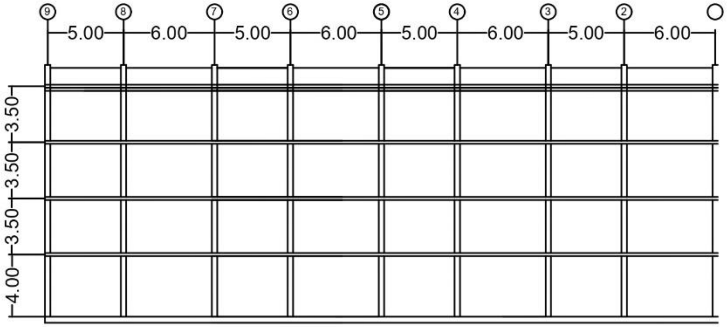


A ROOF DECK PLAN

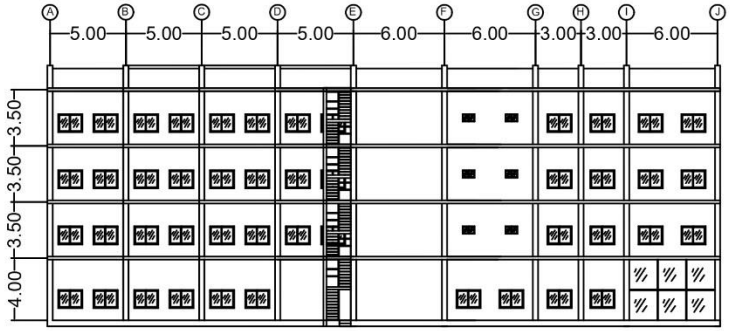
SUBJECT AND CODE:	SUBMITTED BY:		RATING:
BCES 2 (7717)	PETER GINO PANGAPALAN	4 STOREY COMMERCIAL BUILDING	
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	ROOF DECK PLAN	



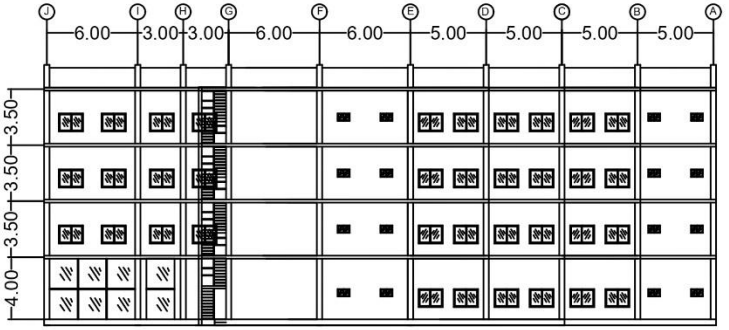
A FRONT ELEVATION
SCALE 1:100



A REAR ELEVATION
SCALE 1:100



A LEFT ELEVATION
SCALE 1:100



A RIGHT ELEVATION
SCALE 1:100

SUBJECT AND CODE:	SUBMITTED BY:	4 STOREY COMMERCIAL BUILDING	RATING:
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SCHOOL:	SUBMITTED TO:		
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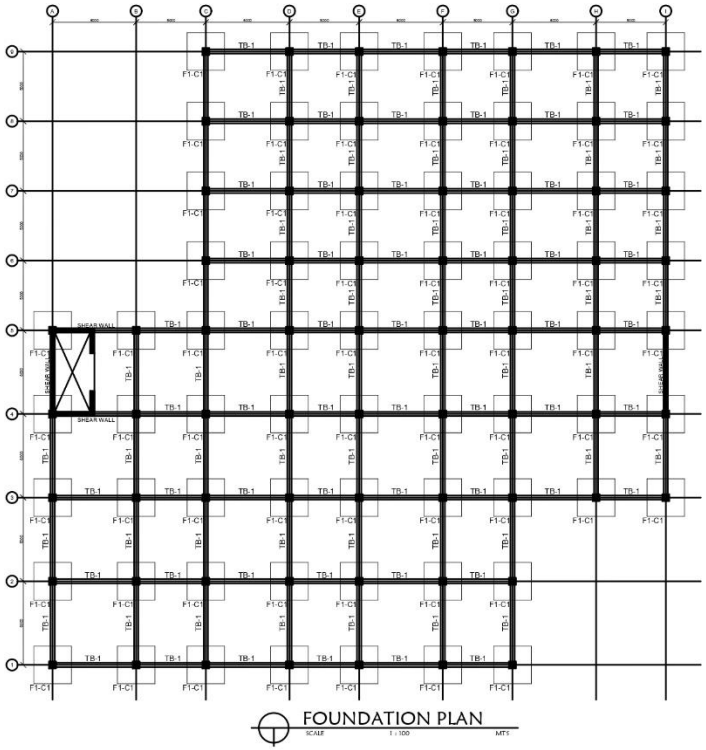

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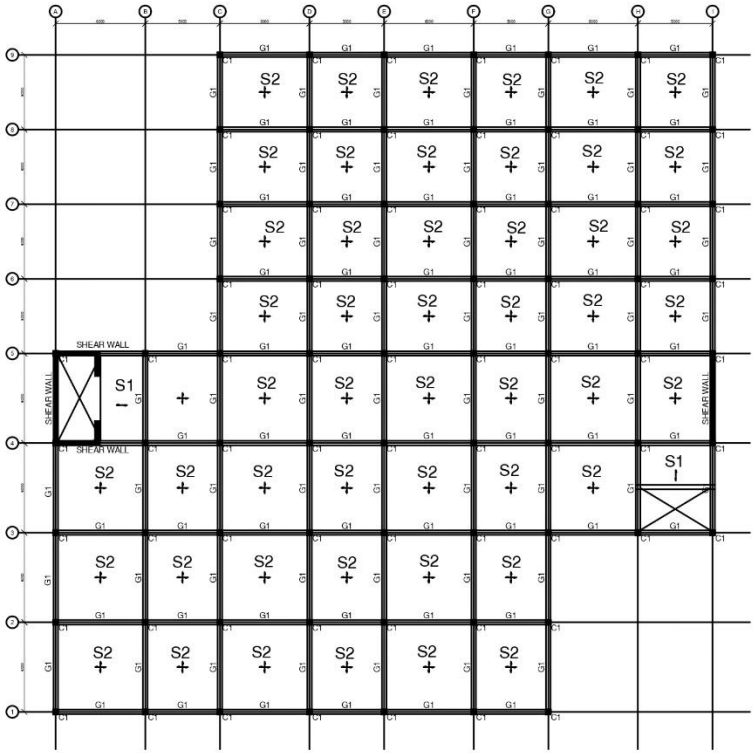
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	GROUND FLOOR PLAN	



SECOND FLOOR FRAMING PLAN

SCALE 1 : 100 MTS

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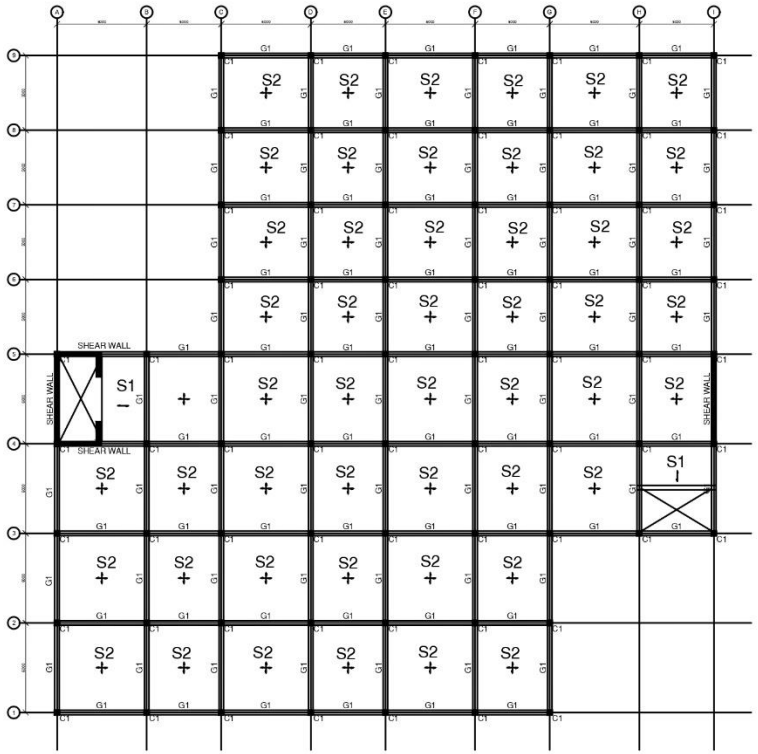
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	GROUND FLOOR PLAN	



THIRD FLOOR FRAMING PLAN

SCALE 1 : 100 MTS

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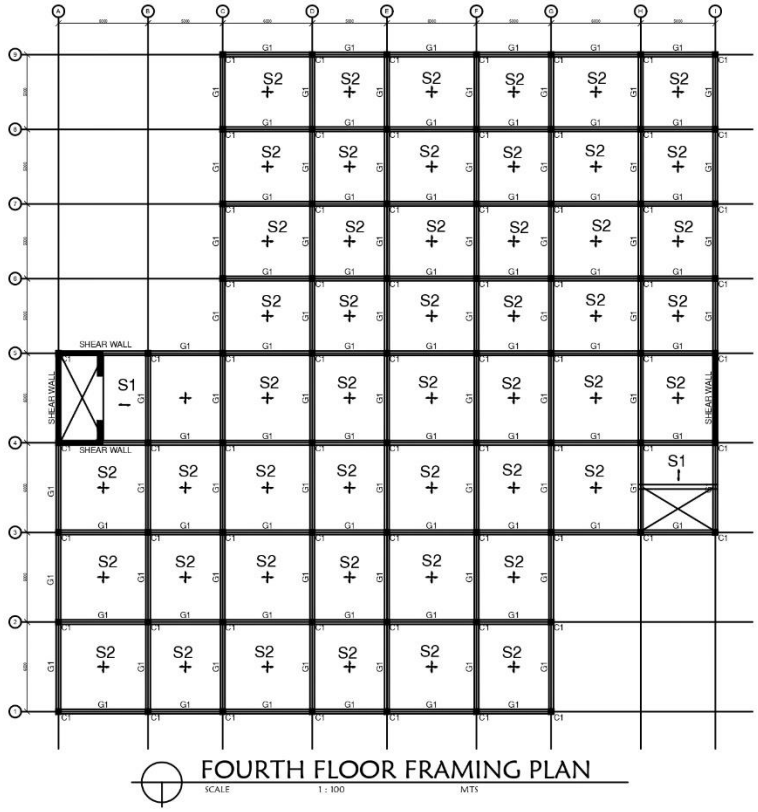
BCES 2 (7717)	PETER GINO PANGAPALAN	4 STOREY COMMERCIAL BUILDING	
SCHOOL:	SUBMITTED TO:		
UNIVERSITY OF MINDANAO	ENGR. GEFFREN BERNARDO	GROUND FLOOR PLAN	



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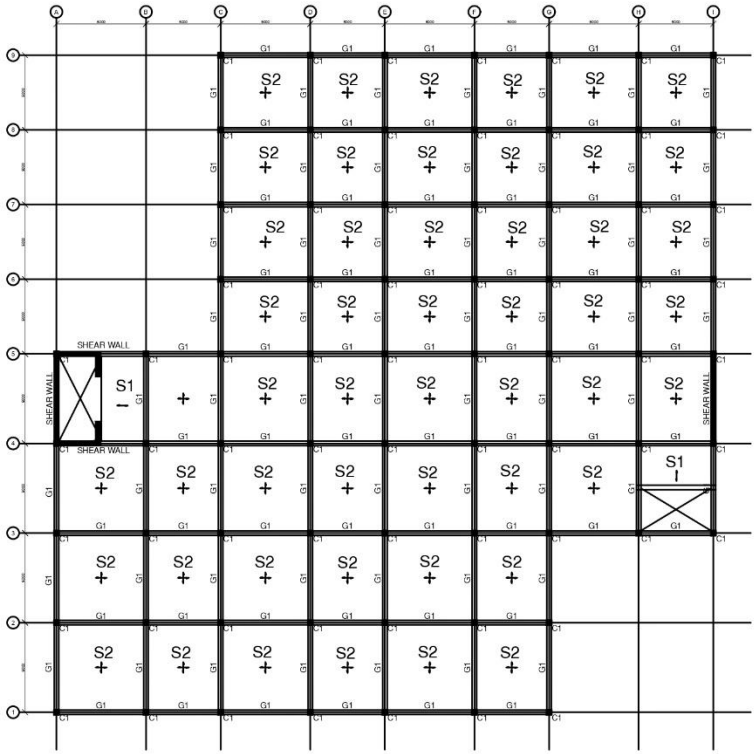

ROOF DECK FLOOR FRAMING PLAN

SCALE 1 : 100 MTS

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SCHOOL:	SUBMITTED TO:		
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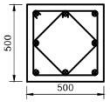
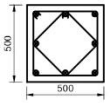
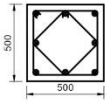
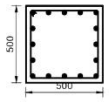
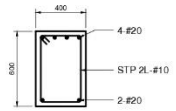
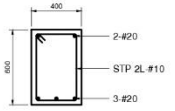
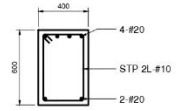
	C1
FOURTH FLOOR TO ROOF DECK	
SECTION	500 x 500
MAIN BARS	8 – 25mm ø
TIES DIAMETER	10mm ø
TIES SPACING	1 @ 50, 5 @ 100mm, REST @ 200mm O.C.
THIRD FLOOR TO FOURTH FLOOR	
SECTION	500 x 500
MAIN BARS	8 – 25mm ø
TIES DIAMETER	10mm ø
TIES SPACING	1 @ 50, 5 @ 100mm, REST @ 200mm O.C.
SECOND FLOOR TO THIRD FLOOR	
SECTION	500 x 500
MAIN BARS	8 – 25mm ø
TIES DIAMETER	10mm ø
TIES SPACING	1 @ 50, 6 @ 100mm, REST @ 200mm O.C.
GROUND FLOOR TO SECOND FLOOR	
SECTION	500 x 500
MAIN BARS	12 – 25mm ø
TIES DIAMETER	10mm ø
TIES SPACING	1 @ 50, 6 @ 100mm, REST @ 200mm O.C.

SCHEDULE OF BEAMS AND GIRDERS

BEAM DESIGNATION	AT LEFT SUPPORT	AT MIDSPAN	AT RIGHT SUPPORT	STIRRUPS SIZE AND SPACES
G-1				10MMØ - 1@50MM, 10@120, REST@240 O.C.

SCHEDULE OF CONCRETE SLABS

MARK	THICKNESS (mm)	BOTTOM BARS		TOP BARS				REMARKS
		SHORT DIRECTION	LONG DIRECTION	SHORT DIRECTION		LONG DIRECTION		
				CONTINUOUS EDGE	DISCONT. EDGE	CONTINUOUS EDGE	DISCONT. EDGE	
S-1	150	10@100	10@100	10@100	10@100	10@100	10@100	ONE WAY
S-2	150	10@200	10@200	10@200	10@200	10@200	10@200	TWO WAY

FOOTING SCHEDULE

FOOTING MARK	FOOTING DIMENSIONS (mm)				REINFORCEMENT		REMARKS
	LENGTH (mm)	WIDTH (mm)	DEPTH (mm)	THICKNESS (mm)	BAR X	BAR Y	
F-1	2500	2500	2000	500	10–20mmø@230mmO.C.	10–20mmø@230mmO.C.	ISOLATED FOOTING

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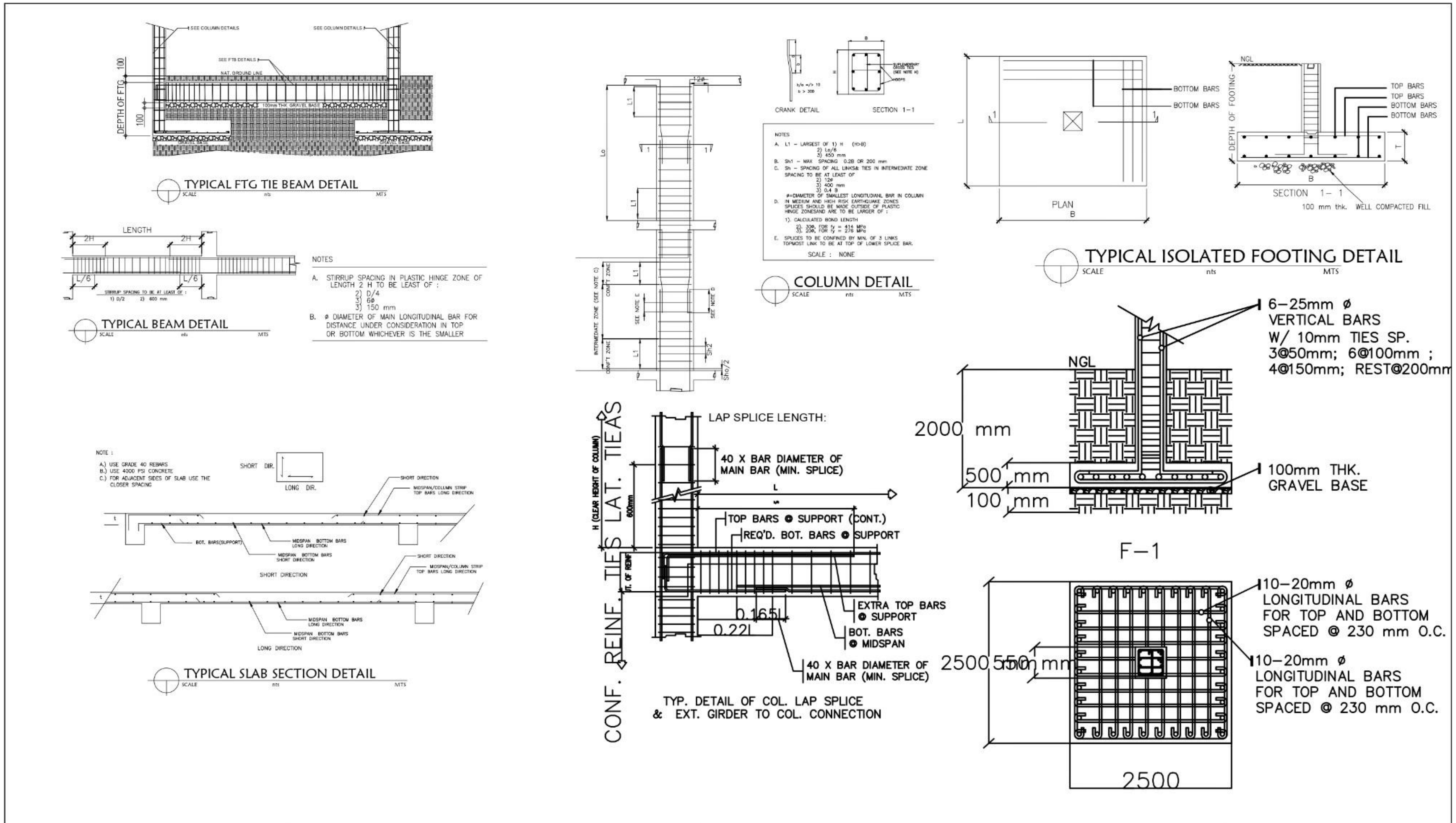

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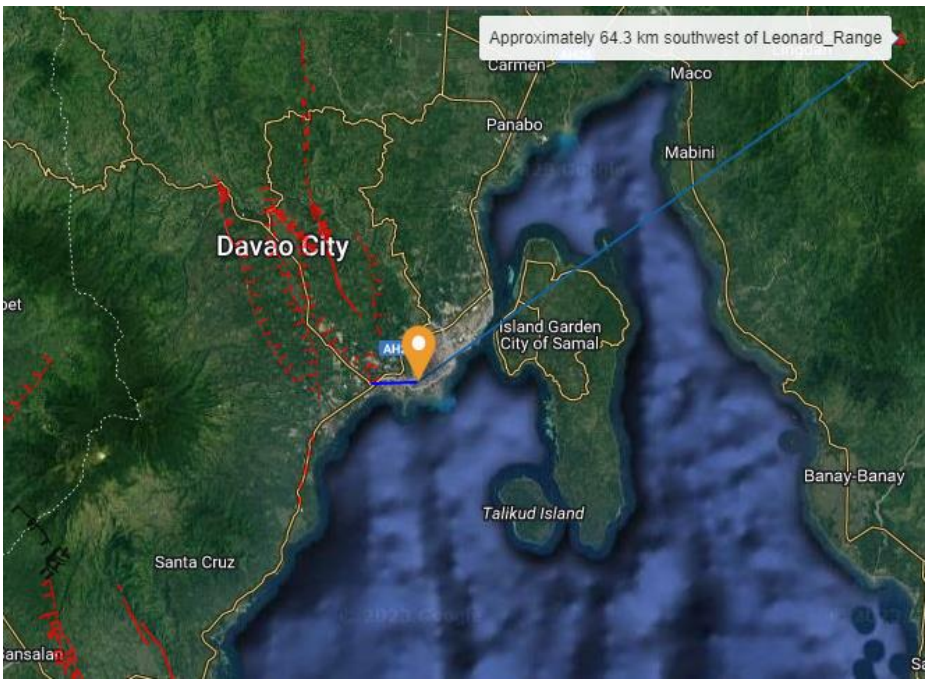
BCES 2 (7717)	PETER GINO PANGAPALAN		
SCHOOL:	SUBMITTED TO:		

HAZARD HUNTER, SHORT AND LONG PERIOD

VICINITY MAP FROM HAZARD HUNTER



COORDINATES:

7° 3' 24.43", 125° 35' 19.42"

Republic of the Philippines
Department of Science and Technology
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY

TQCSI ISO 9001:2015 Quality Certified PH059-QC

DATE	22 April 2023, 1:51 am
LOCATION	Davao City, Davao del Sur
COORDINATES	125.58867, 7.05698

Note: When scanning the QR code, the assessment results in the website might vary from the results stated in this report due to updates in the data in the GeoRiskPH database. You may refer to the report available upon scanning the QR code for the updated assessment results

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SEISMIC HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Ground Rupture	**Safe; Approximately 5 km east of the Central Davao Fault System: Dacudao Fault**	Active faults are faults that have moved within the last 10,000 years. An active fault may show evidence or may have documented history of recent movements. Ground rupture is a displacement along an active fault trace that reaches the surface. Ground rupture hazard assessment is the distance to the nearest known active fault. The recommended buffer zone, or Zone of Avoidance, against ground rupture hazard is at least 5 meters on both sides of the active fault or from its zone of deformation.
Ground Shaking	**Prone; Intensity VIII**	All sites may be affected by ground shaking in the event of an earthquake and can be mitigated by following the provisions of the National Building code and the Structural code of the Philippines.
Liquefaction	**Moderately Susceptible**	Liquefaction is a phenomenon wherein the ground, especially near the river, lake and coasts, behaves like liquid similar to quicksand due to very strong shaking. Liquefaction hazards can be mitigated by following the provisions of the National Building Code and the Structural Code of the Philippines.
Earthquake-Induced Landslide	**Safe**	Earthquake-induced landslides are the downward slope movement of rocks, solid and other debris commonly triggered by strong shaking.
Tsunami	**Data being updated**	A tsunami is a series of sea waves commonly generated by under-the-sea earthquakes.

Note:

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.
- In some areas, hazard assessment may be updated as new data become available for interpretation or as a result of major topographic changes due to onset of natural events.
- For site-specific evaluation or construction of critical facilities, detailed engineering assessment and onsite geotechnical engineering survey may be required.

Republic of the Philippines
Department of Science and Technology
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY

TQCSI ISO 9001:2015 Quality Certified PH059-QC

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VOLCANIC HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Nearest Active Volcano	**Approximately 64.3 km southwest of Leonard_Range**	Active volcanoes are those that erupted within historical times (within the last 600 years). Accounts of these eruptions were documented by man within the last 10,000 years based on the analyses of material from young volcanic deposits.
Ashfall	**Prone**	In case of future eruptions, the site may be affected by ash fallout, depending on the scale of eruption and prevailing wind direction at the time of eruption. Generally, ashfall is heavier near the active vent and thins out indefinitely away from the eruption center.

Note:

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.
- In some areas, hazard assessment may be updated as new data become available for interpretation or as a result of major topographic changes due to onset of natural events.
- For site-specific evaluation or construction of critical facilities, detailed engineering assessment and onsite geotechnical engineering survey may be required.

Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU

DATE	22 April 2023, 1:51 am
LOCATION	Davao City, Davao del Sur
COORDINATES	125.58867, 7.05698

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HYDRO-METEOROLOGICAL HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Flood	**Low Susceptibility; less than 0.5 meters flood height and/or less than 1 day flooding**	Areas with low susceptibility to floods are likely to experience flood heights of less than 0.5 meters and/or flood duration of less than 1 day. These include low hills and gentle slopes that have sparse to moderate drainage density. The implementation of appropriate mitigation measures as deemed necessary by project engineers and LGU building officials is recommended for areas that are susceptible to various flood depths. Site-specific studies including the assessment for other types of hazards should also be conducted to address potential foundation problems.

Note:

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.
- In some areas, hazard assessment may be updated as new data become available for interpretation or as a result of major topographic changes due to onset of natural events.
- The possibility of both rain-induced landslide and flooding occurring is not disregarded. Because of the composite nature of MGB's 1:10,000-scale Rain-induced Landslide and Flood Susceptibility Maps, it spatially prioritizes the more frequently occurring and most damaging hazards in an area. Continuous updating is being done.
- For site-specific evaluation or construction of critical facilities, detailed engineering assessment and onsite geotechnical engineering survey may be required.

Republic of the Philippines
Department of Science and Technology
PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION

DATE	22 April 2023, 1:51 am
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HYDRO-METEOROLOGICAL HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Severe Wind	**60.1 - 88 kph (20-year return period); 88.1 - 117 kph (500-year return period)**	The Regional Severe Wind Hazard Map represents the 3-second peak gust wind speed measured at 10-meter height (above ground) over open and flat terrain. This does not take into account the local factors such as topography, terrain roughness and shielding from neighbouring structures. The Regional Severe Wind Hazard is expressed in terms of Return Periods(RPs) of Tropical Cyclone winds. Return period means the repeat interval, or the estimate of likelihood and severity of severe wind event. Return periods are then translated into Annual Exceedance Probabilities (AEPs) which are the chance that a given severe wind hazard level will be equalled or exceeded in any year. At higher return periods, the wind speeds are stronger but are less frequent. At lower return periods, the wind speeds are less intense but are more frequent. The Regional severe wind hazard maps are used to update the wind zoning map of the Philippines and as reference in designing building structures. For those areas identified as high risk to wind damage, building codes/regulations must be strictly implemented to mitigate severe wind risks. For already developed areas, retrofitting is encouraged – the methods applied in this study can be used to set out a cost-benefit study for retrofitting older, more vulnerable building types to increase their resilience to severe winds.

Republic of the Philippines
Department of Science and Technology
PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION

DATE	22 April 2023, 1:51 am
LOCATION	Davao City, Davao del Sur
COORDINATES	125.58867, 7.05698

Note: When scanning the QR code, the assessment results in the website might vary from the results stated in this report due to updates in the data in the GeoRiskPH database. You may refer to the report available upon scanning the QR code for the updated assessment results

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HYDRO-METEOROLOGICAL HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Storm Surge	**Data are being updated**	A storm surge ("daluyong ng bagyo") is the abnormal rise in sea level that occurs during tropical cyclones or "bagyo". It happens when a very strong tropical cyclone blows-off excessive amounts of seawater toward low-lying coastal communities. It is catastrophic and life-threatening because a storm surge can cause massive inland flooding, sometimes in unimaginable heights. It is even more dangerous when the storm surge coincides with a high tide. For storm surge-prone communities, the most important considerations are 1) the strength of the tropical cyclone, 2) the height of the surge, and 3) if the community is located in a low-lying areas.

Note:

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.
- In some areas, hazard assessment may be updated as new data become available for interpretation or as a result of major topographic changes due to onset of natural events.
- For site-specific evaluation or construction of critical facilities, detailed engineering assessment and onsite geotechnical engineering survey may be required.

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NEAREST CRITICAL FACILITIES

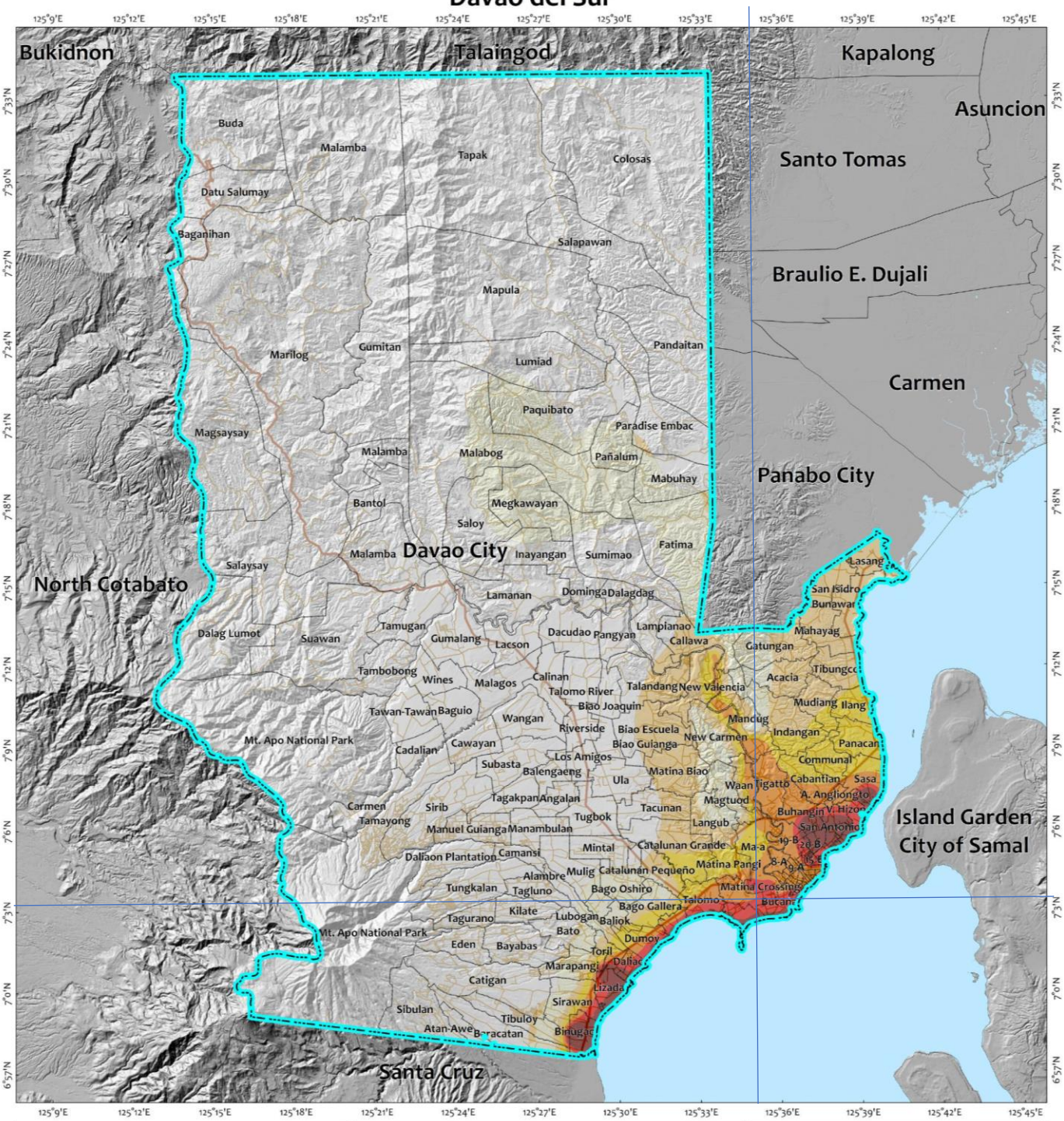
CRITICAL FACILITY NAME	TYPE	DISTANCE FROM SPECIFIED LOCATION
New Matina Es	Public Elementary School	1.4 km
Daniel R. Aguinaldo Nhs (matina Nhs)	Public Secondary School	2.1 km
Talomo North District Health Office	Government Health Facility	1.7 km
Community Health Development Cooperative Hospital	Private Health Facility	2 km
Davao-Cotabato Rd (Davao City-Jct Digos Sect); Davao City (first District)	Primary Road Network	404 m
ABS-CBN-Quimpo Blvd Div. Rd; Davao City (first District)	Secondary Road Network	600 m

Note:

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.
- In some areas, hazard assessment may be updated as new data become available for interpretation or as a result of major topographic changes due to onset of natural events.
- All computations are based on the available exposure data and the coordinates of the user's selected location
- Schools data obtained from Department of Education (2015)
- Health facilities data obtained from Department of Health (2016)

Short Period Microzonation Map

Davao City
Davao del Sur



Period in seconds

- > 1.00
- 0.81 - 1.00
- 0.61 - 0.80
- 0.41 - 0.60
- 0.21 - 0.40
- < 0.20
- No Data

- City/Municipal Boundary
- Barangay Boundary
- Roads / Highways
- National Road

Explanation

This map is interpolated from the results of Horizontal-to-Vertical Spectral Ratio (HVSR) performed in 177 sites at Metro Davao using HVSR Analysis (Nakamura, 1989) and Transfer Function Analysis (Haskell, 1953 & 1962). Data were obtained using a three-component microtremor instrument and refraction microtremor. The survey sites were mostly located in the coastal and populated areas of Davao City. This map can be used as a reference for building designs to avoid ground-to-building period resonance.

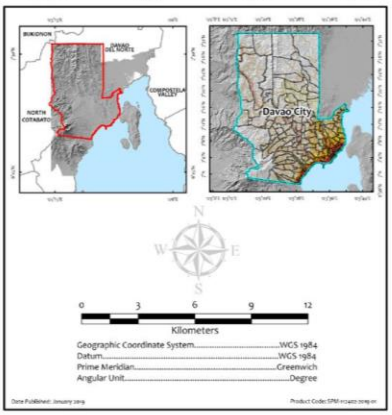
PHIVOLCS-DOST takes necessary steps to continually improve the accuracy of all information reflected in this map. The Short Period Microzonation Map of Davao City may be revised as new information becomes available.

Limitations

1. Survey area covers coastal lowlands and some portions of mountainous terrains in the metropolis.
2. All Short Period zone boundaries are approximate and gradational.
3. Administrative boundaries are approximate.
4. This map is semi-detailed. Hence, site specific evaluation is needed for construction of major structures and lifelines.

Data Source

1. Base map is from IFSAR-DTM, 2013.
2. Administrative boundaries are from City of Davao.
3. Roads and highways are from OpenStreetMap.



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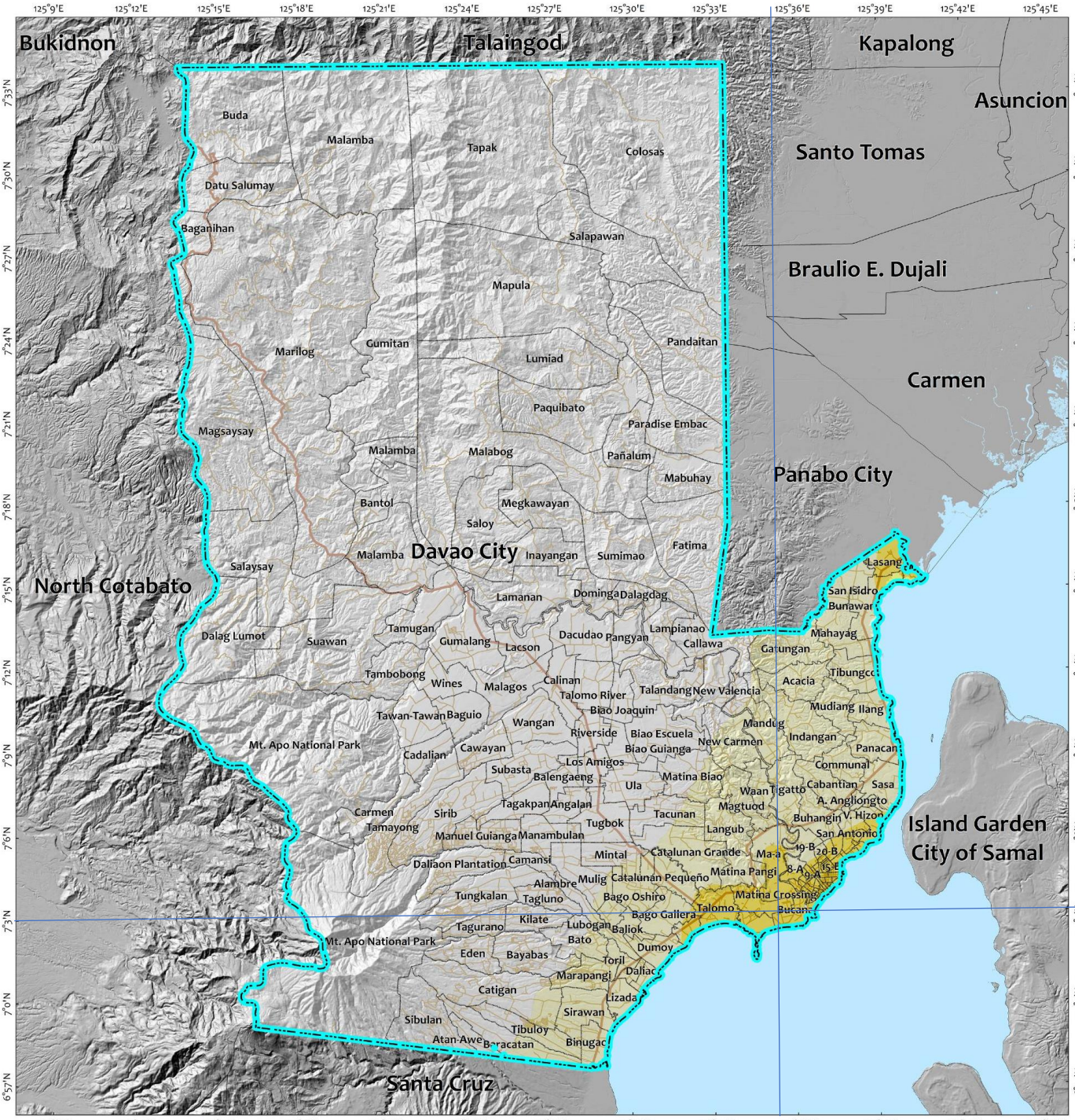
January 2019

Long Period Microzonation Map

Davao City
Davao del Sur



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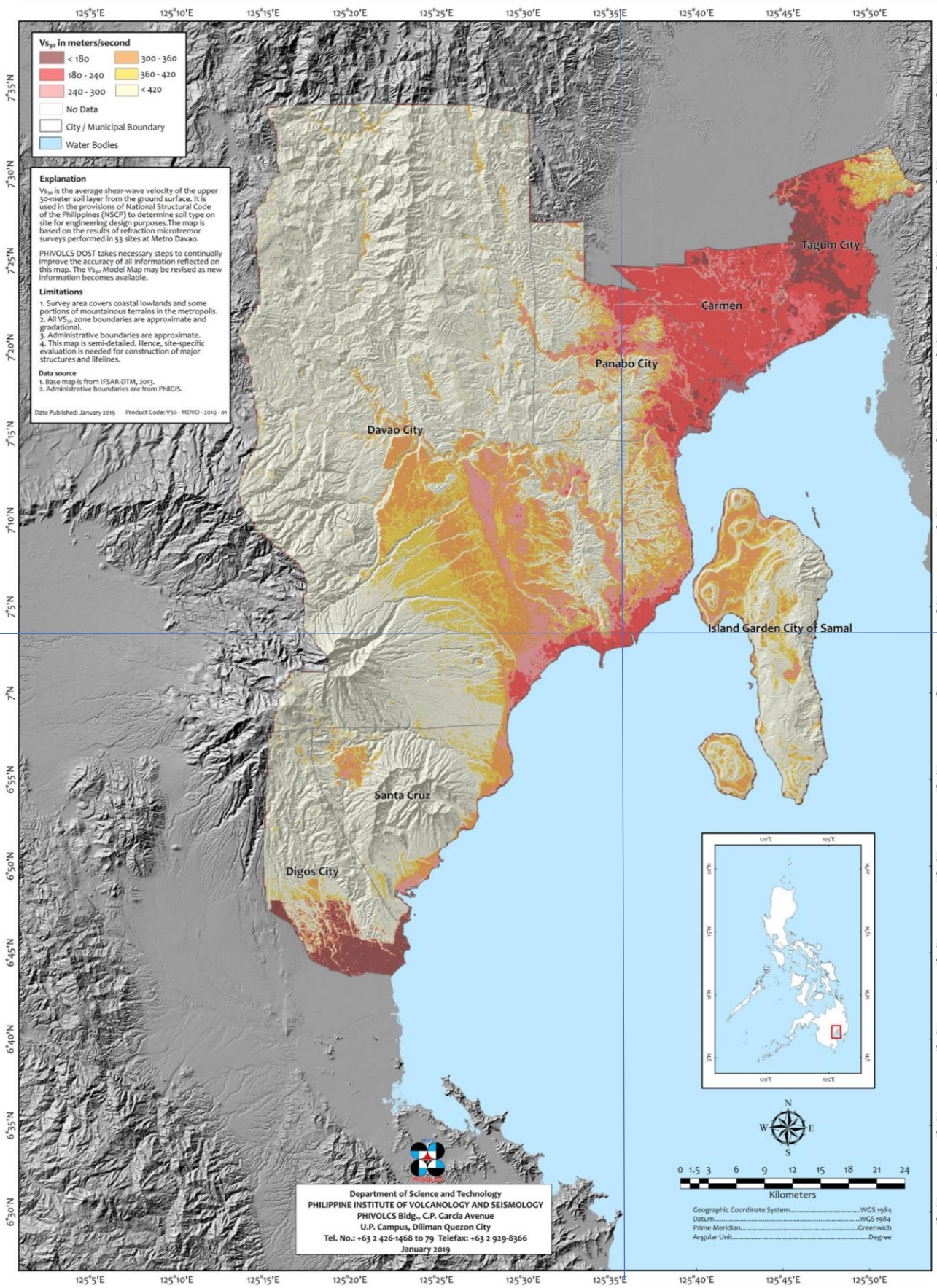
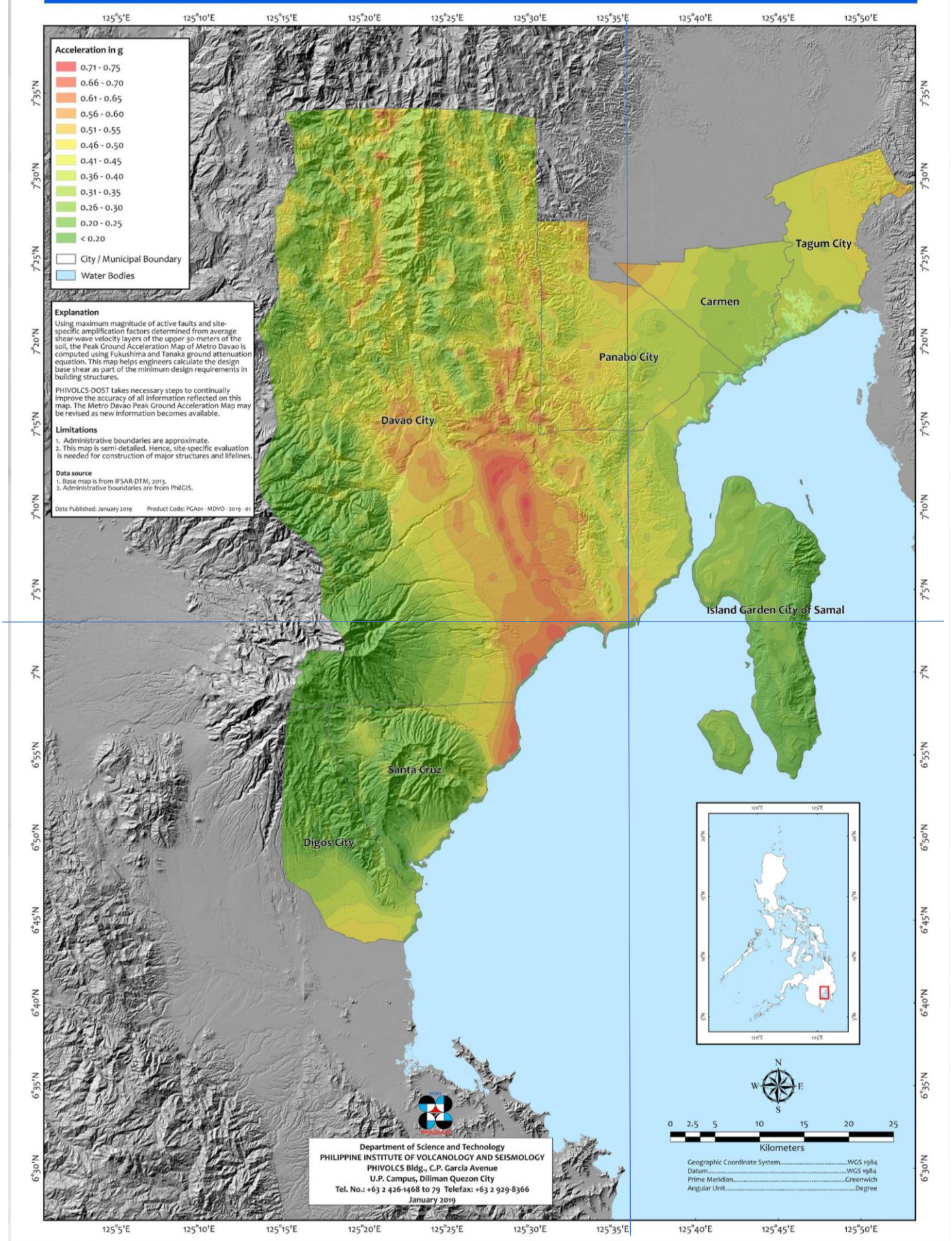
January 2019

Vs_{30} Model Map of Metro Davao



Peak Ground Acceleration Map of Metro Davao



VS30: 180 – 240 KM/S

PEAK GROUND ACCELERATION:0.51-0.55

SHORT PERIOD: 0.61-0.80

LONG PERIOD: 2.01 – 3.00

SEISMIC PARAMETERS

Table 208-1 - Seismic Importance Factors

Occupancy Category	Seismic Importance Factor, I	Seismic Importance Factor, Ip
I. Essential Facilities	1.5	1.5
II. Hazardous Facilities	1.25	1.5
III. Special Occupancy Structures	**1**	**1**
IV. Standard Occupancy Structures	1	1

Table 208-3 Seismic Zone Factor Z

ZONE	2	4
z	0.2	**0.4**

Table 208-4 Seismic Source Types

Seismic Source Type	Seismic Source Description	Seismic Source Definition
		Maximum Moment Magnitude, M
A	**Faults that are capable of producing large magnitude events and that have a high rate of seismic activity**	**7.0 ≤ M ≤ 8.4**
B	All faults other than type A and C	6.5 ≤ M ≤ 7.0
C	Faults that are not capable of producing large magnitude earthquakes and that have relatively low rate of seismic activity	M < 6.5

Table 208-11 A Earthquake-Force-Resisting Structural System of Concrete

Basic Seismic-Force Resisting System	R	Ωo	System Limitation and Building Height Limitaion by Seismic Zone, m	
			Zone 2	Zone 4
A.Bearing Wall Systems				
* Special Reinforce Concrete Shear Walls	4.5	2.8	NL	50
*Ordinary Reinforced Concrete Shear Walls	4.5	2.8	NL	NP
B. Building Frame Systems				
*Special reinforced concrete shear walls or	5	2.8	NL	75
*Ordinary Reinforced Concrete Shear Walls	5.6	2.2	NL	NP
*Intermediate precast shear walls or braced	5	2.5	NL	10
C.Moment Resisting Frame Systems				
*** Special reinforce concrete moment frames**	**8.5**	**2.8**	**NL**	**NL**

SOLUTIONS
(CENTER OF MASS AND RIGIDITY)

Center of Mass and Rigidity

FLOOR - 2 - X AXIS

Grid = 1

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -17.670\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^2 = -70.680\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 3.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -3906250000000.000\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 3.000 \cdot \frac{(500.000\ mm)^4}{12} = 15625000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 33.926\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 2

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 6.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 736.250\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 117.800\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 6.250\ m = 1627604166666666.656\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = 260416666666.667\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 6.250\ m\right) = 848.160\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 3

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 11.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 2.385\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 212.040$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 11.250\ m = 527343749999999.938\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 11.250\ m\right) = 2.799\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 4

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 17.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -3.658\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -212.040$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 17.250\ m = 808593749999999.875\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 17.250\ m\right) = -4.292\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 5

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 22.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -4.718\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -212.040\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 22.250\ m = 1.043\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 22.250\ m\right) = 5.536\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 6

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 28.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 5.990\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 212.040\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 28.250\ m = 1.324\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 28.250\ m\right) = 7.028\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 7

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 33.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -7.050\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -212.040\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 33.250\ m = -1.559\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 468750000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 33.250\ m\right) = 8.272\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 8

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 39.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -6.473\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -164.920\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 39.250\ m = -1.431\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ nan,\ nan] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 39.250\ m\right) = 7.102\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ nan,\ nan] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 180.941\ kN$$

Grid = 9

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 44.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 5.213\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 117.800\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 44.250\ m = 1.152\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = -26041666666.667\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ nan,\ nan] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 44.250\ m\right) = 8.007\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ nan,\ nan] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 180.941\ kN$$

$$\begin{aligned} AnDn_{SW_{Grid}} &= \Sigma\left(length \cdot distance \cdot width \cdot height \cdot \gamma_c\right) \\ &= \Sigma\left([6.000\ m,\ 500.000\ mm,\ 500.000\ mm,\ 6.000\ m] \cdot [250.000\ mm,\ 3.250\ m,\ 3.250\ m,\ 44.250\ m] \cdot 300.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3\right) \\ &= 7.641\ MN \cdot m \end{aligned}$$

$$\begin{aligned} An_{SW_{Grid}} &= \Sigma\left(length \cdot width \cdot height \cdot \gamma_c\right) \\ &= \Sigma\left([6.000\ m,\ 500.000\ mm,\ 500.000\ mm,\ 6.000\ m] \cdot 300.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3\right) \\ &= 367.536\ kN \end{aligned}$$

$$\begin{aligned} RnDn_{SW_{Grid}} &= \Sigma\left(\left(\frac{(length)^3 \cdot width}{12}\right) \cdot distance\right) \\ &\quad - \Sigma\left(\left(\frac{([6.000\ m,\ 500.000\ mm,\ 500.000\ mm,\ 6.000\ m])^3 \cdot 300.000\ mm}{12}\right) \cdot [250.000\ mm,\ 3.250\ m,\ 3.250\ m,\ 44.250\ m]\right) \\ &= 240.320\ m^5 \end{aligned}$$

$$\begin{aligned} Rn_{SW_{Grid}} &= \Sigma\left(\frac{(length)^2 \cdot width}{12}\right) \\ &= \Sigma\left(\frac{([6.000\ m,\ 500.000\ mm,\ 500.000\ mm,\ 6.000\ m])^3 \cdot 300.000\ mm}{12}\right) \\ &= 10.806\ m^4 \end{aligned}$$

$$\begin{aligned} AnDn_{Slab_{Grid}} &= \Sigma\left(area \cdot distance \cdot height \cdot \gamma_c\right) \\ &= \Sigma\left([1936.000\ m^2,\ -220.000\ m^2,\ -132.000\ m^2] \cdot [22.000\ m,\ 6.000\ m,\ 39.000\ m] \cdot 130.000\ mm \cdot 23.560\ kN/m^3\right) \\ &= 110.641\ MN \cdot m \end{aligned}$$

$$\begin{aligned} An_{Slab_{Grid}} &= \Sigma\left(area \cdot height \cdot \gamma_c\right) \\ &= \Sigma\left([1936.000\ m^2,\ 220.000\ m^2,\ 132.000\ m^2] \cdot 130.000\ mm \cdot 23.560\ kN/m^3\right) \\ &= 4.851\ MN \end{aligned}$$

$$\begin{aligned} AnDn_{Wall_{Grid}} &= \Sigma\left(length \cdot distance \cdot width \cdot height \cdot \gamma_c \cdot 0.7\right) \\ &= \Sigma\left([nan,\ nan,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ nan,\ nan,\ nan,\ nan,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m] \cdot [nan,\ nan,\ nan,\ nan,\ 250.000\ mm,\ 250.000\ mm,\ 250.000\ mm,\ 250.000\ mm,\ 250.000\ mm,\ 44.250\ m,\ 44.250\ m,\ 44.250\ m,\ 44.250\ m,\ 44.250\ m,\ 44.250\ m,\ 44.250\ m,\ nan,\ nan,\ 11.250\ m,\ 11.250\ m,\ 11.250\ m,\ 11.250\ m,\ 11.250\ m,\ 11.250\ m,\ 11.250\ m,\ 11.250\ m,\ 11.250\ m] \cdot 150.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 \cdot 0.7\right) \\ &= 22.348\ MN \cdot m \end{aligned}$$

$$\begin{aligned} An_{Wall_{Grid}} &= \Sigma\left(length \cdot width \cdot height \cdot \gamma_c \cdot 0.7\right) \\ &= \Sigma\left([nan,\ nan,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ nan,\ nan,\ nan,\ nan,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m] \cdot 150.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 \cdot 0.7\right) \\ &= 1.108\ MN \end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Col_{Total}} &= \Sigma\left(\text{AnDn}_{Col}\right)\\ &= \Sigma\left([17.670\ \text{kN}\cdot\text{m},\ 736.250\ \text{kN}\cdot\text{m},\ 2.385\ \text{MN}\cdot\text{m},\ 3.658\ \text{MN}\cdot\text{m},\ 4.718\ \text{MN}\cdot\text{m},\ 5.990\ \text{MN}\cdot\text{m},\ 7.050\ \text{MN}\cdot\text{m},\ 6.473\ \text{MN}\cdot\text{m},\ 5.213\ \text{MN}\cdot\text{m}]\right)\\ &= 36.241\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Col_{Total}} &= \Sigma\left(\text{An}_{Col}\right)\\ &= \Sigma\left([70.680\ \text{kN},\ 117.800\ \text{kN},\ 212.040\ \text{kN},\ 212.040\ \text{kN},\ 212.040\ \text{kN},\ 212.040\ \text{kN},\ 212.040\ \text{kN},\ 164.920\ \text{kN},\ 117.800\ \text{kN}]\right)\\ &= 1.531\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{Col_{Total}} &= \Sigma\left(\text{RnDn}_{Col}\right)\\ &= \Sigma\left([3900250000000.000\ \text{mm}^5,\ 1627604116666666.656\ \text{mm}^5,\ 527343749999999.938\ \text{mm}^5,\ 808593749999999.875\ \text{mm}^5,\ 1.043\ \text{m}^5,\ 1.324\ \text{m}^5,\ 1.559\ \text{m}^5,\ 1.431\ \text{m}^5,\ 1.152\ \text{m}^5]\right)\\ &= 8.012\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{Col_{Total}} &= \Sigma\left(\text{Rn}_{Col}\right)\\ &= \Sigma\left([15625000000.000\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 36458333333.333\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4]\right)\\ &= 338541666666.667\ \text{mm}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Beam_{Total}} &= \Sigma\left(\text{AnDn}_{Beam}\right)\\ &= \Sigma\left([33.926\ \text{kN}\cdot\text{m},\ 848.160\ \text{kN}\cdot\text{m},\ 2.799\ \text{MN}\cdot\text{m},\ 4.292\ \text{MN}\cdot\text{m},\ 5.536\ \text{MN}\cdot\text{m},\ 7.028\ \text{MN}\cdot\text{m},\ 8.272\ \text{MN}\cdot\text{m},\ 7.102\ \text{MN}\cdot\text{m},\ 8.007\ \text{MN}\cdot\text{m}]\right)\\ &= 43.918\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Beam_{Total}} &= \Sigma\left(\text{An}_{Beam}\right)\\ &= \Sigma\left([135.706\ \text{kN},\ 135.706\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 180.941\ \text{kN},\ 180.941\ \text{kN}]\right)\\ &= 1.877\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{SW_{Total}} &= \Sigma\left(\text{AnDn}_{SW}\right)\\ &= \Sigma\left([7.641\ \text{MN}\cdot\text{m}]\right)\\ &= 7.641\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{SW_{Total}} &= \Sigma\left(\text{An}_{SW}\right)\\ &= \Sigma\left([367.536\ \text{kN}]\right)\\ &= 367.536\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{SW_{Total}} &= \Sigma\left(\text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(240.320\ \text{m}^5\right)\\ &= 240.320\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{SW_{Total}} &= \Sigma\left(\text{Rn}_{SW}\right)\\ &= \Sigma\left([10.806\ \text{m}^4]\right)\\ &= 10.806\ \text{m}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Slab_{Total}} &= \Sigma\left(\text{AnDn}_{Slab}\right)\\ &= \Sigma\left([110.641\ \text{MN}\cdot\text{m}]\right)\\ &= 110.641\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Slab_{Total}} &= \Sigma\left(\text{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \text{MN}]\right)\\ &= 4.851\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Wall_{Total}} &= \Sigma\left(\text{AnDn}_{Wall}\right)\\ &= \Sigma\left([22.348\ \text{MN}\cdot\text{m}]\right)\\ &= 22.348\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Wall_{Total}} &= \Sigma\left(\text{An}_{Wall}\right)\\ &= \Sigma\left([1.108\ \text{MN}]\right)\\ &= 1.108\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn} &= \Sigma\left(\text{AnDn}_{Col_{Total}} + \text{AnDn}_{SW_{Total}} + \text{AnDn}_{Slab_{Total}} + \text{AnDn}_{Wall_{Total}} + \text{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(36.241\ \text{MN}\cdot\text{m} + 7.641\ \text{MN}\cdot\text{m} + 110.641\ \text{MN}\cdot\text{m} + 22.348\ \text{MN}\cdot\text{m} + 43.918\ \text{MN}\cdot\text{m}\right)\\ &= 220.788\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Au} &= \Sigma\left(\text{Au}_{Col_{Total}} + \text{Au}_{SW_{Total}} + \text{Au}_{Slab_{Total}} + \text{Au}_{Wall_{Total}} + \text{Au}_{Beam_{Total}}\right)\\ &= \Sigma\left(1.531\ \text{MN} + 367.536\ \text{kN} + 4.851\ \text{MN} + 1.108\ \text{MN} + 1.877\ \text{MN}\right)\\ &= 9.736\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn} &= \Sigma\left(\text{RnDn}_{Col_{Total}} + \text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(8.012\ \text{m}^5 + 240.320\ \text{m}^5\right)\\ &= 248.332\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn} &= \Sigma\left(\text{Rn}_{Col_{Total}} + \text{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(338541666666.667\ \text{mm}^4 + 10.806\ \text{m}^4\right)\\ &= 11.145\ \text{m}^4\end{aligned}$$

$$\begin{aligned}C_m &= \frac{\Sigma\left(\text{AnDn}\right)}{\Sigma\left(\text{Au}\right)}\\ &= \frac{\Sigma\left(220.788\ \text{MN}\cdot\text{m}\right)}{\Sigma\left(9.736\ \text{MN}\right)}\\ &= 22.678\ \text{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\text{RnDn}\right)}{\Sigma\left(\text{Rn}\right)}\\ &= \frac{\Sigma\left(248.332\ \text{m}^5\right)}{\Sigma\left(11.145\ \text{m}^4\right)}\\ &= 22.282\ \text{m}\end{aligned}$$

FLOOR - 3 - X AXIS

Grid = 1

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -15.461\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -61.845\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 3.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -3906250000000.000\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 3.000 \cdot \frac{(500.000\ mm)^4}{12} = 156250000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 33.926\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 2

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 6.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -644.219\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -103.075\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 6.250\ m = -162760416666666.656\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = -26041666666.667\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 6.250\ m\right) = 848.160\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 3

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 11.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 2.087\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 185.535$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 11.250\ m = 527343749999999.938\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 11.250\ m\right) = 2.799\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 4

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 17.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 3.200\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 185.535$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 17.250\ m = 808593749999999.875\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 17.250\ m\right) = 4.292\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 5

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 22.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 4.128\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 22.250\ m = 1.043\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 22.250\ m\right) = 5.536\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 6

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 28.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -5.241\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 28.250\ m = 1.324\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 28.250\ m\right) = 7.028\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 7

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 33.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 6.169\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 185.535\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 33.250\ m = 1.559\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 33.250\ m\right) = 8.272\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 8

$$\mathrm{AnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 39.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -5.664\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -144.305\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 7.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 39.250\ \mathrm{m} = -1.431\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 364583333333.333\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 39.250\ \mathrm{m}\right) = 7.102\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 180.941\ \mathrm{kN}$$

Grid = 9

$$\mathrm{AnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 44.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -1.561\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -103.075\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 5.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 44.250\ \mathrm{m} = -1.152\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = -26041666666.667\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 44.250\ \mathrm{m}\right) = 8.007\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 180.941\ \mathrm{kN}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}] \cdot [250.000\ \mathrm{mm},\ 3.250\ \mathrm{m},\ 3.250\ \mathrm{m},\ 44.250\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 6.685\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2}\right)\\ &= 321.594\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Grid}} &= \Sigma\left(\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right) \cdot \mathrm{distance}\right)\\ &= \Sigma\left(\left(\frac{([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right) \cdot [250.000\ \mathrm{mm},\ 3.250\ \mathrm{m},\ 3.250\ \mathrm{m},\ 44.250\ \mathrm{m}]\right)\\ &= 240.320\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Grid}} &= \Sigma\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right)\\ &= \Sigma\left(\frac{([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right)\\ &= 10.806\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Grid}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{distance} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ -220.000\ \mathrm{m^2},\ -132.000\ \mathrm{m^2}] \cdot [22.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 39.000\ \mathrm{m}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 110.641\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Grid}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ 220.000\ \mathrm{m^2},\ 132.000\ \mathrm{m^2}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Wall_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m}] \cdot [nan,\ nan,\ nan,\ nan,\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ nan,\ nan,\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m}] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} \cdot 0.7\right)\\ &= -19.555\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Wall_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m}] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 969.730\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Col_{Total}} &= \Sigma\left(\text{AnDn}_{Col}\right)\\ &= \Sigma\left([15.461\ \text{kN}\cdot\text{m},\ 644.219\ \text{kN}\cdot\text{m},\ 2.087\ \text{MN}\cdot\text{m},\ 3.200\ \text{MN}\cdot\text{m},\ 4.128\ \text{MN}\cdot\text{m},\ 5.241\ \text{MN}\cdot\text{m},\ 6.169\ \text{MN}\cdot\text{m},\ 5.664\ \text{MN}\cdot\text{m},\ 4.561\ \text{MN}\cdot\text{m}]\right)\\ &= 31.711\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Col_{Total}} &= \Sigma\left(\text{An}_{Col}\right)\\ &= \Sigma\left([61.845\ \text{kN},\ 103.075\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 144.305\ \text{kN},\ 103.075\ \text{kN}]\right)\\ &= 1.340\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{Col_{Total}} &= \Sigma\left(\text{RnDn}_{Col}\right)\\ &= \Sigma\left([3906250000000.000\ \text{mm}^5,\ 1627604166666666.656\ \text{mm}^5,\ 527343749999999.938\ \text{mm}^5,\ 808593749999999.875\ \text{mm}^5,\ 1.043\ \text{m}^5,\ 1.324\ \text{m}^5,\ 1.559\ \text{m}^5,\ 1.431\ \text{m}^5,\ 1.152\ \text{m}^5]\right)\\ &= 8.012\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{Col_{Total}} &= \Sigma\left(\text{Rn}_{Col}\right)\\ &= \Sigma\left([15625000000.000\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 36458333333.333\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4]\right)\\ &= 338541666666.667\ \text{mm}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Beam_{Total}} &= \Sigma\left(\text{AnDn}_{Beam}\right)\\ &= \Sigma\left([33.926\ \text{kN}\cdot\text{m},\ 848.160\ \text{kN}\cdot\text{m},\ 2.799\ \text{MN}\cdot\text{m},\ 4.292\ \text{MN}\cdot\text{m},\ 5.536\ \text{MN}\cdot\text{m},\ 7.028\ \text{MN}\cdot\text{m},\ 8.272\ \text{MN}\cdot\text{m},\ 7.102\ \text{MN}\cdot\text{m},\ 8.007\ \text{MN}\cdot\text{m}]\right)\\ &= 43.918\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Beam_{Total}} &= \Sigma\left(\text{An}_{Beam}\right)\\ &= \Sigma\left([135.706\ \text{kN},\ 135.706\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 180.941\ \text{kN},\ 180.941\ \text{kN}]\right)\\ &= 1.877\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{SW_{Total}} &= \Sigma\left(\text{AnDn}_{SW}\right)\\ &= \Sigma\left([6.685\ \text{MN}\cdot\text{m}]\right)\\ &= 6.685\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{SW_{Total}} &= \Sigma\left(\text{An}_{SW}\right)\\ &= \Sigma\left([321.594\ \text{kN}]\right)\\ &= 321.594\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{SW_{Total}} &= \Sigma\left(\text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(240.320\ \text{m}^5\right)\\ &= 240.320\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{SW_{Total}} &= \Sigma\left(\text{Rn}_{SW}\right)\\ &= \Sigma\left([10.806\ \text{m}^4]\right)\\ &= 10.806\ \text{m}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Slab_{Total}} &= \Sigma\left(\text{AnDn}_{Slab}\right)\\ &= \Sigma\left([110.641\ \text{MN}\cdot\text{m}]\right)\\ &= 110.641\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Slab_{Total}} &= \Sigma\left(\text{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \text{MN}]\right)\\ &= 4.851\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Wall_{Total}} &= \Sigma\left(\text{AnDn}_{Wall}\right)\\ &= \Sigma\left([19.555\ \text{MN}\cdot\text{m}]\right)\\ &= 19.555\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Wall_{Total}} &= \Sigma\left(\text{An}_{Wall}\right)\\ &= \Sigma\left([969.730\ \text{kN}]\right)\\ &= 969.730\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn} &= \Sigma\left(\text{AnDn}_{Col_{Total}} + \text{AnDn}_{SW_{Total}} + \text{AnDn}_{Slab_{Total}} + \text{AnDn}_{Wall_{Total}} + \text{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(31.711\ \text{MN}\cdot\text{m} + 6.685\ \text{MN}\cdot\text{m} + 110.641\ \text{MN}\cdot\text{m} + 19.555\ \text{MN}\cdot\text{m} + 43.918\ \text{MN}\cdot\text{m}\right)\\ &= 212.510\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An} &= \Sigma\left(\text{An}_{Col_{Total}} + \text{An}_{SW_{Total}} + \text{An}_{Slab_{Total}} + \text{An}_{Wall_{Total}} + \text{An}_{Beam_{Total}}\right)\\ &= \Sigma\left(1.340\ \text{MN} + 321.594\ \text{kN} + 4.851\ \text{MN} + 969.730\ \text{kN} + 1.877\ \text{MN}\right)\\ &= 9.360\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn} &= \Sigma\left(\text{RnDn}_{Col_{Total}} + \text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(8.012\ \text{m}^5 + 240.320\ \text{m}^5\right)\\ &= 248.332\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn} &= \Sigma\left(\text{Rn}_{Col_{Total}} + \text{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(338541666666.667\ \text{mm}^4 + 10.806\ \text{m}^4\right)\\ &= 11.145\ \text{m}^4\end{aligned}$$

$$\begin{aligned}C_{oo} &= \frac{\Sigma\left(\text{AnDn}\right)}{\Sigma\left(\text{An}\right)}\\ &= \frac{\Sigma\left(212.510\ \text{MN}\cdot\text{m}\right)}{\Sigma\left(9.360\ \text{MN}\right)}\\ &= 22.704\ \text{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\text{RnDn}\right)}{\Sigma\left(\text{Rn}\right)}\\ &= \frac{\Sigma\left(248.332\ \text{m}^5\right)}{\Sigma\left(11.145\ \text{m}^4\right)}\\ &= 22.282\ \text{m}\end{aligned}$$

FLOOR - 4 - X AXIS

Grid = 1

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -15.461\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = -61.845\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 3.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -3906250000000.000\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 3.000 \cdot \frac{(500.000\ mm)^4}{12} = 15625000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 33.926\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 2

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 6.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -644.219\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = -103.075\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 6.250\ m = -162760416666666.656\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = -26041666666.667\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 6.250\ m\right) = 848.160\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 3

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 11.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 2.087\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = 185.535$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 11.250\ m = 527343749999999.938\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 11.250\ m\right) = 2.799\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 4

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 17.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 3.200\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 185.535$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 17.250\ m = 808593749999999.875\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 17.250\ m\right) = 4.292\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 5

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 22.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = 4.128\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 22.250\ m = 1.043\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 22.250\ m\right) = 5.536\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 6

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 28.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = -5.241\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 28.250\ m = 1.324\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 28.250\ m\right) = 7.028\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 7

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 33.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 6.169\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 185.535\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 33.250\ m = 1.559\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 33.250\ m\right) = 8.272\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 8

$$\mathrm{AnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 39.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -5.664\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -144.305\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 7.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 39.250\ \mathrm{m} = -1.431\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 364583333333.333\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 39.250\ \mathrm{m}\right) = 7.102\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 180.941\ \mathrm{kN}$$

Grid = 9

$$\mathrm{AnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 44.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -1.561\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -103.075\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 5.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 44.250\ \mathrm{m} = -1.152\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 26041666666.667\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 44.250\ \mathrm{m}\right) = 8.007\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 180.941\ \mathrm{kN}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}] \cdot [250.000\ \mathrm{mm},\ 3.250\ \mathrm{m},\ 3.250\ \mathrm{m},\ 44.250\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 6.685\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2}\right)\\ &= 321.594\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Grid}} &= \Sigma\left(\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right) \cdot \mathrm{distance}\right)\\ &= \Sigma\left(\left(\frac{([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right) \cdot [250.000\ \mathrm{mm},\ 3.250\ \mathrm{m},\ 3.250\ \mathrm{m},\ 44.250\ \mathrm{m}]\right)\\ &= 240.320\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Grid}} &= \Sigma\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right)\\ &= \Sigma\left(\frac{([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right)\\ &= 10.806\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Grid}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{distance} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ -220.000\ \mathrm{m^2},\ -132.000\ \mathrm{m^2}] \cdot [22.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 39.000\ \mathrm{m}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 110.641\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Grid}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ 220.000\ \mathrm{m^2},\ 132.000\ \mathrm{m^2}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Wall_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m}] \cdot [nan,\ nan,\ nan,\ nan,\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ nan,\ nan,\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m}] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} \cdot 0.7\right)\\ &= -19.555\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Wall_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m}] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 969.730\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Col_{Total}} &= \Sigma\left(\text{AnDn}_{Col}\right)\\ &= \Sigma\left([15.461\ \text{kN}\cdot\text{m},\ 644.219\ \text{kN}\cdot\text{m},\ 2.087\ \text{MN}\cdot\text{m},\ 3.200\ \text{MN}\cdot\text{m},\ 4.128\ \text{MN}\cdot\text{m},\ 5.241\ \text{MN}\cdot\text{m},\ 6.169\ \text{MN}\cdot\text{m},\ 5.664\ \text{MN}\cdot\text{m},\ 4.561\ \text{MN}\cdot\text{m}]\right)\\ &= 31.711\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Col_{Total}} &= \Sigma\left(\text{An}_{Col}\right)\\ &= \Sigma\left([61.845\ \text{kN},\ 103.075\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 185.535\ \text{kN},\ 144.305\ \text{kN},\ 103.075\ \text{kN}]\right)\\ &= 1.340\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{Col_{Total}} &= \Sigma\left(\text{RnDn}_{Col}\right)\\ &= \Sigma\left([3902250000000.000\ \text{mm}^5,\ 1627604116666666.656\ \text{mm}^5,\ 527343749999999.938\ \text{mm}^5,\ 808593749999999.875\ \text{mm}^5,\ 1.043\ \text{m}^5,\ 1.324\ \text{m}^5,\ 1.559\ \text{m}^5,\ 1.431\ \text{m}^5,\ 1.152\ \text{m}^5]\right)\\ &= 8.012\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{Col_{Total}} &= \Sigma\left(\text{Rn}_{Col}\right)\\ &= \Sigma\left([15625000000.000\ \text{mm}^4,\ 26041666666.667\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 36458333333.333\ \text{mm}^4,\ 26041666666.667\ \text{mm}^4]\right)\\ &= 338541666666.667\ \text{mm}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Beam_{Total}} &= \Sigma\left(\text{AnDn}_{Beam}\right)\\ &= \Sigma\left([33.926\ \text{kN}\cdot\text{m},\ 848.160\ \text{kN}\cdot\text{m},\ 2.799\ \text{MN}\cdot\text{m},\ 4.292\ \text{MN}\cdot\text{m},\ 5.536\ \text{MN}\cdot\text{m},\ 7.028\ \text{MN}\cdot\text{m},\ 8.272\ \text{MN}\cdot\text{m},\ 7.102\ \text{MN}\cdot\text{m},\ 8.007\ \text{MN}\cdot\text{m}]\right)\\ &= 43.918\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Beam_{Total}} &= \Sigma\left(\text{An}_{Beam}\right)\\ &= \Sigma\left([135.706\ \text{kN},\ 135.706\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 180.941\ \text{kN},\ 180.941\ \text{kN}]\right)\\ &= 1.877\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{SW_{Total}} &= \Sigma\left(\text{AnDn}_{SW}\right)\\ &= \Sigma\left([6.685\ \text{MN}\cdot\text{m}]\right)\\ &= 6.685\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{SW_{Total}} &= \Sigma\left(\text{An}_{SW}\right)\\ &= \Sigma\left([321.594\ \text{kN}]\right)\\ &= 321.594\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{SW_{Total}} &= \Sigma\left(\text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(240.320\ \text{m}^5\right)\\ &= 240.320\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{SW_{Total}} &= \Sigma\left(\text{Rn}_{SW}\right)\\ &= \Sigma\left([10.806\ \text{m}^4]\right)\\ &= 10.806\ \text{m}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Slab_{Total}} &= \Sigma\left(\text{AnDn}_{Slab}\right)\\ &= \Sigma\left([110.641\ \text{MN}\cdot\text{m}]\right)\\ &= 110.641\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Slab_{Total}} &= \Sigma\left(\text{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \text{MN}]\right)\\ &= 4.851\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Wall_{Total}} &= \Sigma\left(\text{AnDn}_{Wall}\right)\\ &= \Sigma\left([19.555\ \text{MN}\cdot\text{m}]\right)\\ &= 19.555\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Wall_{Total}} &= \Sigma\left(\text{An}_{Wall}\right)\\ &= \Sigma\left([969.730\ \text{kN}]\right)\\ &= 969.730\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn} &= \Sigma\left(\text{AnDn}_{Col_{Total}} + \text{AnDn}_{SW_{Total}} + \text{AnDn}_{Slab_{Total}} + \text{AnDn}_{Wall_{Total}} + \text{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(31.711\ \text{MN}\cdot\text{m} + 6.685\ \text{MN}\cdot\text{m} + 110.641\ \text{MN}\cdot\text{m} + 19.555\ \text{MN}\cdot\text{m} + 43.918\ \text{MN}\cdot\text{m}\right)\\ &= 212.510\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An} &= \Sigma\left(\text{An}_{Col_{Total}} + \text{An}_{SW_{Total}} + \text{An}_{Slab_{Total}} + \text{An}_{Wall_{Total}} + \text{An}_{Beam_{Total}}\right)\\ &= \Sigma\left(1.340\ \text{MN} + 321.594\ \text{kN} + 4.851\ \text{MN} + 969.730\ \text{kN} + 1.877\ \text{MN}\right)\\ &= 9.360\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn} &= \Sigma\left(\text{RnDn}_{Col_{Total}} + \text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(8.012\ \text{m}^5 + 240.320\ \text{m}^5\right)\\ &= 248.332\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn} &= \Sigma\left(\text{Rn}_{Col_{Total}} + \text{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(338541666666.667\ \text{mm}^4 + 10.806\ \text{m}^4\right)\\ &= 11.145\ \text{m}^4\end{aligned}$$

$$\begin{aligned}C_{oo} &= \frac{\Sigma\left(\text{AnDn}\right)}{\Sigma\left(\text{An}\right)}\\ &= \frac{\Sigma\left(212.510\ \text{MN}\cdot\text{m}\right)}{\Sigma\left(9.360\ \text{MN}\right)}\\ &= 22.704\ \text{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\text{RnDn}\right)}{\Sigma\left(\text{Rn}\right)}\\ &= \frac{\Sigma\left(248.332\ \text{m}^5\right)}{\Sigma\left(11.145\ \text{m}^4\right)}\\ &= 22.282\ \text{m}\end{aligned}$$

FLOOR - Roof Deck - X AXIS

Grid = 1

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -7.731\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 3.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^2 = -30.922\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 3.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -3906250000000.000\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 3.000 \cdot \frac{(500.000\ mm)^4}{12} = 15625000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 33.926\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 2

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 6.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -322.109\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^2 = -51.538\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 6.250\ m = -1627604166666666.656\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = -260416666666.667\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 6.250\ m\right) = 848.160\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ nan,\ nan,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 135.706\ kN$$

Grid = 3

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 11.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 1.044\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^2 = 92.767$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 11.250\ m = 5273437499999999.938\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 11.250\ m\right) = 2.799\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 4

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 17.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 1.600\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 92.767$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 17.250\ m = 8085937499999999.875\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 17.250\ m\right) = 4.292\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = 5

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 22.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 2.064\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -92.767\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 22.250\ m = 1.043\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 22.250\ m\right) = 5.536\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 6

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 28.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -2.621\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -92.767\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 28.250\ m = 1.324\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 28.250\ m\right) = 7.028\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 7

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 33.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 3.085\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 92.767\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 33.250\ m = 1.559\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 33.250\ m\right) = 8.272\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 5.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m,\ 6.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = 8

$$\mathrm{AnDn_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \mathrm{distance} \cdot \mathrm{length_{col}} \cdot \mathrm{width_{col}} \cdot \mathrm{height_{col}} \cdot \gamma_c = 7.000 \cdot 39.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -2.832\ \mathrm{MN \cdot m}$$

$$\mathrm{An_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \mathrm{length_{col}} \cdot \mathrm{width_{col}} \cdot \mathrm{height_{col}} \cdot \gamma_c = 7.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -72.153\ \mathrm{kN}$$

$$\mathrm{RnDn_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \left(\frac{(\mathrm{length_{col}})^4}{12}\right) \cdot \mathrm{distance} = 7.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 39.250\ \mathrm{m} = -1.431\ \mathrm{m^5}$$

$$\mathrm{Rn_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \frac{(\mathrm{length_{col}})^4}{12} = 7.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 364583333333.333\ \mathrm{mm^4}$$

$$\mathrm{AnXn_{Beam_{Grid}}} = \Sigma\left(\mathrm{length_{girder}} \cdot \mathrm{width_{girder}} \cdot \mathrm{height_{girder}} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 39.250\ \mathrm{m}\right) = 7.102\ \mathrm{MN \cdot m}$$

$$\mathrm{An_{Beam_{Grid}}} = \Sigma\left(\mathrm{length_{girder}} \cdot \mathrm{width_{girder}} \cdot \mathrm{height_{girder}} \cdot \gamma_c\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 180.941\ \mathrm{kN}$$

Grid = 9

$$\mathrm{AnDn_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \mathrm{distance} \cdot \mathrm{length_{col}} \cdot \mathrm{width_{col}} \cdot \mathrm{height_{col}} \cdot \gamma_c = 5.000 \cdot 44.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -2.281\ \mathrm{MN \cdot m}$$

$$\mathrm{An_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \mathrm{length_{col}} \cdot \mathrm{width_{col}} \cdot \mathrm{height_{col}} \cdot \gamma_c = 5.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -51.538\ \mathrm{kN}$$

$$\mathrm{RnDn_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \left(\frac{(\mathrm{length_{col}})^4}{12}\right) \cdot \mathrm{distance} = 5.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 44.250\ \mathrm{m} = -1.152\ \mathrm{m^5}$$

$$\mathrm{Rn_{Col_{Grid}}} = \mathrm{Col_{No}} \cdot \frac{(\mathrm{length_{col}})^4}{12} = 5.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 260416666666.667\ \mathrm{mm^4}$$

$$\mathrm{AnXn_{Beam_{Grid}}} = \Sigma\left(\mathrm{length_{girder}} \cdot \mathrm{width_{girder}} \cdot \mathrm{height_{girder}} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 44.250\ \mathrm{m}\right) = 8.007\ \mathrm{MN \cdot m}$$

$$\mathrm{An_{Beam_{Grid}}} = \Sigma\left(\mathrm{length_{girder}} \cdot \mathrm{width_{girder}} \cdot \mathrm{height_{girder}} \cdot \gamma_c\right) = \Sigma\left([5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 180.941\ \mathrm{kN}$$

$$\begin{aligned}\mathrm{AnDn_{SW_{Grid}}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}] \cdot [250.000\ \mathrm{mm},\ 3.250\ \mathrm{m},\ 3.250\ \mathrm{m},\ 44.250\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 3.343\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An_{SW_{Grid}}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2}\right)\\ &= 160.797\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn_{SW_{Grid}}} &= \Sigma\left(\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right) \cdot \mathrm{distance}\right)\\ &= \Sigma\left(\left(\frac{([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right) \cdot [250.000\ \mathrm{mm},\ 3.250\ \mathrm{m},\ 3.250\ \mathrm{m},\ 44.250\ \mathrm{m}]\right)\\ &= 240.320\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn_{SW_{Grid}}} &= \Sigma\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right)\\ &= \Sigma\left(\frac{([6.000\ \mathrm{m},\ 500.000\ \mathrm{mm},\ 500.000\ \mathrm{mm},\ 6.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right)\\ &= 10.806\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn_{Slab_{Grid}}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{distance} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ -220.000\ \mathrm{m^2},\ -132.000\ \mathrm{m^2}] \cdot [22.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 39.000\ \mathrm{m}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 110.641\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An_{Slab_{Grid}}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ 220.000\ \mathrm{m^2},\ 132.000\ \mathrm{m^2}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn_{Wall_{Grid}}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m}] \cdot [nan,\ nan,\ nan,\ nan,\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ nan,\ nan,\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m},\ 11.250\ \mathrm{m}] \cdot 150.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} \cdot 0.7\right)\\ &= -9.777\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An_{Wall_{Grid}}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 5.000\ \mathrm{m}] \cdot 150.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 484.865\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Col_{Total}} &= \Sigma\left(\text{AnDn}_{Col}\right)\\ &= \Sigma\left([7.731\ \text{kN}\cdot\text{m},\ 322.109\ \text{kN}\cdot\text{m},\ 1.044\ \text{MN}\cdot\text{m},\ 1.600\ \text{MN}\cdot\text{m},\ 2.064\ \text{MN}\cdot\text{m},\ 2.621\ \text{MN}\cdot\text{m},\ 3.085\ \text{MN}\cdot\text{m},\ 2.832\ \text{MN}\cdot\text{m},\ 2.281\ \text{MN}\cdot\text{m}]\right)\\ &= 15.856\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Col_{Total}} &= \Sigma\left(\text{An}_{Col}\right)\\ &= \Sigma\left([30.922\ \text{kN},\ 51.538\ \text{kN},\ 92.767\ \text{kN},\ 92.767\ \text{kN},\ 92.767\ \text{kN},\ 92.767\ \text{kN},\ 92.767\ \text{kN},\ 72.153\ \text{kN},\ 51.538\ \text{kN}]\right)\\ &= 669.987\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{Col_{Total}} &= \Sigma\left(\text{RnDn}_{Col}\right)\\ &= \Sigma\left([3906250000000.000\ \text{mm}^5,\ 1627604116666666.656\ \text{mm}^5,\ 527343749999999.938\ \text{mm}^5,\ 808593749999999.875\ \text{mm}^5,\ 1.043\ \text{m}^5,\ 1.324\ \text{m}^5,\ 1.559\ \text{m}^5,\ 1.431\ \text{m}^5,\ 1.152\ \text{m}^5]\right)\\ &= 8.012\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{Col_{Total}} &= \Sigma\left(\text{Rn}_{Col}\right)\\ &= \Sigma\left([15625000000.000\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 46875000000.000\ \text{mm}^4,\ 36458333333.333\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4]\right)\\ &= 338541666666.667\ \text{mm}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Beam_{Total}} &= \Sigma\left(\text{AnDn}_{Beam}\right)\\ &= \Sigma\left([33.926\ \text{kN}\cdot\text{m},\ 848.160\ \text{kN}\cdot\text{m},\ 2.799\ \text{MN}\cdot\text{m},\ 4.292\ \text{MN}\cdot\text{m},\ 5.536\ \text{MN}\cdot\text{m},\ 7.028\ \text{MN}\cdot\text{m},\ 8.272\ \text{MN}\cdot\text{m},\ 7.102\ \text{MN}\cdot\text{m},\ 8.007\ \text{MN}\cdot\text{m}]\right)\\ &= 43.918\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Beam_{Total}} &= \Sigma\left(\text{An}_{Beam}\right)\\ &= \Sigma\left([135.706\ \text{kN},\ 135.706\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 180.941\ \text{kN},\ 180.941\ \text{kN}]\right)\\ &= 1.877\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{SW_{Total}} &= \Sigma\left(\text{AnDn}_{SW}\right)\\ &= \Sigma\left([3.343\ \text{MN}\cdot\text{m}]\right)\\ &= 3.343\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{SW_{Total}} &= \Sigma\left(\text{An}_{SW}\right)\\ &= \Sigma\left([160.797\ \text{kN}]\right)\\ &= 160.797\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{SW_{Total}} &= \Sigma\left(\text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(240.320\ \text{m}^5\right)\\ &= 240.320\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{SW_{Total}} &= \Sigma\left(\text{Rn}_{SW}\right)\\ &= \Sigma\left([10.806\ \text{m}^4]\right)\\ &= 10.806\ \text{m}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Slab_{Total}} &= \Sigma\left(\text{AnDn}_{Slab}\right)\\ &= \Sigma\left([110.641\ \text{MN}\cdot\text{m}]\right)\\ &= 110.641\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Slab_{Total}} &= \Sigma\left(\text{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \text{MN}]\right)\\ &= 4.851\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Wall_{Total}} &= \Sigma\left(\text{AnDn}_{Wall}\right)\\ &= \Sigma\left([9.777\ \text{MN}\cdot\text{m}]\right)\\ &= 9.777\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Wall_{Total}} &= \Sigma\left(\text{An}_{Wall}\right)\\ &= \Sigma\left([484.865\ \text{kN}]\right)\\ &= 484.865\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn} &= \Sigma\left(\text{AnDn}_{Col_{Total}} + \text{AnDn}_{SW_{Total}} + \text{AnDn}_{Slab_{Total}} + \text{AnDn}_{Wall_{Total}} + \text{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(15.856\ \text{MN}\cdot\text{m} + 3.343\ \text{MN}\cdot\text{m} + 110.641\ \text{MN}\cdot\text{m} + 9.777\ \text{MN}\cdot\text{m} + 43.918\ \text{MN}\cdot\text{m}\right)\\ &= 183.534\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An} &= \Sigma\left(\text{An}_{Col_{Total}} + \text{An}_{SW_{Total}} + \text{An}_{Slab_{Total}} + \text{An}_{Wall_{Total}} + \text{An}_{Beam_{Total}}\right)\\ &= \Sigma\left(669.987\ \text{kN} + 160.797\ \text{kN} + 4.851\ \text{MN} + 484.865\ \text{kN} + 1.877\ \text{MN}\right)\\ &= 8.044\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn} &= \Sigma\left(\text{RnDn}_{Col_{Total}} + \text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(8.012\ \text{m}^5 + 240.320\ \text{m}^5\right)\\ &= 248.332\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn} &= \Sigma\left(\text{Rn}_{Col_{Total}} + \text{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(338541666666.667\ \text{mm}^4 + 10.806\ \text{m}^4\right)\\ &= 11.145\ \text{m}^4\end{aligned}$$

$$\begin{aligned}C_m &= \frac{\Sigma\left(\text{AnDn}\right)}{\Sigma\left(\text{An}\right)}\\ &= \frac{\Sigma\left(183.534\ \text{MN}\cdot\text{m}\right)}{\Sigma\left(8.044\ \text{MN}\right)}\\ &= 22.815\ \text{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\text{RnDn}\right)}{\Sigma\left(\text{Rn}\right)}\\ &= \frac{\Sigma\left(248.332\ \text{m}^5\right)}{\Sigma\left(11.145\ \text{m}^4\right)}\\ &= 22.282\ \text{m}\end{aligned}$$

FLOOR - 2 - Y AXIS

Grid = A

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -29.450\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^2 = -117.800\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -6510416666666.666\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = 260416666666.667\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 46.649\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = B

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 5.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -865.830\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^2 = -164.920\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 5.250\ m = -191406249999999.969\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 5.250\ m\right) = 979.625\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^2\right) = 186.595\ kN$$

Grid = C

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 10.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 1.690\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^2 = 164.920\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 10.250\ m = 3736979166666666.625\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 10.250\ m\right) = 1.913\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = D

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 15.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 2.515\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 164.920\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 15.250\ m = 5559895833333333.188\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 15.250\ m\right) = 2.846\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = E

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 20.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 4.294\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -212.040$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 20.250\ m = 949218749999999.875\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 20.250\ m\right) = 5.038\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = F

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 26.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -5.566\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = -212.040\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 26.250\ m = 1.230\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 26.250\ m\right) = 6.531\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = G

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 32.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 6.838\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 4.000\ m \cdot 23.560\ kN/m^3 = 212.040\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 32.250\ m = 1.512\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 32.250\ m\right) = 8.024\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = II

$$\mathrm{AnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 38.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -6.308\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -164.920\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 7.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 38.250\ \mathrm{m} = -1.395\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 364583333333.333\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 38.250\ \mathrm{m}\right) = 7.137\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 186.595\ \mathrm{kN}$$

Grid = I

$$\mathrm{AnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 44.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -5.213\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -117.800\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 5.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 44.250\ \mathrm{m} = -1.152\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 26041666666.667\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 44.250\ \mathrm{m}\right) = 8.257\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^2}\right) = 186.595\ \mathrm{kN}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 3.944\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2}\right)\\ &= 169.632\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Total}} &= \Sigma\left(\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right) \cdot \mathrm{distance}\right)\\ &= \Sigma\left(\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right) \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}]\right)\\ &= 31.387\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Total}} &= \Sigma\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right)\\ &= \Sigma\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right)\\ &= 1.350\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Total}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{distance} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ -220.000\ \mathrm{m^2},\ -132.000\ \mathrm{m^2}] \cdot [22.000\ \mathrm{m},\ 10.000\ \mathrm{m},\ 38.000\ \mathrm{m}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^4}\right)\\ &= 108.350\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Total}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ \ 220.000\ \mathrm{m^2},\ \ 132.000\ \mathrm{m^2}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Walk_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot [nan,\ nan,\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ nan,\ nan,\ nan,\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ nan] \cdot 150.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 32.001\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Walk_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 150.000\ \mathrm{mm} \cdot 4.000\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 1.306\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Col_{Total}} &= \Sigma\left(\text{AnDn}_{Col}\right)\\ &= \Sigma\left([29.450\ \text{kN}\cdot\text{m},\ 865.830\ \text{kN}\cdot\text{m},\ 1.690\ \text{MN}\cdot\text{m},\ 2.515\ \text{MN}\cdot\text{m},\ 4.294\ \text{MN}\cdot\text{m},\ 5.566\ \text{MN}\cdot\text{m},\ 6.838\ \text{MN}\cdot\text{m},\ 6.308\ \text{MN}\cdot\text{m},\ 5.213\ \text{MN}\cdot\text{m}]\right)\\ &= 33.320\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Col_{Total}} &= \Sigma\left(\text{An}_{Col}\right)\\ &= \Sigma\left([117.800\ \text{kN},\ 164.920\ \text{kN},\ 164.920\ \text{kN},\ 164.920\ \text{kN},\ 212.040\ \text{kN},\ 212.040\ \text{kN},\ 212.040\ \text{kN},\ 164.920\ \text{kN},\ 117.800\ \text{kN}]\right)\\ &= 1.531\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{Col_{Total}} &= \Sigma\left(\text{RnDn}_{Col}\right)\\ &= \Sigma\left([6510416666666.666\ \text{mm}^5,\ 1914062499999.969\ \text{mm}^5,\ 3736979166666.625\ \text{mm}^5,\ 5559895833333.188\ \text{mm}^5,\ 9492187499999.875\ \text{mm}^5,\ 1.230\ \text{m}^5,\ 1.512\ \text{m}^5,\ 1.395\ \text{m}^5,\ 1.152\ \text{m}^5]\right)\\ &= 7.366\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{Col_{Total}} &= \Sigma\left(\text{Rn}_{Col}\right)\\ &= \Sigma\left([260416666666.667\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 468750000000.000\ \text{mm}^4,\ 468750000000.000\ \text{mm}^4,\ 468750000000.000\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4]\right)\\ &= 3385416666666.667\ \text{mm}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Beam_{Total}} &= \Sigma\left(\text{AnDn}_{Beam}\right)\\ &= \Sigma\left([46.649\ \text{kN}\cdot\text{m},\ 979.625\ \text{kN}\cdot\text{m},\ 1.913\ \text{MN}\cdot\text{m},\ 2.846\ \text{MN}\cdot\text{m},\ 5.038\ \text{MN}\cdot\text{m},\ 6.531\ \text{MN}\cdot\text{m},\ 8.024\ \text{MN}\cdot\text{m},\ 7.137\ \text{MN}\cdot\text{m},\ 8.257\ \text{MN}\cdot\text{m}]\right)\\ &= 40.771\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Beam_{Total}} &= \Sigma\left(\text{An}_{Beam}\right)\\ &= \Sigma\left([186.595\ \text{kN},\ 186.595\ \text{kN},\ 186.595\ \text{kN},\ 186.595\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 186.595\ \text{kN},\ 186.595\ \text{kN}]\right)\\ &= 1.866\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{SW_{Total}} &= \Sigma\left(\text{AnDn}_{SW}\right)\\ &= \Sigma\left([3.944\ \text{MN}\cdot\text{m}]\right)\\ &= 3.944\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{SW_{Total}} &= \Sigma\left(\text{An}_{SW}\right)\\ &= \Sigma\left([169.632\ \text{kN}]\right)\\ &= 169.632\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{SW_{Total}} &= \Sigma\left(\text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(31.387\ \text{m}^5\right)\\ &= 31.387\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{SW_{Total}} &= \Sigma\left(\text{Rn}_{SW}\right)\\ &= \Sigma\left([1.350\ \text{m}^4]\right)\\ &= 1.350\ \text{m}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Slab_{Total}} &= \Sigma\left(\text{AnDn}_{Slab}\right)\\ &= \Sigma\left([108.350\ \text{MN}\cdot\text{m}]\right)\\ &= 108.350\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Slab_{Total}} &= \Sigma\left(\text{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \text{MN}]\right)\\ &= 4.851\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Wall_{Total}} &= \Sigma\left(\text{AnDn}_{Wall}\right)\\ &= \Sigma\left([32.001\ \text{MN}\cdot\text{m}]\right)\\ &= 32.001\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Wall_{Total}} &= \Sigma\left(\text{An}_{Wall}\right)\\ &= \Sigma\left([1.306\ \text{MN}]\right)\\ &= 1.306\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn} &= \Sigma\left(\text{AnDn}_{Col_{Total}} + \text{AnDn}_{SW_{Total}} + \text{AnDn}_{Slab_{Total}} + \text{AnDn}_{Wall_{Total}} + \text{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(33.320\ \text{MN}\cdot\text{m} + 3.944\ \text{MN}\cdot\text{m} + 108.350\ \text{MN}\cdot\text{m} + 32.001\ \text{MN}\cdot\text{m} + 40.771\ \text{MN}\cdot\text{m}\right)\\ &= 218.385\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An} &= \Sigma\left(\text{An}_{Col_{Total}} + \text{An}_{SW_{Total}} + \text{An}_{Slab_{Total}} + \text{An}_{Wall_{Total}} + \text{An}_{Beam_{Total}}\right)\\ &= \Sigma\left(1.531\ \text{MN} + 169.632\ \text{kN} + 4.851\ \text{MN} + 1.306\ \text{MN} + 1.866\ \text{MN}\right)\\ &= 9.725\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn} &= \Sigma\left(\text{RnDn}_{Col_{Total}} + \text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(7.366\ \text{m}^5 + 31.387\ \text{m}^5\right)\\ &= 38.753\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn} &= \Sigma\left(\text{Rn}_{Col_{Total}} + \text{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(3385416666666.667\ \text{mm}^4 + 1.350\ \text{m}^4\right)\\ &= 1.689\ \text{m}^4\end{aligned}$$

$$\begin{aligned}C_m &= \frac{\Sigma\left(\text{AnDn}\right)}{\Sigma\left(\text{An}\right)}\\ &= \frac{\Sigma\left(218.385\ \text{MN}\cdot\text{m}\right)}{\Sigma\left(9.725\ \text{MN}\right)}\\ &= 22.457\ \text{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\text{RnDn}\right)}{\Sigma\left(\text{Rn}\right)}\\ &= \frac{\Sigma\left(38.753\ \text{m}^5\right)}{\Sigma\left(1.689\ \text{m}^4\right)}\\ &= 22.951\ \text{m}\end{aligned}$$

FLOOR - 3 - Y AXIS

Grid = A

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -25.769\ kN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -103.075\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -6510416666666.666\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = 260416666666.667\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 46.649\ kN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = B

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 5.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -757.601\ kN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -144.305\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 5.250\ m = -191406249999999.969\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 5.250\ m\right) = 979.625\ kN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = C

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 10.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 1.479\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 144.305\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 10.250\ m = 3736979166666666.625\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 10.250\ m\right) = 1.913\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = D

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 15.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 2.201\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 144.305\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 15.250\ m = 5559895833333333.188\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 15.250\ m\right) = 2.846\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = E

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 20.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 3.757\ MN$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 20.250\ m = 949218749999999.875\ m$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 20.250\ m\right) = 5.038\ MN$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = F

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 26.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -4.870\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 26.250\ m = 1.230\ m^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 26.250\ m\right) = 6.531\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = G

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 32.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 5.984\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 185.535\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 32.250\ m = 1.512\ m^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 32.250\ m\right) = 8.024\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = II

$$\mathrm{AnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 38.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -5.520\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -144.305\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 7.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 38.250\ \mathrm{m} = -1.395\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 364583333333.333\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 38.250\ \mathrm{m}\right) = 7.137\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 186.595\ \mathrm{kN}$$

Grid = I

$$\mathrm{AnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 44.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -1.561\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -103.075\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 5.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 44.250\ \mathrm{m} = -1.152\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Grid}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 260416666666.667\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 44.250\ \mathrm{m}\right) = 8.257\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Grid}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 186.595\ \mathrm{kN}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 3.451\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2}\right)\\ &= 148.428\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Grid}} &= \Sigma\left(\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right) \cdot \mathrm{distance}\right)\\ &= \Sigma\left(\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right) \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}]\right)\\ &= 31.387\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Grid}} &= \Sigma\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right)\\ &= \Sigma\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right)\\ &= 1.350\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Grid}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{distance} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ -220.000\ \mathrm{m^2},\ -132.000\ \mathrm{m^2}] \cdot [22.000\ \mathrm{m},\ 10.000\ \mathrm{m},\ 38.000\ \mathrm{m}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^4}\right)\\ &= 108.350\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Grid}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ \ 220.000\ \mathrm{m^2},\ \ 132.000\ \mathrm{m^2}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Walk_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot [nan,\ nan,\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ nan,\ nan,\ nan,\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ nan] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} \cdot 0.7\right)\\ &= 28.001\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Walk_{Grid}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 1.143\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Col_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Col}\right)\\ &= \Sigma\left([25.769\ \mathrm{kN\cdot m},\ 757.601\ \mathrm{kN\cdot m},\ 1.479\ \mathrm{MN\cdot m},\ 2.201\ \mathrm{MN\cdot m},\ 3.757\ \mathrm{MN\cdot m},\ 4.870\ \mathrm{MN\cdot m},\ 5.984\ \mathrm{MN\cdot m},\ 5.520\ \mathrm{MN\cdot m},\ 4.561\ \mathrm{MN\cdot m}]\right)\\ &= 29.155\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Col_{Total}} &= \Sigma\left(\mathrm{An}_{Col}\right)\\ &= \Sigma\left([103.075\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 185.535\ \mathrm{kN},\ 185.535\ \mathrm{kN},\ 185.535\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 103.075\ \mathrm{kN}]\right)\\ &= 1.340\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{Col_{Total}} &= \Sigma\left(\mathrm{RnDn}_{Col}\right)\\ &= \Sigma\left([65104166666666.666\ \mathrm{mm^5},\ 1914062499999999.969\ \mathrm{mm^5},\ 3736979166666666.625\ \mathrm{mm^5},\ 5559895833333333.188\ \mathrm{mm^5},\ 9492187499999999.875\ \mathrm{mm^5},\ 1.280\ \mathrm{m^5},\ 1.512\ \mathrm{m^5},\ 1.395\ \mathrm{m^5},\ 1.152\ \mathrm{m^5}]\right)\\ &= 7.366\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{Col_{Total}} &= \Sigma\left(\mathrm{Rn}_{Col}\right)\\ &= \Sigma\left([260416666666.667\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 468750000000.000\ \mathrm{mm^4},\ 468750000000.000\ \mathrm{mm^4},\ 468750000000.000\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 260416666666.667\ \mathrm{mm^4}]\right)\\ &= 3385416666666.667\ \mathrm{mm^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Beam_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Beam}\right)\\ &= \Sigma\left([46.649\ \mathrm{kN\cdot m},\ 979.625\ \mathrm{kN\cdot m},\ 1.913\ \mathrm{MN\cdot m},\ 2.846\ \mathrm{MN\cdot m},\ 5.038\ \mathrm{MN\cdot m},\ 6.531\ \mathrm{MN\cdot m},\ 8.024\ \mathrm{MN\cdot m},\ 7.137\ \mathrm{MN\cdot m},\ 8.257\ \mathrm{MN\cdot m}]\right)\\ &= 40.771\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Beam_{Total}} &= \Sigma\left(\mathrm{An}_{Beam}\right)\\ &= \Sigma\left([186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 248.794\ \mathrm{kN},\ 248.794\ \mathrm{kN},\ 248.794\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN}]\right)\\ &= 1.866\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Total}} &= \Sigma\left(\mathrm{AnDn}_{SW}\right)\\ &= \Sigma\left([3.451\ \mathrm{MN\cdot m}]\right)\\ &= 3.451\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Total}} &= \Sigma\left(\mathrm{An}_{SW}\right)\\ &= \Sigma\left([148.428\ \mathrm{kN}]\right)\\ &= 148.428\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Total}} &= \Sigma\left(\mathrm{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(31.387\ \mathrm{m^5}\right)\\ &= 31.387\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Total}} &= \Sigma\left(\mathrm{Rn}_{SW}\right)\\ &= \Sigma\left([1.350\ \mathrm{m^4}]\right)\\ &= 1.350\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Slab}\right)\\ &= \Sigma\left([108.350\ \mathrm{MN\cdot m}]\right)\\ &= 108.350\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Total}} &= \Sigma\left(\mathrm{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \mathrm{MN}]\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Wall_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Wall}\right)\\ &= \Sigma\left([28.001\ \mathrm{MN\cdot m}]\right)\\ &= 28.001\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Wall_{Total}} &= \Sigma\left(\mathrm{An}_{Wall}\right)\\ &= \Sigma\left([1.143\ \mathrm{MN}]\right)\\ &= 1.143\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn} &= \Sigma\left(\mathrm{AnDn}_{Col_{Total}} + \mathrm{AnDn}_{SW_{Total}} + \mathrm{AnDn}_{Slab_{Total}} + \mathrm{AnDn}_{Wall_{Total}} + \mathrm{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(29.155\ \mathrm{MN\cdot m} + 3.451\ \mathrm{MN\cdot m} + 108.350\ \mathrm{MN\cdot m} + 28.001\ \mathrm{MN\cdot m} + 40.771\ \mathrm{MN\cdot m}\right)\\ &= 209.727\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An} &= \Sigma\left(\mathrm{An}_{Col_{Total}} + \mathrm{An}_{SW_{Total}} + \mathrm{An}_{Slab_{Total}} + \mathrm{An}_{Wall_{Total}} + \mathrm{An}_{Beam_{Total}}\right)\\ &= \Sigma\left(1.340\ \mathrm{MN} + 148.428\ \mathrm{kN} + 4.851\ \mathrm{MN} + 1.143\ \mathrm{MN} + 1.866\ \mathrm{MN}\right)\\ &= 9.349\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn} &= \Sigma\left(\mathrm{RnDn}_{Col_{Total}} + \mathrm{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(7.366\ \mathrm{m^5} + 31.387\ \mathrm{m^5}\right)\\ &= 38.753\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn} &= \Sigma\left(\mathrm{Rn}_{Col_{Total}} + \mathrm{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(3385416666666.667\ \mathrm{mm^4} + 1.350\ \mathrm{m^4}\right)\\ &= 1.689\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}C_{ss} &= \frac{\Sigma\left(\mathrm{AnDn}\right)}{\Sigma\left(\mathrm{An}\right)}\\ &= \frac{\Sigma\left(209.727\ \mathrm{MN\cdot m}\right)}{\Sigma\left(9.349\ \mathrm{MN}\right)}\\ &= 22.434\ \mathrm{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\mathrm{RnDn}\right)}{\Sigma\left(\mathrm{Rn}\right)}\\ &= \frac{\Sigma\left(38.753\ \mathrm{m^5}\right)}{\Sigma\left(1.689\ \mathrm{m^4}\right)}\\ &= 22.951\ \mathrm{m}\end{aligned}$$

FLOOR - 4 - Y AXIS

Grid = A

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -25.769\ kN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = -103.075\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -6510416666666.666\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = 260416666666.667\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 46.649\ kN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = B

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 5.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -757.601\ kN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = -144.305\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 5.250\ m = -1914062499999.969\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 5.250\ m\right) = 979.625\ kN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^2\right) = 186.595\ kN$$

Grid = C

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 10.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 1.479\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^2 = 144.305\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 10.250\ m = 3736979166666666.625\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 10.250\ m\right) = 1.913\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = D

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 15.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 2.201\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 144.305\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 15.250\ m = 5559895833333333.188\ mm^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 15.250\ m\right) = 2.846\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = E

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 20.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 3.757\ MN$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 20.250\ m = 949218749999999.875\ m$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 20.250\ m\right) = 5.038\ MN$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = F

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 26.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -4.870\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = -185.535\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 26.250\ m = 1.230\ m^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 26.250\ m\right) = 6.531\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = G

$$AnDn_{Col_{Total}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 32.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 5.984\ MN \cdot m$$

$$An_{Col_{Total}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 3.500\ m \cdot 23.560\ kN/m^3 = 185.535\ kN$$

$$RnDn_{Col_{Total}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 32.250\ m = 1.512\ m^5$$

$$Ru_{Col_{Total}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = 46875000000.000\ mm^4$$

$$AnXn_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 32.250\ m\right) = 8.024\ MN \cdot m$$

$$An_{Beam_{Total}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = II

$$\mathrm{AnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 38.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -5.520\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -144.305\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 7.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 38.250\ \mathrm{m} = -1.395\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 364583333333.333\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 38.250\ \mathrm{m}\right) = 7.137\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 186.595\ \mathrm{kN}$$

Grid = I

$$\mathrm{AnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 44.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -1.561\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -103.075\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 5.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 44.250\ \mathrm{m} = -1.152\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 260416666666.667\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 44.250\ \mathrm{m}\right) = 8.257\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 186.595\ \mathrm{kN}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 3.451\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2}\right)\\ &= 148.428\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Total}} &= \Sigma\left(\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right) \cdot \mathrm{distance}\right)\\ &= \Sigma\left(\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right) \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}]\right)\\ &= 31.387\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Total}} &= \Sigma\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right)\\ &= \Sigma\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right)\\ &= 1.350\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Total}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{distance} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ -220.000\ \mathrm{m^2},\ -132.000\ \mathrm{m^2}] \cdot [22.000\ \mathrm{m},\ 10.000\ \mathrm{m},\ 38.000\ \mathrm{m}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^4}\right)\\ &= 108.350\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Total}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ \ 220.000\ \mathrm{m^2},\ \ 132.000\ \mathrm{m^2}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Walk_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot [nan,\ nan,\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ nan,\ nan,\ nan,\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ nan] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} \cdot 0.7\right)\\ &= 28.001\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Walk_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 150.000\ \mathrm{mm} \cdot 3.500\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 1.143\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Col_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Col}\right)\\ &= \Sigma\left([25.769\ \mathrm{kN\cdot m},\ 757.601\ \mathrm{kN\cdot m},\ 1.479\ \mathrm{MN\cdot m},\ 2.201\ \mathrm{MN\cdot m},\ 3.757\ \mathrm{MN\cdot m},\ 4.870\ \mathrm{MN\cdot m},\ 5.984\ \mathrm{MN\cdot m},\ 5.520\ \mathrm{MN\cdot m},\ 4.561\ \mathrm{MN\cdot m}]\right)\\ &= 29.155\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Col_{Total}} &= \Sigma\left(\mathrm{An}_{Col}\right)\\ &= \Sigma\left([103.075\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 185.535\ \mathrm{kN},\ 185.535\ \mathrm{kN},\ 185.535\ \mathrm{kN},\ 144.305\ \mathrm{kN},\ 103.075\ \mathrm{kN}]\right)\\ &= 1.340\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{Col_{Total}} &= \Sigma\left(\mathrm{RnDn}_{Col}\right)\\ &= \Sigma\left([65104166666666.666\ \mathrm{mm^5},\ 1914062499999999.969\ \mathrm{mm^5},\ 3736979166666666.625\ \mathrm{mm^5},\ 5559895833333333.188\ \mathrm{mm^5},\ 9492187499999999.875\ \mathrm{mm^5},\ 1.280\ \mathrm{m^5},\ 1.512\ \mathrm{m^5},\ 1.395\ \mathrm{m^5},\ 1.152\ \mathrm{m^5}]\right)\\ &= 7.366\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{Col_{Total}} &= \Sigma\left(\mathrm{Rn}_{Col}\right)\\ &= \Sigma\left([260416666666.667\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 468750000000.000\ \mathrm{mm^4},\ 468750000000.000\ \mathrm{mm^4},\ 468750000000.000\ \mathrm{mm^4},\ 364583333333.333\ \mathrm{mm^4},\ 260416666666.667\ \mathrm{mm^4}]\right)\\ &= 3385416666666.667\ \mathrm{mm^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Beam_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Beam}\right)\\ &= \Sigma\left([46.649\ \mathrm{kN\cdot m},\ 979.625\ \mathrm{kN\cdot m},\ 1.913\ \mathrm{MN\cdot m},\ 2.846\ \mathrm{MN\cdot m},\ 5.038\ \mathrm{MN\cdot m},\ 6.531\ \mathrm{MN\cdot m},\ 8.024\ \mathrm{MN\cdot m},\ 7.137\ \mathrm{MN\cdot m},\ 8.257\ \mathrm{MN\cdot m}]\right)\\ &= 40.771\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Beam_{Total}} &= \Sigma\left(\mathrm{An}_{Beam}\right)\\ &= \Sigma\left([186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 248.794\ \mathrm{kN},\ 248.794\ \mathrm{kN},\ 248.794\ \mathrm{kN},\ 186.595\ \mathrm{kN},\ 186.595\ \mathrm{kN}]\right)\\ &= 1.866\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Total}} &= \Sigma\left(\mathrm{AnDn}_{SW}\right)\\ &= \Sigma\left([3.451\ \mathrm{MN\cdot m}]\right)\\ &= 3.451\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Total}} &= \Sigma\left(\mathrm{An}_{SW}\right)\\ &= \Sigma\left([148.428\ \mathrm{kN}]\right)\\ &= 148.428\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Total}} &= \Sigma\left(\mathrm{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(31.387\ \mathrm{m^5}\right)\\ &= 31.387\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Total}} &= \Sigma\left(\mathrm{Rn}_{SW}\right)\\ &= \Sigma\left([1.350\ \mathrm{m^4}]\right)\\ &= 1.350\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Slab}\right)\\ &= \Sigma\left([108.350\ \mathrm{MN\cdot m}]\right)\\ &= 108.350\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Total}} &= \Sigma\left(\mathrm{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \mathrm{MN}]\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Wall_{Total}} &= \Sigma\left(\mathrm{AnDn}_{Wall}\right)\\ &= \Sigma\left([28.001\ \mathrm{MN\cdot m}]\right)\\ &= 28.001\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Wall_{Total}} &= \Sigma\left(\mathrm{An}_{Wall}\right)\\ &= \Sigma\left([1.143\ \mathrm{MN}]\right)\\ &= 1.143\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn} &= \Sigma\left(\mathrm{AnDn}_{Col_{Total}} + \mathrm{AnDn}_{SW_{Total}} + \mathrm{AnDn}_{Slab_{Total}} + \mathrm{AnDn}_{Wall_{Total}} + \mathrm{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(29.155\ \mathrm{MN\cdot m} + 3.451\ \mathrm{MN\cdot m} + 108.350\ \mathrm{MN\cdot m} + 28.001\ \mathrm{MN\cdot m} + 40.771\ \mathrm{MN\cdot m}\right)\\ &= 209.727\ \mathrm{MN\cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An} &= \Sigma\left(\mathrm{An}_{Col_{Total}} + \mathrm{An}_{SW_{Total}} + \mathrm{An}_{Slab_{Total}} + \mathrm{An}_{Wall_{Total}} + \mathrm{An}_{Beam_{Total}}\right)\\ &= \Sigma\left(1.340\ \mathrm{MN} + 148.428\ \mathrm{kN} + 4.851\ \mathrm{MN} + 1.143\ \mathrm{MN} + 1.866\ \mathrm{MN}\right)\\ &= 9.349\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn} &= \Sigma\left(\mathrm{RnDn}_{Col_{Total}} + \mathrm{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(7.366\ \mathrm{m^5} + 31.387\ \mathrm{m^5}\right)\\ &= 38.753\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn} &= \Sigma\left(\mathrm{Rn}_{Col_{Total}} + \mathrm{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(3385416666666.667\ \mathrm{mm^4} + 1.350\ \mathrm{m^4}\right)\\ &= 1.689\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}C_{rr} &= \frac{\Sigma\left(\mathrm{AnDn}\right)}{\Sigma\left(\mathrm{An}\right)}\\ &= \frac{\Sigma\left(209.727\ \mathrm{MN\cdot m}\right)}{\Sigma\left(9.349\ \mathrm{MN}\right)}\\ &= 22.434\ \mathrm{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\mathrm{RnDn}\right)}{\Sigma\left(\mathrm{Rn}\right)}\\ &= \frac{\Sigma\left(38.753\ \mathrm{m^5}\right)}{\Sigma\left(1.689\ \mathrm{m^4}\right)}\\ &= 22.951\ \mathrm{m}\end{aligned}$$

FLOOR - Roof Deck - Y AXIS

Grid = A

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 250.000\ mm \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -12.884\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -51.538\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 5.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 250.000\ mm = -6510416666666.666\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ mm)^4}{12} = 260416666666.667\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 250.000\ mm\right) = 46.649\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = B

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 5.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -378.801\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -72.153\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 5.250\ m = -1914062499999.969\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 5.250\ m\right) = 979.625\ kN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = C

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 10.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 739.563\ kN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 72.153\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 10.250\ m = 3736979166666666.625\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 10.250\ m\right) = 1.913\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = D

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 15.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 1.100\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 72.153\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 7.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 15.250\ m = 5559895833333333.188\ mm^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ mm)^4}{12} = -36458333333.333\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 15.250\ m\right) = 2.846\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([nan,\ nan,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 186.595\ kN$$

Grid = E

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 20.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 1.879\ MN$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -92.767$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 20.250\ m = 949218749999999.875\ m$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ m$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 20.250\ m\right) = 5.038\ MN$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794$$

Grid = F

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 26.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -2.435\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = -92.767\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 26.250\ m = 1.230\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 26.250\ m\right) = 6.531\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = G

$$AnDn_{Col_{Grid}} = Col_{No} \cdot distance \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 32.250\ m \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 2.992\ MN \cdot m$$

$$An_{Col_{Grid}} = Col_{No} \cdot length_{col} \cdot width_{col} \cdot height_{col} \cdot \gamma_c = 9.000 \cdot 500.000\ mm \cdot 500.000\ mm \cdot 1.750\ m \cdot 23.560\ kN/m^3 = 92.767\ kN$$

$$RnDn_{Col_{Grid}} = Col_{No} \cdot \left(\frac{(length_{col})^4}{12}\right) \cdot distance = 9.000 \cdot \left(\frac{(500.000\ mm)^4}{12}\right) \cdot 32.250\ m = 1.512\ m^5$$

$$Rn_{Col_{Grid}} = Col_{No} \cdot \frac{(length_{col})^4}{12} = 9.000 \cdot \frac{(500.000\ mm)^4}{12} = -46875000000.000\ mm^4$$

$$AnXn_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c \cdot distance\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3 \cdot 32.250\ m\right) = 8.024\ MN \cdot m$$

$$An_{Beam_{Grid}} = \Sigma\left(length_{girder} \cdot width_{girder} \cdot height_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m,\ 6.000\ m,\ 5.000\ m] \cdot 400.000\ mm \cdot 600.000\ mm \cdot 23.560\ kN/m^3\right) = 248.794\ kN$$

Grid = II

$$\mathrm{AnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 38.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -2.760\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 7.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -72.153\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 7.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 38.250\ \mathrm{m} = -1.395\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 7.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 364583333333.333\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 38.250\ \mathrm{m}\right) = 7.137\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 186.595\ \mathrm{kN}$$

Grid = I

$$\mathrm{AnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{distance} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 44.250\ \mathrm{m} \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} = -2.281\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \mathrm{length}_{col} \cdot \mathrm{width}_{col} \cdot \mathrm{height}_{col} \cdot \gamma_c = 5.000 \cdot 500.000\ \mathrm{mm} \cdot 500.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} = -51.538\ \mathrm{kN}$$

$$\mathrm{RnDn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \left(\frac{(\mathrm{length}_{col})^4}{12}\right) \cdot \mathrm{distance} = 5.000 \cdot \left(\frac{(500.000\ \mathrm{mm})^4}{12}\right) \cdot 44.250\ \mathrm{m} = -1.152\ \mathrm{m^5}$$

$$\mathrm{Rn}_{Col_{Total}} = \mathrm{Col}_{No} \cdot \frac{(\mathrm{length}_{col})^4}{12} = 5.000 \cdot \frac{(500.000\ \mathrm{mm})^4}{12} = 260416666666.667\ \mathrm{mm^4}$$

$$\mathrm{AnXn}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c \cdot \mathrm{distance}\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3} \cdot 44.250\ \mathrm{m}\right) = 8.257\ \mathrm{MN \cdot m}$$

$$\mathrm{An}_{Beam_{Total}} = \Sigma\left(\mathrm{length}_{girder} \cdot \mathrm{width}_{girder} \cdot \mathrm{height}_{girder} \cdot \gamma_c\right) = \Sigma\left([6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 400.000\ \mathrm{mm} \cdot 600.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right) = 186.595\ \mathrm{kN}$$

$$\begin{aligned}\mathrm{AnDn}_{SW_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 1.725\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{SW_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}] \cdot 300.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2}\right)\\ &= 74.214\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\mathrm{RnDn}_{SW_{Total}} &= \Sigma\left(\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right) \cdot \mathrm{distance}\right)\\ &= \Sigma\left(\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right) \cdot [20.250\ \mathrm{m},\ 26.250\ \mathrm{m}]\right)\\ &= 31.387\ \mathrm{m^5}\end{aligned}$$

$$\begin{aligned}\mathrm{Rn}_{SW_{Total}} &= \Sigma\left(\frac{(\mathrm{length})^3 \cdot \mathrm{width}}{12}\right)\\ &= \Sigma\left(\frac{([3.000\ \mathrm{m},\ 3.000\ \mathrm{m}])^3 \cdot 300.000\ \mathrm{mm}}{12}\right)\\ &= 1.350\ \mathrm{m^4}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Slab_{Total}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{distance} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ -220.000\ \mathrm{m^2},\ -132.000\ \mathrm{m^2}] \cdot [22.000\ \mathrm{m},\ 10.000\ \mathrm{m},\ 38.000\ \mathrm{m}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^4}\right)\\ &= 108.350\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Slab_{Total}} &= \Sigma\left(\mathrm{area} \cdot \mathrm{height} \cdot \gamma_c\right)\\ &= \Sigma\left([1936.000\ \mathrm{m^2},\ \ 220.000\ \mathrm{m^2},\ \ 132.000\ \mathrm{m^2}] \cdot 130.000\ \mathrm{mm} \cdot 23.560\ \mathrm{kN/m^3}\right)\\ &= 4.851\ \mathrm{MN}\end{aligned}$$

$$\begin{aligned}\mathrm{AnDn}_{Walk_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{distance} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot [nan,\ nan,\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 250.000\ \mathrm{mm},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ 44.250\ \mathrm{m},\ nan,\ nan,\ nan,\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 15.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ 38.250\ \mathrm{m},\ nan] \cdot 150.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^2} \cdot 0.7\right)\\ &= 14.000\ \mathrm{MN \cdot m}\end{aligned}$$

$$\begin{aligned}\mathrm{An}_{Walk_{Total}} &= \Sigma\left(\mathrm{length} \cdot \mathrm{width} \cdot \mathrm{height} \cdot \gamma_c \cdot 0.7\right)\\ &= \Sigma\left([nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan,\ nan,\ nan,\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ 6.000\ \mathrm{m},\ 5.000\ \mathrm{m},\ nan,\ nan] \cdot 150.000\ \mathrm{mm} \cdot 1.750\ \mathrm{m} \cdot 23.560\ \mathrm{kN/m^3} \cdot 0.7\right)\\ &= 571.448\ \mathrm{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Col_{Total}} &= \Sigma\left(\text{AnDn}_{Col}\right)\\ &= \Sigma\left([12.884\ \text{kN}\cdot\text{m},\ 378.801\ \text{kN}\cdot\text{m},\ 739.563\ \text{kN}\cdot\text{m},\ 1.100\ \text{MN}\cdot\text{m},\ 1.879\ \text{MN}\cdot\text{m},\ 2.435\ \text{MN}\cdot\text{m},\ 2.992\ \text{MN}\cdot\text{m},\ 2.760\ \text{MN}\cdot\text{m},\ 2.281\ \text{MN}\cdot\text{m}]\right)\\ &= 14.577\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Col_{Total}} &= \Sigma\left(\text{An}_{Col}\right)\\ &= \Sigma\left([51.538\ \text{kN},\ 73.153\ \text{kN},\ 73.153\ \text{kN},\ 73.153\ \text{kN},\ 92.767\ \text{kN},\ 92.767\ \text{kN},\ 92.767\ \text{kN},\ 73.153\ \text{kN},\ 51.538\ \text{kN}]\right)\\ &= 669.987\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{Col_{Total}} &= \Sigma\left(\text{RnDn}_{Col}\right)\\ &= \Sigma\left([651041666666.666\ \text{mm}^5,\ 191406249999999.969\ \text{mm}^5,\ 37369791666666.625\ \text{mm}^5,\ 5559895833333.188\ \text{mm}^5,\ 949218749999999.875\ \text{mm}^5,\ 1.230\ \text{m}^5,\ 1.512\ \text{m}^5,\ 1.395\ \text{m}^5,\ 1.152\ \text{m}^5]\right)\\ &= 7.366\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{Col_{Total}} &= \Sigma\left(\text{Rn}_{Col}\right)\\ &= \Sigma\left([260416666666.667\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 468750000000.000\ \text{mm}^4,\ 468750000000.000\ \text{mm}^4,\ 468750000000.000\ \text{mm}^4,\ 364583333333.333\ \text{mm}^4,\ 260416666666.667\ \text{mm}^4]\right)\\ &= 3385416666666.667\ \text{mm}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Beam_{Total}} &= \Sigma\left(\text{AnDn}_{Beam}\right)\\ &= \Sigma\left([46.649\ \text{kN}\cdot\text{m},\ 979.625\ \text{kN}\cdot\text{m},\ 1.913\ \text{MN}\cdot\text{m},\ 2.846\ \text{MN}\cdot\text{m},\ 5.038\ \text{MN}\cdot\text{m},\ 6.531\ \text{MN}\cdot\text{m},\ 8.024\ \text{MN}\cdot\text{m},\ 7.137\ \text{MN}\cdot\text{m},\ 8.257\ \text{MN}\cdot\text{m}]\right)\\ &= 40.771\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Beam_{Total}} &= \Sigma\left(\text{An}_{Beam}\right)\\ &= \Sigma\left([186.595\ \text{kN},\ 186.595\ \text{kN},\ 186.595\ \text{kN},\ 186.595\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 248.794\ \text{kN},\ 186.595\ \text{kN},\ 186.595\ \text{kN}]\right)\\ &= 1.866\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{SW_{Total}} &= \Sigma\left(\text{AnDn}_{SW}\right)\\ &= \Sigma\left([1.725\ \text{MN}\cdot\text{m}]\right)\\ &= 1.725\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{SW_{Total}} &= \Sigma\left(\text{An}_{SW}\right)\\ &= \Sigma\left([74.214\ \text{kN}]\right)\\ &= 74.214\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{RnDn}_{SW_{Total}} &= \Sigma\left(\text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(31.387\ \text{m}^5\right)\\ &= 31.387\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn}_{SW_{Total}} &= \Sigma\left(\text{Rn}_{SW}\right)\\ &= \Sigma\left([1.350\ \text{m}^4]\right)\\ &= 1.350\ \text{m}^4\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Slab_{Total}} &= \Sigma\left(\text{AnDn}_{Slab}\right)\\ &= \Sigma\left([108.350\ \text{MN}\cdot\text{m}]\right)\\ &= 108.350\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Slab_{Total}} &= \Sigma\left(\text{An}_{Slab}\right)\\ &= \Sigma\left([4.851\ \text{MN}]\right)\\ &= 4.851\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{AnDn}_{Wall_{Total}} &= \Sigma\left(\text{AnDn}_{Wall}\right)\\ &= \Sigma\left([14.000\ \text{MN}\cdot\text{m}]\right)\\ &= 14.000\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An}_{Wall_{Total}} &= \Sigma\left(\text{An}_{Wall}\right)\\ &= \Sigma\left([571.448\ \text{kN}]\right)\\ &= 571.448\ \text{kN}\end{aligned}$$

$$\begin{aligned}\text{AnDn} &= \Sigma\left(\text{AnDn}_{Col_{Total}} + \text{AnDn}_{SW_{Total}} + \text{AnDn}_{Slab_{Total}} + \text{AnDn}_{Wall_{Total}} + \text{AnDn}_{Beam_{Total}}\right)\\ &= \Sigma\left(14.577\ \text{MN}\cdot\text{m} + 1.725\ \text{MN}\cdot\text{m} + 108.350\ \text{MN}\cdot\text{m} + 14.000\ \text{MN}\cdot\text{m} + 40.771\ \text{MN}\cdot\text{m}\right)\\ &= 179.424\ \text{MN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{An} &= \Sigma\left(\text{An}_{Col_{Total}} + \text{An}_{SW_{Total}} + \text{An}_{Slab_{Total}} + \text{An}_{Wall_{Total}} + \text{An}_{Beam_{Total}}\right)\\ &= \Sigma\left(669.987\ \text{kN} + 74.214\ \text{kN} + 4.851\ \text{MN} + 571.448\ \text{kN} + 1.866\ \text{MN}\right)\\ &= 8.033\ \text{MN}\end{aligned}$$

$$\begin{aligned}\text{RnDn} &= \Sigma\left(\text{RnDn}_{Col_{Total}} + \text{RnDn}_{SW_{Total}}\right)\\ &= \Sigma\left(7.366\ \text{m}^5 + 31.387\ \text{m}^5\right)\\ &= 38.753\ \text{m}^5\end{aligned}$$

$$\begin{aligned}\text{Rn} &= \Sigma\left(\text{Rn}_{Col_{Total}} + \text{Rn}_{SW_{Total}}\right)\\ &= \Sigma\left(3385416666666.667\ \text{mm}^4 + 1.350\ \text{m}^4\right)\\ &= 1.689\ \text{m}^4\end{aligned}$$

$$\begin{aligned}C_m &= \frac{\Sigma\left(\text{AnDn}\right)}{\Sigma\left(\text{An}\right)}\\ &= \frac{\Sigma\left(179.424\ \text{MN}\cdot\text{m}\right)}{\Sigma\left(8.033\ \text{MN}\right)}\\ &= 22.336\ \text{m}\end{aligned}$$

$$\begin{aligned}C_r &= \frac{\Sigma\left(\text{RnDn}\right)}{\Sigma\left(\text{Rn}\right)}\\ &= \frac{\Sigma\left(38.753\ \text{m}^5\right)}{\Sigma\left(1.689\ \text{m}^4\right)}\\ &= 22.951\ \text{m}\end{aligned}$$

C_t

TABULATION WEIGHT AND RIGIDITY

2ND FLOOR X,Y

	Weight	Moment of Inertia	WxD	IxD
Column	1.531 MN	338541666666.667 mm⁴	36.241 MN·m	8.012 m⁵
Beam	1.877 MN	nan	43.918 MN·m	nan
Slab	4.851 MN	nan	110.641 MN·m	nan
Shear Wall	367.536 kN	10.806 m⁴	7.641 MN·m	240.320 m⁵
Wall	1.108 MN	nan	22.348 MN·m	nan
Total	**9.736 MN**	**11.145 m⁴**	**220.788 MN·m**	**248.332 m⁵**

	Weight	Moment of Inertia	WxD	IxD
Column	1.531 MN	338541666666.667 mm⁴	33.320 MN·m	7.366 m⁵
Beam	1.866 MN	nan	40.771 MN·m	nan
Slab	4.851 MN	nan	108.350 MN·m	nan
Shear Wall	169.632 kN	1.350 m⁴	3.944 MN·m	31.387 m⁵
Wall	1.306 MN	nan	32.001 MN·m	nan
Total	**9.725 MN**	**1.689 m⁴**	**218.385 MN·m**	**38.753 m⁵**

3RD FLOOR X,Y

	Weight	Moment of Inertia	WxD	IxD
Column	1.340 MN	338541666666.667 mm⁴	31.711 MN·m	8.012 m⁵
Beam	1.877 MN	nan	43.918 MN·m	nan
Slab	4.851 MN	nan	110.641 MN·m	nan
Shear Wall	321.594 kN	10.806 m⁴	6.685 MN·m	240.320 m⁵
Wall	969.730 kN	nan	19.555 MN·m	nan
Total	**9.360 MN**	**11.145 m⁴**	**212.510 MN·m**	**248.332 m⁵**

	Weight	Moment of Inertia	WxD	IxD
Column	1.340 MN	338541666666.667 mm⁴	29.155 MN·m	7.366 m⁵
Beam	1.866 MN	nan	40.771 MN·m	nan
Slab	4.851 MN	nan	108.350 MN·m	nan
Shear Wall	148.428 kN	1.350 m⁴	3.451 MN·m	31.387 m⁵
Wall	1.143 MN	nan	28.001 MN·m	nan
Total	**9.349 MN**	**1.689 m⁴**	**209.727 MN·m**	**38.753 m⁵**

4TH FLOOR X,Y

	Weight	Moment of Inertia	WxD	IxD
Column	1.340 MN	338541666666.667 mm⁴	31.711 MN·m	8.012 m⁵
Beam	1.877 MN	nan	43.918 MN·m	nan
Slab	4.851 MN	nan	110.641 MN·m	nan
Shear Wall	321.594 kN	10.806 m⁴	6.685 MN·m	240.320 m⁵
Wall	969.730 kN	nan	19.555 MN·m	nan
Total	**9.360 MN**	**11.145 m⁴**	**212.510 MN·m**	**248.332 m⁵**

	Weight	Moment of Inertia	WxD	IxD
Column	1.340 MN	338541666666.667 mm⁴	29.155 MN·m	7.366 m⁵
Beam	1.866 MN	nan	40.771 MN·m	nan
Slab	4.851 MN	nan	108.350 MN·m	nan
Shear Wall	148.428 kN	1.350 m⁴	3.451 MN·m	31.387 m⁵
Wall	1.143 MN	nan	28.001 MN·m	nan
Total	**9.349 MN**	**1.689 m⁴**	**209.727 MN·m**	**38.753 m⁵**

ROOF DECK X,Y

	Weight	Moment of Inertia	WxD	IxD
Column	669.987 kN	338541666666.667 mm⁴	15.856 MN·m	8.012 m⁵
Beam	1.877 MN	nan	43.918 MN·m	nan
Slab	4.851 MN	nan	110.641 MN·m	nan
Shear Wall	160.797 kN	10.806 m⁴	3.343 MN·m	240.320 m⁵
Wall	484.865 kN	nan	9.777 MN·m	nan
Total	**8.044 MN**	**11.145 m⁴**	**183.534 MN·m**	**248.332 m⁵**

	Weight	Moment of Inertia	WxD	IxD
Column	669.987 kN	338541666666.667 mm⁴	14.577 MN·m	7.366 m⁵
Beam	1.866 MN	nan	40.771 MN·m	nan
Slab	4.851 MN	nan	108.350 MN·m	nan
Shear Wall	74.214 kN	1.350 m⁴	1.725 MN·m	31.387 m⁵
Wall	571.448 kN	nan	14.000 MN·m	nan
Total	**8.033 MN**	**1.689 m⁴**	**179.424 MN·m**	**38.753 m⁵**

CENTER OF MASS, CENTER OF RIGIDITY

	Center of Mass	Center of Rigidity
FLOOR - 2 - Y AXIS	22.457 m	22.951 m
FLOOR - 3 - Y AXIS	22.434 m	22.951 m
FLOOR - 4 - Y AXIS	22.434 m	22.951 m
FLOOR - Roof Deck - Y AXIS	**22.336 m**	**22.951 m**

	Center of Mass	Center of Rigidity
FLOOR - 2 - X AXIS	22.678 m	22.282 m
FLOOR - 3 - X AXIS	22.704 m	22.282 m
FLOOR - 4 - X AXIS	22.704 m	22.282 m
FLOOR - Roof Deck - X AXIS	**22.815 m**	**22.282 m**

ECCENTRICITY

$$e_x = \text{abs}\,(22.678 - 22.282) = 0.396$$

$$e_y = \text{abs}\,(22.336 - 22.951) = 0.615$$

$$e = \sqrt{(e_x)^2 + (e_y)^2} = \sqrt{(0.396)^2 + (0.615)^2} = 0.731$$

$$e_{natural} = 0.05 \cdot 44 = 2.200$$

$$\text{Since, } e < e_{natural} \rightarrow (0.731 < 2.200) :$$

$$e = 2.200$$

COMPUTATION OF BASE SHEAR BASED ON STATIC PROCEDURE

	Column	Beam	Slab	Shear Wall	Wall	Total
Roof Deck	669.987 kN	3.755 MN	4.851 MN	321.594 kN	969.730 kN	10.567308
Floor 4	1.340 MN	3.755 MN	4.851 MN	643.188 kN	1.939 MN	12.528619
Floor 3	1.340 MN	3.755 MN	4.851 MN	643.188 kN	1.939 MN	12.528619
Floor 2	**1.531 MN**	**3.755 MN**	**4.851 MN**	**735.072 kN**	**2.217 MN**	**13.088994**

	W	H	H_n	WxH
Roof	10.567308	3.500000	15.000000	158.510 MN
Floor 4	12.528619	3.500000	11.500000	144.079 MN
Floor 3	12.528619	3.500000	8.000000	100.229 MN
Floor 2	**13.088994**	**4.500000**	**4.500000**	**58.900 MN**

PARAMETERS

$$A_e = 0.3 \cdot 6 = 1.80000$$

$$A_c = \Sigma\left(A_e \cdot \left(0.2 + \left(\frac{D_c}{(\Sigma(H_n))^2}\right)\right)\right)$$
$$= \Sigma\left(1.80000 \cdot \left(0.2 + \left(\frac{[5.50000,\ 5.50000]}{(\Sigma([4.50000,\ 3.50000,\ 3.50000,\ 3.50000]))^2}\right)\right)\right)$$
$$= 0.80800$$

$$C_t = 0.0743 \cdot \sqrt{A_c}$$
$$= 0.0743 \cdot \sqrt{0.80800}$$
$$= 0.06679$$

$$\text{Zone} = 0.40000 \qquad \text{SeismicSource} = A \qquad \text{Soil} = \text{SD}$$

$$I = 1 \qquad R = 8.50000 \qquad \text{Distance} = 5.00000\ \text{km}$$

$$H_n = 15.00000 \qquad C_t = 0.06679 \qquad W = 48.71354\ \text{MN}$$

Since, Distance $> 5 \rightarrow (5 > 5)$: (Table 208-6)

$$\begin{aligned} Na &= 1.2 \quad \left(\left(\frac{\text{Distance} \quad 5}{5}\right) \cdot (1.2 \quad 1)\right) \\ &= 1.2 - \left(\left(\frac{5 \quad 5}{5}\right) \cdot (1.2 - 1)\right) \\ &= 1.20000 \end{aligned}$$

Since, Distance $\geq 5 \rightarrow (5 \geq 5)$: (Table 208-5)

$$\begin{aligned} Nv &= 1.6 \quad \left(\left(\frac{\text{Distance} - 5}{5}\right) \cdot (1.6 \quad 1.2)\right) \\ &= 1.6 - \left(\left(\frac{5 \quad 5}{5}\right) \cdot (1.6 - 1.2)\right) \\ &= 1.60000 \end{aligned}$$

Since, $\text{Soil}_{Profile} \rightarrow (SD)$: (Table 208-7)

$$\begin{aligned} Ca &= 0.44 \cdot na \\ &= 0.44 \cdot 1.20000 \\ &= 0.52800 \end{aligned}$$

Since, $\text{Soil}_{Profile} \rightarrow (SD)$: (Table 208-8)

$$\begin{aligned} Cv &= 0.64 \cdot nv \\ &= 0.64 \cdot 1.60000 \\ &= 1.02400 \end{aligned}$$

$$\begin{aligned} T - C_l \cdot (\Sigma(H_a))^{\left(\frac{3}{4}\right)} \\ &= 0.06679 \cdot (\Sigma([4.50000,\ 3.50000,\ 3.50000,\ 3.50000]))^{\left(\frac{3}{4}\right)} \\ &= 0.50905 \quad \text{(Equation 208-12)} \end{aligned}$$

$$V = \left(\frac{cv \cdot I}{r \cdot t}\right) \cdot w$$
$$= \left(\frac{1.02400 \cdot 1}{8.50000 \cdot 0.50905}\right) \cdot 48.71354 \text{ MN}$$
$$= 11.52837 \text{ MN} \quad \text{(Equation 208-8)}$$

$$V = \left(\frac{2.5 \cdot ca \cdot I}{r}\right) \cdot w$$
$$= \left(\frac{2.5 \cdot 0.52800 \cdot 1}{8.50000}\right) \cdot 48.71354 \text{ MN}$$
$$= 7.56493 \text{ MN} \quad \text{(Equation 208-9)}$$

$$V = 0.11 \cdot ca \cdot I \cdot w$$
$$= 0.11 \cdot 0.52800 \cdot 1 \cdot 48.71354 \text{ MN}$$
$$= 2.82928 \text{ MN} \quad \text{(Equation 208-10)}$$

$$V = \left(\frac{0.8 \cdot z \cdot nv \cdot I}{r}\right) \cdot w$$
$$= \left(\frac{0.8 \cdot 0.40000 \cdot 1.60000 \cdot 1}{8.50000}\right) \cdot 48.71354 \text{ MN}$$
$$= 2.93427 \text{ MN} \quad \text{(Equation 208-11)}$$

$$\text{Since, } v > \text{vmax} \rightarrow (11.52837 \text{ MN} > 7.56493 \text{ MN}) :$$

$$\text{BaseShear} = 7.56493 \text{ MN}$$

$$F' = \frac{(n - \text{ft}) \cdot \text{WixHi}}{\text{WixHi}_{Total}}$$

	Forces
F4	3.282 MN
F3	2.199 MN
F2	1.466 MN
F1	**618.230 kN**

DIRECT AND TORSIONAL COEFFICIENT

FRAME	ELEMENT	RIGIDITY (I/L^3)	TOTAL R	DISTANCE FROM ECCENTRICITY, (d)	DIRECT COEFFICIENT	d^2, m^2	Rd	Rd^2	$Rd/\Sigma Rd^2$	MT	TORSIONAL COEFFICIENT	Direct + Torsional Coefficient
1	COLUMN	2.999487367	20.99641	-22.951	0.022247834	526.7484	-481.889	11059.83	0.009033072	2.2	0.019872758	0.042120592
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
2	COLUMN	2.999487367	20.99641	-16.951	0.022247834	287.3364	-355.91	6033.033	0.006671587	2.2	0.014677492	0.036925326
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
3	COLUMN	2.999487367	26.99539	-10.951	0.028604358	119.9244	-295.626	3237.406	0.005541561	2.2	0.012191434	0.040795792
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
4	COLUMN	2.999487367	383.3905	-4.951	0.406241271	24.5124	-1898.17	9397.822	0.035581405	2.2	0.078279091	0.484520361
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	SHEARWALL	356.3951459										
5	COLUMN	2.999487367	383.3905	1.049	0.406241271	1.100401	402.1767	421.8833	0.00753886	2.2	0.016585491	0.422826762
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	SHEARWALL	356.3951459										

	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
6	COLUMN	2.999487367	26.99539	6.049	0.028604358	36.5904	163.2951	987.772	0.00306099	2.2	0.006734178	0.035338536
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
7	COLUMN	2.999487367	26.99539	11.049	0.028604358	122.0804	298.272	3295.608	0.005591152	2.2	0.012300534	0.040904892
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
8	COLUMN	2.999487367	26.99539	16.049	0.028604358	257.5704	433.249	6953.212	0.008121314	2.2	0.017866891	0.046471249
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
9	COLUMN	2.999487367	26.99539	21.049	0.028604358	443.0604	568.2259	11960.59	0.010651476	2.2	0.023433247	0.052037605
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
TOTAL			943.7508					53347.15				

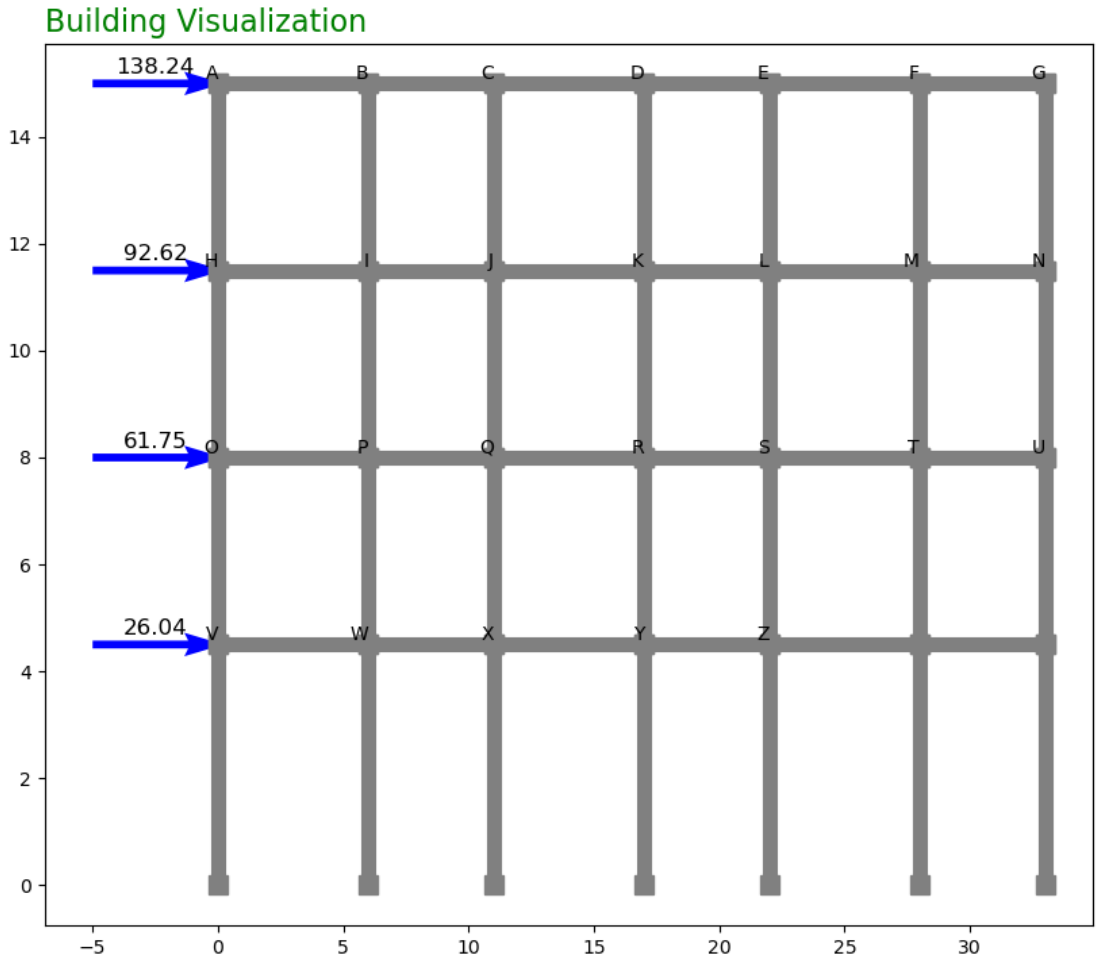
FRAME	ELEMENT	RIGIDITY (I/L^3)	TOTAL R	DISTANCE FROM ECCENTRICITY, (d)	DIRECT COEFFICIENT	d^2, m^2	Rd	Rd^2	$Rd/\Sigma Rd^2$	MT	TORSIONAL COEFFICIENT	Direct + Torsional Coefficient
A	COLUMN	2.999487367	4947.35446	-22.282	0.490643803	496.4875	-110236.9522	2456299.768	0.022892194	2.2	0.050362826	0.54100663
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	SHEARWALL	4938.356002										
B	COLUMN	2.999487367	14.9974368	-17.282	0.00148734	298.6675	-259.1857034	4479.247327	5.38234E-05	2.2	0.000118412	0.001605752
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
C	COLUMN	2.999487367	26.9953863	-11.282	0.002677212	127.2835	-304.5619483	3436.067901	6.32464E-05	2.2	0.000139142	0.002816355
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
D	COLUMN	2.999487367	26.9953863	-6.282	0.002677212	39.46352	-169.5850168	1065.333075	3.52166E-05	2.2	7.74766E-05	0.002754689
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
E	COLUMN	2.999487367	26.9953863	-0.282	0.002677212	0.079524	-7.612698939	2.146781101	1.58088E-06	2.2	3.47794E-06	0.00268069
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										

F	COLUMN	2.999487367	26.9953863	4.718	0.002677212	22.25952	127.3642326	600.9044494	2.64489E-05	2.2	5.81876E-05	0.0027354
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
G	COLUMN	2.999487367	26.9953863	10.718	0.002677212	114.8755	289.3365504	3101.109148	6.00846E-05	2.2	0.000132186	0.002809399
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
H	COLUMN	2.999487367	20.9964116	15.718	0.002082276	247.0555	330.0215971	5187.279463	6.85334E-05	2.2	0.000150774	0.00223305
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
I	COLUMN	2.999487367	4959.35241	21.718	0.491833676	471.6715	107707.2157	2339185.311	0.02236686	2.2	0.049207091	0.541040767
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	COLUMN	2.999487367										
	SHEARWALL	4938.356002										
X	SHEARWALL	2.857844908	5.71568982	-19.282	0.000566842	371.7955	-110.209931	2125.06789	2.28866E-05	2.2	5.03505E-05	0.000617192
	SHEARWALL	2.857844908										
TOTAL			10083.3933					4815482.235				

FRAME	DIRECT + TORSIONAL COEFFICIENT	FORCES/LEVEL				FI			
		2ND	3RD	4TH	ROOF	2ND	3RD	4TH	ROOF
1	0.042120592	618.23	1466	2199	3282	26.04021	61.74879	92.62318	138.2398
2	0.036925326	618.23	1466	2199	3282	22.8283	54.1325	81.1988	121.189
3	0.040795792	618.23	1466	2199	3282	25.22118	59.80663	89.70995	133.8918
4	0.484520361	618.23	1466	2199	3282	299.545	710.307	1065.46	1590.2
5	0.422826762	618.23	1466	2199	3282	261.404	619.864	929.796	1387.72
6	0.035338536	618.23	1466	2199	3282	21.8473	51.8063	77.7094	115.981
7	0.040904892	618.23	1466	2199	3282	25.2886	59.9666	89.9499	134.25
8	0.046471249	618.23	1466	2199	3282	28.7299	68.1269	102.19	152.519
9	0.052037605	618.23	1466	2199	3282	32.1712	76.2871	114.431	170.787
A	0.535525634	618.23	1466	2199	3282	331.078	785.081	1177.62	1757.6
B	0.002520964	618.23	1466	2199	3282	1.55854	3.69573	5.5436	8.2738
C	0.004420718	618.23	1466	2199	3282	2.733021	6.480773	9.72116	14.5088
D	0.004323205	618.23	1466	2199	3282	2.67274	6.33782	9.50673	14.1888
E	0.004206189	618.23	1466	2199	3282	2.60039	6.16627	9.24941	13.8047
F	0.004292703	618.23	1466	2199	3282	2.65388	6.2931	9.43965	14.0887
G	0.004409719	618.23	1466	2199	3282	2.726221	6.464648	9.696972	14.4727
H	0.003505625	618.23	1466	2199	3282	2.16728	5.13925	7.70887	11.5055
I	0.536310045	618.23	1466	2199	3282	331.563	786.231	1179.35	1760.17

STRUCTURAL ANALYSIS USING (PORTAL,CANTILEVER AND FACTOR METHOD)

FRAME 1


Building Visualization
138.24
92.62
61.75
26.04
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
14
12
10
8
6
4
2
0
−5
0
5
10
15
20
25
30

PORTAL METHOD OF ANALYSIS

CALCULATION:

COLUMN-H-O

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{230.86\ \text{kN}}{12} = 19.24\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 19.24\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 19.24\ \text{kN} = 19.24\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 19.24\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 33.67\ \text{kN} \cdot \text{m}$$

COLUMN-I-P

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{230.86\ \text{kN}}{12} = 19.24\ \text{kN}$$

$$\text{Shear} = 38.48\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 19.24\ \text{kN} = 38.48\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 38.48\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 67.33\ \text{kN} \cdot \text{m}$$

COLUMN-J-Q

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{230.86\ \text{kN}}{12} = 19.24\ \text{kN}$$

$$\text{Shear} = 38.48\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 19.24\ \text{kN} = 38.48\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 38.48\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 67.33\ \text{kN} \cdot \text{m}$$

COLUMN-K-R

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{230.86\ \text{kN}}{12} = 19.24\ \text{kN}$$

$$\text{Shear} = 38.48\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 19.24\ \text{kN} = 38.48\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 38.48\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 67.33\ \text{kN} \cdot \text{m}$$

COLUMN-L-S

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{230.86\ \text{kN}}{12} = 19.24\ \text{kN}$$

$$\text{Shear} = 38.48\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 19.24\ \text{kN} = 38.48\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 38.48\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 67.33\ \text{kN} \cdot \text{m}$$

COLUMN-M-T

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{230.86\ \text{kN}}{12} = 19.24\ \text{kN}$$

$$\text{Shear} = 38.48\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 19.24\ \text{kN} = 38.48\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 38.48\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 67.33\ \text{kN} \cdot \text{m}$$

COLUMN-N-U

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{230.86\ \text{kN}}{12} = 19.24\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 19.24\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 19.24\ \text{kN} = 19.24\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 19.24\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 33.67\ \text{kN} \cdot \text{m}$$

COLUMN-A-H

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{138.24\ \text{kN}}{12} = 11.52\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 11.52\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 11.52\ \text{kN} = 11.52\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 11.52\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 20.16\ \text{kN} \cdot \text{m}$$

COLUMN-B-I

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{138.24\ \text{kN}}{12} = 11.52\ \text{kN}$$

$$\text{Shear} = 23.04\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 11.52\ \text{kN} = 23.04\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 23.04\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 40.32\ \text{kN} \cdot \text{m}$$

COLUMN-C-J

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{138.24\ \text{kN}}{12} = 11.52\ \text{kN}$$

$$\text{Shear} = 23.04\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 11.52\ \text{kN} = 23.04\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 23.04\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 40.32\ \text{kN} \cdot \text{m}$$

COLUMN-D-K

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{138.24\ \text{kN}}{12} = 11.52\ \text{kN}$$

$$\text{Shear} = 23.04\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 11.52\ \text{kN} = 23.04\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 23.04\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 40.32\ \text{kN} \cdot \text{m}$$

COLUMN-E-L

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{138.24\ \text{kN}}{12} = 11.52\ \text{kN}$$

$$\text{Shear} = 23.04\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 11.52\ \text{kN} = 23.04\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 23.04\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 40.32\ \text{kN} \cdot \text{m}$$

COLUMN-F-M

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{138.24\ \text{kN}}{12} = 11.52\ \text{kN}$$

$$\text{Shear} = 23.04\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 11.52\ \text{kN} = 23.04\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 23.04\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 40.32\ \text{kN} \cdot \text{m}$$

COLUMN-G-N

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{138.24\ \text{kN}}{12} = 11.52\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 11.52\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 11.52\ \text{kN} = 11.52\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 11.52\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 20.16\ \text{kN} \cdot \text{m}$$

COLUMN-O-V

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{292.61\ \text{kN}}{12} = 24.38\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 24.38\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 24.38\ \text{kN} = 24.38\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 24.38\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 42.67\ \text{kN} \cdot \text{m}$$

COLUMN-P-W

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{292.61\ \text{kN}}{12} = 24.38\ \text{kN}$$

$$\text{Shear} = 48.77\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 24.38\ \text{kN} = 48.77\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 48.77\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 85.34\ \text{kN} \cdot \text{m}$$

COLUMN-Q-X

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{292.61\ \text{kN}}{12} = 24.38\ \text{kN}$$

$$\text{Shear} = 48.77\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 24.38\ \text{kN} = 48.77\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 48.77\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 85.34\ \text{kN} \cdot \text{m}$$

COLUMN-R-Y

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{292.61\ \text{kN}}{12} = 24.38\ \text{kN}$$

$$\text{Shear} = 48.77\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 24.38\ \text{kN} = 48.77\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 48.77\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 85.34\ \text{kN} \cdot \text{m}$$

COLUMN-S-Z

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{292.61\ \text{kN}}{12} = 24.38\ \text{kN}$$

$$\text{Shear} = 48.77\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 24.38\ \text{kN} = 48.77\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 48.77\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 85.34\ \text{kN} \cdot \text{m}$$

COLUMN-T-a

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{292.61\ \text{kN}}{12} = 24.38\ \text{kN}$$

$$\text{Shear} = 48.77\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 24.38\ \text{kN} = 48.77\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 48.77\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 85.34\ \text{kN} \cdot \text{m}$$

COLUMN-U-b

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{292.61\ \text{kN}}{12} = 24.38\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 24.38\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 24.38\ \text{kN} = 24.38\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 24.38\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 42.67\ \text{kN} \cdot \text{m}$$

COLUMN-V-c

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{318.65\ \text{kN}}{12} = 26.55\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 26.55\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 26.55\ \text{kN} = 26.55\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 26.55\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 59.75\ \text{kN} \cdot \text{m}$$

COLUMN-W-d

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{318.65\ \text{kN}}{12} = 26.55\ \text{kN}$$

$$\text{Shear} = 53.11\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 26.55\ \text{kN} = 53.11\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 53.11\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 119.49\ \text{kN} \cdot \text{m}$$

COLUMN-X-e

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{318.65\ \text{kN}}{12} = 26.55\ \text{kN}$$

$$\text{Shear} = 53.11\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 26.55\ \text{kN} = 53.11\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 53.11\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 119.49\ \text{kN} \cdot \text{m}$$

COLUMN-Y-f

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{318.65\ \text{kN}}{12} = 26.55\ \text{kN}$$

$$\text{Shear} = 53.11\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 26.55\ \text{kN} = 53.11\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 53.11\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 119.49\ \text{kN} \cdot \text{m}$$

COLUMN-Z-g

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{318.65\ \text{kN}}{12} = 26.55\ \text{kN}$$

$$\text{Shear} = 53.11\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 26.55\ \text{kN} = 53.11\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 53.11\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 119.49\ \text{kN} \cdot \text{m}$$

COLUMN-a-h

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{318.65\ \text{kN}}{12} = 26.55\ \text{kN}$$

$$\text{Shear} = 53.11\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 26.55\ \text{kN} = 53.11\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 53.11\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 119.49\ \text{kN} \cdot \text{m}$$

COLUMN-b-i

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{318.65\ \text{kN}}{12} = 26.55\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 26.55\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 26.55\ \text{kN} = 26.55\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 26.55\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 59.75\ \text{kN} \cdot \text{m}$$

BEAM-B-A

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([20.16\ \text{kN} \cdot \text{m}]) - \Sigma([]) \\ &= 20.16\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{20.16\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 6.72\ \text{kN}\end{aligned}$$

BEAM-C-B

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m}]) - \Sigma([20.16\ \text{kN} \cdot \text{m}]) \\ &= 20.16\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{20.16\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 8.06\ \text{kN}\end{aligned}$$

BEAM-D-C

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m}]) - \Sigma([20.16\ \text{kN} \cdot \text{m}]) \\ &= 20.16\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{20.16\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 6.72\ \text{kN}\end{aligned}$$

BEAM-E-D

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m}]) - \Sigma([20.16\ \text{kN} \cdot \text{m}]) \\ &= 20.16\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{20.16\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 8.06\ \text{kN}\end{aligned}$$

BEAM-F-E

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m}]) - \Sigma([20.16\ \text{kN} \cdot \text{m}]) \\ &= 20.16\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{20.16\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 6.72\ \text{kN}\end{aligned}$$

BEAM-G-F

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m}]) - \Sigma([20.16\ \text{kN} \cdot \text{m}]) \\ &= 20.16\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{20.16\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 8.06\ \text{kN}\end{aligned}$$

BEAM-I-H

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([20.16\ \text{kN} \cdot \text{m},\ 33.67\ \text{kN} \cdot \text{m}]) - \Sigma([]) \\ &= 53.83\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{53.83\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 17.94\ \text{kN}\end{aligned}$$

BEAM-J-I

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m},\ 67.33\ \text{kN} \cdot \text{m}]) - \Sigma([53.83\ \text{kN} \cdot \text{m}]) \\ &= 53.83\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{53.83\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 21.53\ \text{kN}\end{aligned}$$

BEAM-K-J

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m},\ 67.33\ \text{kN} \cdot \text{m}]) - \Sigma([53.83\ \text{kN} \cdot \text{m}]) \\ &= 53.83\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{53.83\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 17.94\ \text{kN}\end{aligned}$$

BEAM-L-K

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m},\ 67.33\ \text{kN} \cdot \text{m}]) - \Sigma([53.83\ \text{kN} \cdot \text{m}]) \\ &= 53.83\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{53.83\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 21.53\ \text{kN}\end{aligned}$$

BEAM-M-L

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m},\ 67.33\ \text{kN} \cdot \text{m}]) - \Sigma([53.83\ \text{kN} \cdot \text{m}]) \\ &= 53.83\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{53.83\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 17.94\ \text{kN}\end{aligned}$$

BEAM-N-M

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([40.32\ \text{kN} \cdot \text{m},\ 67.33\ \text{kN} \cdot \text{m}]) - \Sigma([53.83\ \text{kN} \cdot \text{m}]) \\ &= 53.83\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{53.83\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 21.53\ \text{kN}\end{aligned}$$

BEAM-P-O

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([33.67\ \text{kN}\cdot\text{m},\ 42.67\ \text{kN}\cdot\text{m}]) - \Sigma([]) \\ &= 76.34\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{76.34\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 25.45\ \text{kN}\end{aligned}$$

BEAM-Q-P

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([67.33\ \text{kN}\cdot\text{m},\ 85.34\ \text{kN}\cdot\text{m}]) - \Sigma([76.34\ \text{kN}\cdot\text{m}]) \\ &= 76.34\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{76.34\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 30.54\ \text{kN}\end{aligned}$$

BEAM-R-Q

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([67.33\ \text{kN}\cdot\text{m},\ 85.34\ \text{kN}\cdot\text{m}]) - \Sigma([76.34\ \text{kN}\cdot\text{m}]) \\ &= 76.34\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{76.34\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 25.45\ \text{kN}\end{aligned}$$

BEAM-S-R

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([67.33\ \text{kN}\cdot\text{m},\ 85.34\ \text{kN}\cdot\text{m}]) - \Sigma([76.34\ \text{kN}\cdot\text{m}]) \\ &= 76.34\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{76.34\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 30.54\ \text{kN}\end{aligned}$$

BEAM-T-S

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([67.33\ \text{kN}\cdot\text{m},\ 85.34\ \text{kN}\cdot\text{m}]) - \Sigma([76.34\ \text{kN}\cdot\text{m}]) \\ &= 76.34\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{76.34\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 25.45\ \text{kN}\end{aligned}$$

BEAM-U-T

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([67.33\ \text{kN}\cdot\text{m},\ 85.34\ \text{kN}\cdot\text{m}]) - \Sigma([76.34\ \text{kN}\cdot\text{m}]) \\ &= 76.34\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{76.34\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 30.54\ \text{kN}\end{aligned}$$

BEAM-W-V

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([42.67\ \text{kN}\cdot\text{m},\ 59.75\ \text{kN}\cdot\text{m}]) - \Sigma([]) \\ &= 102.42\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{102.42\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 34.14\ \text{kN}\end{aligned}$$

BEAM-X-W

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([85.34\ \text{kN}\cdot\text{m},\ 119.49\ \text{kN}\cdot\text{m}]) - \Sigma([102.42\ \text{kN}\cdot\text{m}]) \\ &= 102.42\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{102.42\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 40.97\ \text{kN}\end{aligned}$$

BEAM-Y-X

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([85.34\ \text{kN}\cdot\text{m},\ 119.49\ \text{kN}\cdot\text{m}]) - \Sigma([102.42\ \text{kN}\cdot\text{m}]) \\ &= 102.42\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{102.42\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 34.14\ \text{kN}\end{aligned}$$

BEAM-Z-Y

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([85.34\ \text{kN}\cdot\text{m},\ 119.49\ \text{kN}\cdot\text{m}]) - \Sigma([102.42\ \text{kN}\cdot\text{m}]) \\ &= 102.42\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{102.42\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 40.97\ \text{kN}\end{aligned}$$

BEAM-a-Z

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([85.34\ \text{kN}\cdot\text{m},\ 119.49\ \text{kN}\cdot\text{m}]) - \Sigma([102.42\ \text{kN}\cdot\text{m}]) \\ &= 102.42\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{102.42\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 34.14\ \text{kN}\end{aligned}$$

BEAM-b-a

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([85.34\ \text{kN}\cdot\text{m},\ 119.49\ \text{kN}\cdot\text{m}]) - \Sigma([102.42\ \text{kN}\cdot\text{m}]) \\ &= 102.42\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{102.42\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 40.97\ \text{kN}\end{aligned}$$

COLUMN-A-H

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[6.72\text{ kN}\right]\right) + \Sigma\left(\left[\right]\right) - \Sigma\left(\left[\right]\right)\\ &= 6.72\text{ kN}\end{aligned}$$

COLUMN-B-I

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[8.06\text{ kN}\right]\right) + \Sigma\left(\left[\right]\right) - \Sigma\left(\left[6.72\text{ kN}\right]\right)\\ &= 1.34\text{ kN}\end{aligned}$$

COLUMN-C-J

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[6.72\text{ kN}\right]\right) + \Sigma\left(\left[\right]\right) - \Sigma\left(\left[8.06\text{ kN}\right]\right)\\ &= -1.34\text{ kN}\end{aligned}$$

COLUMN-D-K

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[8.06\text{ kN}\right]\right) + \Sigma\left(\left[\right]\right) - \Sigma\left(\left[6.72\text{ kN}\right]\right)\\ &= 1.34\text{ kN}\end{aligned}$$

COLUMN-E-L

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[6.72\text{ kN}\right]\right) + \Sigma\left(\left[\right]\right) - \Sigma\left(\left[8.06\text{ kN}\right]\right)\\ &= -1.34\text{ kN}\end{aligned}$$

COLUMN-F-M

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[8.06\text{ kN}\right]\right) + \Sigma\left(\left[\right]\right) - \Sigma\left(\left[6.72\text{ kN}\right]\right)\\ &= 1.34\text{ kN}\end{aligned}$$

COLUMN-G-N

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[\right]\right) + \Sigma\left(\left[\right]\right) - \Sigma\left(\left[8.06\text{ kN}\right]\right)\\ &= -8.06\text{ kN}\end{aligned}$$

COLUMN-H-O

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[17.94\text{ kN}\right]\right) + \Sigma\left(\left[6.72\text{ kN}\right]\right) - \Sigma\left(\left[\right]\right)\\ &= 24.66\text{ kN}\end{aligned}$$

COLUMN-I-P

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[21.53\text{ kN}\right]\right) + \Sigma\left(\left[1.34\text{ kN}\right]\right) - \Sigma\left(\left[17.94\text{ kN}\right]\right)\\ &= 4.93\text{ kN}\end{aligned}$$

COLUMN-J-Q

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[17.94\text{ kN}\right]\right) + \Sigma\left(\left[-1.34\text{ kN}\right]\right) - \Sigma\left(\left[21.53\text{ kN}\right]\right)\\ &= -4.93\text{ kN}\end{aligned}$$

COLUMN-K-R

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[21.53\text{ kN}\right]\right) + \Sigma\left(\left[1.34\text{ kN}\right]\right) - \Sigma\left(\left[17.94\text{ kN}\right]\right)\\ &= 4.93\text{ kN}\end{aligned}$$

COLUMN-L-S

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[17.94\text{ kN}\right]\right) + \Sigma\left(\left[-1.34\text{ kN}\right]\right) - \Sigma\left(\left[21.53\text{ kN}\right]\right)\\ &= -4.93\text{ kN}\end{aligned}$$

COLUMN-M-T

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[21.53\text{ kN}\right]\right) + \Sigma\left(\left[1.34\text{ kN}\right]\right) - \Sigma\left(\left[17.94\text{ kN}\right]\right)\\ &= 4.93\text{ kN}\end{aligned}$$

COLUMN-N-U

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[\right]\right) + \Sigma\left(\left[-8.06\text{ kN}\right]\right) - \Sigma\left(\left[21.53\text{ kN}\right]\right)\\ &= -29.59\text{ kN}\end{aligned}$$

COLUMN-O-V

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[25.45\text{ kN}\right]\right) + \Sigma\left(\left[24.66\text{ kN}\right]\right) - \Sigma\left(\left[\right]\right)\\ &= 50.11\text{ kN}\end{aligned}$$

COLUMN-P-W

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[30.54\text{ kN}\right]\right) + \Sigma\left(\left[4.93\text{ kN}\right]\right) - \Sigma\left(\left[25.45\text{ kN}\right]\right)\\ &= 10.02\text{ kN}\end{aligned}$$

COLUMN-Q-X

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[25.45\text{ kN}\right]\right) + \Sigma\left(\left[-4.93\text{ kN}\right]\right) - \Sigma\left(\left[30.54\text{ kN}\right]\right)\\ &= -10.02\text{ kN}\end{aligned}$$

COLUMN-R-Y

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[30.54\text{ kN}\right]\right) + \Sigma\left(\left[4.93\text{ kN}\right]\right) - \Sigma\left(\left[25.45\text{ kN}\right]\right)\\ &= 10.02\text{ kN}\end{aligned}$$

COLUMN-S-Z

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[25.45\text{ kN}\right]\right) + \Sigma\left(\left[-4.93\text{ kN}\right]\right) - \Sigma\left(\left[30.54\text{ kN}\right]\right)\\ &= -10.02\text{ kN}\end{aligned}$$

COLUMN-T-a

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[30.54\text{ kN}\right]\right) + \Sigma\left(\left[4.93\text{ kN}\right]\right) - \Sigma\left(\left[25.45\text{ kN}\right]\right)\\ &= 10.02\text{ kN}\end{aligned}$$

COLUMN-U-b

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[\right]\right) + \Sigma\left(\left[-29.59\text{ kN}\right]\right) - \Sigma\left(\left[30.54\text{ kN}\right]\right)\\ &= -60.13\text{ kN}\end{aligned}$$

COLUMN-V-c

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[34.14\text{ kN}\right]\right) + \Sigma\left(\left[50.11\text{ kN}\right]\right) - \Sigma\left(\left[\right]\right)\\ &= 84.25\text{ kN}\end{aligned}$$

COLUMN-W-d

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[40.97\text{ kN}\right]\right) + \Sigma\left(\left[10.02\text{ kN}\right]\right) - \Sigma\left(\left[34.14\text{ kN}\right]\right)\\ &= 16.85\text{ kN}\end{aligned}$$

COLUMN-X-e

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[34.14\text{ kN}\right]\right) + \Sigma\left(\left[-10.02\text{ kN}\right]\right) - \Sigma\left(\left[40.97\text{ kN}\right]\right)\\ &= -16.85\text{ kN}\end{aligned}$$

COLUMN-Y-f

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[40.97\text{ kN}\right]\right) + \Sigma\left(\left[10.02\text{ kN}\right]\right) - \Sigma\left(\left[34.14\text{ kN}\right]\right)\\ &= 16.85\text{ kN}\end{aligned}$$

COLUMN-Z-g

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[34.14\text{ kN}\right]\right) + \Sigma\left(\left[-10.02\text{ kN}\right]\right) - \Sigma\left(\left[40.97\text{ kN}\right]\right)\\ &= -16.85\text{ kN}\end{aligned}$$

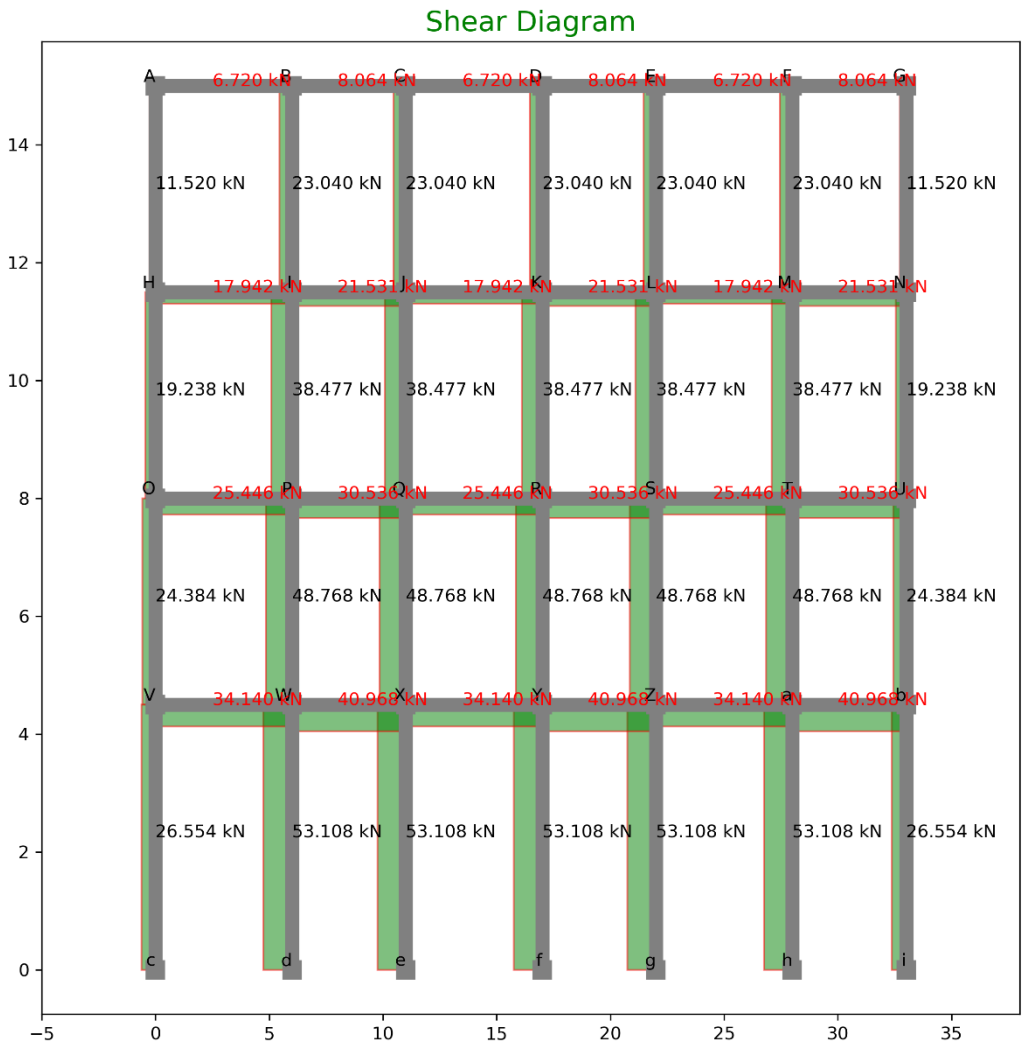
COLUMN-a-h

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[40.97\text{ kN}\right]\right) + \Sigma\left(\left[10.02\text{ kN}\right]\right) - \Sigma\left(\left[34.14\text{ kN}\right]\right)\\ &= 16.85\text{ kN}\end{aligned}$$

COLUMN-b-i

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(\left[\right]\right) + \Sigma\left(\left[-60.13\text{ kN}\right]\right) - \Sigma\left(\left[40.97\text{ kN}\right]\right)\\ &= -101.10\text{ kN}\end{aligned}$$

DIAGRAMS:


Shear Diagram
A
B
C
D
E
F
G
6.720 kN
8.064 kN
6.720 kN
8.064 kN
6.720 kN
8.064 kN
11.520 kN
23.040 kN
23.040 kN
23.040 kN
23.040 kN
23.040 kN
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H
I
J
K
L
M
N
17.942 kN
21.531 kN
17.942 kN
21.531 kN
17.942 kN
21.531 kN
19.238 kN
38.477 kN
38.477 kN
38.477 kN
38.477 kN
38.477 kN
19.238 kN
O
P
Q
R
S
T
U
25.446 kN
30.536 kN
25.446 kN
30.536 kN
25.446 kN
30.536 kN
24.384 kN
48.768 kN
48.768 kN
48.768 kN
48.768 kN
48.768 kN
24.384 kN
V
W
X
Y
Z
a
b
34.140 kN
40.968 kN
34.140 kN
40.968 kN
34.140 kN
40.968 kN
26.554 kN
53.108 kN
53.108 kN
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53.108 kN
26.554 kN
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12
10
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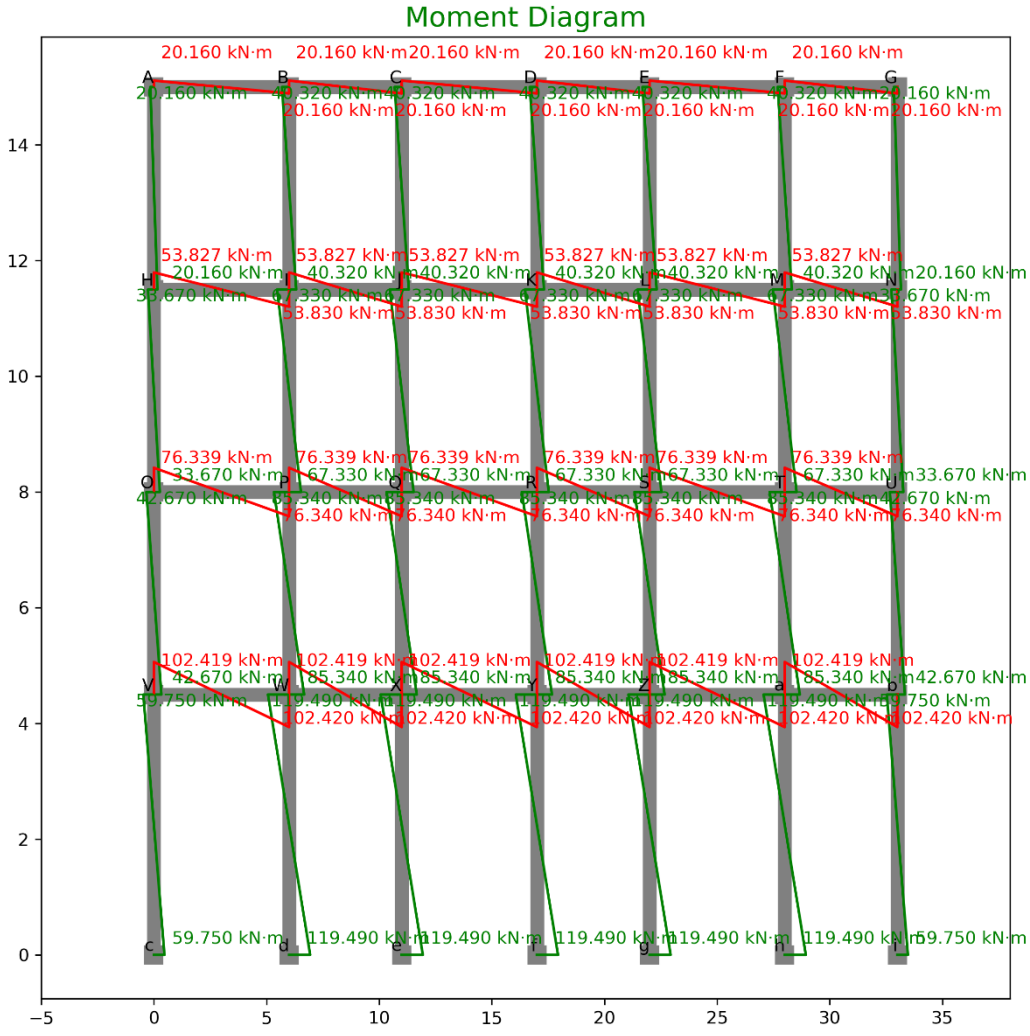
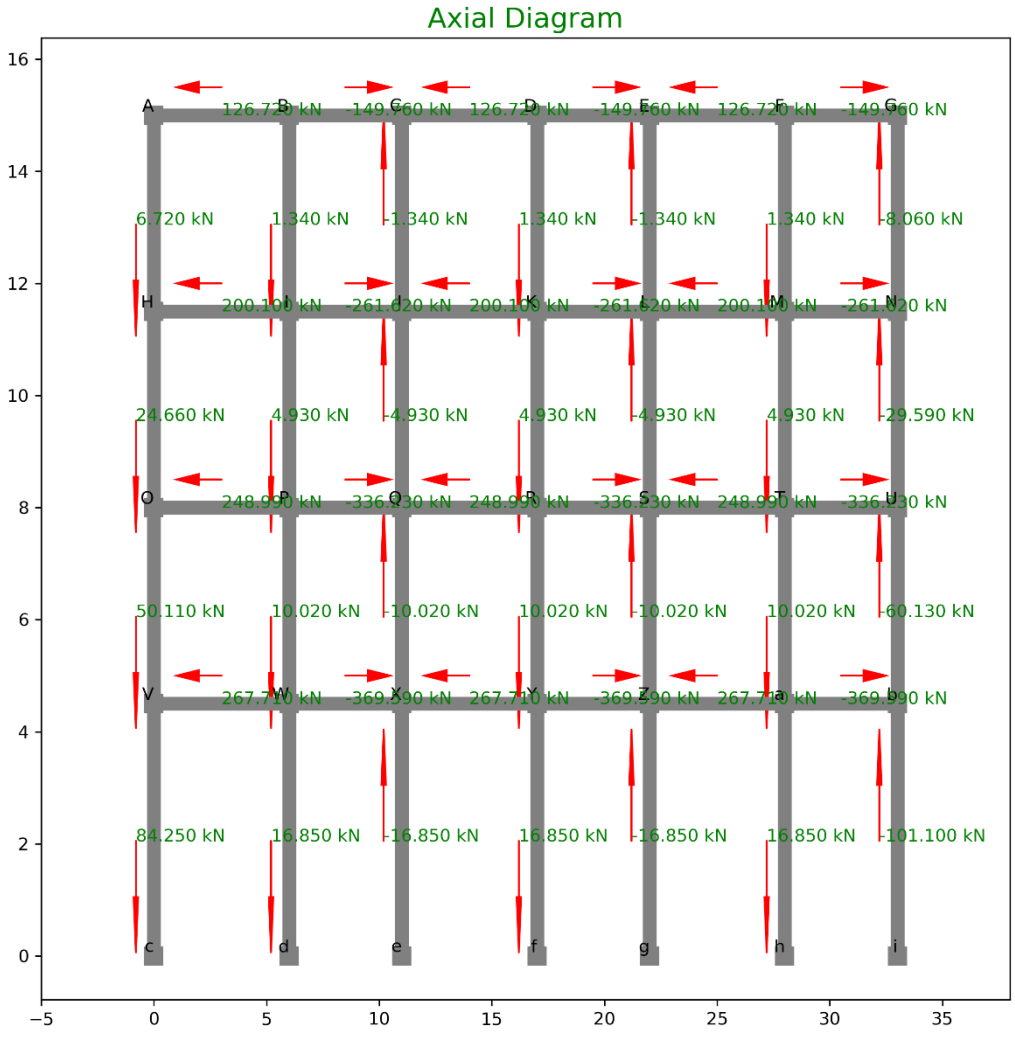
20
25
30
35


Moment Diagram
20.160 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
A
B
C
D
E
F
G
20.160 kN·m
40.320 kN·m
40.320 kN·m
40.320 kN·m
40.320 kN·m
40.320 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
20.160 kN·m
14
53.827 kN·m
53.827 kN·m
53.827 kN·m
53.827 kN·m
53.827 kN·m
53.827 kN·m
12
H
M
N
20.160 kN·m
40.320 kN·m
40.320 kN·m
40.320 kN·m
40.320 kN·m
40.320 kN·m
20.160 kN·m
33.670 kN·m
67.330 kN·m
67.330 kN·m
67.330 kN·m
67.330 kN·m
33.670 kN·m
53.830 kN·m
53.830 kN·m
53.830 kN·m
53.830 kN·m
53.830 kN·m
53.830 kN·m
10
76.339 kN·m
76.339 kN·m
76.339 kN·m
76.339 kN·m
76.339 kN·m
76.339 kN·m
O
P
Q
R
S
T
U
33.670 kN·m
67.330 kN·m
67.330 kN·m
67.330 kN·m
67.330 kN·m
67.330 kN·m
33.670 kN·m
42.670 kN·m
85.340 kN·m
85.340 kN·m
85.340 kN·m
85.340 kN·m
85.340 kN·m
42.670 kN·m
76.340 kN·m
76.340 kN·m
76.340 kN·m
76.340 kN·m
76.340 kN·m
76.340 kN·m
8
6
102.419 kN·m
102.419 kN·m
102.419 kN·m
102.419 kN·m
102.419 kN·m
102.419 kN·m
V
W
X
Y
Z
a
b
42.670 kN·m
85.340 kN·m
85.340 kN·m
85.340 kN·m
85.340 kN·m
85.340 kN·m
42.670 kN·m
59.750 kN·m
119.490 kN·m
119.490 kN·m
119.490 kN·m
119.490 kN·m
119.490 kN·m
59.750 kN·m
102.420 kN·m
102.420 kN·m
102.420 kN·m
102.420 kN·m
102.420 kN·m
102.420 kN·m
4
2
0
c
d
e
g
n
59.750 kN·m
119.490 kN·m
119.490 kN·m
119.490 kN·m
119.490 kN·m
119.490 kN·m
59.750 kN·m
−5
0
5
10
15
20
25
30
35


Axial Diagram
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
a
b
c
d
e
f
g
h
i
126.720 kN
-149.960 kN
126.720 kN
-149.960 kN
126.720 kN
-149.960 kN
6.720 kN
1.340 kN
-1.340 kN
1.340 kN
-1.340 kN
1.340 kN
-8.060 kN
200.100 kN
-261.620 kN
200.100 kN
-261.620 kN
200.100 kN
-261.620 kN
24.660 kN
4.930 kN
-4.930 kN
4.930 kN
-4.930 kN
4.930 kN
-29.590 kN
248.990 kN
-336.230 kN
248.990 kN
-336.230 kN
248.990 kN
-336.230 kN
50.110 kN
10.020 kN
-10.020 kN
10.020 kN
-10.020 kN
10.020 kN
-60.130 kN
267.710 kN
-369.590 kN
267.710 kN
-369.590 kN
267.710 kN
-369.590 kN
84.250 kN
16.850 kN
-16.850 kN
16.850 kN
-16.850 kN
16.850 kN
-101.100 kN
16
14
12
10
8
6
4
2
0
−5
0
5
10
15
20
25
30
35

TABULATION OF FORCES:

SHEAR

INDEX	X	Y	Loc	Shear	Type
0	0	11.5	Top	11.52	Col
1	0	15	Bot	11.52	Col
2	6	11.5	Top	23.04	Col
3	6	15	Bot	23.04	Col
4	11	11.5	Top	23.04	Col
5	11	15	Bot	23.04	Col
6	17	11.5	Top	23.04	Col
7	17	15	Bot	23.04	Col
8	22	11.5	Top	23.04	Col
9	22	15	Bot	23.04	Col
10	28	11.5	Top	23.04	Col
11	28	15	Bot	23.04	Col
12	33	11.5	Top	11.52	Col
13	33	15	Bot	11.52	Col
14	0	8	Top	19.23833	Col
15	0	11.5	Bot	19.23833	Col
16	6	8	Top	38.47667	Col
17	6	11.5	Bot	38.47667	Col
18	11	8	Top	38.47667	Col
19	11	11.5	Bot	38.47667	Col
20	17	8	Top	38.47667	Col
21	17	11.5	Bot	38.47667	Col
22	22	8	Top	38.47667	Col
23	22	11.5	Bot	38.47667	Col
24	28	8	Top	38.47667	Col
25	28	11.5	Bot	38.47667	Col
26	33	8	Top	19.23833	Col
27	33	11.5	Bot	19.23833	Col
28	0	4.5	Top	24.38417	Col
29	0	8	Bot	24.38417	Col
30	6	4.5	Top	48.76833	Col
31	6	8	Bot	48.76833	Col
32	11	4.5	Top	48.76833	Col
33	11	8	Bot	48.76833	Col
34	17	4.5	Top	48.76833	Col
35	17	8	Bot	48.76833	Col
36	22	4.5	Top	48.76833	Col
37	22	8	Bot	48.76833	Col
38	28	4.5	Top	48.76833	Col
39	28	8	Bot	48.76833	Col
40	33	4.5	Top	24.38417	Col
41	33	8	Bot	24.38417	Col
42	0	0	Top	26.55417	Col
43	0	4.5	Bot	26.55417	Col
44	6	0	Top	53.10833	Col
45	6	4.5	Bot	53.10833	Col
46	11	0	Top	53.10833	Col
47	11	4.5	Bot	53.10833	Col
48	17	0	Top	53.10833	Col
49	17	4.5	Bot	53.10833	Col
50	22	0	Top	53.10833	Col
51	22	4.5	Bot	53.10833	Col
52	28	0	Top	53.10833	Col
53	28	4.5	Bot	53.10833	Col
54	33	0	Top	26.55417	Col
55	33	4.5	Bot	26.55417	Col
56	0	15	Right	6.72	Beam
57	6	15	Left	6.72	Beam
58	6	15	Right	8.064	Beam
59	11	15	Left	8.064	Beam
60	11	15	Right	6.72	Beam
61	17	15	Left	6.72	Beam
62	17	15	Right	8.064	Beam
63	22	15	Left	8.064	Beam
64	22	15	Right	6.72	Beam
65	28	15	Left	6.72	Beam
66	28	15	Right	8.064	Beam
67	33	15	Left	8.064	Beam
68	0	11.5	Right	17.94236	Beam
69	6	11.5	Left	17.94236	Beam
70	6	11.5	Right	21.53083	Beam
71	11	11.5	Left	21.53083	Beam
72	11	11.5	Right	17.94236	Beam
73	17	11.5	Left	17.94236	Beam
74	17	11.5	Right	21.53083	Beam
75	22	11.5	Left	21.53083	Beam
76	22	11.5	Right	17.94236	Beam
77	28	11.5	Left	17.94236	Beam
78	28	11.5	Right	21.53083	Beam
79	33	11.5	Left	21.53083	Beam
80	0	8	Right	25.44646	Beam
81	6	8	Left	25.44646	Beam
82	6	8	Right	30.53575	Beam
83	11	8	Left	30.53575	Beam
84	11	8	Right	25.44646	Beam
85	17	8	Left	25.44646	Beam
86	17	8	Right	30.53575	Beam
87	22	8	Left	30.53575	Beam
88	22	8	Right	25.44646	Beam
89	28	8	Left	25.44646	Beam

90	28	8	Right	30.53575	Beam
91	33	8	Left	30.53575	Beam
92	0	4.5	Right	34.13972	Beam
93	6	4.5	Left	34.13972	Beam
94	6	4.5	Right	40.96767	Beam
95	11	4.5	Left	40.96767	Beam
96	11	4.5	Right	34.13972	Beam
97	17	4.5	Left	34.13972	Beam
98	17	4.5	Right	40.96767	Beam
99	22	4.5	Left	40.96767	Beam
100	22	4.5	Right	34.13972	Beam
101	28	4.5	Left	34.13972	Beam
102	28	4.5	Right	40.96767	Beam
103	33	4.5	Left	40.96767	Beam

MOMENT

INDEX	X	Y	Loc	Moment	Type
0	0	11.5	Top	20.16	Col
1	0	15	Bot	20.16	Col
2	6	11.5	Top	40.32	Col
3	6	15	Bot	40.32	Col
4	11	11.5	Top	40.32	Col
5	11	15	Bot	40.32	Col
6	17	11.5	Top	40.32	Col
7	17	15	Bot	40.32	Col
8	22	11.5	Top	40.32	Col
9	22	15	Bot	40.32	Col
10	28	11.5	Top	40.32	Col
11	28	15	Bot	40.32	Col
12	33	11.5	Top	20.16	Col
13	33	15	Bot	20.16	Col
14	0	8	Top	33.6670833	Col
15	0	11.5	Bot	33.6670833	Col
16	6	8	Top	67.3341667	Col
17	6	11.5	Bot	67.3341667	Col
18	11	8	Top	67.3341667	Col
19	11	11.5	Bot	67.3341667	Col
20	17	8	Top	67.3341667	Col
21	17	11.5	Bot	67.3341667	Col
22	22	8	Top	67.3341667	Col
23	22	11.5	Bot	67.3341667	Col
24	28	8	Top	67.3341667	Col
25	28	11.5	Bot	67.3341667	Col
26	33	8	Top	33.6670833	Col
27	33	11.5	Bot	33.6670833	Col
28	0	4.5	Top	42.6722917	Col
29	0	8	Bot	42.6722917	Col
30	6	4.5	Top	85.3445833	Col
31	6	8	Bot	85.3445833	Col
32	11	4.5	Top	85.3445833	Col
33	11	8	Bot	85.3445833	Col
34	17	4.5	Top	85.3445833	Col
35	17	8	Bot	85.3445833	Col
36	22	4.5	Top	85.3445833	Col
37	22	8	Bot	85.3445833	Col
38	28	4.5	Top	85.3445833	Col
39	28	8	Bot	85.3445833	Col
40	33	4.5	Top	42.6722917	Col
41	33	8	Bot	42.6722917	Col
42	0	0	Top	59.746875	Col
43	0	4.5	Bot	59.746875	Col
44	6	0	Top	119.49375	Col
45	6	4.5	Bot	119.49375	Col
46	11	0	Top	119.49375	Col
47	11	4.5	Bot	119.49375	Col
48	17	0	Top	119.49375	Col
49	17	4.5	Bot	119.49375	Col
50	22	0	Top	119.49375	Col
51	22	4.5	Bot	119.49375	Col
52	28	0	Top	119.49375	Col
53	28	4.5	Bot	119.49375	Col
54	33	0	Top	59.746875	Col
55	33	4.5	Bot	59.746875	Col
56	0	15	Right	20.16	Beam
57	6	15	Left	20.16	Beam
58	6	15	Right	20.16	Beam
59	11	15	Left	20.16	Beam
60	11	15	Right	20.16	Beam
61	17	15	Left	20.16	Beam
62	17	15	Right	20.16	Beam
63	22	15	Left	20.16	Beam
64	22	15	Right	20.16	Beam
65	28	15	Left	20.16	Beam
66	28	15	Right	20.16	Beam
67	33	15	Left	20.16	Beam
68	0	11.5	Right	53.8270833	Beam
69	6	11.5	Left	53.8270833	Beam
70	6	11.5	Right	53.8270833	Beam
71	11	11.5	Left	53.8270833	Beam
72	11	11.5	Right	53.8270833	Beam
73	17	11.5	Left	53.8270833	Beam
74	17	11.5	Right	53.8270833	Beam
75	22	11.5	Left	53.8270833	Beam

76	22	11.5	Right	53.8270833	Beam
77	28	11.5	Left	53.8270833	Beam
78	28	11.5	Right	53.8270833	Beam
79	33	11.5	Left	53.8270833	Beam
80	0	8	Right	76.339375	Beam
81	6	8	Left	76.339375	Beam
82	6	8	Right	76.339375	Beam
83	11	8	Left	76.339375	Beam
84	11	8	Right	76.339375	Beam
85	17	8	Left	76.339375	Beam
86	17	8	Right	76.339375	Beam
87	22	8	Left	76.339375	Beam
88	22	8	Right	76.339375	Beam
89	28	8	Left	76.339375	Beam
90	28	8	Right	76.339375	Beam
91	33	8	Left	76.339375	Beam
92	0	4.5	Right	102.419167	Beam
93	6	4.5	Left	102.419167	Beam
94	6	4.5	Right	102.419167	Beam
95	11	4.5	Left	102.419167	Beam
96	11	4.5	Right	102.419167	Beam
97	17	4.5	Left	102.419167	Beam
98	17	4.5	Right	102.419167	Beam
99	22	4.5	Left	102.419167	Beam
100	22	4.5	Right	102.419167	Beam
101	28	4.5	Left	102.419167	Beam
102	28	4.5	Right	102.419167	Beam
103	33	4.5	Left	102.419167	Beam

AXIAL

INDEX	X	Y	Loc	Axial	Type
0	0	11.5	Top	6.72	Col
1	0	15	Bot	6.72	Col
2	6	11.5	Top	1.344	Col
3	6	15	Bot	1.344	Col
4	11	11.5	Top	-1.344	Col
5	11	15	Bot	-1.344	Col
6	17	11.5	Top	1.344	Col
7	17	15	Bot	1.344	Col
8	22	11.5	Top	-1.344	Col
9	22	15	Bot	-1.344	Col
10	28	11.5	Top	1.344	Col
11	28	15	Bot	1.344	Col
12	33	11.5	Top	-8.064	Col
13	33	15	Bot	-8.064	Col
14	0	8	Top	24.66236	Col
15	0	11.5	Bot	24.66236	Col
16	6	8	Top	4.932472	Col
17	6	11.5	Bot	4.932472	Col
18	11	8	Top	-4.93247	Col
19	11	11.5	Bot	-4.93247	Col
20	17	8	Top	4.932472	Col
21	17	11.5	Bot	4.932472	Col
22	22	8	Top	-4.93247	Col
23	22	11.5	Bot	-4.93247	Col
24	28	8	Top	4.932472	Col
25	28	11.5	Bot	4.932472	Col
26	33	8	Top	-29.5948	Col
27	33	11.5	Bot	-29.5948	Col
28	0	4.5	Top	50.10882	Col
29	0	8	Bot	50.10882	Col
30	6	4.5	Top	10.02176	Col
31	6	8	Bot	10.02176	Col
32	11	4.5	Top	-10.0218	Col
33	11	8	Bot	-10.0218	Col
34	17	4.5	Top	10.02176	Col
35	17	8	Bot	10.02176	Col
36	22	4.5	Top	-10.0218	Col
37	22	8	Bot	-10.0218	Col
38	28	4.5	Top	10.02176	Col
39	28	8	Bot	10.02176	Col
40	33	4.5	Top	-60.1306	Col
41	33	8	Bot	-60.1306	Col
42	0	0	Top	84.24854	Col
43	0	4.5	Bot	84.24854	Col
44	6	0	Top	16.84971	Col
45	6	4.5	Bot	16.84971	Col
46	11	0	Top	-16.8497	Col
47	11	4.5	Bot	-16.8497	Col
48	17	0	Top	16.84971	Col
49	17	4.5	Bot	16.84971	Col
50	22	0	Top	-16.8497	Col
51	22	4.5	Bot	-16.8497	Col
52	28	0	Top	16.84971	Col
53	28	4.5	Bot	16.84971	Col
54	33	0	Top	-101.098	Col
55	33	4.5	Bot	-101.098	Col
56	0	15	Right	126.72	Beam
57	6	15	Left	126.72	Beam
58	6	15	Right	-149.76	Beam
59	11	15	Left	-149.76	Beam

60	11	15	Right	126.72	Beam
61	17	15	Left	126.72	Beam
62	17	15	Right	-149.76	Beam
63	22	15	Left	-149.76	Beam
64	22	15	Right	126.72	Beam
65	28	15	Left	126.72	Beam
66	28	15	Right	-149.76	Beam
67	33	15	Left	-149.76	Beam
68	0	11.5	Right	200.1017	Beam
69	6	11.5	Left	200.1017	Beam
70	6	11.5	Right	-261.618	Beam
71	11	11.5	Left	-261.618	Beam
72	11	11.5	Right	200.1017	Beam
73	17	11.5	Left	200.1017	Beam
74	17	11.5	Right	-261.618	Beam
75	22	11.5	Left	-261.618	Beam
76	22	11.5	Right	200.1017	Beam
77	28	11.5	Left	200.1017	Beam
78	28	11.5	Right	-261.618	Beam
79	33	11.5	Left	-261.618	Beam
80	0	8	Right	248.9875	Beam
81	6	8	Left	248.9875	Beam
82	6	8	Right	-336.233	Beam
83	11	8	Left	-336.233	Beam
84	11	8	Right	248.9875	Beam
85	17	8	Left	248.9875	Beam
86	17	8	Right	-336.233	Beam
87	22	8	Left	-336.233	Beam
88	22	8	Right	248.9875	Beam
89	28	8	Left	248.9875	Beam
90	28	8	Right	-336.233	Beam

91	33	8	Left	-336.233	Beam
92	0	4.5	Right	267.7117	Beam
93	6	4.5	Left	267.7117	Beam
94	6	4.5	Right	-369.588	Beam
95	11	4.5	Left	-369.588	Beam
96	11	4.5	Right	267.7117	Beam
97	17	4.5	Left	267.7117	Beam
98	17	4.5	Right	-369.588	Beam
99	22	4.5	Left	-369.588	Beam
100	22	4.5	Right	267.7117	Beam
101	28	4.5	Left	267.7117	Beam
102	28	4.5	Right	-369.588	Beam
103	33	4.5	Left	-369.588	Beam

CANTILEVER METHOD OF ANALYSIS:

CALCULATION

Floor-1

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000])}{7} = 16.71429 \ \text{(Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{16.71429 - [0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000]}{16.71429} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([138.24000,\ 92.62000,\ 61.75000,\ 26.04000] \cdot [12.75000,\ 9.25000,\ 5.75000,\ 2.25000])}{\Sigma([1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot [33.00000,\ 27.00000,\ 22.00000,\ 16.00000,\ 11.00000,\ 5.00000,\ 0.00000])} = 59.82044 \ \text{(Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot 59.82044 = [59.82044,\ 38.34644,\ 20.45143,\ -1.02257,\ -18.91758,\ -40.39158,\ -58.28658]$$

Floor-2

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000])}{7} = 16.71429 \ \text{(Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{16.71429 - [0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000]}{16.71429} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([138.24000,\ 92.62000,\ 61.75000] \cdot [8.75000,\ 5.25000,\ 1.75000])}{\Sigma([1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot [33.00000,\ 27.00000,\ 22.00000,\ 16.00000,\ 11.00000,\ 5.00000,\ 0.00000])} = 35.57963 \ \text{(Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot 35.57963 = [35.57963,\ 22.80745,\ 12.16398,\ -0.60820,\ -11.25168,\ -24.02385,\ -34.66733]$$

Floor-3

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000])}{7} = 16.71429 \ \text{(Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{16.71429 - [0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000]}{16.71429} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([138.24000,\ 92.62000] \cdot [5.25000,\ 1.75000])}{\Sigma([1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot [33.00000,\ 27.00000,\ 22.00000,\ 16.00000,\ 11.00000,\ 5.00000,\ 0.00000])} = 17.51144 \ \text{(Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot 17.51144 = [17.51144,\ 11.22528,\ 5.98682,\ -0.29934,\ -5.53781,\ -11.82396,\ -17.06243]$$

Floor-4

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000])}{7} = 16.71429 \ \text{(Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{16.71429 - [0.00000,\ 6.00000,\ 11.00000,\ 17.00000,\ 22.00000,\ 28.00000,\ 33.00000]}{16.71429} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([138.24000] \cdot [1.75000])}{\Sigma([1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot [33.00000,\ 27.00000,\ 22.00000,\ 16.00000,\ 11.00000,\ 5.00000,\ 0.00000])} = 4.77152 \ \text{(Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.64103,\ 0.34188,\ -0.01709,\ -0.31624,\ -0.67521,\ -0.97436] \cdot 4.77152 = [4.77152,\ 3.05866,\ 1.63129,\ -0.08156,\ -1.50894,\ -3.22179,\ -4.64917]$$

BEAM-A-B

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([4.77]) + \Sigma([]) - \Sigma([]) \\ &= 4.77\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 4.77 \cdot \frac{6.00}{2} \\ &= 14.31\end{aligned}$$

BEAM-B-C

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([3.06]) + \Sigma([4.77]) - \Sigma([]) \\ &= 7.83\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 7.83 \cdot \frac{5.00}{2} \\ &= 19.58\end{aligned}$$

BEAM-C-D

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([1.63]) + \Sigma([7.83]) - \Sigma([]) \\ &= 9.46\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 9.46 \cdot \frac{6.00}{2} \\ &= 28.38\end{aligned}$$

BEAM-D-E

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.08]) + \Sigma([9.46]) - \Sigma([]) \\ &= 9.38\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 9.38 \cdot \frac{5.00}{2} \\ &= 23.45\end{aligned}$$

BEAM-E-F

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-1.51]) + \Sigma([9.38]) - \Sigma([]) \\ &= 7.87\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 7.87 \cdot \frac{6.00}{2} \\ &= 23.61\end{aligned}$$

BEAM-F-G

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-3.22]) + \Sigma([7.87]) - \Sigma([]) \\ &= 4.65\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 4.65 \cdot \frac{5.00}{2} \\ &= 11.62\end{aligned}$$

BEAM-H-I

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([17.51]) + \Sigma([]) - \Sigma([4.77]) \\ &= 12.74\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 12.74 \cdot \frac{6.00}{2} \\ &= 38.22\end{aligned}$$

BEAM-I-J

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([11.23]) + \Sigma([12.74]) - \Sigma([3.06]) \\ &= 20.91\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 20.91 \cdot \frac{5.00}{2} \\ &= 52.27\end{aligned}$$

BEAM-J-K

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([5.99]) + \Sigma([20.91]) - \Sigma([1.63]) \\ &= 25.26\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 25.26 \cdot \frac{6.00}{2} \\ &= 75.79\end{aligned}$$

BEAM-K-L

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.30]) + \Sigma([25.26]) - \Sigma([-0.08]) \\ &= 25.04\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 25.04 \cdot \frac{5.00}{2} \\ &= 62.61\end{aligned}$$

BEAM-L-M

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-5.54]) + \Sigma([25.04]) - \Sigma([-1.51]) \\ &= 21.02\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 21.02 \cdot \frac{6.00}{2} \\ &= 63.05\end{aligned}$$

BEAM-M-N

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-11.82]) + \Sigma([21.02]) - \Sigma([-3.22]) \\ &= 12.41\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 12.41 \cdot \frac{5.00}{2} \\ &= 31.03\end{aligned}$$

BEAM-O-P

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([35.58]\right) + \Sigma\left([]\right) - \Sigma\left([17.51]\right)\\ &= 18.07\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 18.07 \cdot \frac{6.00}{2}\\ &= 54.20\end{aligned}$$

BEAM-P-Q

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([22.81]\right) + \Sigma\left([18.07]\right) - \Sigma\left([11.23]\right)\\ &= 29.65\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 29.65 \cdot \frac{5.00}{2}\\ &= 74.13\end{aligned}$$

BEAM-Q-R

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([12.16]\right) + \Sigma\left([29.65]\right) - \Sigma\left([5.99]\right)\\ &= 35.83\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 35.83 \cdot \frac{6.00}{2}\\ &= 107.48\end{aligned}$$

BEAM-R-S

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([-0.61]\right) + \Sigma\left([35.83]\right) - \Sigma\left([-0.30]\right)\\ &= 35.52\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 35.52 \cdot \frac{5.00}{2}\\ &= 88.80\end{aligned}$$

BEAM-S-T

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([-11.25]\right) + \Sigma\left([35.52]\right) - \Sigma\left([-5.54]\right)\\ &= 29.80\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 29.80 \cdot \frac{6.00}{2}\\ &= 89.41\end{aligned}$$

BEAM-T-U

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([-24.02]\right) + \Sigma\left([29.80]\right) - \Sigma\left([-11.82]\right)\\ &= 17.60\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 17.60 \cdot \frac{5.00}{2}\\ &= 44.01\end{aligned}$$

BEAM-V-W

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([59.82]\right) + \Sigma\left([]\right) - \Sigma\left([35.58]\right)\\ &= 24.24\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 24.24 \cdot \frac{6.00}{2}\\ &= 72.72\end{aligned}$$

BEAM-W-X

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([38.35]\right) + \Sigma\left([24.24]\right) - \Sigma\left([22.81]\right)\\ &= 39.78\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 39.78 \cdot \frac{5.00}{2}\\ &= 99.45\end{aligned}$$

BEAM-X-Y

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([20.45]\right) + \Sigma\left([39.78]\right) - \Sigma\left([12.16]\right)\\ &= 48.07\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 48.07 \cdot \frac{6.00}{2}\\ &= 144.20\end{aligned}$$

BEAM-Y-Z

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([-1.02]\right) + \Sigma\left([48.07]\right) - \Sigma\left([-0.61]\right)\\ &= 47.65\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 47.65 \cdot \frac{5.00}{2}\\ &= 119.13\end{aligned}$$

BEAM-Z-a

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([-18.92]\right) + \Sigma\left([47.65]\right) - \Sigma\left([-11.25]\right)\\ &= 39.99\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 39.99 \cdot \frac{6.00}{2}\\ &= 119.96\end{aligned}$$

BEAM-a-b

$$\begin{aligned}\text{Shear} &= \Sigma\left(\text{ColAxial}_{Bot}\right) + \Sigma\left(\text{BeamShear}\right) - \Sigma\left(\text{ColAxial}_{Top}\right)\\ &= \Sigma\left([-40.39]\right) + \Sigma\left([39.99]\right) - \Sigma\left([-24.02]\right)\\ &= 23.62\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2}\\ &= 23.62 \cdot \frac{5.00}{2}\\ &= 59.05\end{aligned}$$

COLUMN-V-O

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([54.20]) - \Sigma([23.91]) \\ &= 30.30\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{30.30 \cdot 2}{4} \\ &= 15.15\end{aligned}$$

COLUMN-W-P

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([54.20,\ 74.13]) - \Sigma([56.60]) \\ &= 71.73\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{71.73 \cdot 2}{4} \\ &= 35.87\end{aligned}$$

COLUMN-X-Q

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([74.13,\ 107.48]) - \Sigma([80.09]) \\ &= 101.52\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{101.52 \cdot 2}{4} \\ &= 50.76\end{aligned}$$

COLUMN-Y-R

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([107.48,\ 88.80]) - \Sigma([86.56]) \\ &= 109.72\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{109.72 \cdot 2}{4} \\ &= 54.86\end{aligned}$$

COLUMN-Z-S

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([88.80,\ 89.41]) - \Sigma([78.59]) \\ &= 99.62\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{99.62 \cdot 2}{4} \\ &= 49.81\end{aligned}$$

COLUMN-a-T

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([89.41,\ 44.01]) - \Sigma([58.84]) \\ &= 74.58\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{74.58 \cdot 2}{4} \\ &= 37.29\end{aligned}$$

COLUMN-b-U

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([44.01]) - \Sigma([19.41]) \\ &= 24.60\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{24.60 \cdot 2}{4} \\ &= 12.30\end{aligned}$$

COLUMN-O-H

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([38.22]) - \Sigma([14.31]) \\ &= 23.91\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{23.91 \cdot 2}{3} \\ &= 15.94\end{aligned}$$

COLUMN-P-I

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([38.22,\ 52.27]) - \Sigma([33.89]) \\ &= 56.60\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{56.60 \cdot 2}{3} \\ &= 37.73\end{aligned}$$

COLUMN-Q-J

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([52.27,\ 75.79]) - \Sigma([47.96]) \\ &= 80.09\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{80.09 \cdot 2}{3} \\ &= 53.40\end{aligned}$$

COLUMN-R-K

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([75.79,\ 62.61]) - \Sigma([51.83]) \\ &= 86.56\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{86.56 \cdot 2}{3} \\ &= 57.71\end{aligned}$$

COLUMN-S-L

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([62.61,\ 63.05]) - \Sigma([47.06]) \\ &= 78.59\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{78.59 \cdot 2}{3} \\ &= 52.40\end{aligned}$$

COLUMN-T-M

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([63.05,\ 31.03]) - \Sigma([35.24]) \\ &= 58.84\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{58.84 \cdot 2}{3} \\ &= 39.23\end{aligned}$$

COLUMN-U-N

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([31.03]) - \Sigma([11.62]) \\ &= 19.41\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{19.41 \cdot 2}{3} \\ &= 12.94\end{aligned}$$

COLUMN-H-A

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([14.31]) - \Sigma([]) \\ &= 14.31\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{14.31 \cdot 2}{4} \\ &= 7.16\end{aligned}$$

COLUMN-I-B

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([14.31,\ 19.58]) - \Sigma([]) \\ &= 33.89\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{33.89 \cdot 2}{4} \\ &= 16.95\end{aligned}$$

COLUMN-J-C

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([19.58,\ 28.38]) - \Sigma([]) \\ &= 47.96\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{47.96 \cdot 2}{4} \\ &= 23.98\end{aligned}$$

COLUMN-K-D

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([28.38,\ 23.45]) - \Sigma([]) \\ &= 51.83\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{51.83 \cdot 2}{4} \\ &= 25.92\end{aligned}$$

COLUMN-L-E

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([23.45,\ 23.61]) - \Sigma([]) \\ &= 47.06\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{47.06 \cdot 2}{4} \\ &= 23.53\end{aligned}$$

COLUMN-M-F

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([23.61,\ 11.62]) - \Sigma([]) \\ &= 35.24\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{35.24 \cdot 2}{4} \\ &= 17.62\end{aligned}$$

COLUMN-N-G

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([11.62]) - \Sigma([]) \\ &= 11.62\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{11.62 \cdot 2}{4} \\ &= 5.81\end{aligned}$$

COLUMN-c-V

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([72.72]) - \Sigma([30.30]) \\ &= 42.42\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{42.42 \cdot 2}{4} \\ &= 21.21\end{aligned}$$

COLUMN-d-W

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([72.72,\ 99.45]) - \Sigma([71.73]) \\ &= 100.44\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{100.44 \cdot 2}{4} \\ &= 50.22\end{aligned}$$

COLUMN-e-X

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([99.45,\ 144.20]) - \Sigma([101.52]) \\ &= 142.14\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{142.14 \cdot 2}{4} \\ &= 71.07\end{aligned}$$

COLUMN-f-Y

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([144.20,\ 119.13]) - \Sigma([109.72]) \\ &= 153.62\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{153.62 \cdot 2}{4} \\ &= 76.81\end{aligned}$$

COLUMN-g-Z

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([119.13,\ 119.96]) - \Sigma([99.62]) \\ &= 139.48\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{139.48 \cdot 2}{4} \\ &= 69.74\end{aligned}$$

COLUMN-h-a

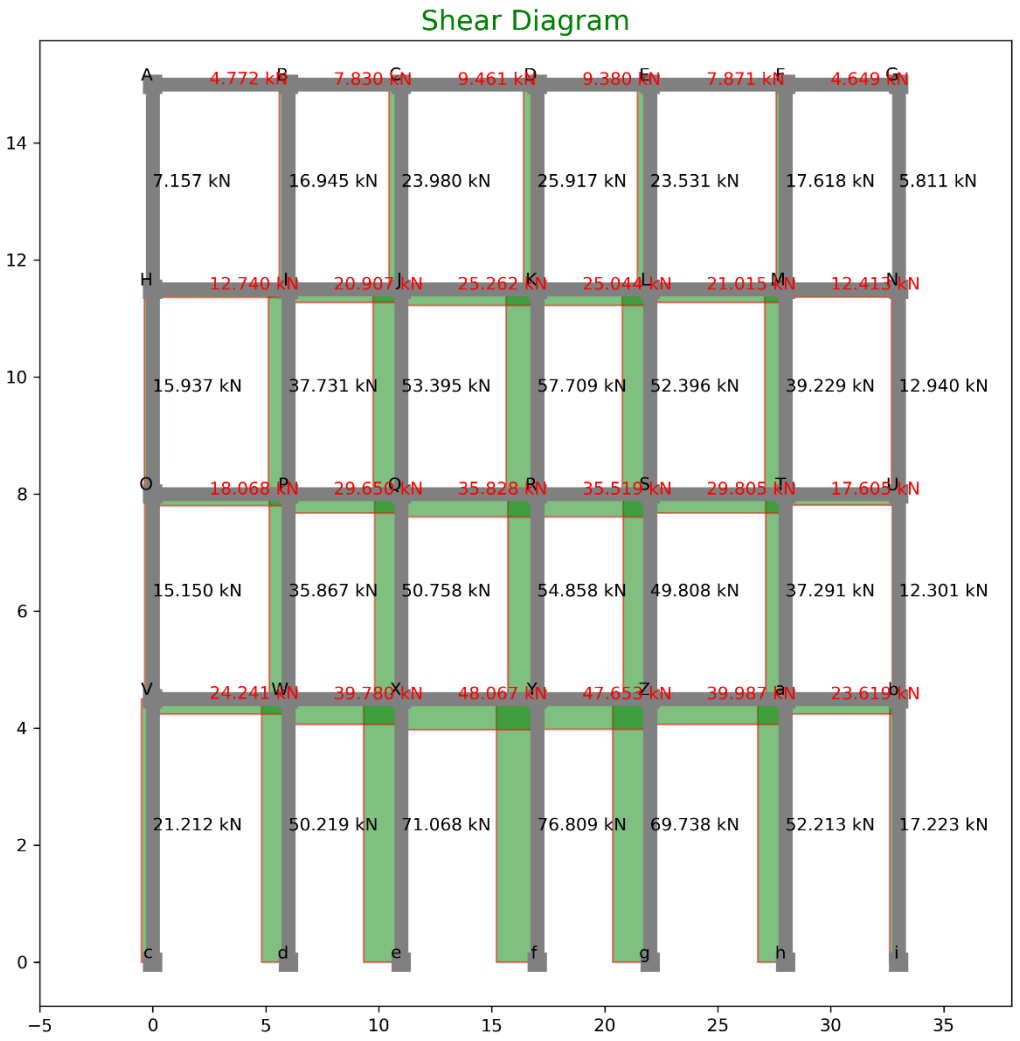
$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([119.96,\ 59.05]) - \Sigma([74.58]) \\ &= 104.43\end{aligned}$$

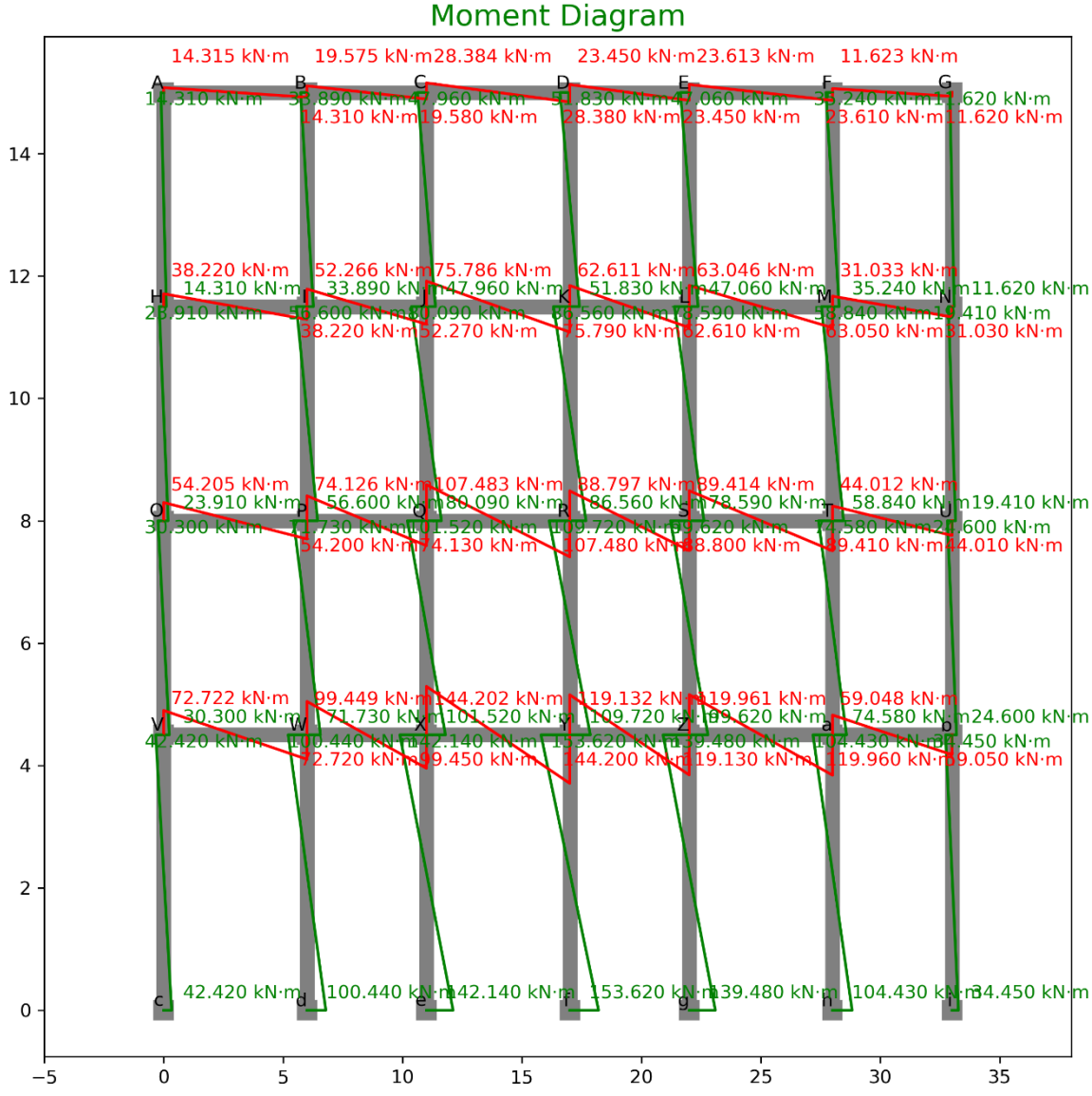
$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{104.43 \cdot 2}{4} \\ &= 52.21\end{aligned}$$

COLUMN-i-b

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([59.05]) - \Sigma([24.60]) \\ &= 34.45\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{34.45 \cdot 2}{4} \\ &= 17.22\end{aligned}$$


Shear Diagram
A
4.772 kN
B
7.830 kN
C
9.461 kN
D
9.380 kN
E
7.871 kN
F
4.649 kN
G
7.157 kN
16.945 kN
23.980 kN
25.917 kN
23.531 kN
17.618 kN
5.811 kN
H
12.740 kN
I
20.907 kN
J
25.262 kN
K
25.044 kN
L
21.015 kN
M
12.413 kN
N
15.937 kN
37.731 kN
53.395 kN
57.709 kN
52.396 kN
39.229 kN
12.940 kN
O
18.068 kN
P
29.650 kN
Q
35.828 kN
R
35.519 kN
S
29.805 kN
T
17.605 kN
U
15.150 kN
35.867 kN
50.758 kN
54.858 kN
49.808 kN
37.291 kN
12.301 kN
V
24.241 kN
W
39.780 kN
X
48.067 kN
Y
47.653 kN
Z
39.987 kN
a
23.619 kN
b
21.212 kN
50.219 kN
71.068 kN
76.809 kN
69.738 kN
52.213 kN
17.223 kN
c
d
e
f
g
h
i
14
12
10
8
6
4
2
0
−5
0
5
10
15
20
25
30
35


Moment Diagram
14.315 kN·m
19.575 kN·m
28.384 kN·m
23.450 kN·m
23.613 kN·m
11.623 kN·m
A
B
C
D
E
F
G
14.310 kN·m
33.890 kN·m
47.960 kN·m
51.830 kN·m
47.060 kN·m
35.240 kN·m
17.620 kN·m
14.310 kN·m
19.580 kN·m
28.380 kN·m
23.450 kN·m
23.610 kN·m
11.620 kN·m
38.220 kN·m
52.266 kN·m
75.786 kN·m
62.611 kN·m
63.046 kN·m
31.033 kN·m
14.310 kN·m
33.890 kN·m
47.960 kN·m
51.830 kN·m
47.060 kN·m
35.240 kN·m
11.620 kN·m
H
I
J
K
L
M
N
28.910 kN·m
56.600 kN·m
80.090 kN·m
86.560 kN·m
78.590 kN·m
58.840 kN·m
19.410 kN·m
38.220 kN·m
52.270 kN·m
75.790 kN·m
62.610 kN·m
63.050 kN·m
31.030 kN·m
54.205 kN·m
74.126 kN·m
107.483 kN·m
88.797 kN·m
89.414 kN·m
44.012 kN·m
23.910 kN·m
56.600 kN·m
80.090 kN·m
86.560 kN·m
78.590 kN·m
58.840 kN·m
19.410 kN·m
O
P
Q
R
S
T
U
30.300 kN·m
71.730 kN·m
101.520 kN·m
109.720 kN·m
99.620 kN·m
74.580 kN·m
24.600 kN·m
54.200 kN·m
74.130 kN·m
107.480 kN·m
88.800 kN·m
89.410 kN·m
44.010 kN·m
72.722 kN·m
99.449 kN·m
144.202 kN·m
119.132 kN·m
119.961 kN·m
59.048 kN·m
30.300 kN·m
71.730 kN·m
101.520 kN·m
109.720 kN·m
99.620 kN·m
74.580 kN·m
24.600 kN·m
V
W
X
Y
Z
a
b
42.420 kN·m
100.440 kN·m
142.140 kN·m
153.620 kN·m
139.480 kN·m
104.430 kN·m
34.450 kN·m
72.720 kN·m
99.450 kN·m
144.200 kN·m
119.130 kN·m
119.960 kN·m
59.050 kN·m
c
d
e
f
g
h
i
42.420 kN·m
100.440 kN·m
142.140 kN·m
153.620 kN·m
139.480 kN·m
104.430 kN·m
34.450 kN·m
14
12
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8
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2
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0
5
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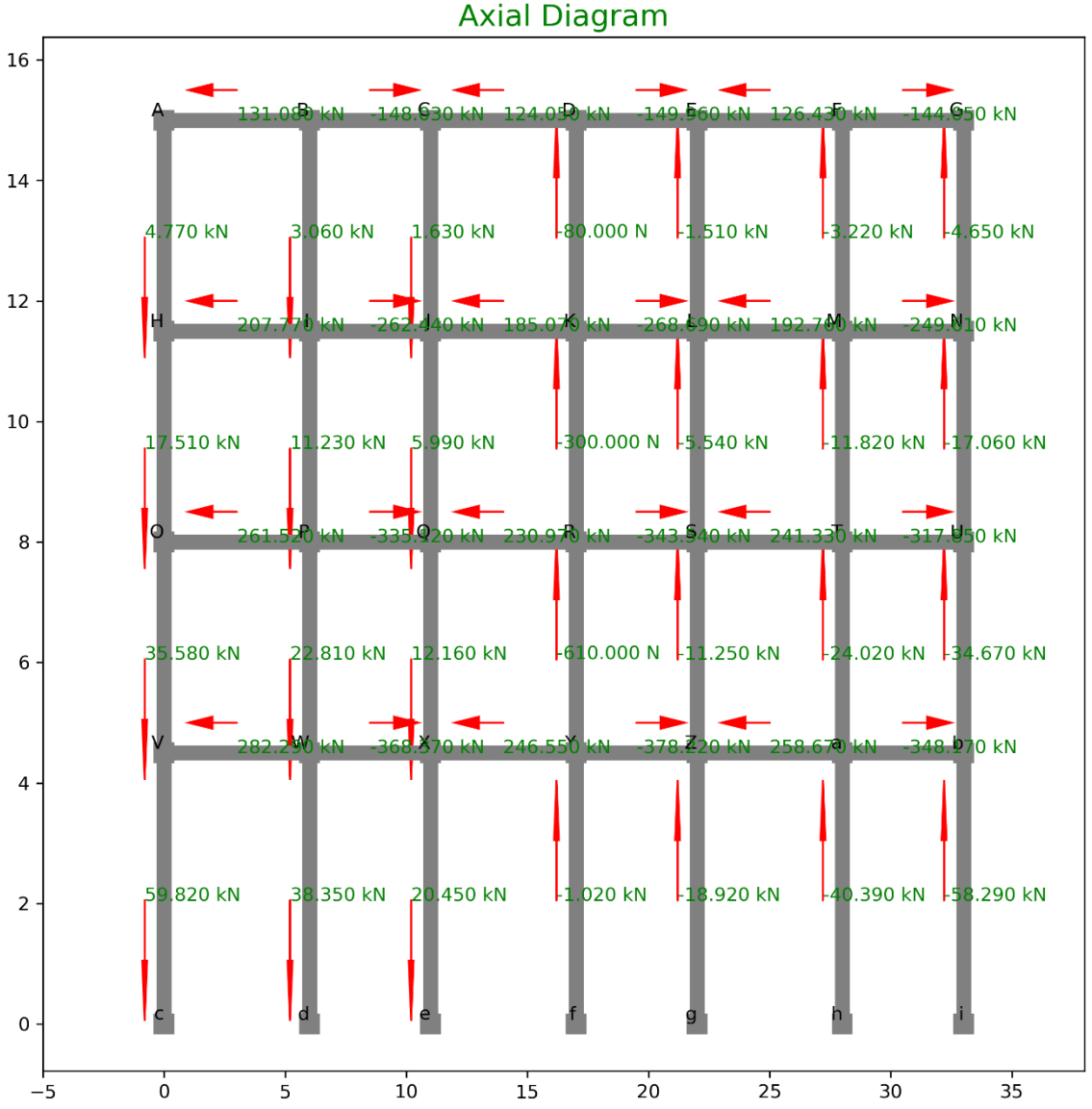
15
20
25
30
35


Axial Diagram
A
B
C
D
E
F
G
131.080 kN
-148.630 kN
124.050 kN
-149.560 kN
126.430 kN
-144.050 kN
4.770 kN
3.060 kN
1.630 kN
-80.000 N
-1.510 kN
-3.220 kN
-4.650 kN
H
I
J
K
L
M
N
207.770 kN
-262.440 kN
185.070 kN
-268.690 kN
192.780 kN
-249.010 kN
17.510 kN
11.230 kN
5.990 kN
-300.000 N
-5.540 kN
-11.820 kN
-17.060 kN
O
P
Q
R
S
T
U
261.520 kN
-335.420 kN
230.970 kN
-343.940 kN
241.330 kN
-317.050 kN
35.580 kN
22.810 kN
12.160 kN
-610.000 N
-11.250 kN
-24.020 kN
-34.670 kN
V
W
X
Y
Z
a
b
282.290 kN
-368.370 kN
246.550 kN
-378.220 kN
258.670 kN
-348.070 kN
59.820 kN
38.350 kN
20.450 kN
-1.020 kN
-18.920 kN
-40.390 kN
-58.290 kN
c
d
e
f
g
h
i
16
14
12
10
8
6
4
2
0
−5
0
5
10
15
20
25
30
35

TABULATION OF FORCES:

INDEX	X	Y	Loc	Shear	Type
0	0	15	Right	4.771517	Beam
1	6	15	Left	4.771517	Beam
2	6	15	Right	7.830182	Beam
3	11	15	Left	7.830182	Beam
4	11	15	Right	9.46147	Beam
5	17	15	Left	9.46147	Beam
6	17	15	Right	9.379906	Beam
7	22	15	Left	9.379906	Beam
8	22	15	Right	7.870964	Beam
9	28	15	Left	7.870964	Beam
10	28	15	Right	4.649171	Beam
11	33	15	Left	4.649171	Beam
12	0	11.5	Right	12.73992	Beam
13	6	11.5	Left	12.73992	Beam
14	6	11.5	Right	20.90654	Beam
15	11	11.5	Left	20.90654	Beam
16	11	11.5	Right	25.26207	Beam
17	17	11.5	Left	25.26207	Beam
18	17	11.5	Right	25.04429	Beam
19	22	11.5	Left	25.04429	Beam
20	22	11.5	Right	21.01543	Beam
21	28	11.5	Left	21.01543	Beam
22	28	11.5	Right	12.41326	Beam
23	33	11.5	Left	12.41326	Beam
24	0	8	Right	18.06819	Beam
25	6	8	Left	18.06819	Beam
26	6	8	Right	29.65036	Beam
27	11	8	Left	29.65036	Beam
28	11	8	Right	35.82752	Beam
29	17	8	Left	35.82752	Beam
30	17	8	Right	35.51866	Beam
31	22	8	Left	35.51866	Beam
32	22	8	Right	29.80479	Beam
33	28	8	Left	29.80479	Beam
34	28	8	Right	17.6049	Beam
35	33	8	Left	17.6049	Beam
36	0	4.5	Right	24.24081	Beam
37	6	4.5	Left	24.24081	Beam
38	6	4.5	Right	39.7798	Beam
39	11	4.5	Left	39.7798	Beam
40	11	4.5	Right	48.06726	Beam
41	17	4.5	Left	48.06726	Beam
42	17	4.5	Right	47.65288	Beam
43	22	4.5	Left	47.65288	Beam
44	22	4.5	Right	39.98698	Beam
45	28	4.5	Left	39.98698	Beam
46	28	4.5	Right	23.61925	Beam
47	33	4.5	Left	23.61925	Beam
48	0	11.5	Top	7.157276	Col
49	0	15	Bot	7.157276	Col
50	6	11.5	Top	16.945	Col
51	6	15	Bot	16.945	Col
52	11	11.5	Top	23.97993	Col
53	11	15	Bot	23.97993	Col
54	17	11.5	Top	25.91709	Col
55	17	15	Bot	25.91709	Col
56	22	11.5	Top	23.53133	Col
57	22	15	Bot	23.53133	Col
58	28	11.5	Top	17.61791	Col
59	28	15	Bot	17.61791	Col
60	33	11.5	Top	5.811463	Col
61	33	15	Bot	5.811463	Col
62	0	8	Top	15.93681	Col
63	0	11.5	Bot	15.93681	Col
64	6	8	Top	37.73074	Col
65	6	11.5	Bot	37.73074	Col
66	11	8	Top	53.39513	Col
67	11	11.5	Bot	53.39513	Col
68	17	8	Top	57.70851	Col
69	17	11.5	Bot	57.70851	Col
70	22	8	Top	52.39624	Col
71	22	11.5	Bot	52.39624	Col
72	28	8	Top	39.22908	Col
73	28	11.5	Bot	39.22908	Col
74	33	8	Top	12.94015	Col
75	33	11.5	Bot	12.94015	Col
76	0	4.5	Top	15.14967	Col
77	0	8	Bot	15.14967	Col
78	6	4.5	Top	35.86717	Col
79	6	8	Bot	35.86717	Col
80	11	4.5	Top	50.75787	Col
81	11	8	Bot	50.75787	Col
82	17	4.5	Top	54.85821	Col
83	17	8	Bot	54.85821	Col
84	22	4.5	Top	49.80832	Col
85	22	8	Bot	49.80832	Col
86	28	4.5	Top	37.2915	Col
87	28	8	Bot	37.2915	Col
88	33	4.5	Top	12.30101	Col
89	33	8	Bot	12.30101	Col
90	0	0	Top	21.21155	Col
91	0	4.5	Bot	21.21155	Col

92	6	0	Top	50.2188	Col
93	6	4.5	Bot	50.2188	Col
94	11	0	Top	71.06776	Col
95	11	4.5	Bot	71.06776	Col
96	17	0	Top	76.80878	Col
97	17	4.5	Bot	76.80878	Col
98	22	0	Top	69.73826	Col
99	22	4.5	Bot	69.73826	Col
100	28	0	Top	52.21305	Col
101	28	4.5	Bot	52.21305	Col
102	33	0	Top	17.22305	Col
103	33	4.5	Bot	17.22305	Col

MOMENT

INDEX	X	Y	Loc	Moment	Type
0	0	15	Right	14.3145516	Beam
1	6	15	Left	14.3145516	Beam
2	6	15	Right	19.5754552	Beam
3	11	15	Left	19.5754552	Beam
4	11	15	Right	28.38441	Beam
5	17	15	Left	28.38441	Beam
6	17	15	Right	23.449764	Beam
7	22	15	Left	23.449764	Beam
8	22	15	Right	23.6128928	Beam
9	28	15	Left	23.6128928	Beam
10	28	15	Right	11.6229265	Beam
11	33	15	Left	11.6229265	Beam
12	0	11.5	Right	38.2197699	Beam
13	6	11.5	Left	38.2197699	Beam
14	6	11.5	Right	52.266352	Beam
15	11	11.5	Left	52.266352	Beam
16	11	11.5	Right	75.7862104	Beam
17	17	11.5	Left	75.7862104	Beam
18	17	11.5	Right	62.6107342	Beam
19	22	11.5	Left	62.6107342	Beam
20	22	11.5	Right	63.0462871	Beam
21	28	11.5	Left	63.0462871	Beam
22	28	11.5	Right	31.0331465	Beam
23	33	11.5	Left	31.0331465	Beam
24	0	8	Right	54.2045596	Beam
25	6	8	Left	54.2045596	Beam
26	6	8	Right	74.1258935	Beam
27	11	8	Left	74.1258935	Beam
28	11	8	Right	107.482546	Beam
29	17	8	Left	107.482546	Beam
30	17	8	Right	88.7966432	Beam
31	22	8	Left	88.7966432	Beam
32	22	8	Right	89.414359	Beam
33	28	8	Left	89.414359	Beam
34	28	8	Right	44.0122492	Beam
35	33	8	Left	44.0122492	Beam
36	0	4.5	Right	72.7224427	Beam
37	6	4.5	Left	72.7224427	Beam
38	6	4.5	Right	99.4494943	Beam
39	11	4.5	Left	99.4494943	Beam
40	11	4.5	Right	144.201767	Beam
41	17	4.5	Left	144.201767	Beam
42	17	4.5	Right	119.132207	Beam
43	22	4.5	Left	119.132207	Beam
44	22	4.5	Right	119.960952	Beam
45	28	4.5	Left	119.960952	Beam
46	28	4.5	Right	59.0481372	Beam
47	33	4.5	Left	59.0481372	Beam
48	0	11.5	Top	14.3145516	Col
49	0	15	Bot	14.3145516	Col
50	6	11.5	Top	33.8900067	Col
51	6	15	Bot	33.8900067	Col
52	11	11.5	Top	47.9598651	Col
53	11	15	Bot	47.9598651	Col
54	17	11.5	Top	51.834174	Col
55	17	15	Bot	51.834174	Col
56	22	11.5	Top	47.0626568	Col
57	22	15	Bot	47.0626568	Col
58	28	11.5	Top	35.2358193	Col
59	28	15	Bot	35.2358193	Col
60	33	11.5	Top	11.6229265	Col
61	33	15	Bot	11.6229265	Col
62	0	8	Top	23.9052183	Col
63	0	11.5	Bot	23.9052183	Col
64	6	8	Top	56.5961151	Col
65	6	11.5	Bot	56.5961151	Col
66	11	8	Top	80.0926972	Col
67	11	11.5	Bot	80.0926972	Col
68	17	8	Top	86.5627706	Col
69	17	11.5	Bot	86.5627706	Col
70	22	8	Top	78.5943645	Col
71	22	11.5	Bot	78.5943645	Col
72	28	8	Top	58.8436143	Col
73	28	11.5	Bot	58.8436143	Col
74	33	8	Top	19.41022	Col
75	33	11.5	Bot	19.41022	Col
76	0	4.5	Top	30.2993413	Col
77	0	8	Bot	30.2993413	Col

78	6	4.5	Top	71.7343379	Col
79	6	8	Bot	71.7343379	Col
80	11	4.5	Top	101.515742	Col
81	11	8	Bot	101.515742	Col
82	17	4.5	Top	109.716418	Col
83	17	8	Bot	109.716418	Col
84	22	4.5	Top	99.6166377	Col
85	22	8	Bot	99.6166377	Col
86	28	4.5	Top	74.5829939	Col
87	28	8	Bot	74.5829939	Col
88	33	4.5	Top	24.6020292	Col
89	33	8	Bot	24.6020292	Col
90	0	0	Top	42.4231014	Col
91	0	4.5	Bot	42.4231014	Col
92	6	0	Top	100.437599	Col
93	6	4.5	Bot	100.437599	Col
94	11	0	Top	142.135519	Col
95	11	4.5	Bot	142.135519	Col
96	17	0	Top	153.617555	Col
97	17	4.5	Bot	153.617555	Col
98	22	0	Top	139.476521	Col
99	22	4.5	Bot	139.476521	Col
100	28	0	Top	104.426096	Col
101	28	4.5	Bot	104.426096	Col
102	33	0	Top	34.446108	Col
103	33	4.5	Bot	34.446108	Col

AXIAL

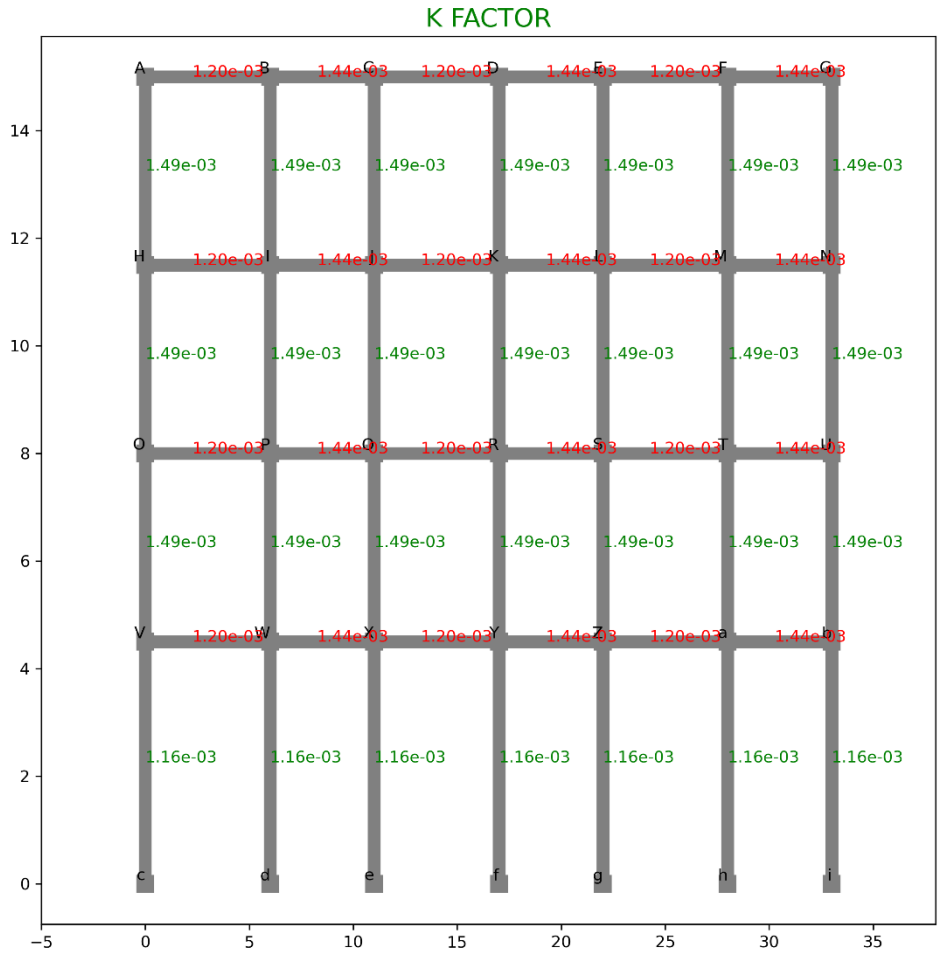
INDEX	X	Y	Loc	Axial	Type
0	0	11.5	Top	4.771517	Col
1	0	15	Bot	4.771517	Col
2	6	11.5	Top	3.058665	Col
3	6	15	Bot	3.058665	Col
4	11	11.5	Top	1.631288	Col
5	11	15	Bot	1.631288	Col
6	17	11.5	Top	-0.08156	Col
7	17	15	Bot	-0.08156	Col
8	22	11.5	Top	-1.50894	Col
9	22	15	Bot	-1.50894	Col
10	28	11.5	Top	-3.22179	Col
11	28	15	Bot	-3.22179	Col
12	33	11.5	Top	-4.64917	Col
13	33	15	Bot	-4.64917	Col
14	0	8	Top	17.51144	Col
15	0	11.5	Bot	17.51144	Col
16	6	8	Top	11.22528	Col
17	6	11.5	Bot	11.22528	Col
18	11	8	Top	5.986817	Col
19	11	11.5	Bot	5.986817	Col
20	17	8	Top	-0.29934	Col
21	17	11.5	Bot	-0.29934	Col
22	22	8	Top	-5.53781	Col
23	22	11.5	Bot	-5.53781	Col
24	28	8	Top	-11.824	Col
25	28	11.5	Bot	-11.824	Col
26	33	8	Top	-17.0624	Col
27	33	11.5	Bot	-17.0624	Col
28	0	4.5	Top	35.57963	Col
29	0	8	Bot	35.57963	Col

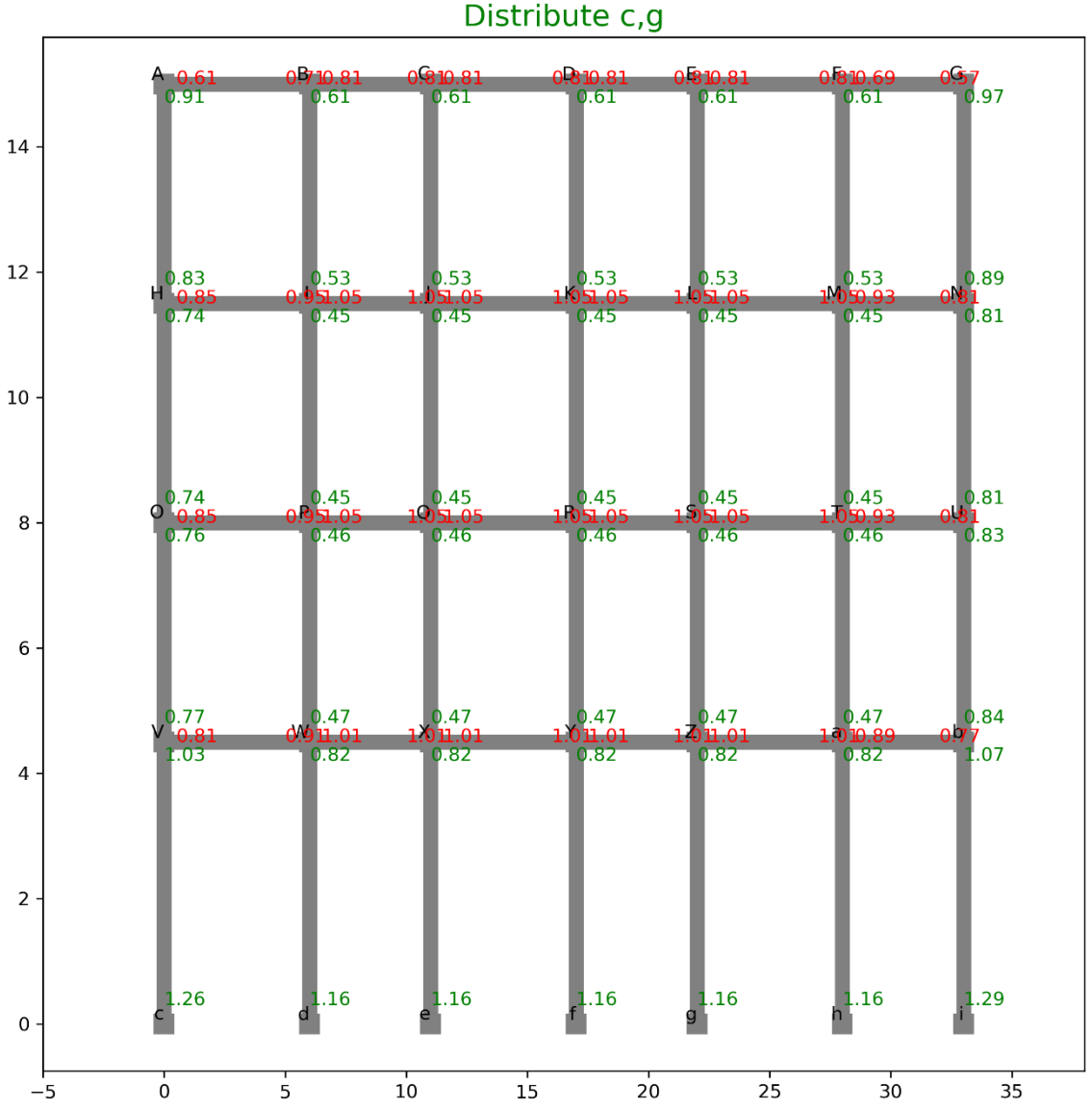
30	6	4.5	Top	22.80745	Col
31	6	8	Bot	22.80745	Col
32	11	4.5	Top	12.16398	Col
33	11	8	Bot	12.16398	Col
34	17	4.5	Top	-0.6082	Col
35	17	8	Bot	-0.6082	Col
36	22	4.5	Top	-11.2517	Col
37	22	8	Bot	-11.2517	Col
38	28	4.5	Top	-24.0239	Col
39	28	8	Bot	-24.0239	Col
40	33	4.5	Top	-34.6673	Col
41	33	8	Bot	-34.6673	Col
42	0	0	Top	59.82044	Col
43	0	4.5	Bot	59.82044	Col
44	6	0	Top	38.34644	Col
45	6	4.5	Bot	38.34644	Col
46	11	0	Top	20.45143	Col
47	11	4.5	Bot	20.45143	Col
48	17	0	Top	-1.02257	Col
49	17	4.5	Bot	-1.02257	Col
50	22	0	Top	-18.9176	Col
51	22	4.5	Bot	-18.9176	Col
52	28	0	Top	-40.3916	Col
53	28	4.5	Bot	-40.3916	Col
54	33	0	Top	-58.2866	Col
55	33	4.5	Bot	-58.2866	Col
56	0	15	Right	131.0827	Beam
57	6	15	Left	131.0827	Beam
58	6	15	Right	-148.028	Beam
59	11	15	Left	-148.028	Beam
60	11	15	Right	124.0478	Beam

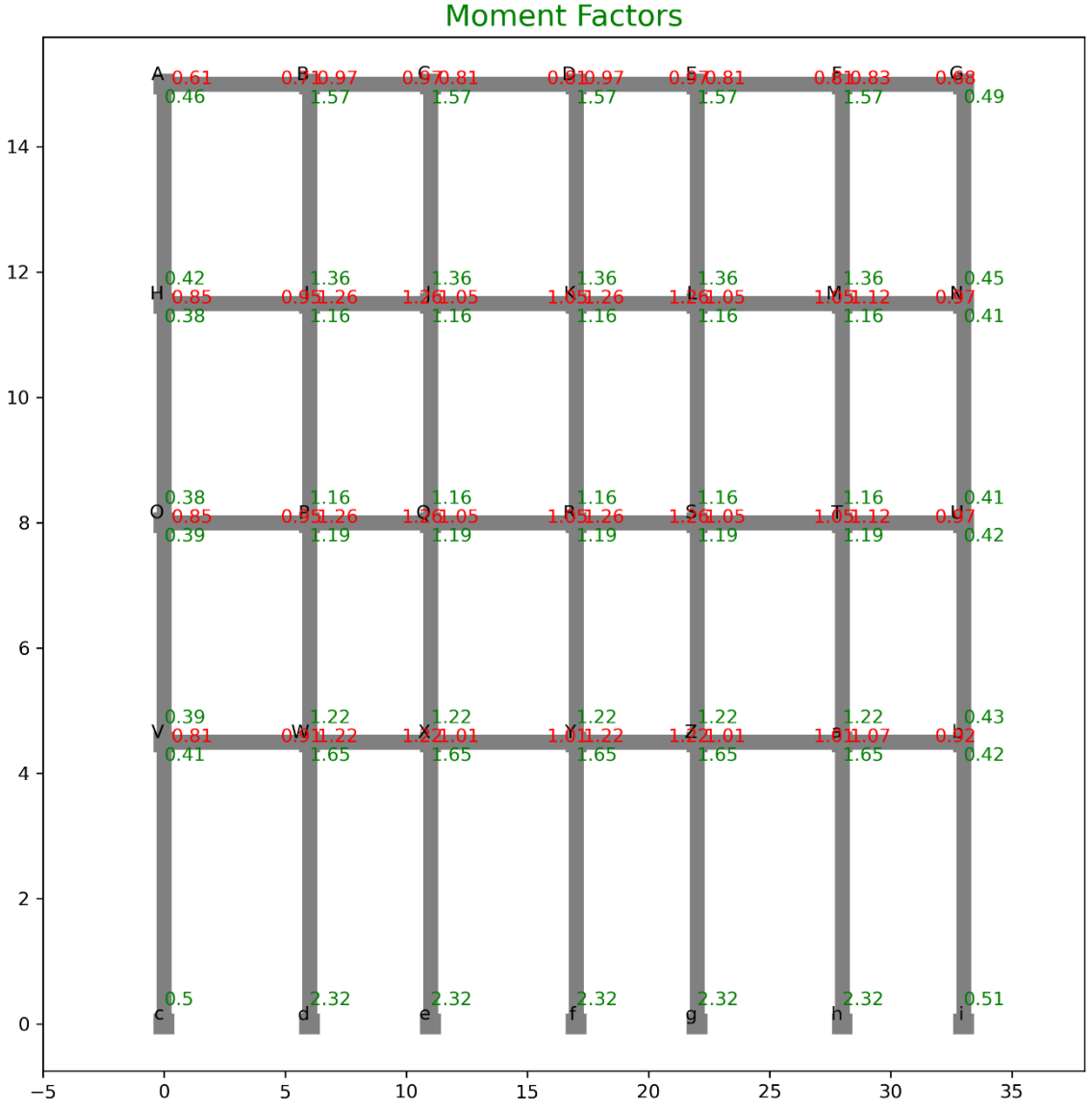
61	17	15	Left	124.0478	Beam
62	17	15	Right	-149.965	Beam
63	22	15	Left	-149.965	Beam
64	22	15	Right	126.4336	Beam
65	28	15	Left	126.4336	Beam
66	28	15	Right	-144.051	Beam
67	33	15	Left	-144.051	Beam
68	0	11.5	Right	207.7659	Beam
69	6	11.5	Left	207.7659	Beam
70	6	11.5	Right	-262.442	Beam
71	11	11.5	Left	-262.442	Beam
72	11	11.5	Right	185.0666	Beam
73	17	11.5	Left	185.0666	Beam
74	17	11.5	Right	-268.692	Beam
75	22	11.5	Left	-268.692	Beam
76	22	11.5	Right	192.7646	Beam
77	28	11.5	Left	192.7646	Beam
78	28	11.5	Right	-249.612	Beam
79	33	11.5	Left	-249.612	Beam
80	0	8	Right	261.5235	Beam
81	6	8	Left	261.5235	Beam
82	6	8	Right	-335.121	Beam
83	11	8	Left	-335.121	Beam
84	11	8	Right	230.9684	Beam
85	17	8	Left	230.9684	Beam
86	17	8	Right	-343.535	Beam
87	22	8	Left	-343.535	Beam
88	22	8	Right	241.3306	Beam
89	28	8	Left	241.3306	Beam
90	28	8	Right	-317.851	Beam
91	33	8	Left	-317.851	Beam
92	0	4.5	Right	282.2888	Beam
93	6	4.5	Left	282.2888	Beam
94	6	4.5	Right	-368.375	Beam
95	11	4.5	Left	-368.375	Beam
96	11	4.5	Right	246.5491	Beam
97	17	4.5	Left	246.5491	Beam
98	17	4.5	Right	-378.216	Beam
99	22	4.5	Left	-378.216	Beam
100	22	4.5	Right	258.6695	Beam
101	28	4.5	Left	258.6695	Beam
102	28	4.5	Right	-348.174	Beam
103	33	4.5	Left	-348.174	Beam

FACTOR METHOD OF ANALYSIS:

CALCULATION:




Distribute c,g
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
a
b
c
d
e
f
g
h
i
0.61
0.81
0.69
0.91
0.97
0.83
0.53
0.89
0.85
1.05
0.93
0.74
0.45
0.81
0.76
0.46
0.83
0.77
0.47
0.84
0.81
1.01
0.89
1.03
0.82
1.07
1.26
1.16
1.29
−5
0
5
10
15
20
25
30
35
0
2
4
6
8
10
12
14


Moment Factors
A
B
C
D
E
F
G
H
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
a
b
c
d
e
f
g
h
i
0.61
0.97
0.81
0.97
0.81
0.83
0.88
0.46
1.57
1.57
1.57
1.57
1.57
0.49
0.42
1.36
1.36
1.36
1.36
1.36
0.45
0.85
1.26
1.05
1.26
1.05
1.12
0.97
0.38
1.16
1.16
1.16
1.16
1.16
0.41
0.38
1.16
1.16
1.16
1.16
1.16
0.41
0.85
1.26
1.05
1.26
1.05
1.12
0.97
0.39
1.19
1.19
1.19
1.19
1.19
0.42
0.39
1.22
1.22
1.22
1.22
1.22
0.43
0.81
1.22
1.01
1.22
1.01
1.07
0.92
0.41
1.65
1.65
1.65
1.65
1.65
0.42
0.5
2.32
2.32
2.32
2.32
2.32
0.51
14
12
10
8
6
4
2
0
−5
0
5
10
15
20
25
30
35

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([138.24000]) \cdot 3.50000}{\Sigma([0.42039,\ 1.36324,\ 1.36324,\ 1.36324,\ 1.36324,\ 1.36324,\ 0.45351,\ 0.46283,\ 1.57084,\ 1.57084,\ 1.57084,\ 1.57084,\ 1.57084,\ 0.49441])}$$

$$= 29.32086$$

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([138.24000,\ 92.62000]) \cdot 3.50000}{\Sigma([0.37795,\ 1.15564,\ 1.15564,\ 1.15564,\ 1.15564,\ 1.15564,\ 0.41261,\ 0.37795,\ 1.15564,\ 1.15564,\ 1.15564,\ 1.15564,\ 1.15564,\ 0.41261])}$$

$$= 61.50390$$

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([138.24000,\ 92.62000,\ 61.75000]) \cdot 3.50000}{\Sigma([0.39290,\ 1.22066,\ 1.22066,\ 1.22066,\ 1.22066,\ 1.22066,\ 0.42737,\ 0.38543,\ 1.18815,\ 1.18815,\ 1.18815,\ 1.18815,\ 1.18815,\ 0.41999])}$$

$$= 74.91998$$

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([138.24000,\ 92.62000,\ 61.75000,\ 26.04000]) \cdot 4.50000}{\Sigma([0.49886,\ 2.32489,\ 2.32489,\ 2.32489,\ 2.32489,\ 2.32489,\ 0.50778,\ 0.40513,\ 1.64979,\ 1.64979,\ 1.64979,\ 1.64979,\ 1.64979,\ 0.42296])}$$

$$= 66.05470$$

NODE-A

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(|13.57046|\right)}{\Sigma\left(|0.60630|\right)} = 22.38231$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.70734,\ 0.97006|\right)} = 27.45819$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.60630 \cdot 22.38231 = 13.57046$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.70734 \cdot 27.45819 = 19.42236$$

NODE-B

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.70734,\ 0.97006|\right)} = 27.45819$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.97006,\ 0.80838|\right)} = 25.89819$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.97006 \cdot 27.45819 = 26.63609$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.97006 \cdot 25.89819 = 25.12279$$

NODE-C

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.97006,\ 0.80838|\right)} = 25.89819$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.80838,\ 0.97006|\right)} = 25.89819$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.80838 \cdot 25.89819 = 20.93566$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.80838 \cdot 25.89819 = 20.93566$$

NODE-D

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.80838,\ 0.97006|\right)} = 25.89819$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.97006,\ 0.80838|\right)} = 25.89819$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.97006 \cdot 25.89819 = 25.12279$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.97006 \cdot 25.89819 = 25.12279$$

NODE-E

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.97006,\ 0.80838|\right)} = 25.89819$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.80838,\ 0.82515|\right)} = 28.19568$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.80838 \cdot 25.89819 = 20.93566$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.80838 \cdot 28.19568 = 22.79292$$

NODE-F

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(|46.05845|\right)}{\Sigma\left(|0.80838,\ 0.82515|\right)} = 28.19568$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(|14.49662|\right)}{\Sigma\left(|0.68023|\right)} = 21.31133$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.82515 \cdot 28.19568 = 23.26553$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.68023 \cdot 21.31133 = 14.49662$$

NODE-H

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([12.32618,\ 23.24557]\right)}{\Sigma\left([0.85413]\right)} = 41.64669$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([0.95236,\ 1.26070]\right)} = 50.17850$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.85413 \cdot 41.64669 = 35.57175$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.95236 \cdot 50.17850 = 47.78787$$

NODE-I

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([0.95236,\ 1.26070]\right)} = 50.17850$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 48.04599$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.26070 \cdot 50.17850 = 63.26005$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.26070 \cdot 48.04599 = 60.57160$$

NODE-J

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 48.04599$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.05058,\ 1.26070]\right)} = 48.04599$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.05058 \cdot 48.04599 = 50.47633$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.05058 \cdot 48.04599 = 50.47633$$

NODE-K

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.05058,\ 1.26070]\right)} = 48.04599$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 48.04599$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.26070 \cdot 48.04599 = 60.57160$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.26070 \cdot 48.04599 = 60.57160$$

NODE-L

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 48.04599$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.05058,\ 1.11554]\right)} = 51.26577$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.05058 \cdot 48.04599 = 50.47633$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.05058 \cdot 51.26577 = 53.85898$$

NODE-M

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([39.97143,\ 71.07649]\right)}{\Sigma\left([1.05058,\ 1.11554]\right)} = 51.26577$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([13.29731,\ 25.37697]\right)}{\Sigma\left([0.97038]\right)} = 39.85491$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.11554 \cdot 51.26577 = 57.18894$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.97038 \cdot 39.85491 = 38.67428$$

NODE-O

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([23.24557,\ 28.87607]\right)}{\Sigma\left([0.85413]\right)} = 61.02296$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([0.95236,\ 1.26070]\right)} = 72.34001$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.85413 \cdot 61.02296 = 52.12163$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.95236 \cdot 72.34001 = 68.89356$$

NODE-P

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([0.95236,\ 1.26070]\right)} = 72.34001$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 69.26567$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.26070 \cdot 72.34001 = 91.19908$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.26070 \cdot 69.26567 = 87.32326$$

NODE-Q

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 69.26567$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.05058,\ 1.26070]\right)} = 69.26567$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.05058 \cdot 69.26567 = 72.76938$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.05058 \cdot 69.26567 = 72.76938$$

NODE-R

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.05058,\ 1.26070]\right)} = 69.26567$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 69.26567$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.26070 \cdot 69.26567 = 87.32326$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.26070 \cdot 69.26567 = 87.32326$$

NODE-S

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.26070,\ 1.05058]\right)} = 69.26567$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.05058,\ 1.11554]\right)} = 73.90748$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.05058 \cdot 69.26567 = 72.76938$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.05058 \cdot 73.90748 = 77.64599$$

NODE-T

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([71.07649,\ 89.01614]\right)}{\Sigma\left([1.05058,\ 1.11554]\right)} = 73.90748$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([25.37697,\ 31.46560]\right)}{\Sigma\left([0.97038]\right)} = 58.57784$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.11554 \cdot 73.90748 = 82.44665$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.97038 \cdot 58.57784 = 56.84257$$

NODE-V

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([29.43592,\ 26.76077]\right)}{\Sigma\left([0.81207]\right)} = 69.20211$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([0.91236,\ 1.21519]\right)} = 94.20589$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.81207 \cdot 69.20211 = 56.19669$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.91236 \cdot 94.20589 = 85.94989$$

NODE-W

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([0.91236,\ 1.21519]\right)} = 94.20589$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.21519,\ 1.01266]\right)} = 89.96481$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.21519 \cdot 94.20589 = 114.47804$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.21519 \cdot 89.96481 = 109.32433$$

NODE-X

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.21519,\ 1.01266]\right)} = 89.96481$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.01266,\ 1.21519]\right)} = 89.96481$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.01266 \cdot 89.96481 = 91.10360$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.01266 \cdot 89.96481 = 91.10360$$

NODE-Y

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.01266,\ 1.21519]\right)} = 89.96481$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.21519,\ 1.01266]\right)} = 89.96481$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.21519 \cdot 89.96481 = 109.32433$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.21519 \cdot 89.96481 = 109.32433$$

NODE-Z

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.21519,\ 1.01266]\right)} = 89.96481$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.01266,\ 1.06776]\right)} = 96.34029$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.01266 \cdot 89.96481 = 91.10360$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.01266 \cdot 96.34029 = 97.55979$$

NODE-a

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left([91.45161,\ 108.97632]\right)}{\Sigma\left([1.01266,\ 1.06776]\right)} = 96.34029$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left([32.01866,\ 27.93840]\right)}{\Sigma\left([0.92033]\right)} = 65.14759$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.06776 \cdot 96.34029 = 102.86814$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.92033 \cdot 65.14759 = 59.95706$$

COLUMN-H-A

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.42039 \cdot 29.32086 = 12.32618$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.46283 \cdot 29.32086 = 13.57046$$

COLUMN-I-B

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.36324 \cdot 29.32086 = 39.97143$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.57084 \cdot 29.32086 = 46.05845$$

COLUMN-J-C

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.36324 \cdot 29.32086 = 39.97143$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.57084 \cdot 29.32086 = 46.05845$$

COLUMN-K-D

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.36324 \cdot 29.32086 = 39.97143$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.57084 \cdot 29.32086 = 46.05845$$

COLUMN-L-E

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.36324 \cdot 29.32086 = 39.97143$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.57084 \cdot 29.32086 = 46.05845$$

COLUMN-M-F

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.36324 \cdot 29.32086 = 39.97143$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.57084 \cdot 29.32086 = 46.05845$$

COLUMN-N-G

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.45351 \cdot 29.32086 = 13.29731$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.49441 \cdot 29.32086 = 14.49662$$

COLUMN-O-H

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.37795 \cdot 61.50390 = 23.24557$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.37795 \cdot 61.50390 = 23.24557$$

COLUMN-P-I

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

COLUMN-Q-J

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

COLUMN-R-K

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

COLUMN-S-L

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

COLUMN-T-M

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.15564 \cdot 61.50390 = 71.07649$$

COLUMN-U-N

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.41261 \cdot 61.50390 = 25.37697$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.41261 \cdot 61.50390 = 25.37697$$

COLUMN-V-O

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.39290 \cdot 74.91998 = 29.43592$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.38543 \cdot 74.91998 = 28.87607$$

COLUMN-W-P

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.22066 \cdot 74.91998 = 91.45161$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.18815 \cdot 74.91998 = 89.01614$$

COLUMN-X-Q

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.22066 \cdot 74.91998 = 91.45161$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.18815 \cdot 74.91998 = 89.01614$$

COLUMN-Y-R

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.22066 \cdot 74.91998 = 91.45161$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.18815 \cdot 74.91998 = 89.01614$$

COLUMN-Z-S

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.22066 \cdot 74.91998 = 91.45161$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.18815 \cdot 74.91998 = 89.01614$$

COLUMN-a-T

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 1.22066 \cdot 74.91998 = 91.45161$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.18815 \cdot 74.91998 = 89.01614$$

COLUMN-b-U

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.42737 \cdot 74.91998 = 32.01866$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.41999 \cdot 74.91998 = 31.46560$$

COLUMN-c-V

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.49886 \cdot 66.05470 = 32.95215$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.40513 \cdot 66.05470 = 26.76077$$

COLUMN-d-W

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 2.32489 \cdot 66.05470 = 153.57022$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.64979 \cdot 66.05470 = 108.97632$$

COLUMN-e-X

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 2.32489 \cdot 66.05470 = 153.57022$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.64979 \cdot 66.05470 = 108.97632$$

COLUMN-f-Y

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 2.32489 \cdot 66.05470 = 153.57022$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.64979 \cdot 66.05470 = 108.97632$$

COLUMN-g-Z

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 2.32489 \cdot 66.05470 = 153.57022$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.64979 \cdot 66.05470 = 108.97632$$

COLUMN-h-a

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 2.32489 \cdot 66.05470 = 153.57022$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 1.64979 \cdot 66.05470 = 108.97632$$

COLUMN-i-b

$$\text{EndMoment}_{Bot} = \text{MomentFactor}_{bot} \cdot \alpha = 0.50778 \cdot 66.05470 = 33.54097$$

$$\text{EndMoment}_{Top} = \text{MomentFactor}_{top} \cdot \alpha = 0.42296 \cdot 66.05470 = 27.93840$$

COLUMN-H-A $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{12.32618 + 13.57046}{3.50000} = 7.39904$	**COLUMN-I-B** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-J-C** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-K-D** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$
COLUMN-L-E $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-M-F** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-N-G** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{13.29731 + 14.49662}{3.50000} = 7.94112$	**COLUMN-H-A** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{12.32618 + 13.57046}{3.50000} = 7.39904$
COLUMN-I-B $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-J-C** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-K-D** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-L-E** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$
COLUMN-M-F $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-N-G** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{13.29731 + 14.49662}{3.50000} = 7.94112$	**COLUMN-H-A** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{12.32618 + 13.57046}{3.50000} = 7.39904$	**COLUMN-I-B** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$
COLUMN-J-C $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-K-D** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-L-E** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$	**COLUMN-M-F** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{39.97143 + 46.05845}{3.50000} = 24.57997$
COLUMN-N-G $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{13.29731 + 14.49662}{3.50000} = 7.94112$			

COLUMN-O-H

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{23.24557 + 23.24557}{3.50000} = 13.28318$$

COLUMN-P-I

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-Q-J

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-R-K

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-S-L

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-T-M

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-U-N

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{25.37697 + 25.37697}{3.50000} = 14.50112$$

COLUMN-O-H

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{23.24557 + 23.24557}{3.50000} = 13.28318$$

COLUMN-P-I

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-Q-J

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-R-K

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-S-L

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-T-M

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-U-N

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{25.37697 + 25.37697}{3.50000} = 14.50112$$

COLUMN-O-H

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{23.24557 + 23.24557}{3.50000} = 13.28318$$

COLUMN-P-I

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-Q-J

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-R-K

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-S-L

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-T-M

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{71.07649 + 71.07649}{3.50000} = 40.61514$$

COLUMN-U-N

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{25.37697 + 25.37697}{3.50000} = 14.50112$$

COLUMN-V-O $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{29.43592 + 28.87607}{3.50000} = 16.66057$	**COLUMN-W-P** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-X-Q** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-Y-R** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$
COLUMN-Z-S $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-a-T** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-b-U** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{32.01866 + 31.46560}{3.50000} = 18.13836$	**COLUMN-V-O** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{29.43592 + 28.87607}{3.50000} = 16.66057$
COLUMN-W-P $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-X-Q** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-Y-R** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-Z-S** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$
COLUMN-a-T $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-b-U** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{32.01866 + 31.46560}{3.50000} = 18.13836$	**COLUMN-V-O** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{29.43592 + 28.87607}{3.50000} = 16.66057$	**COLUMN-W-P** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$
COLUMN-X-Q $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-Y-R** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-Z-S** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$	**COLUMN-a-T** $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{91.45161 + 89.01614}{3.50000} = 51.56221$
COLUMN-b-U $\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{32.01866 + 31.46560}{3.50000} = 18.13836$			

COLUMN-c-V

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{32.95215 + 26.76077}{4.50000} = 13.26954$$

COLUMN-d-W

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-e-X

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-f-Y

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-g-Z

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-h-a

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-i-b

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{33.54097 + 27.93840}{4.50000} = 13.66208$$

COLUMN-c-V

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{32.95215 + 26.76077}{4.50000} = 13.26954$$

COLUMN-d-W

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-e-X

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-f-Y

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-g-Z

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-h-a

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-i-b

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{33.54097 + 27.93840}{4.50000} = 13.66208$$

COLUMN-c-V

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{32.95215 + 26.76077}{4.50000} = 13.26954$$

COLUMN-d-W

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-e-X

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-f-Y

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-g-Z

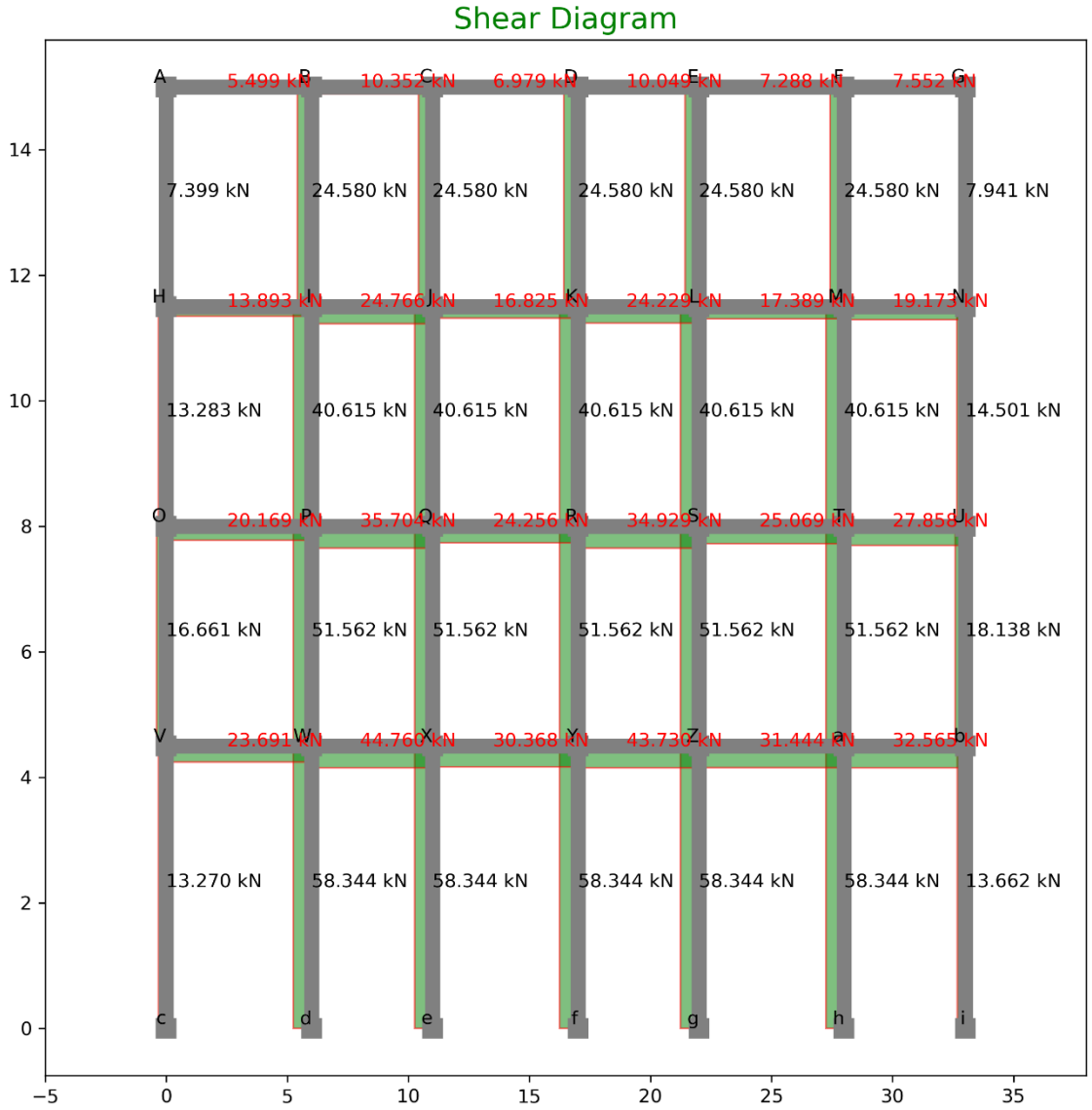
$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-h-a

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{153.57022 + 108.97632}{4.50000} = 58.34368$$

COLUMN-i-b

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{33.54097 + 27.93840}{4.50000} = 13.66208$$


Shear Diagram
A
B
C
D
E
F
G
5.499 kN
10.352 kN
6.979 kN
10.045 kN
7.288 kN
7.552 kN
7.399 kN
24.580 kN
24.580 kN
24.580 kN
24.580 kN
24.580 kN
7.941 kN
H
I
J
K
L
M
N
13.893 kN
24.766 kN
16.825 kN
24.229 kN
17.389 kN
19.173 kN
13.283 kN
40.615 kN
40.615 kN
40.615 kN
40.615 kN
40.615 kN
14.501 kN
O
P
Q
R
S
T
U
20.169 kN
35.704 kN
24.256 kN
34.929 kN
25.069 kN
27.858 kN
16.661 kN
51.562 kN
51.562 kN
51.562 kN
51.562 kN
51.562 kN
18.138 kN
V
W
X
Y
Z
a
b
23.691 kN
44.760 kN
30.368 kN
43.730 kN
31.444 kN
32.565 kN
13.270 kN
58.344 kN
58.344 kN
58.344 kN
58.344 kN
58.344 kN
13.662 kN
c
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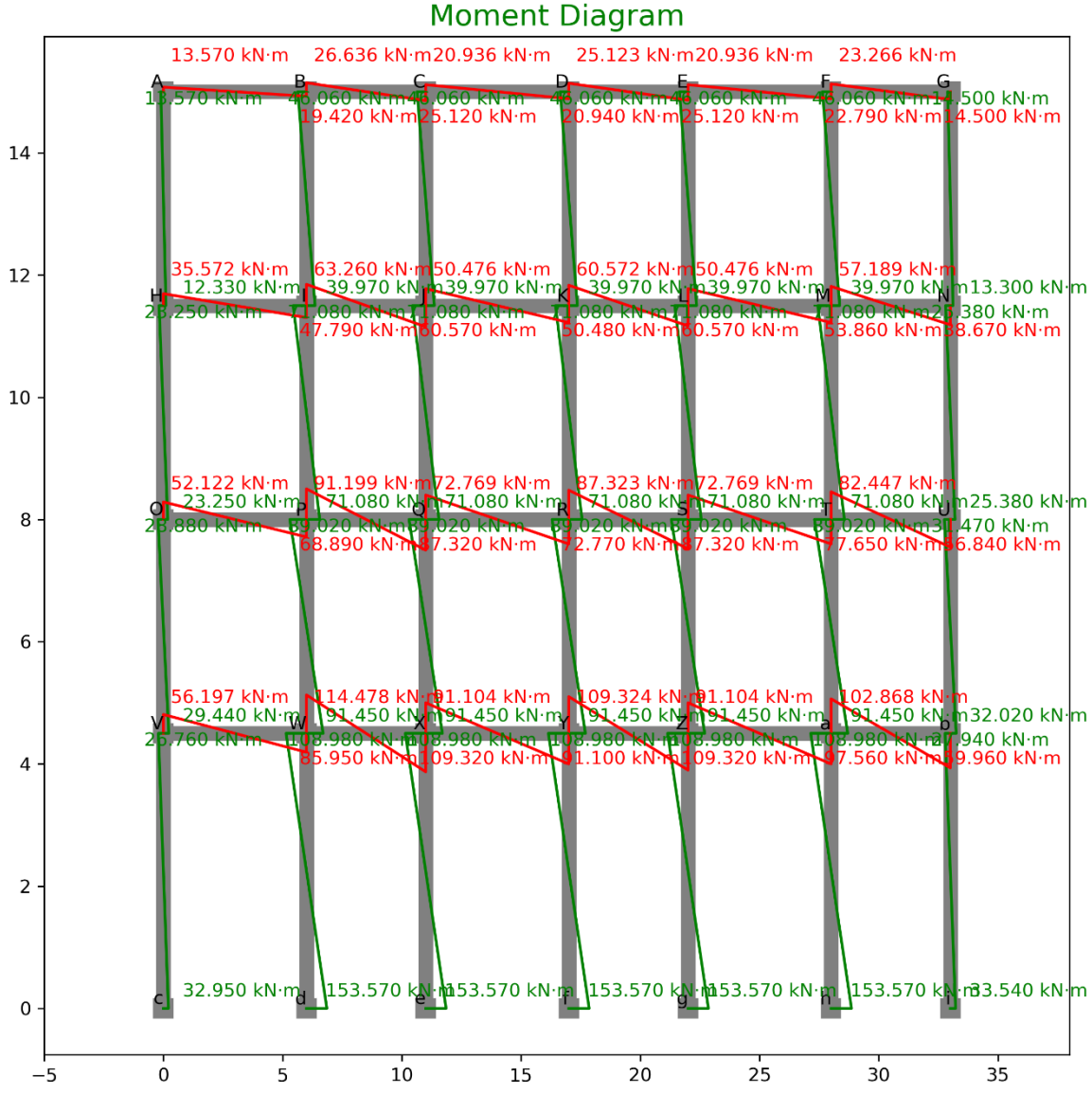
Moment Diagram
13.570 kN·m
26.636 kN·m
20.936 kN·m
25.123 kN·m
20.936 kN·m
23.266 kN·m
A
B
C
D
E
F
G
13.570 kN·m
46.060 kN·m
46.060 kN·m
46.060 kN·m
46.060 kN·m
46.060 kN·m
14.500 kN·m
19.420 kN·m
25.120 kN·m
20.940 kN·m
25.120 kN·m
22.790 kN·m
14.500 kN·m
35.572 kN·m
63.260 kN·m
50.476 kN·m
60.572 kN·m
50.476 kN·m
57.189 kN·m
12.330 kN·m
39.970 kN·m
39.970 kN·m
39.970 kN·m
39.970 kN·m
39.970 kN·m
13.300 kN·m
H
I
J
K
L
M
N
28.250 kN·m
71.080 kN·m
71.080 kN·m
71.080 kN·m
71.080 kN·m
71.080 kN·m
25.380 kN·m
47.790 kN·m
60.570 kN·m
50.480 kN·m
60.570 kN·m
53.860 kN·m
38.670 kN·m
52.122 kN·m
91.199 kN·m
72.769 kN·m
87.323 kN·m
72.769 kN·m
82.447 kN·m
23.250 kN·m
71.080 kN·m
71.080 kN·m
71.080 kN·m
71.080 kN·m
71.080 kN·m
25.380 kN·m
O
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Q
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S
T
U
25.880 kN·m
89.020 kN·m
89.020 kN·m
89.020 kN·m
89.020 kN·m
89.020 kN·m
37.470 kN·m
68.890 kN·m
87.320 kN·m
72.770 kN·m
87.320 kN·m
77.650 kN·m
46.840 kN·m
56.197 kN·m
114.478 kN·m
91.104 kN·m
109.324 kN·m
91.104 kN·m
102.868 kN·m
29.440 kN·m
91.450 kN·m
91.450 kN·m
91.450 kN·m
91.450 kN·m
91.450 kN·m
32.020 kN·m
V
W
X
Y
Z
a
b
25.760 kN·m
108.980 kN·m
108.980 kN·m
108.980 kN·m
108.980 kN·m
108.980 kN·m
41.940 kN·m
85.950 kN·m
109.320 kN·m
91.100 kN·m
109.320 kN·m
97.560 kN·m
49.960 kN·m
32.950 kN·m
153.570 kN·m
153.570 kN·m
153.570 kN·m
153.570 kN·m
153.570 kN·m
33.540 kN·m
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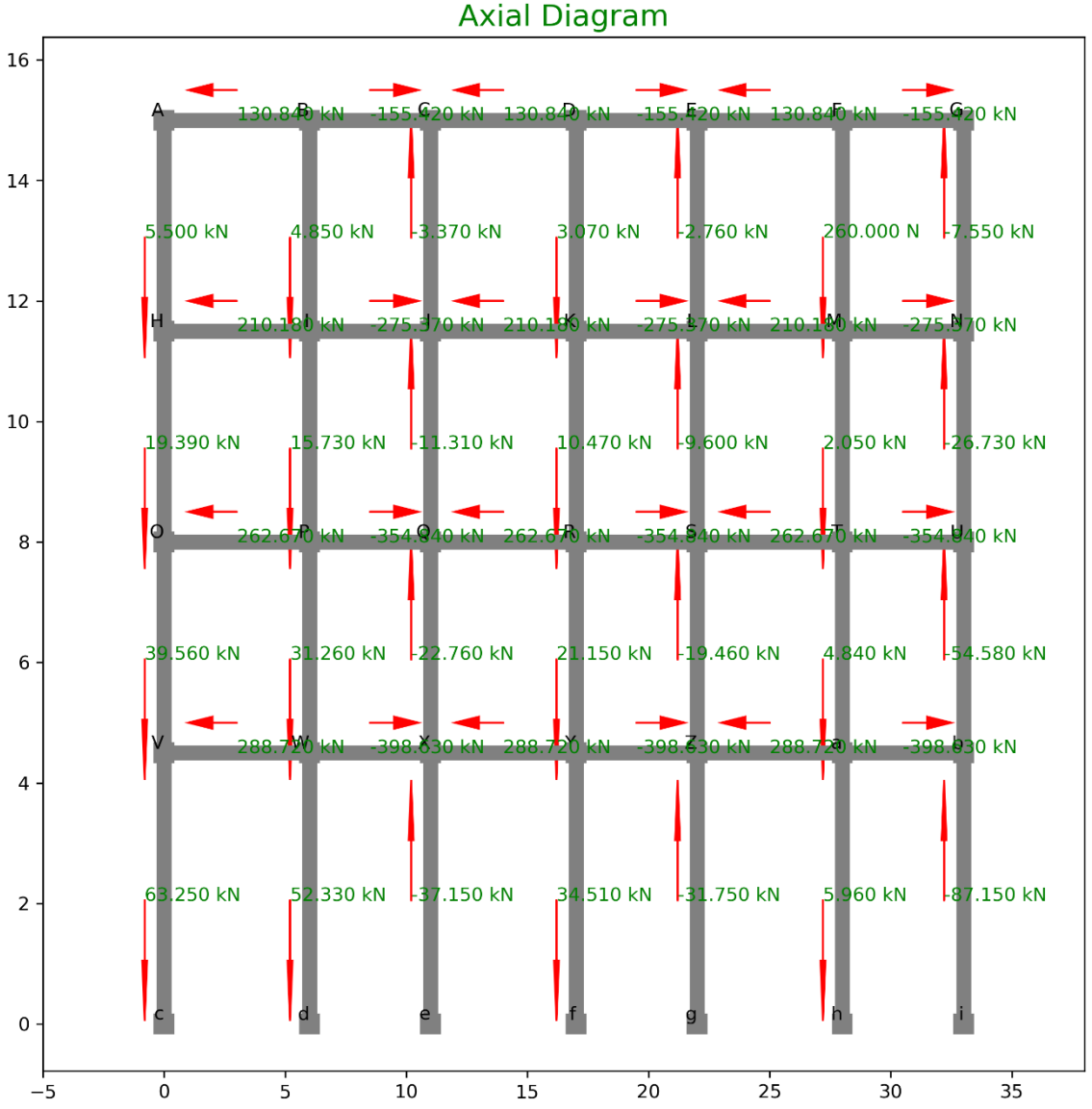
Axial Diagram
A
B
C
D
E
F
G
130.840 kN
-155.420 kN
130.840 kN
-155.420 kN
130.840 kN
-155.420 kN
5.500 kN
4.850 kN
-3.370 kN
3.070 kN
-2.760 kN
260.000 N
-7.550 kN
H
I
J
K
L
M
N
210.180 kN
-275.970 kN
210.180 kN
-275.970 kN
210.180 kN
-275.970 kN
19.390 kN
15.730 kN
-11.310 kN
10.470 kN
-9.600 kN
2.050 kN
-26.730 kN
O
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Q
R
S
T
U
262.670 kN
-354.840 kN
262.670 kN
-354.840 kN
262.670 kN
-354.840 kN
39.560 kN
31.260 kN
-22.760 kN
21.150 kN
-19.460 kN
4.840 kN
-54.580 kN
V
W
X
Y
Z
a
b
288.720 kN
-398.630 kN
288.720 kN
-398.630 kN
288.720 kN
-398.630 kN
63.250 kN
52.330 kN
-37.150 kN
34.510 kN
-31.750 kN
5.960 kN
-87.150 kN
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TABULATION OF FORCES

SHEAR

INDEX	X	Y	Loc	Shear	Type
0	0	15	Right	5.498805	Beam
1	6	15	Left	5.498805	Beam
2	6	15	Right	10.35178	Beam
3	11	15	Left	10.35178	Beam
4	11	15	Right	6.978553	Beam
5	17	15	Left	6.978553	Beam
6	17	15	Right	10.04912	Beam
7	22	15	Left	10.04912	Beam
8	22	15	Right	7.288096	Beam
9	28	15	Left	7.288096	Beam
10	28	15	Right	7.55243	Beam
11	33	15	Left	7.55243	Beam
12	0	11.5	Right	13.89327	Beam
13	6	11.5	Left	13.89327	Beam
14	6	11.5	Right	24.76633	Beam
15	11	11.5	Left	24.76633	Beam
16	11	11.5	Right	16.82544	Beam
17	17	11.5	Left	16.82544	Beam
18	17	11.5	Right	24.22864	Beam
19	22	11.5	Left	24.22864	Beam
20	22	11.5	Right	17.38922	Beam
21	28	11.5	Left	17.38922	Beam
22	28	11.5	Right	19.17264	Beam
23	33	11.5	Left	19.17264	Beam
24	0	8	Right	20.1692	Beam
25	6	8	Left	20.1692	Beam
26	6	8	Right	35.70447	Beam
27	11	8	Left	35.70447	Beam
28	11	8	Right	24.25646	Beam
29	17	8	Left	24.25646	Beam
30	17	8	Right	34.9293	Beam
31	22	8	Left	34.9293	Beam
32	22	8	Right	25.06923	Beam
33	28	8	Left	25.06923	Beam
34	28	8	Right	27.85784	Beam
35	33	8	Left	27.85784	Beam
36	0	4.5	Right	23.6911	Beam
37	6	4.5	Left	23.6911	Beam
38	6	4.5	Right	44.76047	Beam
39	11	4.5	Left	44.76047	Beam
40	11	4.5	Right	30.36787	Beam
41	17	4.5	Left	30.36787	Beam
42	17	4.5	Right	43.72973	Beam
43	22	4.5	Left	43.72973	Beam
44	22	4.5	Right	31.4439	Beam
45	28	4.5	Left	31.4439	Beam
46	28	4.5	Right	32.56504	Beam
47	33	4.5	Left	32.56504	Beam
48	0	11.5	Top	7.399042	Col
49	0	15	Bot	7.399042	Col
50	6	11.5	Top	24.57997	Col
51	6	15	Bot	24.57997	Col
52	11	11.5	Top	24.57997	Col
53	11	15	Bot	24.57997	Col
54	17	11.5	Top	24.57997	Col
55	17	15	Bot	24.57997	Col
56	22	11.5	Top	24.57997	Col
57	22	15	Bot	24.57997	Col
58	28	11.5	Top	24.57997	Col
59	28	15	Bot	24.57997	Col
60	33	11.5	Top	7.941122	Col
61	33	15	Bot	7.941122	Col
62	0	8	Top	13.28318	Col
63	0	11.5	Bot	13.28318	Col
64	6	8	Top	40.61514	Col
65	6	11.5	Bot	40.61514	Col
66	11	8	Top	40.61514	Col
67	11	11.5	Bot	40.61514	Col
68	17	8	Top	40.61514	Col
69	17	11.5	Bot	40.61514	Col
70	22	8	Top	40.61514	Col
71	22	11.5	Bot	40.61514	Col
72	28	8	Top	40.61514	Col
73	28	11.5	Bot	40.61514	Col
74	33	8	Top	14.50112	Col
75	33	11.5	Bot	14.50112	Col
76	0	4.5	Top	16.66057	Col
77	0	8	Bot	16.66057	Col
78	6	4.5	Top	51.56221	Col
79	6	8	Bot	51.56221	Col
80	11	4.5	Top	51.56221	Col
81	11	8	Bot	51.56221	Col
82	17	4.5	Top	51.56221	Col
83	17	8	Bot	51.56221	Col
84	22	4.5	Top	51.56221	Col
85	22	8	Bot	51.56221	Col
86	28	4.5	Top	51.56221	Col
87	28	8	Bot	51.56221	Col
88	33	4.5	Top	18.13836	Col
89	33	8	Bot	18.13836	Col

90	0	0	Top	13.26954	Col
91	0	4.5	Bot	13.26954	Col
92	6	0	Top	58.34368	Col
93	6	4.5	Bot	58.34368	Col
94	11	0	Top	58.34368	Col
95	11	4.5	Bot	58.34368	Col
96	17	0	Top	58.34368	Col
97	17	4.5	Bot	58.34368	Col
98	22	0	Top	58.34368	Col
99	22	4.5	Bot	58.34368	Col
100	28	0	Top	58.34368	Col
101	28	4.5	Bot	58.34368	Col
102	33	0	Top	13.66208	Col
103	33	4.5	Bot	13.66208	Col

MOMENT

INDEX	X	Y	Loc	Moment	Type
0	0	11.5	Top	12.3261813	Col
1	0	15	Bot	13.5704646	Col
2	6	11.5	Top	39.9714327	Col
3	6	15	Bot	46.0584529	Col
4	11	11.5	Top	39.9714327	Col
5	11	15	Bot	46.0584529	Col
6	17	11.5	Top	39.9714327	Col
7	17	15	Bot	46.0584529	Col
8	22	11.5	Top	39.9714327	Col
9	22	15	Bot	46.0584529	Col
10	28	11.5	Top	39.9714327	Col
11	28	15	Bot	46.0584529	Col
12	33	11.5	Top	13.2973097	Col
13	33	15	Bot	14.4966161	Col
14	0	8	Top	23.2455689	Col
15	0	11.5	Bot	23.2455689	Col
16	6	8	Top	71.0764927	Col
17	6	11.5	Bot	71.0764927	Col
18	11	8	Top	71.0764927	Col
19	11	11.5	Bot	71.0764927	Col
20	17	8	Top	71.0764927	Col
21	17	11.5	Bot	71.0764927	Col
22	22	8	Top	71.0764927	Col
23	22	11.5	Bot	71.0764927	Col
24	28	8	Top	71.0764927	Col
25	28	11.5	Bot	71.0764927	Col
26	33	8	Top	25.3769678	Col
27	33	11.5	Bot	25.3769678	Col
28	0	4.5	Top	29.4359165	Col
29	0	8	Bot	28.8760655	Col
30	6	4.5	Top	91.4516065	Col
31	6	8	Bot	89.0161443	Col
32	11	4.5	Top	91.4516065	Col
33	11	8	Bot	89.0161443	Col
34	17	4.5	Top	91.4516065	Col
35	17	8	Bot	89.0161443	Col
36	22	4.5	Top	91.4516065	Col
37	22	8	Bot	89.0161443	Col
38	28	4.5	Top	91.4516065	Col
39	28	8	Bot	89.0161443	Col
40	33	4.5	Top	32.0186617	Col
41	33	8	Bot	31.4656026	Col
42	0	0	Top	32.9521511	Col
43	0	4.5	Bot	26.7607744	Col
44	6	0	Top	153.570217	Col
45	6	4.5	Bot	108.976324	Col
46	11	0	Top	153.570217	Col
47	11	4.5	Bot	108.976324	Col
48	17	0	Top	153.570217	Col
49	17	4.5	Bot	108.976324	Col
50	22	0	Top	153.570217	Col
51	22	4.5	Bot	108.976324	Col
52	28	0	Top	153.570217	Col
53	28	4.5	Bot	108.976324	Col
54	33	0	Top	33.5409653	Col
55	33	4.5	Bot	27.9384029	Col
56	0	15	Right	13.5704646	Beam
57	6	15	Left	19.4223643	Beam
58	6	15	Right	26.6360886	Beam
59	11	15	Left	25.1227925	Beam
60	11	15	Right	20.9356604	Beam
61	17	15	Left	20.9356604	Beam
62	17	15	Right	25.1227925	Beam
63	22	15	Left	25.1227925	Beam
64	22	15	Right	20.9356604	Beam
65	28	15	Left	22.7929182	Beam
66	28	15	Right	23.2655347	Beam
67	33	15	Left	14.4966161	Beam
68	0	11.5	Right	35.5717502	Beam
69	6	11.5	Left	47.787874	Beam
70	6	11.5	Right	63.2600514	Beam
71	11	11.5	Left	60.5715957	Beam
72	11	11.5	Right	50.4763297	Beam
73	17	11.5	Left	50.4763297	Beam
74	17	11.5	Right	60.5715957	Beam
75	22	11.5	Left	60.5715957	Beam

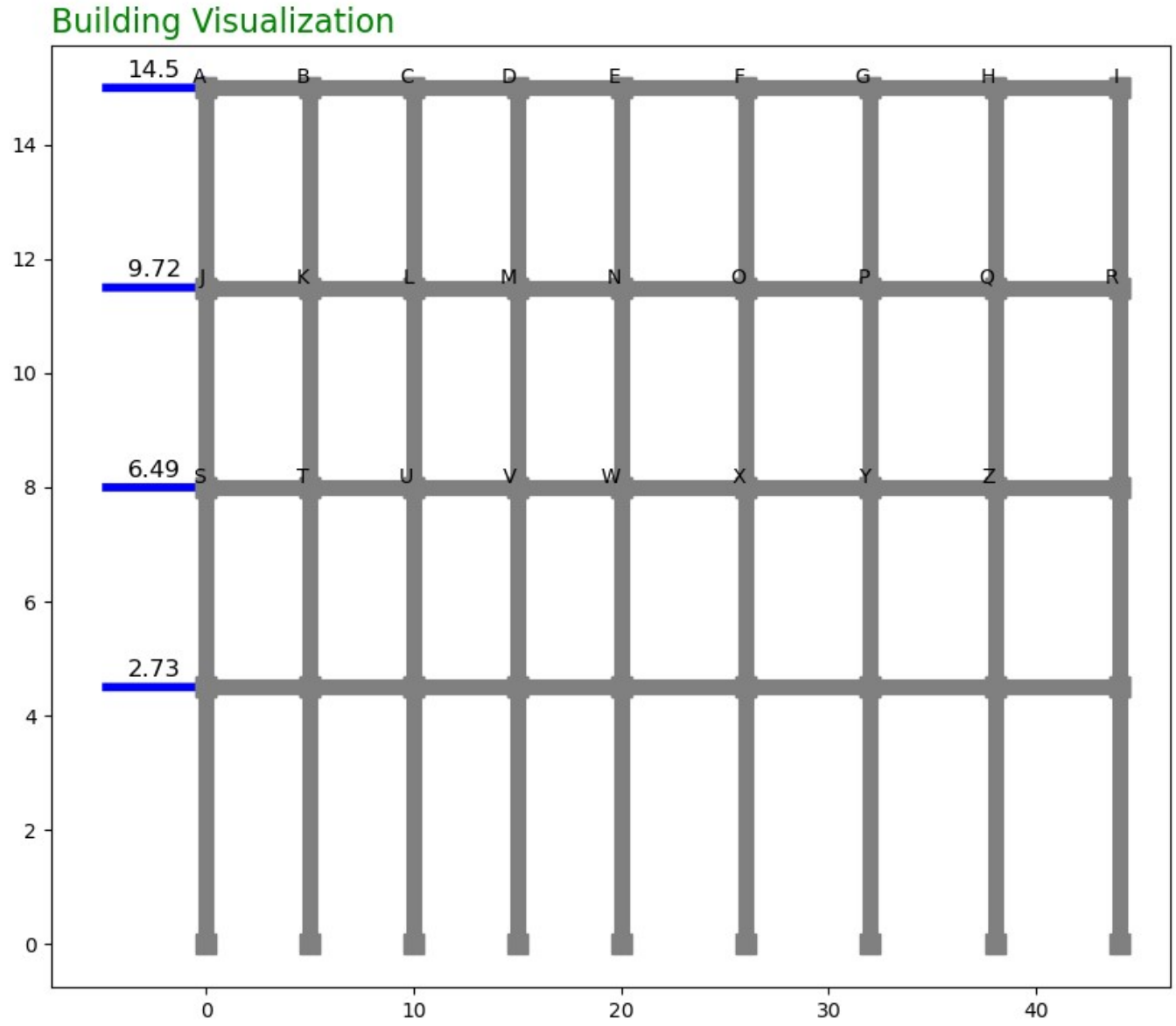
76	22	11.5	Right	50.4763297	Beam
77	28	11.5	Left	53.8589811	Beam
78	28	11.5	Right	57.1889442	Beam
79	33	11.5	Left	38.6742775	Beam
80	0	8	Right	52.1216344	Beam
81	6	8	Left	68.8935586	Beam
82	6	8	Right	91.1990783	Beam
83	11	8	Left	87.3232565	Beam
84	11	8	Right	72.7693804	Beam
85	17	8	Left	72.7693804	Beam
86	17	8	Right	87.3232565	Beam
87	22	8	Left	87.3232565	Beam
88	22	8	Right	72.7693804	Beam
89	28	8	Left	77.6459919	Beam
90	28	8	Right	82.4466451	Beam
91	33	8	Left	56.8425704	Beam
92	0	4.5	Right	56.1966909	Beam
93	6	4.5	Left	85.9498909	Beam
94	6	4.5	Right	114.47804	Beam
95	11	4.5	Left	109.324326	Beam
96	11	4.5	Right	91.103605	Beam
97	17	4.5	Left	91.103605	Beam
98	17	4.5	Right	109.324326	Beam
99	22	4.5	Left	109.324326	Beam
100	22	4.5	Right	91.103605	Beam
101	28	4.5	Left	97.5597894	Beam
102	28	4.5	Right	102.868142	Beam
103	33	4.5	Left	59.9570646	Beam

AXIAL

INDEX	X	Y	Loc	Axial	Type
0	0	11.5	Top	5.498805	Col
1	0	15	Bot	5.498805	Col
2	6	11.5	Top	4.852971	Col
3	6	15	Bot	4.852971	Col
4	11	11.5	Top	-3.37322	Col
5	11	15	Bot	-3.37322	Col
6	17	11.5	Top	3.070564	Col
7	17	15	Bot	3.070564	Col
8	22	11.5	Top	-2.76102	Col
9	22	15	Bot	-2.76102	Col
10	28	11.5	Top	0.264334	Col
11	28	15	Bot	0.264334	Col
12	33	11.5	Top	-7.55243	Col
13	33	15	Bot	-7.55243	Col
14	0	8	Top	19.39208	Col
15	0	11.5	Bot	19.39208	Col
16	6	8	Top	15.72603	Col
17	6	11.5	Bot	15.72603	Col
18	11	8	Top	-11.3141	Col
19	11	11.5	Bot	-11.3141	Col
20	17	8	Top	10.47376	Col
21	17	11.5	Bot	10.47376	Col
22	22	8	Top	-9.60044	Col
23	22	11.5	Bot	-9.60044	Col
24	28	8	Top	2.04776	Col
25	28	11.5	Bot	2.04776	Col
26	33	8	Top	-26.7251	Col
27	33	11.5	Bot	-26.7251	Col
28	0	4.5	Top	39.56127	Col
29	0	8	Bot	39.56127	Col
30	6	4.5	Top	31.2613	Col
31	6	8	Bot	31.2613	Col
32	11	4.5	Top	-22.7621	Col
33	11	8	Bot	-22.7621	Col
34	17	4.5	Top	21.1466	Col
35	17	8	Bot	21.1466	Col
36	22	4.5	Top	-19.4605	Col
37	22	8	Bot	-19.4605	Col
38	28	4.5	Top	4.836374	Col
39	28	8	Bot	4.836374	Col
40	33	4.5	Top	-54.5829	Col
41	33	8	Bot	-54.5829	Col
42	0	0	Top	63.25237	Col
43	0	4.5	Bot	63.25237	Col
44	6	0	Top	52.33067	Col
45	6	4.5	Bot	52.33067	Col
46	11	0	Top	-37.1547	Col
47	11	4.5	Bot	-37.1547	Col
48	17	0	Top	34.50846	Col
49	17	4.5	Bot	34.50846	Col
50	22	0	Top	-31.7463	Col
51	22	4.5	Bot	-31.7463	Col
52	28	0	Top	5.957516	Col
53	28	4.5	Bot	5.957516	Col
54	33	0	Top	-87.148	Col
55	33	4.5	Bot	-87.148	Col
56	0	15	Right	130.841	Beam

57	6	15	Left	130.841	Beam
58	6	15	Right	-155.421	Beam
59	11	15	Left	-155.421	Beam
60	11	15	Right	130.841	Beam
61	17	15	Left	130.841	Beam
62	17	15	Right	-155.421	Beam
63	22	15	Left	-155.421	Beam
64	22	15	Right	130.841	Beam
65	28	15	Left	130.841	Beam
66	28	15	Right	-155.421	Beam
67	33	15	Left	-155.421	Beam
68	0	11.5	Right	210.1778	Beam
69	6	11.5	Left	210.1778	Beam
70	6	11.5	Right	-275.373	Beam
71	11	11.5	Left	-275.373	Beam
72	11	11.5	Right	210.1778	Beam
73	17	11.5	Left	210.1778	Beam
74	17	11.5	Right	-275.373	Beam
75	22	11.5	Left	-275.373	Beam
76	22	11.5	Right	210.1778	Beam
77	28	11.5	Left	210.1778	Beam
78	28	11.5	Right	-275.373	Beam
79	33	11.5	Left	-275.373	Beam
80	0	8	Right	262.6663	Beam
81	6	8	Left	262.6663	Beam
82	6	8	Right	-354.844	Beam
83	11	8	Left	-354.844	Beam
84	11	8	Right	262.6663	Beam
85	17	8	Left	262.6663	Beam
86	17	8	Right	-354.844	Beam
87	22	8	Left	-354.844	Beam
88	22	8	Right	262.6663	Beam
89	28	8	Left	262.6663	Beam
90	28	8	Right	-354.844	Beam
91	33	8	Left	-354.844	Beam
92	0	4.5	Right	288.7199	Beam
93	6	4.5	Left	288.7199	Beam
94	6	4.5	Right	-398.626	Beam
95	11	4.5	Left	-398.626	Beam
96	11	4.5	Right	288.7199	Beam
97	17	4.5	Left	288.7199	Beam
98	17	4.5	Right	-398.626	Beam
99	22	4.5	Left	-398.626	Beam
100	22	4.5	Right	288.7199	Beam
101	28	4.5	Left	288.7199	Beam
102	28	4.5	Right	-398.626	Beam
103	33	4.5	Left	-398.626	Beam

FRAME C


Building Visualization
14.5
9.72
6.49
2.73
A
B
C
D
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F
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H
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J
K
L
M
N
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U
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Y
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0
2
4
6
8
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12
14
0
10
20
30
40

PORTAL METHOD OF ANALYSIS

CALCULATION:

COLUMN-A-J

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

Since, Side → (Exterior) :

$$\text{Shear} = 906.25\ \text{N}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 906.25\ \text{N}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 906.25\ \text{N} \cdot \frac{3.50\ \text{m}}{2} = 1.59\ \text{kN} \cdot \text{m}$$

COLUMN-B-K

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

$$\text{Shear} = 1.81\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 1.81\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.81\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.17\ \text{kN} \cdot \text{m}$$

COLUMN-C-L

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

$$\text{Shear} = 1.81\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 1.81\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.81\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.17\ \text{kN} \cdot \text{m}$$

COLUMN-D-M

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

$$\text{Shear} = 1.81\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 1.81\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.81\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.17\ \text{kN} \cdot \text{m}$$

COLUMN-E-N

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

$$\text{Shear} = 1.81\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 1.81\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.81\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.17\ \text{kN} \cdot \text{m}$$

COLUMN-F-O

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

$$\text{Shear} = 1.81\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 1.81\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.81\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.17\ \text{kN} \cdot \text{m}$$

COLUMN-G-P

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

$$\text{Shear} = 1.81\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 1.81\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.81\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.17\ \text{kN} \cdot \text{m}$$

COLUMN-H-Q

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

$$\text{Shear} = 1.81\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 1.81\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.81\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.17\ \text{kN} \cdot \text{m}$$

COLUMN-I-R

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{14.50\ \text{kN}}{16} = 906.25\ \text{N}$$

Since, Side → (Exterior) :

$$\text{Shear} = 906.25\ \text{N}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 906.25\ \text{N} = 906.25\ \text{N}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 906.25\ \text{N} \cdot \frac{3.50\ \text{m}}{2} = 1.59\ \text{kN} \cdot \text{m}$$

COLUMN-J-S

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 1.51\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 1.51\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.51\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 2.65\ \text{kN} \cdot \text{m}$$

COLUMN-K-T

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

$$\text{Shear} = 3.03\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 3.03\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.03\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 5.30\ \text{kN} \cdot \text{m}$$

COLUMN-L-U

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

$$\text{Shear} = 3.03\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 3.03\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.03\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 5.30\ \text{kN} \cdot \text{m}$$

COLUMN-M-V

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

$$\text{Shear} = 3.03\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 3.03\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.03\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 5.30\ \text{kN} \cdot \text{m}$$

COLUMN-N-W

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

$$\text{Shear} = 3.03\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 3.03\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.03\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 5.30\ \text{kN} \cdot \text{m}$$

COLUMN-O-X

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

$$\text{Shear} = 3.03\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 3.03\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.03\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 5.30\ \text{kN} \cdot \text{m}$$

COLUMN-P-Y

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

$$\text{Shear} = 3.03\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 3.03\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.03\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 5.30\ \text{kN} \cdot \text{m}$$

COLUMN-Q-Z

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

$$\text{Shear} = 3.03\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 3.03\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.03\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 5.30\ \text{kN} \cdot \text{m}$$

COLUMN-R-a

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{24.22\ \text{kN}}{16} = 1.51\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 1.51\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.51\ \text{kN} = 1.51\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.51\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 2.65\ \text{kN} \cdot \text{m}$$

COLUMN-S-b

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 1.92\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 1.92\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.92\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.36\ \text{kN} \cdot \text{m}$$

COLUMN-T-c

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

$$\text{Shear} = 3.84\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 3.84\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.84\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 6.72\ \text{kN} \cdot \text{m}$$

COLUMN-U-d

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

$$\text{Shear} = 3.84\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 3.84\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.84\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 6.72\ \text{kN} \cdot \text{m}$$

COLUMN-V-e

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

$$\text{Shear} = 3.84\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 3.84\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.84\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 6.72\ \text{kN} \cdot \text{m}$$

COLUMN-W-f

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

$$\text{Shear} = 3.84\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 3.84\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.84\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 6.72\ \text{kN} \cdot \text{m}$$

COLUMN-X-g

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

$$\text{Shear} = 3.84\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 3.84\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.84\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 6.72\ \text{kN} \cdot \text{m}$$

COLUMN-Y-h

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

$$\text{Shear} = 3.84\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 3.84\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.84\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 6.72\ \text{kN} \cdot \text{m}$$

COLUMN-Z-i

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

$$\text{Shear} = 3.84\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 3.84\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 3.84\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 6.72\ \text{kN} \cdot \text{m}$$

COLUMN-a-j

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{30.71\ \text{kN}}{16} = 1.92\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 1.92\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 1.92\ \text{kN} = 1.92\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 1.92\ \text{kN} \cdot \frac{3.50\ \text{m}}{2} = 3.36\ \text{kN} \cdot \text{m}$$

COLUMN-b-k

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 2.09\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 2.09\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 2.09\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 4.70\ \text{kN} \cdot \text{m}$$

COLUMN-c-l

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

$$\text{Shear} = 4.18\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 4.18\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 4.18\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 9.40\ \text{kN} \cdot \text{m}$$

COLUMN-d-m

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

$$\text{Shear} = 4.18\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 4.18\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 4.18\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 9.40\ \text{kN} \cdot \text{m}$$

COLUMN-e-n

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

$$\text{Shear} = 4.18\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 4.18\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 4.18\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 9.40\ \text{kN} \cdot \text{m}$$

COLUMN-f-o

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

$$\text{Shear} = 4.18\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 4.18\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 4.18\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 9.40\ \text{kN} \cdot \text{m}$$

COLUMN-g-p

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

$$\text{Shear} = 4.18\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 4.18\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 4.18\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 9.40\ \text{kN} \cdot \text{m}$$

COLUMN-h-q

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

$$\text{Shear} = 4.18\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 4.18\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 4.18\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 9.40\ \text{kN} \cdot \text{m}$$

COLUMN-i-r

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

$$\text{Shear} = 4.18\ \text{kN}$$

Since, Side → (Interior) :

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 4.18\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 4.18\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 9.40\ \text{kN} \cdot \text{m}$$

COLUMN-j-s

$$V = \frac{\text{Force}}{\text{NumberCol}} = \frac{33.44\ \text{kN}}{16} = 2.09\ \text{kN}$$

Since, Side → (Exterior) :

$$\text{Shear} = 2.09\ \text{kN}$$

$$\text{Shear} = 2 \cdot V = 2 \cdot 2.09\ \text{kN} = 2.09\ \text{kN}$$

$$\text{EndMoment} = \text{Shear} \cdot \frac{\text{length}}{2} = 2.09\ \text{kN} \cdot \frac{4.50\ \text{m}}{2} = 4.70\ \text{kN} \cdot \text{m}$$

BEAM-B-A

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([1.59\ \text{kN} \cdot \text{m}]) - \Sigma([]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 634.38\ \text{N}\end{aligned}$$

BEAM-C-B

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m}]) - \Sigma([1.59\ \text{kN} \cdot \text{m}]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 634.38\ \text{N}\end{aligned}$$

BEAM-D-C

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m}]) - \Sigma([1.59\ \text{kN} \cdot \text{m}]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 634.38\ \text{N}\end{aligned}$$

BEAM-E-D

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m}]) - \Sigma([1.59\ \text{kN} \cdot \text{m}]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 634.38\ \text{N}\end{aligned}$$

BEAM-F-E

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m}]) - \Sigma([1.59\ \text{kN} \cdot \text{m}]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 528.65\ \text{N}\end{aligned}$$

BEAM-G-F

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m}]) - \Sigma([1.59\ \text{kN} \cdot \text{m}]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 528.65\ \text{N}\end{aligned}$$

BEAM-H-G

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m}]) - \Sigma([1.59\ \text{kN} \cdot \text{m}]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 528.65\ \text{N}\end{aligned}$$

BEAM-I-H

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m}]) - \Sigma([1.59\ \text{kN} \cdot \text{m}]) \\ &= 1.59\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{1.59\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 528.65\ \text{N}\end{aligned}$$

BEAM-K-J

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([1.59\ \text{kN} \cdot \text{m},\ 2.65\ \text{kN} \cdot \text{m}]) - \Sigma([]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 1.69\ \text{kN}\end{aligned}$$

BEAM-L-K

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m},\ 5.30\ \text{kN} \cdot \text{m}]) - \Sigma([4.24\ \text{kN} \cdot \text{m}]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 1.69\ \text{kN}\end{aligned}$$

BEAM-M-L

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m},\ 5.30\ \text{kN} \cdot \text{m}]) - \Sigma([4.24\ \text{kN} \cdot \text{m}]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 1.69\ \text{kN}\end{aligned}$$

BEAM-N-M

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m},\ 5.30\ \text{kN} \cdot \text{m}]) - \Sigma([4.24\ \text{kN} \cdot \text{m}]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{5.00\ \text{m}} \\ &= 1.69\ \text{kN}\end{aligned}$$

BEAM-O-N

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m},\ 5.30\ \text{kN} \cdot \text{m}]) - \Sigma([4.24\ \text{kN} \cdot \text{m}]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 1.41\ \text{kN}\end{aligned}$$

BEAM-P-O

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m},\ 5.30\ \text{kN} \cdot \text{m}]) - \Sigma([4.24\ \text{kN} \cdot \text{m}]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 1.41\ \text{kN}\end{aligned}$$

BEAM-Q-P

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m},\ 5.30\ \text{kN} \cdot \text{m}]) - \Sigma([4.24\ \text{kN} \cdot \text{m}]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 1.41\ \text{kN}\end{aligned}$$

BEAM-R-Q

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.17\ \text{kN} \cdot \text{m},\ 5.30\ \text{kN} \cdot \text{m}]) - \Sigma([4.24\ \text{kN} \cdot \text{m}]) \\ &= 4.24\ \text{kN} \cdot \text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment} \cdot 2}{\text{Length}} \\ &= \frac{4.24\ \text{kN} \cdot \text{m} \cdot 2}{6.00\ \text{m}} \\ &= 1.41\ \text{kN}\end{aligned}$$

BEAM-c-b

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([3.36\ \text{kN}\cdot\text{m},\ 4.70\ \text{kN}\cdot\text{m}]) - \Sigma([]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 3.22\ \text{kN}\end{aligned}$$

BEAM-d-c

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([6.72\ \text{kN}\cdot\text{m},\ 9.40\ \text{kN}\cdot\text{m}]) - \Sigma([8.06\ \text{kN}\cdot\text{m}]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 3.22\ \text{kN}\end{aligned}$$

BEAM-e-d

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([6.72\ \text{kN}\cdot\text{m},\ 9.40\ \text{kN}\cdot\text{m}]) - \Sigma([8.06\ \text{kN}\cdot\text{m}]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 3.22\ \text{kN}\end{aligned}$$

BEAM-f-e

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([6.72\ \text{kN}\cdot\text{m},\ 9.40\ \text{kN}\cdot\text{m}]) - \Sigma([8.06\ \text{kN}\cdot\text{m}]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 3.22\ \text{kN}\end{aligned}$$

BEAM-g-f

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([6.72\ \text{kN}\cdot\text{m},\ 9.40\ \text{kN}\cdot\text{m}]) - \Sigma([8.06\ \text{kN}\cdot\text{m}]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.69\ \text{kN}\end{aligned}$$

BEAM-h-g

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([6.72\ \text{kN}\cdot\text{m},\ 9.40\ \text{kN}\cdot\text{m}]) - \Sigma([8.06\ \text{kN}\cdot\text{m}]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.69\ \text{kN}\end{aligned}$$

BEAM-i-h

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([6.72\ \text{kN}\cdot\text{m},\ 9.40\ \text{kN}\cdot\text{m}]) - \Sigma([8.06\ \text{kN}\cdot\text{m}]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.69\ \text{kN}\end{aligned}$$

BEAM-j-i

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([6.72\ \text{kN}\cdot\text{m},\ 9.40\ \text{kN}\cdot\text{m}]) - \Sigma([8.06\ \text{kN}\cdot\text{m}]) \\ &= 8.06\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{8.06\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.69\ \text{kN}\end{aligned}$$

BEAM-T-S

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([2.65\ \text{kN}\cdot\text{m},\ 3.36\ \text{kN}\cdot\text{m}]) - \Sigma([]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 2.40\ \text{kN}\end{aligned}$$

BEAM-U-T

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([5.30\ \text{kN}\cdot\text{m},\ 6.72\ \text{kN}\cdot\text{m}]) - \Sigma([6.01\ \text{kN}\cdot\text{m}]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 2.40\ \text{kN}\end{aligned}$$

BEAM-V-U

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([5.30\ \text{kN}\cdot\text{m},\ 6.72\ \text{kN}\cdot\text{m}]) - \Sigma([6.01\ \text{kN}\cdot\text{m}]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 2.40\ \text{kN}\end{aligned}$$

BEAM-W-V

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([5.30\ \text{kN}\cdot\text{m},\ 6.72\ \text{kN}\cdot\text{m}]) - \Sigma([6.01\ \text{kN}\cdot\text{m}]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{5.00\ \text{m}} \\ &= 2.40\ \text{kN}\end{aligned}$$

BEAM-X-W

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([5.30\ \text{kN}\cdot\text{m},\ 6.72\ \text{kN}\cdot\text{m}]) - \Sigma([6.01\ \text{kN}\cdot\text{m}]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.00\ \text{kN}\end{aligned}$$

BEAM-Y-X

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([5.30\ \text{kN}\cdot\text{m},\ 6.72\ \text{kN}\cdot\text{m}]) - \Sigma([6.01\ \text{kN}\cdot\text{m}]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.00\ \text{kN}\end{aligned}$$

BEAM-Z-Y

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([5.30\ \text{kN}\cdot\text{m},\ 6.72\ \text{kN}\cdot\text{m}]) - \Sigma([6.01\ \text{kN}\cdot\text{m}]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.00\ \text{kN}\end{aligned}$$

BEAM-a-Z

$$\begin{aligned}\text{EndMoment} &= \Sigma(\text{ColMoment}) - \Sigma(\text{BeamMoment}) \\ &= \Sigma([5.30\ \text{kN}\cdot\text{m},\ 6.72\ \text{kN}\cdot\text{m}]) - \Sigma([6.01\ \text{kN}\cdot\text{m}]) \\ &= 6.01\ \text{kN}\cdot\text{m}\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{EndMoment}\cdot 2}{\text{Length}} \\ &= \frac{6.01\ \text{kN}\cdot\text{m}\cdot 2}{6.00\ \text{m}} \\ &= 2.00\ \text{kN}\end{aligned}$$

COLUMN-A-J

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|634.38\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left([]\right)\\ &= 634.38\text{ N}\end{aligned}$$

COLUMN-B-K

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|634.38\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left(|634.38\text{ N}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-C-L

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|634.38\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left(|634.38\text{ N}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-D-M

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|634.38\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left(|634.38\text{ N}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-E-N

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|528.65\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left(|634.38\text{ N}|\right)\\ &= -105.73\text{ N}\end{aligned}$$

COLUMN-F-O

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|528.65\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left(|528.65\text{ N}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-G-P

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|528.65\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left(|528.65\text{ N}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-H-Q

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|528.65\text{ N}|\right) + \Sigma\left([]\right) - \Sigma\left(|528.65\text{ N}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-I-R

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left([]\right) + \Sigma\left([]\right) - \Sigma\left(|528.65\text{ N}|\right)\\ &= -528.65\text{ N}\end{aligned}$$

COLUMN-J-S

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.69\text{ kN}|\right) + \Sigma\left(|634.38\text{ N}|\right) - \Sigma\left([]\right)\\ &= 2.33\text{ kN}\end{aligned}$$

COLUMN-K-T

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.69\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|1.69\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-L-U

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.69\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|1.69\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-M-V

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.69\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|1.69\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-N-W

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.41\text{ kN}|\right) + \Sigma\left(|-105.73\text{ N}|\right) - \Sigma\left(|1.69\text{ kN}|\right)\\ &= -388.06\text{ N}\end{aligned}$$

COLUMN-O-X

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.41\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|1.41\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-P-Y

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.41\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|1.41\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-Q-Z

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|1.41\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|1.41\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-R-a

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left([]\right) + \Sigma\left(|-528.65\text{ N}|\right) - \Sigma\left(|1.41\text{ kN}|\right)\\ &= -1.94\text{ kN}\end{aligned}$$

COLUMN-S-b

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.40\text{ kN}|\right) + \Sigma\left(|2.33\text{ kN}|\right) - \Sigma\left([]\right)\\ &= 4.73\text{ kN}\end{aligned}$$

COLUMN-T-c

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.40\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.40\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-U-d

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.40\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.40\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-V-e

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.40\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.40\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-W-f

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.00\text{ kN}|\right) + \Sigma\left(|-388.06\text{ N}|\right) - \Sigma\left(|2.40\text{ kN}|\right)\\ &= -788.59\text{ N}\end{aligned}$$

COLUMN-X-g

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.00\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.00\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-Y-h

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.00\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.00\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-Z-i

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.00\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.00\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-a-j

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left([]\right) + \Sigma\left(|-1.94\text{ kN}|\right) - \Sigma\left(|2.00\text{ kN}|\right)\\ &= -3.94\text{ kN}\end{aligned}$$

COLUMN-b-k

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|3.22\text{ kN}|\right) + \Sigma\left(|4.73\text{ kN}|\right) - \Sigma\left([]\right)\\ &= 7.96\text{ kN}\end{aligned}$$

COLUMN-c-l

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|3.22\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|3.22\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-d-m

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|3.22\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|3.22\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-e-n

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|3.22\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|3.22\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-f-o

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.69\text{ kN}|\right) + \Sigma\left(|-788.59\text{ N}|\right) - \Sigma\left(|3.22\text{ kN}|\right)\\ &= -1.33\text{ kN}\end{aligned}$$

COLUMN-g-p

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.69\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.69\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-h-q

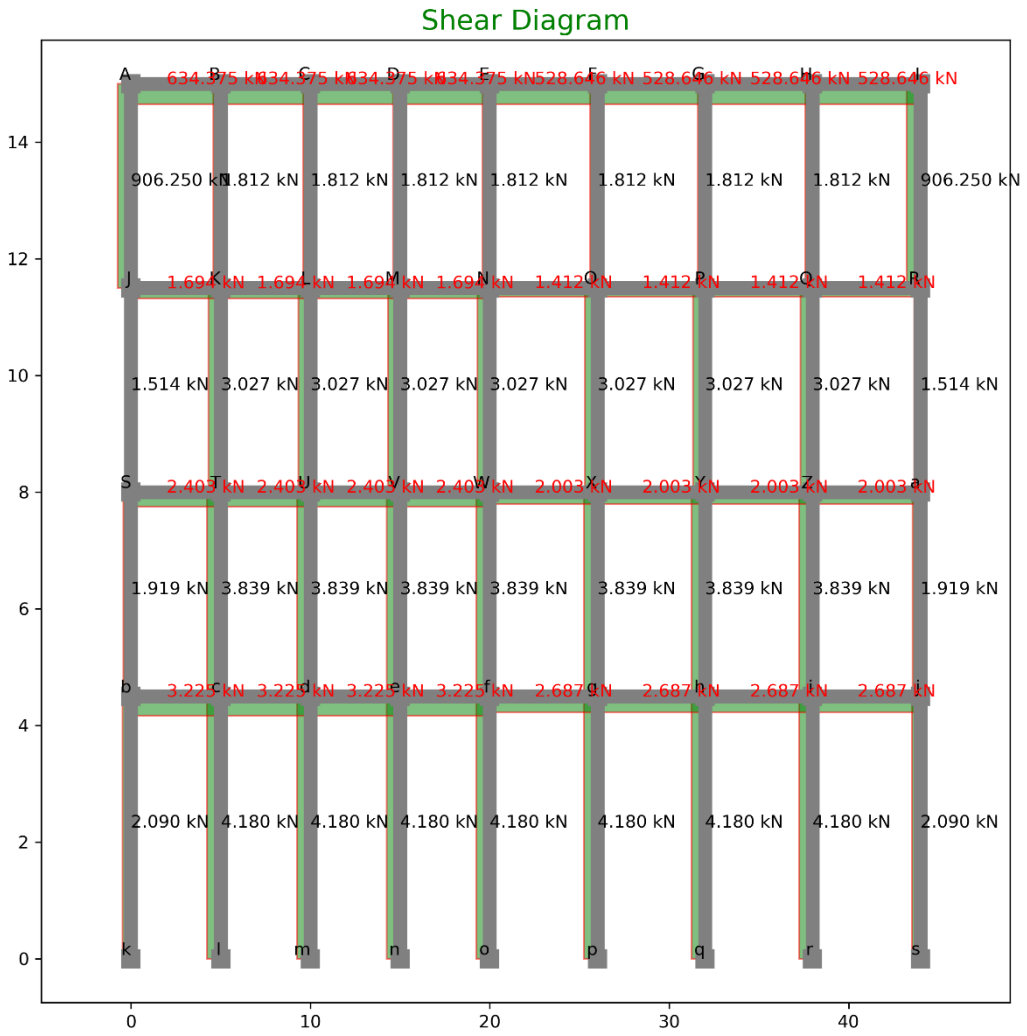
$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.69\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.69\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

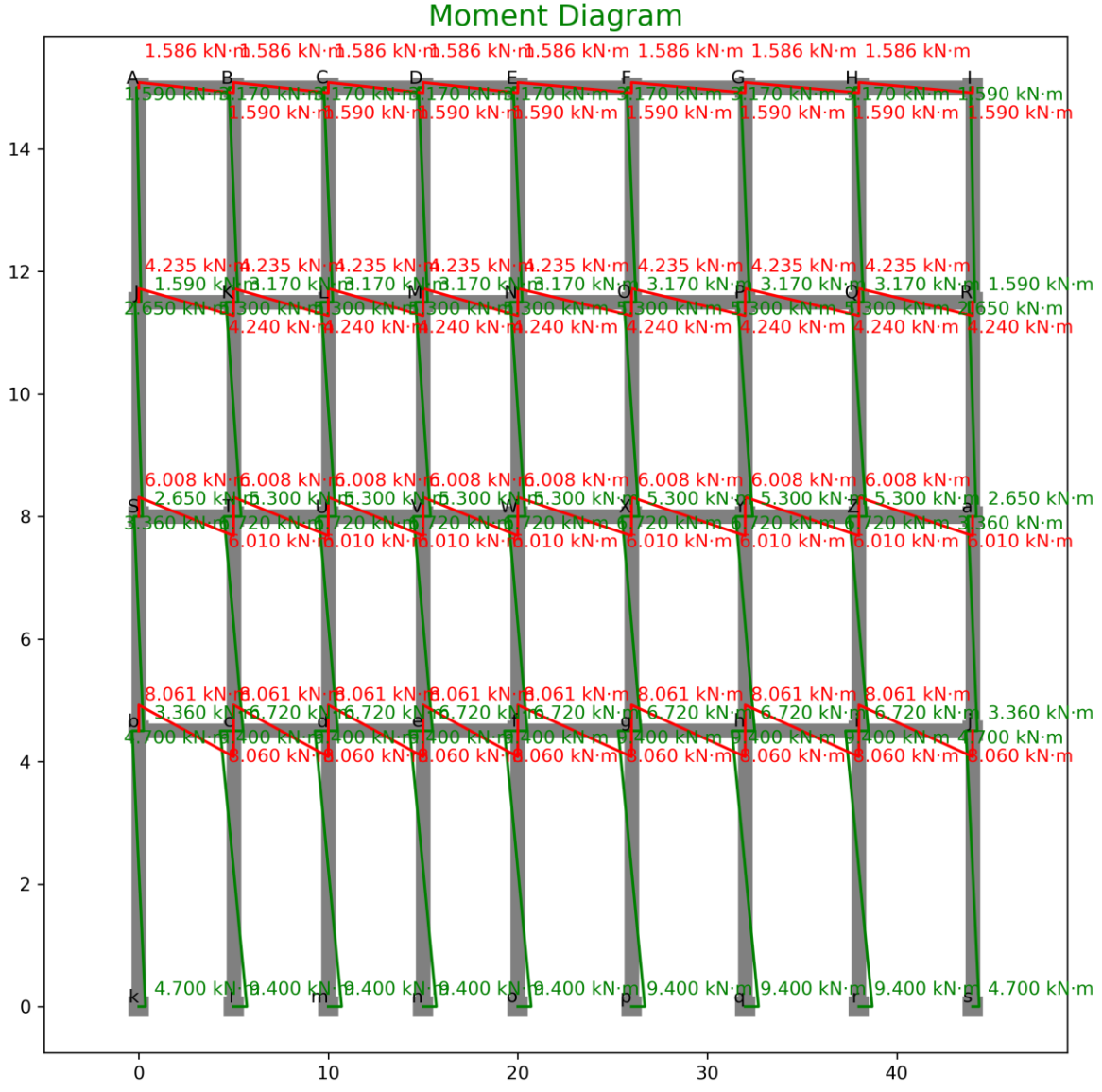
COLUMN-i-r

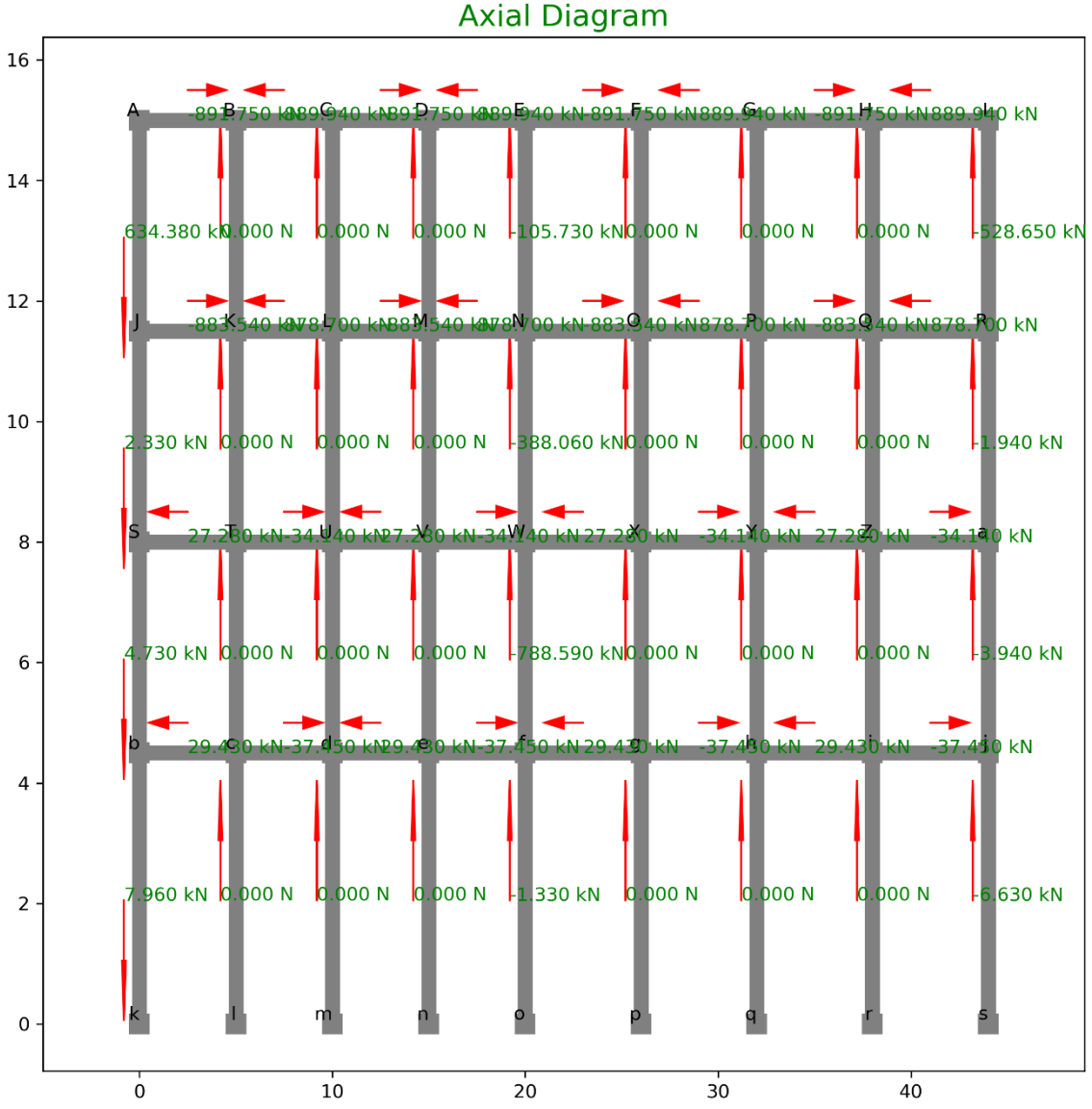
$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left(|2.69\text{ kN}|\right) + \Sigma\left(|0.00\text{ N}|\right) - \Sigma\left(|2.69\text{ kN}|\right)\\ &= 0.00\text{ N}\end{aligned}$$

COLUMN-j-s

$$\begin{aligned}\text{axial}_{col} &= \Sigma\left(\text{BeamShear}_{right}\right) + \Sigma\left(\text{ColAxial}\right) - \Sigma\left(\text{BeamShear}_{left}\right)\\ &= \Sigma\left([]\right) + \Sigma\left(|-3.94\text{ kN}|\right) - \Sigma\left(|2.69\text{ kN}|\right)\\ &= -6.63\text{ kN}\end{aligned}$$


Shear Diagram
A
B
C
D
E
F
G
H
I
634.375 kN
534.375 kN
534.375 kN
534.375 kN
534.375 kN
528.646 kN
528.646 kN
528.646 kN
528.646 kN
906.250 kN
1.812 kN
1.812 kN
1.812 kN
1.812 kN
1.812 kN
1.812 kN
1.812 kN
906.250 kN
J
K
L
M
N
O
P
Q
R
1.694 kN
1.694 kN
1.694 kN
1.694 kN
1.412 kN
1.412 kN
1.412 kN
1.412 kN
1.514 kN
3.027 kN
3.027 kN
3.027 kN
3.027 kN
3.027 kN
3.027 kN
3.027 kN
1.514 kN
S
T
U
V
W
X
Y
Z
a
2.403 kN
2.403 kN
2.403 kN
2.403 kN
2.003 kN
2.003 kN
2.003 kN
2.003 kN
1.919 kN
3.839 kN
3.839 kN
3.839 kN
3.839 kN
3.839 kN
3.839 kN
3.839 kN
1.919 kN
b
c
d
e
f
g
h
i
j
3.225 kN
3.225 kN
3.225 kN
3.225 kN
2.687 kN
2.687 kN
2.687 kN
2.687 kN
2.090 kN
4.180 kN
4.180 kN
4.180 kN
4.180 kN
4.180 kN
4.180 kN
4.180 kN
2.090 kN
k
l
m
n
o
p
q
r
s
0
2
4
6
8
10
12
14
0
10
20
30
40


Moment Diagram
1.586 kN·m 1.586 kN·m 1.586 kN·m 1.586 kN·m 1.586 kN·m 1.586 kN·m 1.586 kN·m 1.586 kN·m
A B C D E F G H I
1.590 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 1.590 kN·m
1.590 kN·m 1.590 kN·m 1.590 kN·m 1.590 kN·m 1.590 kN·m 1.590 kN·m 1.590 kN·m 1.590 kN·m
4.235 kN·m 4.235 kN·m 4.235 kN·m 4.235 kN·m 4.235 kN·m 4.235 kN·m 4.235 kN·m 4.235 kN·m
1.590 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 3.170 kN·m 1.590 kN·m
J K L M N O P Q R
2.650 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 2.650 kN·m
4.240 kN·m 4.240 kN·m 4.240 kN·m 4.240 kN·m 4.240 kN·m 4.240 kN·m 4.240 kN·m 4.240 kN·m
6.008 kN·m 6.008 kN·m 6.008 kN·m 6.008 kN·m 6.008 kN·m 6.008 kN·m 6.008 kN·m 6.008 kN·m
2.650 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 5.300 kN·m 2.650 kN·m
S T U V W X Y Z a
3.360 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 3.360 kN·m
6.010 kN·m 6.010 kN·m 6.010 kN·m 6.010 kN·m 6.010 kN·m 6.010 kN·m 6.010 kN·m 6.010 kN·m
8.061 kN·m 8.061 kN·m 8.061 kN·m 8.061 kN·m 8.061 kN·m 8.061 kN·m 8.061 kN·m 8.061 kN·m
3.360 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 6.720 kN·m 3.360 kN·m
b c d e f g h i j
4.700 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 4.700 kN·m
8.060 kN·m 8.060 kN·m 8.060 kN·m 8.060 kN·m 8.060 kN·m 8.060 kN·m 8.060 kN·m 8.060 kN·m
4.700 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 9.400 kN·m 4.700 kN·m
k l m n o p q r s
0 2 4 6 8 10 12 14
0 10 20 30 40


Axial Diagram
A
B
C
D
E
F
G
H
I
-891.750 kN
889.940 kN
634.380 kN
0.000 N
-105.730 kN
-528.650 kN
J
K
L
M
N
O
P
Q
R
-883.540 kN
878.700 kN
2.330 kN
-388.060 kN
-1.940 kN
S
T
U
V
W
X
Y
Z
a
27.280 kN
-34.940 kN
-34.140 kN
4.730 kN
-788.590 kN
-3.940 kN
b
c
d
e
f
g
h
i
j
29.430 kN
-37.450 kN
-37.150 kN
-37.430 kN
7.960 kN
-1.330 kN
-6.630 kN
k
l
m
n
o
p
q
r
s
0
2
4
6
8
10
12
14
16
0
10
20
30
40

TABULATION OF FORCES:

SHEAR:

INDEX	X	Y	Loc	Shear	Type
0	0	11.5	Top	906.25	Col
1	0	15	Bot	906.25	Col
2	5	11.5	Top	1.8125	Col
3	5	15	Bot	1.8125	Col
4	10	11.5	Top	1.8125	Col
5	10	15	Bot	1.8125	Col
6	15	11.5	Top	1.8125	Col
7	15	15	Bot	1.8125	Col
8	20	11.5	Top	1.8125	Col
9	20	15	Bot	1.8125	Col
10	26	11.5	Top	1.8125	Col
11	26	15	Bot	1.8125	Col
12	32	11.5	Top	1.8125	Col
13	32	15	Bot	1.8125	Col
14	38	11.5	Top	1.8125	Col
15	38	15	Bot	1.8125	Col
16	44	11.5	Top	906.25	Col
17	44	15	Bot	906.25	Col
18	0	8	Top	1.51375	Col
19	0	11.5	Bot	1.51375	Col
20	5	8	Top	3.0275	Col
21	5	11.5	Bot	3.0275	Col
22	10	8	Top	3.0275	Col
23	10	11.5	Bot	3.0275	Col
24	15	8	Top	3.0275	Col
25	15	11.5	Bot	3.0275	Col
26	20	8	Top	3.0275	Col
27	20	11.5	Bot	3.0275	Col
28	26	8	Top	3.0275	Col
29	26	11.5	Bot	3.0275	Col
30	32	8	Top	3.0275	Col
31	32	11.5	Bot	3.0275	Col
32	38	8	Top	3.0275	Col
33	38	11.5	Bot	3.0275	Col
34	44	8	Top	1.51375	Col
35	44	11.5	Bot	1.51375	Col
36	0	4.5	Top	1.919375	Col
37	0	8	Bot	1.919375	Col
38	5	4.5	Top	3.83875	Col
39	5	8	Bot	3.83875	Col
40	10	4.5	Top	3.83875	Col
41	10	8	Bot	3.83875	Col
42	15	4.5	Top	3.83875	Col
43	15	8	Bot	3.83875	Col
44	20	4.5	Top	3.83875	Col
45	20	8	Bot	3.83875	Col
46	26	4.5	Top	3.83875	Col
47	26	8	Bot	3.83875	Col
48	32	4.5	Top	3.83875	Col
49	32	8	Bot	3.83875	Col
50	38	4.5	Top	3.83875	Col
51	38	8	Bot	3.83875	Col
52	44	4.5	Top	1.919375	Col
53	44	8	Bot	1.919375	Col
54	0	0	Top	2.09	Col
55	0	4.5	Bot	2.09	Col
56	5	0	Top	4.18	Col
57	5	4.5	Bot	4.18	Col
58	10	0	Top	4.18	Col
59	10	4.5	Bot	4.18	Col
60	15	0	Top	4.18	Col
61	15	4.5	Bot	4.18	Col
62	20	0	Top	4.18	Col
63	20	4.5	Bot	4.18	Col
64	26	0	Top	4.18	Col
65	26	4.5	Bot	4.18	Col
66	32	0	Top	4.18	Col
67	32	4.5	Bot	4.18	Col
68	38	0	Top	4.18	Col
69	38	4.5	Bot	4.18	Col
70	44	0	Top	2.09	Col
71	44	4.5	Bot	2.09	Col
72	0	15	Right	634.375	Beam
73	5	15	Left	634.375	Beam
74	5	15	Right	634.375	Beam
75	10	15	Left	634.375	Beam
76	10	15	Right	634.375	Beam
77	15	15	Left	634.375	Beam
78	15	15	Right	634.375	Beam
79	20	15	Left	634.375	Beam
80	20	15	Right	528.6458	Beam
81	26	15	Left	528.6458	Beam
82	26	15	Right	528.6458	Beam
83	32	15	Left	528.6458	Beam
84	32	15	Right	528.6458	Beam
85	38	15	Left	528.6458	Beam
86	38	15	Right	528.6458	Beam
87	44	15	Left	528.6458	Beam
88	0	11.5	Right	1.694	Beam
89	5	11.5	Left	1.694	Beam

90	5	11.5	Right	1.694	Beam
91	10	11.5	Left	1.694	Beam
92	10	11.5	Right	1.694	Beam
93	15	11.5	Left	1.694	Beam
94	15	11.5	Right	1.694	Beam
95	20	11.5	Left	1.694	Beam
96	20	11.5	Right	1.411667	Beam
97	26	11.5	Left	1.411667	Beam
98	26	11.5	Right	1.411667	Beam
99	32	11.5	Left	1.411667	Beam
100	32	11.5	Right	1.411667	Beam
101	38	11.5	Left	1.411667	Beam
102	38	11.5	Right	1.411667	Beam
103	44	11.5	Left	1.411667	Beam
104	0	8	Right	2.403188	Beam
105	5	8	Left	2.403188	Beam
106	5	8	Right	2.403188	Beam
107	10	8	Left	2.403188	Beam
108	10	8	Right	2.403188	Beam
109	15	8	Left	2.403188	Beam
110	15	8	Right	2.403188	Beam
111	20	8	Left	2.403188	Beam
112	20	8	Right	2.002656	Beam
113	26	8	Left	2.002656	Beam
114	26	8	Right	2.002656	Beam
115	32	8	Left	2.002656	Beam
116	32	8	Right	2.002656	Beam
117	38	8	Left	2.002656	Beam
118	38	8	Right	2.002656	Beam
119	44	8	Left	2.002656	Beam
120	0	4.5	Right	3.224563	Beam
121	5	4.5	Left	3.224563	Beam
122	5	4.5	Right	3.224563	Beam
123	10	4.5	Left	3.224563	Beam
124	10	4.5	Right	3.224563	Beam
125	15	4.5	Left	3.224563	Beam
126	15	4.5	Right	3.224563	Beam
127	20	4.5	Left	3.224563	Beam
128	20	4.5	Right	2.687135	Beam
129	26	4.5	Left	2.687135	Beam
130	26	4.5	Right	2.687135	Beam
131	32	4.5	Left	2.687135	Beam
132	32	4.5	Right	2.687135	Beam
133	38	4.5	Left	2.687135	Beam
134	38	4.5	Right	2.687135	Beam
135	44	4.5	Left	2.687135	Beam

MOMENT

INDEX	X	Y	Loc	Moment	Type
0	0	11.5	Top	1.5859375	Col
1	0	15	Bot	1.5859375	Col
2	5	11.5	Top	3.171875	Col
3	5	15	Bot	3.171875	Col
4	10	11.5	Top	3.171875	Col
5	10	15	Bot	3.171875	Col
6	15	11.5	Top	3.171875	Col
7	15	15	Bot	3.171875	Col
8	20	11.5	Top	3.171875	Col
9	20	15	Bot	3.171875	Col
10	26	11.5	Top	3.171875	Col
11	26	15	Bot	3.171875	Col
12	32	11.5	Top	3.171875	Col
13	32	15	Bot	3.171875	Col
14	38	11.5	Top	3.171875	Col
15	38	15	Bot	3.171875	Col
16	44	11.5	Top	1.5859375	Col
17	44	15	Bot	1.5859375	Col
18	0	8	Top	2.6490625	Col
19	0	11.5	Bot	2.6490625	Col
20	5	8	Top	5.298125	Col
21	5	11.5	Bot	5.298125	Col
22	10	8	Top	5.298125	Col
23	10	11.5	Bot	5.298125	Col
24	15	8	Top	5.298125	Col
25	15	11.5	Bot	5.298125	Col
26	20	8	Top	5.298125	Col
27	20	11.5	Bot	5.298125	Col
28	26	8	Top	5.298125	Col
29	26	11.5	Bot	5.298125	Col
30	32	8	Top	5.298125	Col
31	32	11.5	Bot	5.298125	Col
32	38	8	Top	5.298125	Col
33	38	11.5	Bot	5.298125	Col
34	44	8	Top	2.6490625	Col
35	44	11.5	Bot	2.6490625	Col
36	0	4.5	Top	3.35890625	Col
37	0	8	Bot	3.35890625	Col
38	5	4.5	Top	6.7178125	Col
39	5	8	Bot	6.7178125	Col
40	10	4.5	Top	6.7178125	Col
41	10	8	Bot	6.7178125	Col
42	15	4.5	Top	6.7178125	Col
43	15	8	Bot	6.7178125	Col

44	20	4.5	Top	6.7178125	Col
45	20	8	Bot	6.7178125	Col
46	26	4.5	Top	6.7178125	Col
47	26	8	Bot	6.7178125	Col
48	32	4.5	Top	6.7178125	Col
49	32	8	Bot	6.7178125	Col
50	38	4.5	Top	6.7178125	Col
51	38	8	Bot	6.7178125	Col
52	44	4.5	Top	3.35890625	Col
53	44	8	Bot	3.35890625	Col
54	0	0	Top	4.7025	Col
55	0	4.5	Bot	4.7025	Col
56	5	0	Top	9.405	Col
57	5	4.5	Bot	9.405	Col
58	10	0	Top	9.405	Col
59	10	4.5	Bot	9.405	Col
60	15	0	Top	9.405	Col
61	15	4.5	Bot	9.405	Col
62	20	0	Top	9.405	Col
63	20	4.5	Bot	9.405	Col
64	26	0	Top	9.405	Col
65	26	4.5	Bot	9.405	Col
66	32	0	Top	9.405	Col
67	32	4.5	Bot	9.405	Col
68	38	0	Top	9.405	Col
69	38	4.5	Bot	9.405	Col
70	44	0	Top	4.7025	Col
71	44	4.5	Bot	4.7025	Col
72	0	15	Right	1.5859375	Beam
73	5	15	Left	1.5859375	Beam
74	5	15	Right	1.5859375	Beam
75	10	15	Left	1.5859375	Beam
76	10	15	Right	1.5859375	Beam
77	15	15	Left	1.5859375	Beam
78	15	15	Right	1.5859375	Beam
79	20	15	Left	1.5859375	Beam
80	20	15	Right	1.5859375	Beam
81	26	15	Left	1.5859375	Beam
82	26	15	Right	1.5859375	Beam
83	32	15	Left	1.5859375	Beam
84	32	15	Right	1.5859375	Beam
85	38	15	Left	1.5859375	Beam
86	38	15	Right	1.5859375	Beam
87	44	15	Left	1.5859375	Beam
88	0	11.5	Right	4.235	Beam
89	5	11.5	Left	4.235	Beam
90	5	11.5	Right	4.235	Beam
91	10	11.5	Left	4.235	Beam
92	10	11.5	Right	4.235	Beam
93	15	11.5	Left	4.235	Beam
94	15	11.5	Right	4.235	Beam
95	20	11.5	Left	4.235	Beam
96	20	11.5	Right	4.235	Beam
97	26	11.5	Left	4.235	Beam
98	26	11.5	Right	4.235	Beam
99	32	11.5	Left	4.235	Beam
100	32	11.5	Right	4.235	Beam
101	38	11.5	Left	4.235	Beam
102	38	11.5	Right	4.235	Beam
103	44	11.5	Left	4.235	Beam
104	0	8	Right	6.00796875	Beam
105	5	8	Left	6.00796875	Beam
106	5	8	Right	6.00796875	Beam
107	10	8	Left	6.00796875	Beam
108	10	8	Right	6.00796875	Beam
109	15	8	Left	6.00796875	Beam
110	15	8	Right	6.00796875	Beam
111	20	8	Left	6.00796875	Beam
112	20	8	Right	6.00796875	Beam
113	26	8	Left	6.00796875	Beam
114	26	8	Right	6.00796875	Beam
115	32	8	Left	6.00796875	Beam
116	32	8	Right	6.00796875	Beam
117	38	8	Left	6.00796875	Beam
118	38	8	Right	6.00796875	Beam
119	44	8	Left	6.00796875	Beam
120	0	4.5	Right	8.06140625	Beam
121	5	4.5	Left	8.06140625	Beam
122	5	4.5	Right	8.06140625	Beam
123	10	4.5	Left	8.06140625	Beam
124	10	4.5	Right	8.06140625	Beam
125	15	4.5	Left	8.06140625	Beam
126	15	4.5	Right	8.06140625	Beam
127	20	4.5	Left	8.06140625	Beam
128	20	4.5	Right	8.06140625	Beam
129	26	4.5	Left	8.06140625	Beam
130	26	4.5	Right	8.06140625	Beam
131	32	4.5	Left	8.06140625	Beam
132	32	4.5	Right	8.06140625	Beam
133	38	4.5	Left	8.06140625	Beam
134	38	4.5	Right	8.06140625	Beam
135	44	4.5	Left	8.06140625	Beam

AXIAL

INDEX	X	Y	Loc	Axial	Type
0	0	11.5	Top	634.375	Col
1	0	15	Bot	634.375	Col
2	5	11.5	Top	0	Col
3	5	15	Bot	0	Col
4	10	11.5	Top	0	Col
5	10	15	Bot	0	Col
6	15	11.5	Top	0	Col
7	15	15	Bot	0	Col
8	20	11.5	Top	-105.729	Col
9	20	15	Bot	-105.729	Col
10	26	11.5	Top	0	Col
11	26	15	Bot	0	Col
12	32	11.5	Top	0	Col
13	32	15	Bot	0	Col
14	38	11.5	Top	0	Col
15	38	15	Bot	0	Col
16	44	11.5	Top	-528.646	Col
17	44	15	Bot	-528.646	Col
18	0	8	Top	2.328375	Col
19	0	11.5	Bot	2.328375	Col
20	5	8	Top	0	Col
21	5	11.5	Bot	0	Col
22	10	8	Top	0	Col
23	10	11.5	Bot	0	Col
24	15	8	Top	0	Col
25	15	11.5	Bot	0	Col
26	20	8	Top	-388.063	Col
27	20	11.5	Bot	-388.063	Col
28	26	8	Top	0	Col
29	26	11.5	Bot	0	Col
30	32	8	Top	0	Col
31	32	11.5	Bot	0	Col
32	38	8	Top	0	Col
33	38	11.5	Bot	0	Col
34	44	8	Top	-1.94031	Col
35	44	11.5	Bot	-1.94031	Col
36	0	4.5	Top	4.731563	Col
37	0	8	Bot	4.731563	Col
38	5	4.5	Top	0	Col
39	5	8	Bot	0	Col
40	10	4.5	Top	0	Col
41	10	8	Bot	0	Col
42	15	4.5	Top	0	Col
43	15	8	Bot	0	Col
44	20	4.5	Top	-788.594	Col
45	20	8	Bot	-788.594	Col
46	26	4.5	Top	0	Col
47	26	8	Bot	0	Col
48	32	4.5	Top	0	Col
49	32	8	Bot	0	Col
50	38	4.5	Top	0	Col
51	38	8	Bot	0	Col
52	44	4.5	Top	-3.94297	Col
53	44	8	Bot	-3.94297	Col
54	0	0	Top	7.956125	Col
55	0	4.5	Bot	7.956125	Col
56	5	0	Top	0	Col
57	5	4.5	Bot	0	Col
58	10	0	Top	0	Col
59	10	4.5	Bot	0	Col
60	15	0	Top	0	Col
61	15	4.5	Bot	0	Col
62	20	0	Top	-1.32602	Col
63	20	4.5	Bot	-1.32602	Col
64	26	0	Top	0	Col
65	26	4.5	Bot	0	Col
66	32	0	Top	0	Col
67	32	4.5	Bot	0	Col
68	38	0	Top	0	Col
69	38	4.5	Bot	0	Col
70	44	0	Top	-6.6301	Col
71	44	4.5	Bot	-6.6301	Col
72	0	15	Right	-891.75	Beam
73	5	15	Left	-891.75	Beam
74	5	15	Right	889.9375	Beam
75	10	15	Left	889.9375	Beam
76	10	15	Right	-891.75	Beam
77	15	15	Left	-891.75	Beam
78	15	15	Right	889.9375	Beam
79	20	15	Left	889.9375	Beam
80	20	15	Right	-891.75	Beam
81	26	15	Left	-891.75	Beam
82	26	15	Right	889.9375	Beam
83	32	15	Left	889.9375	Beam
84	32	15	Right	-891.75	Beam
85	38	15	Left	-891.75	Beam
86	38	15	Right	889.9375	Beam
87	44	15	Left	889.9375	Beam
88	0	11.5	Right	-883.544	Beam
89	5	11.5	Left	-883.544	Beam
90	5	11.5	Right	878.7037	Beam

91	10	11.5	Left	878.7037	Beam
92	10	11.5	Right	-883.544	Beam
93	15	11.5	Left	-883.544	Beam
94	15	11.5	Right	878.7037	Beam
95	20	11.5	Left	878.7037	Beam
96	20	11.5	Right	-883.544	Beam
97	26	11.5	Left	-883.544	Beam
98	26	11.5	Right	878.7037	Beam
99	32	11.5	Left	878.7037	Beam
100	32	11.5	Right	-883.544	Beam
101	38	11.5	Left	-883.544	Beam
102	38	11.5	Right	878.7037	Beam
103	44	11.5	Left	878.7037	Beam
104	0	8	Right	27.27688	Beam
105	5	8	Left	27.27688	Beam
106	5	8	Right	-34.1431	Beam
107	10	8	Left	-34.1431	Beam
108	10	8	Right	27.27687	Beam
109	15	8	Left	27.27687	Beam
110	15	8	Right	-34.1431	Beam
111	20	8	Left	-34.1431	Beam
112	20	8	Right	27.27687	Beam
113	26	8	Left	27.27687	Beam
114	26	8	Right	-34.1431	Beam
115	32	8	Left	-34.1431	Beam
116	32	8	Right	27.27687	Beam
117	38	8	Left	27.27687	Beam
118	38	8	Right	-34.1431	Beam
119	44	8	Left	-34.1431	Beam
120	0	4.5	Right	29.43063	Beam
121	5	4.5	Left	29.43063	Beam
122	5	4.5	Right	-37.4494	Beam
123	10	4.5	Left	-37.4494	Beam
124	10	4.5	Right	29.43063	Beam
125	15	4.5	Left	29.43063	Beam
126	15	4.5	Right	-37.4494	Beam
127	20	4.5	Left	-37.4494	Beam
128	20	4.5	Right	29.43063	Beam
129	26	4.5	Left	29.43063	Beam
130	26	4.5	Right	-37.4494	Beam
131	32	4.5	Left	-37.4494	Beam
132	32	4.5	Right	29.43063	Beam
133	38	4.5	Left	29.43063	Beam
134	38	4.5	Right	-37.4494	Beam
135	44	4.5	Left	-37.4494	Beam

CANTILEVER METHOD OF ANALYSIS

CALCULATION:

Floor-2

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000])}{9} = 21.11111 \text{ (Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{21.11111 - [0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000]}{21.11111} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([14.50000,\ 9.72000,\ 6.49000] \cdot [8.75000,\ 5.25000,\ 1.75000])}{\Sigma([1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot [44.00000,\ 39.00000,\ 34.00000,\ 29.00000,\ 24.00000,\ 18.00000,\ 12.00000,\ 6.00000,\ 0.00000])} = 2.19669 \text{ (Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot 2.19669 = [2.19669,\ 1.67642,\ 1.15615,\ 0.63589,\ 0.11562,\ -0.50871,\ -1.13303,\ -1.75735,\ -2.38168]$$

Floor-3

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000])}{9} = 21.11111 \text{ (Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{21.11111 - [0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000]}{21.11111} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([14.50000,\ 9.72000] \cdot [5.25000,\ 1.75000])}{\Sigma([1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot [44.00000,\ 39.00000,\ 34.00000,\ 29.00000,\ 24.00000,\ 18.00000,\ 12.00000,\ 6.00000,\ 0.00000])} = 1.08098 \text{ (Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot 1.08098 = [1.08098,\ 0.82496,\ 0.56894,\ 0.31292,\ 0.05689,\ -0.25033,\ -0.55756,\ -0.86478,\ -1.17201]$$

Floor-4

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000])}{9} = 21.11111 \text{ (Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{21.11111 - [0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000]}{21.11111} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([14.50000] \cdot [1.75000])}{\Sigma([1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot [44.00000,\ 39.00000,\ 34.00000,\ 29.00000,\ 24.00000,\ 18.00000,\ 12.00000,\ 6.00000,\ 0.00000])} = 0.29452 \text{ (Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot 0.29452 = [0.29452,\ 0.22476,\ 0.15501,\ 0.08526,\ 0.01550,\ -0.06820,\ -0.15191,\ -0.23561,\ -0.31932]$$

Floor-1

$$X_{bar} = \frac{\Sigma(\text{ColList})}{\text{Col}_{Number}} = \frac{\Sigma([0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000])}{9} = 21.11111 \text{ (Since Same Section)}$$

$$\text{ColCoefficient} = \frac{X_{bar} - \text{ColList}}{X_{bar}} = \frac{21.11111 - [0.00000,\ 5.00000,\ 10.00000,\ 15.00000,\ 20.00000,\ 26.00000,\ 32.00000,\ 38.00000,\ 44.00000]}{21.11111} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421]$$

$$\text{Moment} = \frac{\Sigma(\text{Force} \cdot \text{ForceHeight})}{\Sigma(\text{ColCoefficient} \cdot \text{SpanCum})} = \frac{\Sigma([14.50000,\ 9.72000,\ 6.49000,\ 2.73000] \cdot [12.75000,\ 9.25000,\ 5.75000,\ 2.25000])}{\Sigma([1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot [44.00000,\ 39.00000,\ 34.00000,\ 29.00000,\ 24.00000,\ 18.00000,\ 12.00000,\ 6.00000,\ 0.00000])} = 3.69374 \text{ (Moment of Leftmost Column)}$$

$$\text{ColAxialArray} = \text{ColCoefficient} \cdot \text{Moment} = [1.00000,\ 0.76316,\ 0.52632,\ 0.28947,\ 0.05263,\ -0.23158,\ -0.51579,\ -0.80000,\ -1.08421] \cdot 3.69374 = [3.69374,\ 2.81891,\ 1.94407,\ 1.06924,\ 0.19441,\ -0.85539,\ -1.90519,\ -2.95499,\ -4.00479]$$

COLUMN-J-A

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([0.74]) - \Sigma([]) \\ &= 0.74\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{0.74 \cdot 2}{4} \\ &= 0.37\end{aligned}$$

COLUMN-K-B

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([0.74,\ 1.30]) - \Sigma([]) \\ &= 2.03\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{2.03 \cdot 2}{4} \\ &= 1.02\end{aligned}$$

COLUMN-L-C

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([1.30,\ 1.69]) - \Sigma([]) \\ &= 2.98\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{2.98 \cdot 2}{4} \\ &= 1.49\end{aligned}$$

COLUMN-M-D

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([1.69,\ 1.90]) - \Sigma([]) \\ &= 3.58\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{3.58 \cdot 2}{4} \\ &= 1.79\end{aligned}$$

COLUMN-N-E

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([1.90,\ 2.33]) - \Sigma([]) \\ &= 4.22\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{4.22 \cdot 2}{4} \\ &= 2.11\end{aligned}$$

COLUMN-O-F

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([2.33,\ 2.12]) - \Sigma([]) \\ &= 4.45\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{4.45 \cdot 2}{4} \\ &= 2.22\end{aligned}$$

COLUMN-P-G

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([2.12,\ 1.66]) - \Sigma([]) \\ &= 3.79\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{3.79 \cdot 2}{4} \\ &= 1.89\end{aligned}$$

COLUMN-Q-H

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([1.66,\ 0.96]) - \Sigma([]) \\ &= 2.62\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{2.62 \cdot 2}{4} \\ &= 1.31\end{aligned}$$

COLUMN-R-I

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([0.96]) - \Sigma([]) \\ &= 0.96\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{0.96 \cdot 2}{4} \\ &= 0.48\end{aligned}$$

COLUMN-S-J

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([1.97]) - \Sigma([0.74]) \\ &= 1.23\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{1.23 \cdot 2}{3} \\ &= 0.82\end{aligned}$$

COLUMN-T-K

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([1.97,\ 3.47]) - \Sigma([2.03]) \\ &= 3.40\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{3.40 \cdot 2}{3} \\ &= 2.27\end{aligned}$$

COLUMN-U-L

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([3.47,\ 4.50]) - \Sigma([2.98]) \\ &= 4.98\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{4.98 \cdot 2}{3} \\ &= 3.32\end{aligned}$$

COLUMN-V-M

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([4.50,\ 5.07]) - \Sigma([3.58]) \\ &= 5.99\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{5.99 \cdot 2}{3} \\ &= 3.99\end{aligned}$$

COLUMN-W-N

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([5.07,\ 6.21]) - \Sigma([4.22]) \\ &= 7.06\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{7.06 \cdot 2}{3} \\ &= 4.70\end{aligned}$$

COLUMN-X-O

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([6.21,\ 5.66]) - \Sigma([4.45]) \\ &= 7.43\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{7.43 \cdot 2}{3} \\ &= 4.95\end{aligned}$$

COLUMN-Y-P

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([5.66,\ 4.45]) - \Sigma([3.79]) \\ &= 6.32\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{6.32 \cdot 2}{3} \\ &= 4.22\end{aligned}$$

COLUMN-Z-Q

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([4.45,\ 2.56]) - \Sigma([2.62]) \\ &= 4.38\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{4.38 \cdot 2}{3} \\ &= 2.92\end{aligned}$$

COLUMN-a-R

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([2.56]) - \Sigma([0.96]) \\ &= 1.60\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{1.60 \cdot 2}{3} \\ &= 1.07\end{aligned}$$

COLUMN-b-S

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([2.79]) - \Sigma([1.23]) \\ &= 1.56\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{1.56 \cdot 2}{4} \\ &= 0.78\end{aligned}$$

COLUMN-c-T

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([2.79,\ 4.92]) - \Sigma([3.40]) \\ &= 4.31\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{4.31 \cdot 2}{4} \\ &= 2.15\end{aligned}$$

COLUMN-d-U

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([4.92,\ 6.39]) - \Sigma([4.98]) \\ &= 6.32\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{6.32 \cdot 2}{4} \\ &= 3.16\end{aligned}$$

COLUMN-e-V

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([6.39,\ 7.19]) - \Sigma([5.99]) \\ &= 7.59\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{7.59 \cdot 2}{4} \\ &= 3.80\end{aligned}$$

COLUMN-f-W

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([7.19,\ 8.81]) - \Sigma([7.06]) \\ &= 8.95\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{8.95 \cdot 2}{4} \\ &= 4.47\end{aligned}$$

COLUMN-g-X

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([8.81,\ 8.03]) - \Sigma([7.43]) \\ &= 9.42\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{9.42 \cdot 2}{4} \\ &= 4.71\end{aligned}$$

COLUMN-h-Y

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([8.03,\ 6.31]) - \Sigma([6.32]) \\ &= 8.02\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{8.02 \cdot 2}{4} \\ &= 4.01\end{aligned}$$

COLUMN-i-Z

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([6.31,\ 3.63]) - \Sigma([4.38]) \\ &= 5.55\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{5.55 \cdot 2}{4} \\ &= 2.78\end{aligned}$$

COLUMN-j-a

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([3.63]) - \Sigma([1.60]) \\ &= 2.03\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{2.03 \cdot 2}{4} \\ &= 1.01\end{aligned}$$

COLUMN-k-b

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([3.74]) - \Sigma([1.56]) \\ &= 2.18\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{2.18 \cdot 2}{4} \\ &= 1.09\end{aligned}$$

COLUMN-l-c

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([3.74,\ 6.60]) - \Sigma([4.31]) \\ &= 6.03\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{6.03 \cdot 2}{4} \\ &= 3.02\end{aligned}$$

COLUMN-m-d

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([6.60,\ 8.57]) - \Sigma([6.32]) \\ &= 8.85\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{8.85 \cdot 2}{4} \\ &= 4.42\end{aligned}$$

COLUMN-n-e

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([8.57,\ 9.65]) - \Sigma([7.59]) \\ &= 10.63\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{10.63 \cdot 2}{4} \\ &= 5.31\end{aligned}$$

COLUMN-o-f

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([9.65,\ 11.82]) - \Sigma([8.95]) \\ &= 12.52\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{12.52 \cdot 2}{4} \\ &= 6.26\end{aligned}$$

COLUMN-p-g

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([11.82,\ 10.78]) - \Sigma([9.42]) \\ &= 13.18\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{13.18 \cdot 2}{4} \\ &= 6.59\end{aligned}$$

COLUMN-q-h

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([10.78,\ 8.46]) - \Sigma([8.02]) \\ &= 11.22\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{11.22 \cdot 2}{4} \\ &= 5.61\end{aligned}$$

COLUMN-r-i

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([8.46,\ 4.87]) - \Sigma([5.55]) \\ &= 7.78\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{7.78 \cdot 2}{4} \\ &= 3.89\end{aligned}$$

COLUMN-s-j

$$\begin{aligned}\text{Moment} &= \Sigma(\text{BeamMoment}) - \Sigma(\text{ColMoment}) \\ &= \Sigma([4.87]) - \Sigma([2.03]) \\ &= 2.84\end{aligned}$$

$$\begin{aligned}\text{Shear} &= \frac{\text{Moment} \cdot 2}{\text{Height}} \\ &= \frac{2.84 \cdot 2}{4} \\ &= 1.42\end{aligned}$$

BEAM-b-c

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([3.69]) + \Sigma([]) - \Sigma([2.20]) \\ &= 1.50\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.50 \cdot \frac{5.00}{2} \\ &= 3.74\end{aligned}$$

BEAM-c-d

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([2.82]) + \Sigma([1.50]) - \Sigma([1.68]) \\ &= 2.64\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.64 \cdot \frac{5.00}{2} \\ &= 6.60\end{aligned}$$

BEAM-d-e

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([1.94]) + \Sigma([2.64]) - \Sigma([1.16]) \\ &= 3.43\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 3.43 \cdot \frac{5.00}{2} \\ &= 8.57\end{aligned}$$

BEAM-e-f

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([1.07]) + \Sigma([3.43]) - \Sigma([0.64]) \\ &= 3.86\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 3.86 \cdot \frac{5.00}{2} \\ &= 9.65\end{aligned}$$

BEAM-f-g

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.19]) + \Sigma([3.86]) - \Sigma([0.12]) \\ &= 3.94\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 3.94 \cdot \frac{6.00}{2} \\ &= 11.82\end{aligned}$$

BEAM-g-h

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.86]) + \Sigma([3.94]) - \Sigma([-0.51]) \\ &= 3.59\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 3.59 \cdot \frac{6.00}{2} \\ &= 10.78\end{aligned}$$

BEAM-h-i

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-1.91]) + \Sigma([3.59]) - \Sigma([-1.13]) \\ &= 2.82\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.82 \cdot \frac{6.00}{2} \\ &= 8.46\end{aligned}$$

BEAM-i-j

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-2.95]) + \Sigma([2.82]) - \Sigma([-1.76]) \\ &= 1.62\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.62 \cdot \frac{6.00}{2} \\ &= 4.87\end{aligned}$$

BEAM-A-B

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.29]) + \Sigma([]) - \Sigma([]) \\ &= 0.29\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.29 \cdot \frac{5.00}{2} \\ &= 0.74\end{aligned}$$

BEAM-B-C

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.22]) + \Sigma([0.29]) - \Sigma([]) \\ &= 0.52\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.52 \cdot \frac{5.00}{2} \\ &= 1.30\end{aligned}$$

BEAM-C-D

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.16]) + \Sigma([0.52]) - \Sigma([]) \\ &= 0.67\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.67 \cdot \frac{5.00}{2} \\ &= 1.69\end{aligned}$$

BEAM-D-E

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.09]) + \Sigma([0.67]) - \Sigma([]) \\ &= 0.76\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.76 \cdot \frac{5.00}{2} \\ &= 1.90\end{aligned}$$

BEAM-E-F

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.02]) + \Sigma([0.76]) - \Sigma([]) \\ &= 0.78\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.78 \cdot \frac{6.00}{2} \\ &= 2.33\end{aligned}$$

BEAM-F-G

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.07]) + \Sigma([0.78]) - \Sigma([]) \\ &= 0.71\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.71 \cdot \frac{6.00}{2} \\ &= 2.12\end{aligned}$$

BEAM-G-H

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.15]) + \Sigma([0.71]) - \Sigma([]) \\ &= 0.55\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.55 \cdot \frac{6.00}{2} \\ &= 1.66\end{aligned}$$

BEAM-H-I

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.24]) + \Sigma([0.55]) - \Sigma([]) \\ &= 0.32\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.32 \cdot \frac{6.00}{2} \\ &= 0.96\end{aligned}$$

BEAM-S-T

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([2.20]) + \Sigma([]) - \Sigma([1.08]) \\ &= 1.12\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.12 \cdot \frac{5.00}{2} \\ &= 2.79\end{aligned}$$

BEAM-T-U

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([1.68]) + \Sigma([1.12]) - \Sigma([0.82]) \\ &= 1.97\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.97 \cdot \frac{5.00}{2} \\ &= 4.92\end{aligned}$$

BEAM-U-V

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([1.16]) + \Sigma([1.97]) - \Sigma([0.57]) \\ &= 2.55\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.55 \cdot \frac{5.00}{2} \\ &= 6.39\end{aligned}$$

BEAM-V-W

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.64]) + \Sigma([2.55]) - \Sigma([0.31]) \\ &= 2.88\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.88 \cdot \frac{5.00}{2} \\ &= 7.19\end{aligned}$$

BEAM-W-X

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.12]) + \Sigma([2.88]) - \Sigma([0.06]) \\ &= 2.94\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.94 \cdot \frac{6.00}{2} \\ &= 8.81\end{aligned}$$

BEAM-X-Y

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.51]) + \Sigma([2.94]) - \Sigma([-0.25]) \\ &= 2.68\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.68 \cdot \frac{6.00}{2} \\ &= 8.03\end{aligned}$$

BEAM-Y-Z

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-1.13]) + \Sigma([2.68]) - \Sigma([-0.56]) \\ &= 2.10\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.10 \cdot \frac{6.00}{2} \\ &= 6.31\end{aligned}$$

BEAM-Z-a

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-1.76]) + \Sigma([2.10]) - \Sigma([-0.86]) \\ &= 1.21\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.21 \cdot \frac{6.00}{2} \\ &= 3.63\end{aligned}$$

BEAM-J-K

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([1.08]) + \Sigma([]) - \Sigma([0.29]) \\ &= 0.79\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.79 \cdot \frac{5.00}{2} \\ &= 1.97\end{aligned}$$

BEAM-K-L

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.82]) + \Sigma([0.79]) - \Sigma([0.22]) \\ &= 1.39\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.39 \cdot \frac{5.00}{2} \\ &= 3.47\end{aligned}$$

BEAM-L-M

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.57]) + \Sigma([1.39]) - \Sigma([0.16]) \\ &= 1.80\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.80 \cdot \frac{5.00}{2} \\ &= 4.50\end{aligned}$$

BEAM-M-N

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.31]) + \Sigma([1.80]) - \Sigma([0.09]) \\ &= 2.03\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.03 \cdot \frac{5.00}{2} \\ &= 5.07\end{aligned}$$

BEAM-N-O

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([0.06]) + \Sigma([2.03]) - \Sigma([0.02]) \\ &= 2.07\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 2.07 \cdot \frac{6.00}{2} \\ &= 6.21\end{aligned}$$

BEAM-O-P

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.25]) + \Sigma([2.07]) - \Sigma([-0.07]) \\ &= 1.89\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.89 \cdot \frac{6.00}{2} \\ &= 5.66\end{aligned}$$

BEAM-P-Q

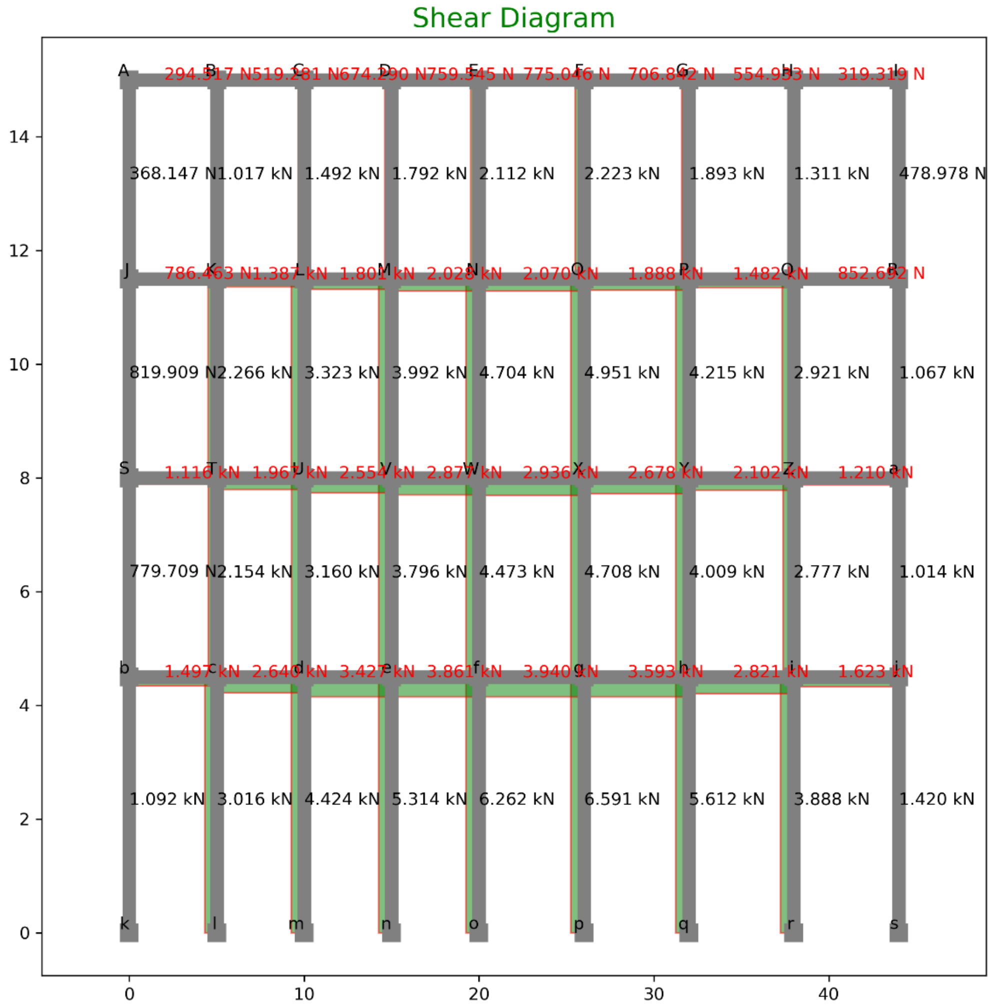
$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.56]) + \Sigma([1.89]) - \Sigma([-0.15]) \\ &= 1.48\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 1.48 \cdot \frac{6.00}{2} \\ &= 4.45\end{aligned}$$

BEAM-Q-R

$$\begin{aligned}\text{Shear} &= \Sigma(\text{ColAxial}_{Bot}) + \Sigma(\text{BeamShear}) - \Sigma(\text{ColAxial}_{Top}) \\ &= \Sigma([-0.86]) + \Sigma([1.48]) - \Sigma([-0.24]) \\ &= 0.85\end{aligned}$$

$$\begin{aligned}\text{Moment} &= \text{Shear} \cdot \frac{\text{length}}{2} \\ &= 0.85 \cdot \frac{6.00}{2} \\ &= 2.56\end{aligned}$$


Shear Diagram
368.147 N 1.017 kN 1.492 kN 1.792 kN 2.112 kN 2.223 kN 1.893 kN 1.311 kN 478.978 N
819.909 N 2.266 kN 3.323 kN 3.992 kN 4.704 kN 4.951 kN 4.215 kN 2.921 kN 1.067 kN
779.709 N 2.154 kN 3.160 kN 3.796 kN 4.473 kN 4.708 kN 4.009 kN 2.777 kN 1.014 kN
1.092 kN 3.016 kN 4.424 kN 5.314 kN 6.262 kN 6.591 kN 5.612 kN 3.888 kN 1.420 kN
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10
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30
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0
2
4
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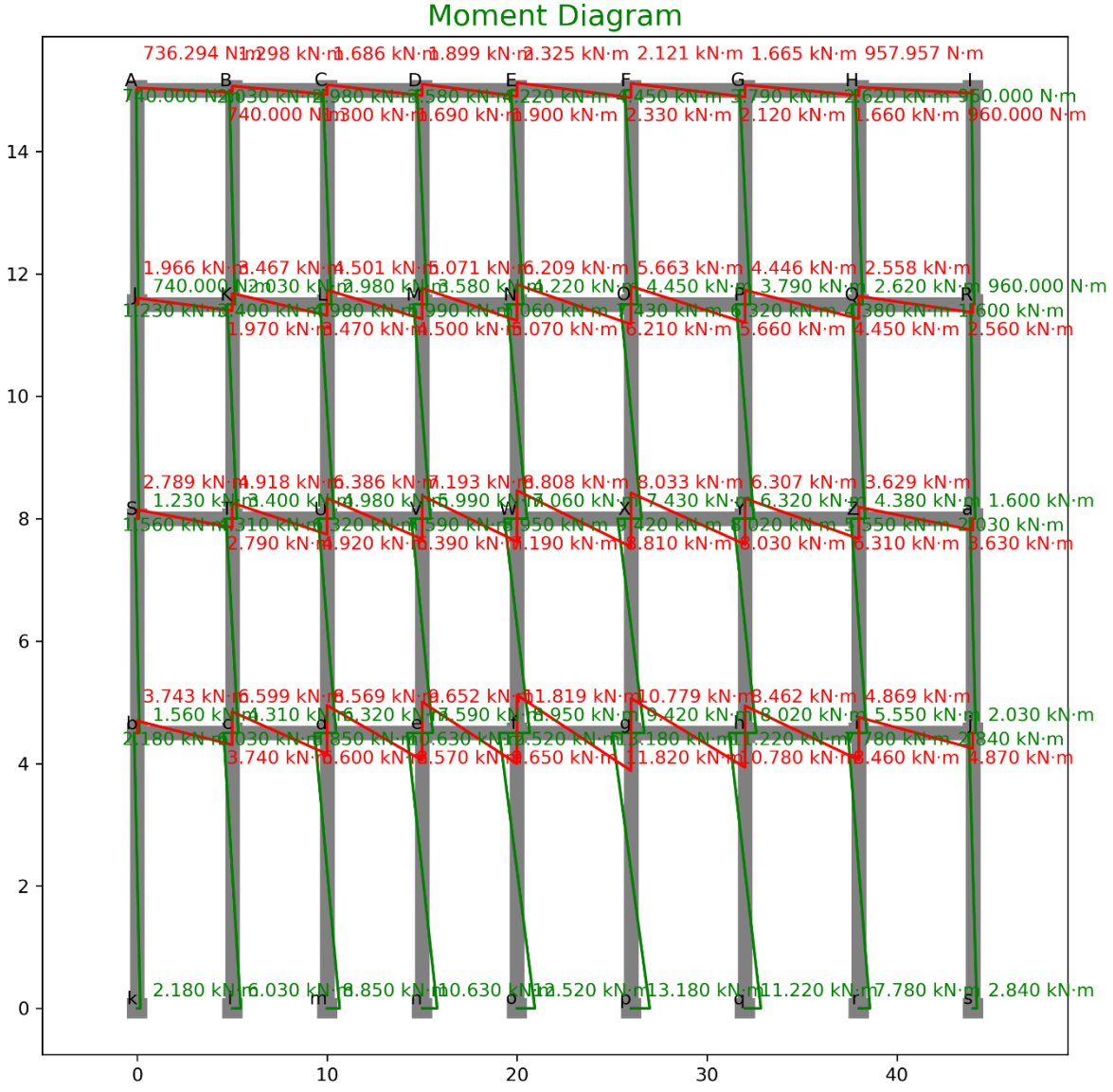
10
12
14


Moment Diagram
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1.298 kN·m
1.686 kN·m
1.899 kN·m
2.325 kN·m
2.121 kN·m
1.665 kN·m
957.957 N·m
A
B
C
D
E
F
G
H
I
740.000 N·m
2.030 kN·m
2.980 kN·m
3.580 kN·m
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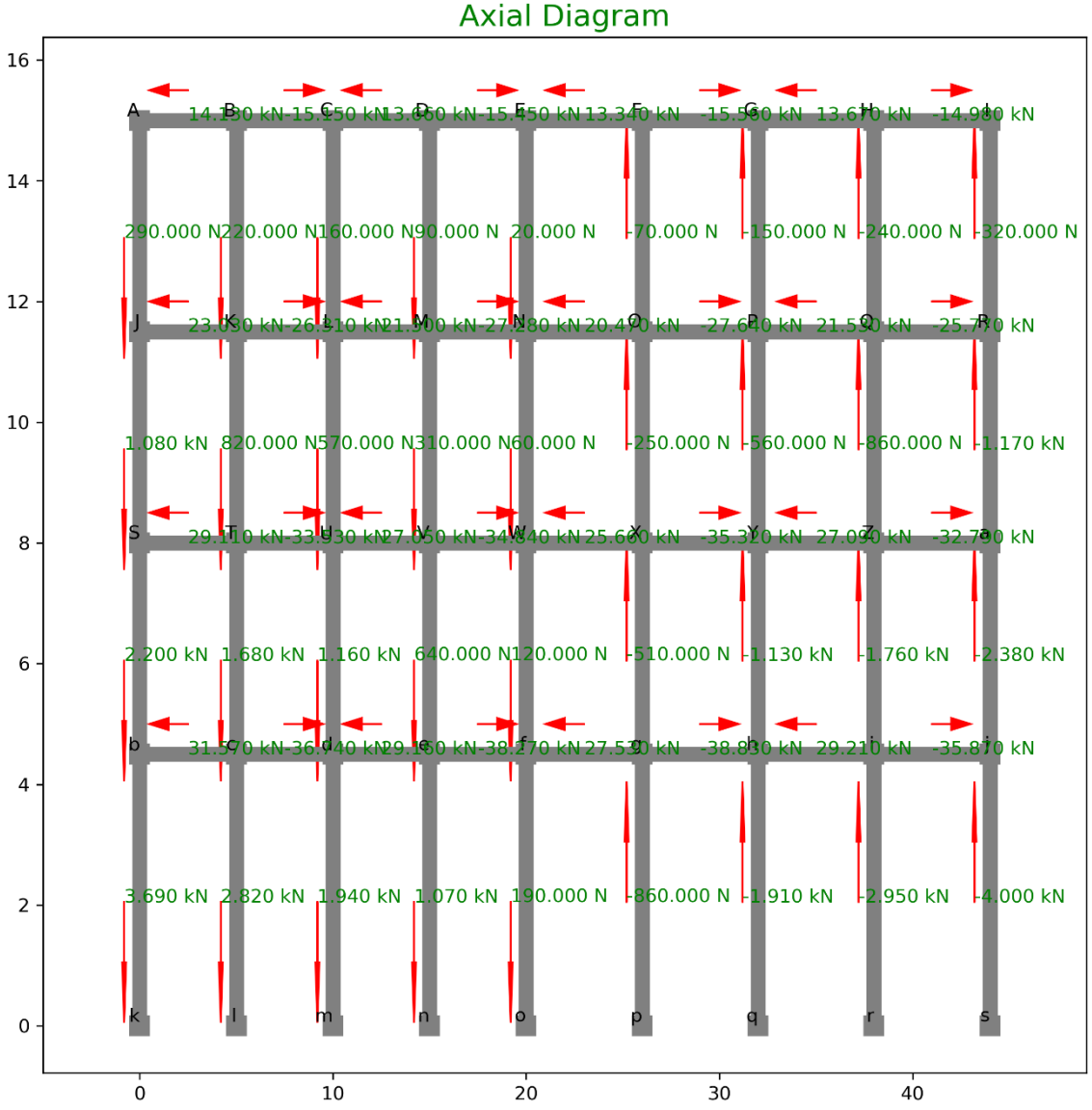
Axial Diagram
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14.130 kN -15.450 kN 13.650 kN -15.450 kN 13.340 kN -15.560 kN 13.670 kN -14.980 kN
290.000 N 220.000 N 160.000 N 90.000 N 20.000 N -70.000 N -150.000 N -240.000 N -320.000 N
23.030 kN -26.510 kN 21.900 kN -27.280 kN 20.470 kN -27.640 kN 21.520 kN -25.770 kN
1.080 kN 820.000 N 570.000 N 310.000 N 60.000 N -250.000 N -560.000 N -860.000 N -1.170 kN
29.110 kN -33.930 kN 27.050 kN -34.840 kN 25.660 kN -35.320 kN 27.090 kN -32.790 kN
2.200 kN 1.680 kN 1.160 kN 640.000 N 120.000 N -510.000 N -1.130 kN -1.760 kN -2.380 kN
31.970 kN -36.940 kN 29.460 kN -38.270 kN 27.530 kN -38.830 kN 29.210 kN -35.870 kN
3.690 kN 2.820 kN 1.940 kN 1.070 kN 190.000 N -860.000 N -1.910 kN -2.950 kN -4.000 kN
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TABULATION OF FORCES:

SHEAR

INDEX	X	Y	Loc	Shear	Type
0	0	15	Right	0.294517	Beam
1	5	15	Left	0.294517	Beam
2	5	15	Right	0.519281	Beam
3	10	15	Left	0.519281	Beam
4	10	15	Right	0.67429	Beam
5	15	15	Left	0.67429	Beam
6	15	15	Right	0.759545	Beam
7	20	15	Left	0.759545	Beam
8	20	15	Right	0.775046	Beam
9	26	15	Left	0.775046	Beam
10	26	15	Right	0.706842	Beam
11	32	15	Left	0.706842	Beam
12	32	15	Right	0.554933	Beam
13	38	15	Left	0.554933	Beam
14	38	15	Right	0.319319	Beam
15	44	15	Left	0.319319	Beam
16	0	11.5	Right	0.786463	Beam
17	5	11.5	Left	0.786463	Beam
18	5	11.5	Right	1.386659	Beam
19	10	11.5	Left	1.386659	Beam
20	10	11.5	Right	1.800586	Beam
21	15	11.5	Left	1.800586	Beam
22	15	11.5	Right	2.028247	Beam
23	20	11.5	Left	2.028247	Beam
24	20	11.5	Right	2.06964	Beam
25	26	11.5	Left	2.06964	Beam
26	26	11.5	Right	1.887511	Beam
27	32	11.5	Left	1.887511	Beam
28	32	11.5	Right	1.481862	Beam
29	38	11.5	Left	1.481862	Beam
30	38	11.5	Right	0.852692	Beam
31	44	11.5	Left	0.852692	Beam
32	0	8	Right	1.115713	Beam
33	5	8	Left	1.115713	Beam
34	5	8	Right	1.967179	Beam
35	10	8	Left	1.967179	Beam
36	10	8	Right	2.554396	Beam
37	15	8	Left	2.554396	Beam
38	15	8	Right	2.877366	Beam
39	20	8	Left	2.877366	Beam
40	20	8	Right	2.936087	Beam
41	26	8	Left	2.936087	Beam
42	26	8	Right	2.677712	Beam
43	32	8	Left	2.677712	Beam
44	32	8	Right	2.102239	Beam
45	38	8	Left	2.102239	Beam
46	38	8	Right	1.209668	Beam
47	44	8	Left	1.209668	Beam
48	0	4.5	Right	1.497048	Beam
49	5	4.5	Left	1.497048	Beam
50	5	4.5	Right	2.639532	Beam
51	10	4.5	Left	2.639532	Beam
52	10	4.5	Right	3.427452	Beam
53	15	4.5	Left	3.427452	Beam
54	15	4.5	Right	3.860808	Beam
55	20	4.5	Left	3.860808	Beam
56	20	4.5	Right	3.9396	Beam
57	26	4.5	Left	3.9396	Beam
58	26	4.5	Right	3.592915	Beam
59	32	4.5	Left	3.592915	Beam
60	32	4.5	Right	2.820754	Beam
61	38	4.5	Left	2.820754	Beam
62	38	4.5	Right	1.623115	Beam
63	44	4.5	Left	1.623115	Beam
64	0	11.5	Top	0.368147	Col
65	0	15	Bot	0.368147	Col
66	5	11.5	Top	1.017248	Col
67	5	15	Bot	1.017248	Col
68	10	11.5	Top	1.491963	Col
69	10	15	Bot	1.491963	Col
70	15	11.5	Top	1.792293	Col
71	15	15	Bot	1.792293	Col
72	20	11.5	Top	2.112	Col
73	20	15	Bot	2.112	Col
74	26	11.5	Top	2.222831	Col
75	26	15	Bot	2.222831	Col
76	32	11.5	Top	1.892662	Col
77	32	15	Bot	1.892662	Col
78	38	11.5	Top	1.311378	Col
79	38	15	Bot	1.311378	Col
80	44	11.5	Top	0.478978	Col
81	44	15	Bot	0.478978	Col
82	0	8	Top	0.819909	Col
83	0	11.5	Bot	0.819909	Col
84	5	8	Top	2.265539	Col
85	5	11.5	Bot	2.265539	Col
86	10	8	Top	3.322791	Col
87	10	11.5	Bot	3.322791	Col
88	15	8	Top	3.991664	Col

89	15	11.5	Bot	3.991664	Col
90	20	8	Top	4.703691	Col
91	20	11.5	Bot	4.703691	Col
92	26	8	Top	4.950527	Col
93	26	11.5	Bot	4.950527	Col
94	32	8	Top	4.215197	Col
95	32	11.5	Bot	4.215197	Col
96	38	8	Top	2.920604	Col
97	38	11.5	Bot	2.920604	Col
98	44	8	Top	1.066745	Col
99	44	11.5	Bot	1.066745	Col
100	0	4.5	Top	0.779709	Col
101	0	8	Bot	0.779709	Col
102	5	4.5	Top	2.15446	Col
103	5	8	Bot	2.15446	Col
104	10	4.5	Top	3.159875	Col
105	10	8	Bot	3.159875	Col
106	15	4.5	Top	3.795954	Col
107	15	8	Bot	3.795954	Col
108	20	4.5	Top	4.47307	Col
109	20	8	Bot	4.47307	Col
110	26	4.5	Top	4.707804	Col
111	26	8	Bot	4.707804	Col
112	32	4.5	Top	4.008527	Col
113	32	8	Bot	4.008527	Col
114	38	4.5	Top	2.777407	Col
115	38	8	Bot	2.777407	Col
116	44	4.5	Top	1.014443	Col
117	44	8	Bot	1.014443	Col
118	0	0	Top	1.0916	Col
119	0	4.5	Bot	1.0916	Col
120	5	0	Top	3.016265	Col
121	5	4.5	Bot	3.016265	Col
122	10	0	Top	4.423855	Col
123	10	4.5	Bot	4.423855	Col
124	15	0	Top	5.314371	Col
125	15	4.5	Bot	5.314371	Col
126	20	0	Top	6.26234	Col
127	20	4.5	Bot	6.26234	Col
128	26	0	Top	6.590969	Col
129	26	4.5	Bot	6.590969	Col
130	32	0	Top	5.611976	Col
131	32	4.5	Bot	5.611976	Col
132	38	0	Top	3.888396	Col
133	38	4.5	Bot	3.888396	Col
134	44	0	Top	1.42023	Col
135	44	4.5	Bot	1.42023	Col

MOMENT

INDEX	X	Y	Loc	Shear	Type
0	0	15	Right	0.294517	Beam
1	5	15	Left	0.294517	Beam
2	5	15	Right	0.519281	Beam
3	10	15	Left	0.519281	Beam
4	10	15	Right	0.67429	Beam
5	15	15	Left	0.67429	Beam
6	15	15	Right	0.759545	Beam
7	20	15	Left	0.759545	Beam
8	20	15	Right	0.775046	Beam
9	26	15	Left	0.775046	Beam
10	26	15	Right	0.706842	Beam
11	32	15	Left	0.706842	Beam
12	32	15	Right	0.554933	Beam
13	38	15	Left	0.554933	Beam
14	38	15	Right	0.319319	Beam
15	44	15	Left	0.319319	Beam
16	0	11.5	Right	0.786463	Beam
17	5	11.5	Left	0.786463	Beam
18	5	11.5	Right	1.386659	Beam
19	10	11.5	Left	1.386659	Beam
20	10	11.5	Right	1.800586	Beam
21	15	11.5	Left	1.800586	Beam
22	15	11.5	Right	2.028247	Beam
23	20	11.5	Left	2.028247	Beam
24	20	11.5	Right	2.06964	Beam
25	26	11.5	Left	2.06964	Beam
26	26	11.5	Right	1.887511	Beam
27	32	11.5	Left	1.887511	Beam
28	32	11.5	Right	1.481862	Beam
29	38	11.5	Left	1.481862	Beam
30	38	11.5	Right	0.852692	Beam
31	44	11.5	Left	0.852692	Beam
32	0	8	Right	1.115713	Beam
33	5	8	Left	1.115713	Beam
34	5	8	Right	1.967179	Beam
35	10	8	Left	1.967179	Beam
36	10	8	Right	2.554396	Beam
37	15	8	Left	2.554396	Beam
38	15	8	Right	2.877366	Beam
39	20	8	Left	2.877366	Beam
40	20	8	Right	2.936087	Beam
41	26	8	Left	2.936087	Beam
42	26	8	Right	2.677712	Beam

43	32	8	Left	2.677712	Beam
44	32	8	Right	2.102239	Beam
45	38	8	Left	2.102239	Beam
46	38	8	Right	1.209668	Beam
47	44	8	Left	1.209668	Beam
48	0	4.5	Right	1.497048	Beam
49	5	4.5	Left	1.497048	Beam
50	5	4.5	Right	2.639532	Beam
51	10	4.5	Left	2.639532	Beam
52	10	4.5	Right	3.427452	Beam
53	15	4.5	Left	3.427452	Beam
54	15	4.5	Right	3.860808	Beam
55	20	4.5	Left	3.860808	Beam
56	20	4.5	Right	3.9396	Beam
57	26	4.5	Left	3.9396	Beam
58	26	4.5	Right	3.592915	Beam
59	32	4.5	Left	3.592915	Beam
60	32	4.5	Right	2.820754	Beam
61	38	4.5	Left	2.820754	Beam
62	38	4.5	Right	1.623115	Beam
63	44	4.5	Left	1.623115	Beam
64	0	11.5	Top	0.368147	Col
65	0	15	Bot	0.368147	Col
66	5	11.5	Top	1.017248	Col
67	5	15	Bot	1.017248	Col
68	10	11.5	Top	1.491963	Col
69	10	15	Bot	1.491963	Col
70	15	11.5	Top	1.792293	Col
71	15	15	Bot	1.792293	Col
72	20	11.5	Top	2.112	Col
73	20	15	Bot	2.112	Col
74	26	11.5	Top	2.222831	Col
75	26	15	Bot	2.222831	Col
76	32	11.5	Top	1.892662	Col
77	32	15	Bot	1.892662	Col
78	38	11.5	Top	1.311378	Col
79	38	15	Bot	1.311378	Col
80	44	11.5	Top	0.478978	Col
81	44	15	Bot	0.478978	Col
82	0	8	Top	0.819909	Col
83	0	11.5	Bot	0.819909	Col
84	5	8	Top	2.265539	Col
85	5	11.5	Bot	2.265539	Col
86	10	8	Top	3.322791	Col
87	10	11.5	Bot	3.322791	Col
88	15	8	Top	3.991664	Col
89	15	11.5	Bot	3.991664	Col
90	20	8	Top	4.703691	Col
91	20	11.5	Bot	4.703691	Col
92	26	8	Top	4.950527	Col
93	26	11.5	Bot	4.950527	Col
94	32	8	Top	4.215197	Col
95	32	11.5	Bot	4.215197	Col
96	38	8	Top	2.920604	Col
97	38	11.5	Bot	2.920604	Col
98	44	8	Top	1.066745	Col
99	44	11.5	Bot	1.066745	Col
100	0	4.5	Top	0.779709	Col
101	0	8	Bot	0.779709	Col
102	5	4.5	Top	2.15446	Col
103	5	8	Bot	2.15446	Col
104	10	4.5	Top	3.159875	Col
105	10	8	Bot	3.159875	Col
106	15	4.5	Top	3.795954	Col
107	15	8	Bot	3.795954	Col
108	20	4.5	Top	4.47307	Col
109	20	8	Bot	4.47307	Col
110	26	4.5	Top	4.707804	Col
111	26	8	Bot	4.707804	Col
112	32	4.5	Top	4.008527	Col
113	32	8	Bot	4.008527	Col
114	38	4.5	Top	2.777407	Col
115	38	8	Bot	2.777407	Col
116	44	4.5	Top	1.014443	Col
117	44	8	Bot	1.014443	Col
118	0	0	Top	1.0916	Col
119	0	4.5	Bot	1.0916	Col
120	5	0	Top	3.016265	Col
121	5	4.5	Bot	3.016265	Col
122	10	0	Top	4.423855	Col
123	10	4.5	Bot	4.423855	Col
124	15	0	Top	5.314371	Col
125	15	4.5	Bot	5.314371	Col
126	20	0	Top	6.26234	Col
127	20	4.5	Bot	6.26234	Col
128	26	0	Top	6.590969	Col
129	26	4.5	Bot	6.590969	Col
130	32	0	Top	5.611976	Col
131	32	4.5	Bot	5.611976	Col
132	38	0	Top	3.888396	Col
133	38	4.5	Bot	3.888396	Col
134	44	0	Top	1.42023	Col
135	44	4.5	Bot	1.42023	Col

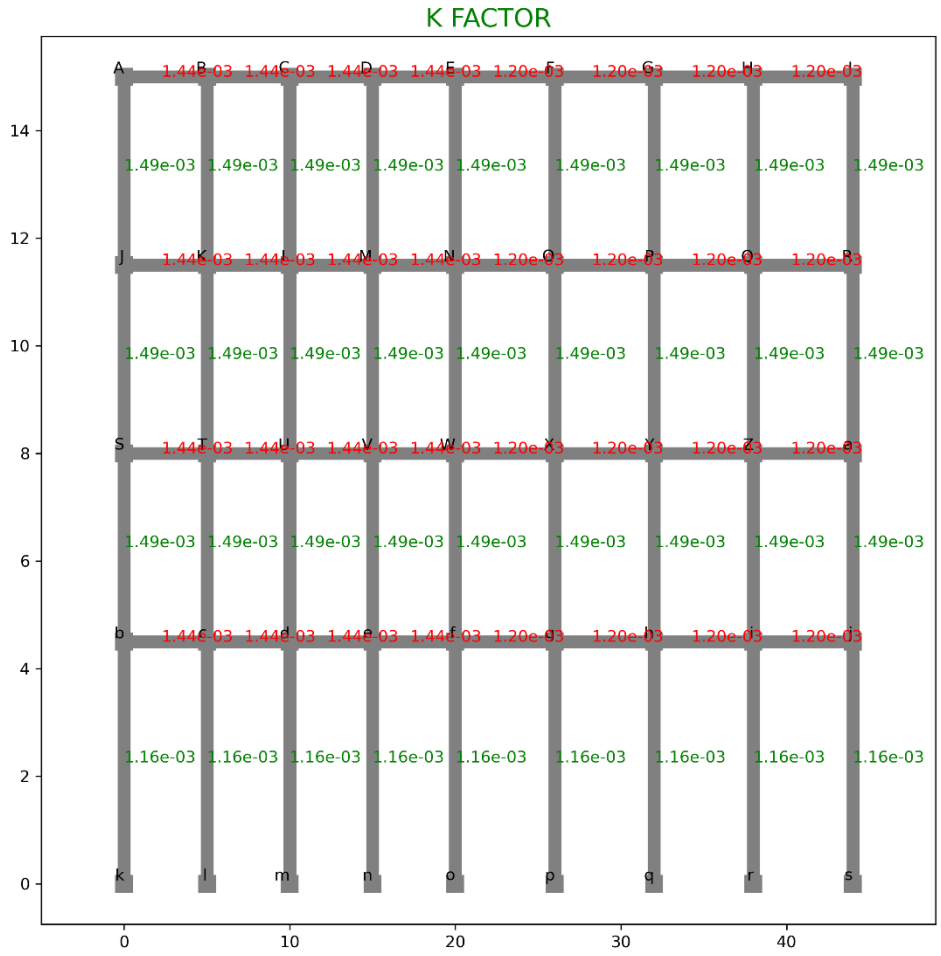
AXIAL

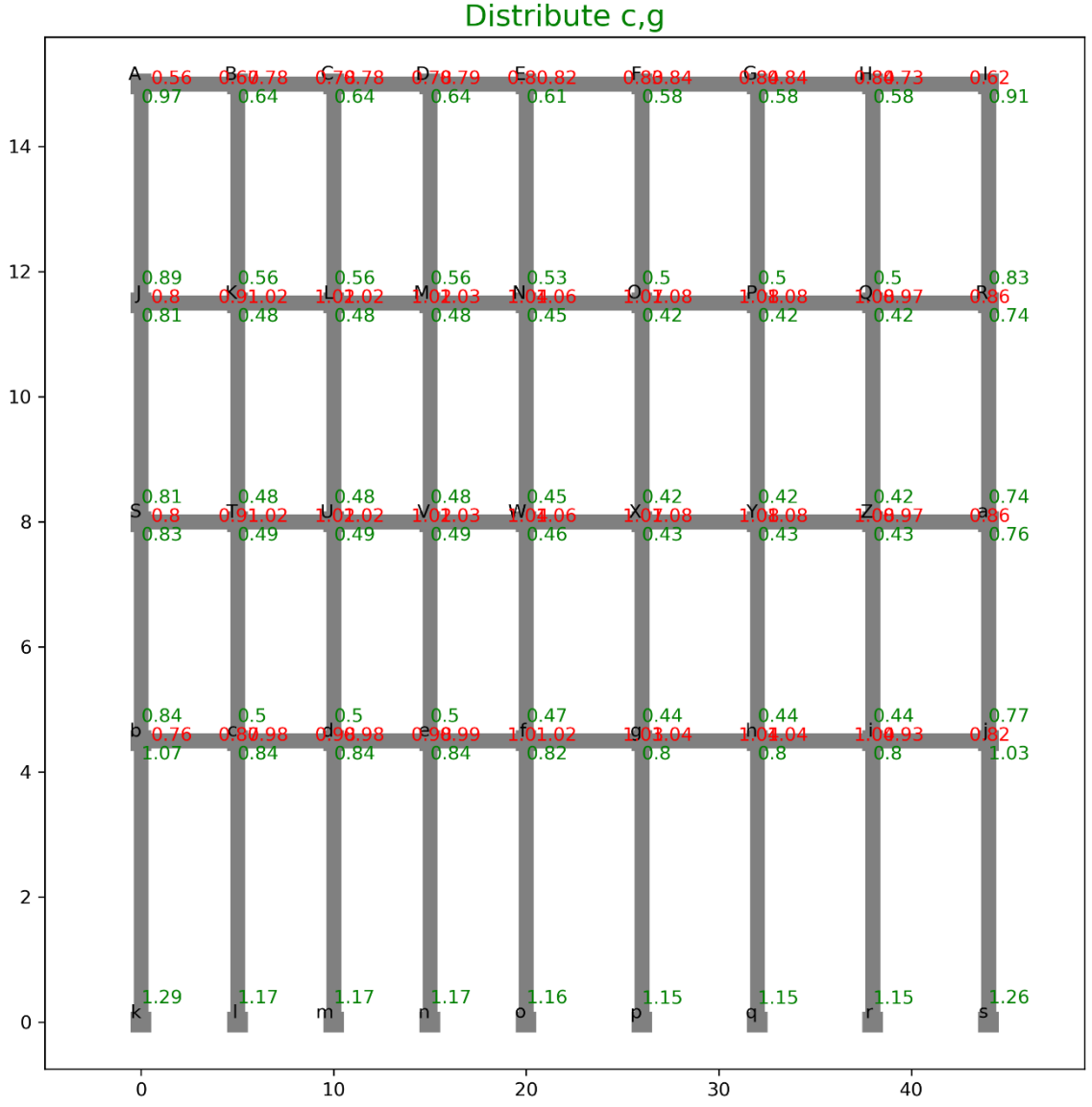
INDEX	X	Y	Loc	Axial2	Type
0	0	11.5	Top	0.294517	Col
1	0	15	Bot	0.294517	Col
2	5	11.5	Top	0.224763	Col
3	5	15	Bot	0.224763	Col
4	10	11.5	Top	0.155009	Col
5	10	15	Bot	0.155009	Col
6	15	11.5	Top	0.085255	Col
7	15	15	Bot	0.085255	Col
8	20	11.5	Top	0.015501	Col
9	20	15	Bot	0.015501	Col
10	26	11.5	Top	-0.0682	Col
11	26	15	Bot	-0.0682	Col
12	32	11.5	Top	-0.15191	Col
13	32	15	Bot	-0.15191	Col
14	38	11.5	Top	-0.23561	Col
15	38	15	Bot	-0.23561	Col
16	44	11.5	Top	-0.31932	Col
17	44	15	Bot	-0.31932	Col
18	0	8	Top	1.08098	Col
19	0	11.5	Bot	1.08098	Col
20	5	8	Top	0.824959	Col
21	5	11.5	Bot	0.824959	Col
22	10	8	Top	0.568937	Col
23	10	11.5	Bot	0.568937	Col
24	15	8	Top	0.312915	Col
25	15	11.5	Bot	0.312915	Col
26	20	8	Top	0.056894	Col
27	20	11.5	Bot	0.056894	Col
28	26	8	Top	-0.25033	Col
29	26	11.5	Bot	-0.25033	Col
30	32	8	Top	-0.55756	Col
31	32	11.5	Bot	-0.55756	Col
32	38	8	Top	-0.86478	Col
33	38	11.5	Bot	-0.86478	Col
34	44	8	Top	-1.17201	Col
35	44	11.5	Bot	-1.17201	Col
36	0	4.5	Top	2.196694	Col
37	0	8	Bot	2.196694	Col
38	5	4.5	Top	1.676424	Col
39	5	8	Bot	1.676424	Col
40	10	4.5	Top	1.156155	Col
41	10	8	Bot	1.156155	Col
42	15	4.5	Top	0.635885	Col
43	15	8	Bot	0.635885	Col
44	20	4.5	Top	0.115615	Col
45	20	8	Bot	0.115615	Col
46	26	4.5	Top	-0.50871	Col
47	26	8	Bot	-0.50871	Col
48	32	4.5	Top	-1.13303	Col
49	32	8	Bot	-1.13303	Col
50	38	4.5	Top	-1.75735	Col
51	38	8	Bot	-1.75735	Col
52	44	4.5	Top	-2.38168	Col
53	44	8	Bot	-2.38168	Col
54	0	0	Top	3.693742	Col
55	0	4.5	Bot	3.693742	Col
56	5	0	Top	2.818908	Col
57	5	4.5	Bot	2.818908	Col
58	10	0	Top	1.944075	Col
59	10	4.5	Bot	1.944075	Col
60	15	0	Top	1.069241	Col
61	15	4.5	Bot	1.069241	Col
62	20	0	Top	0.194407	Col
63	20	4.5	Bot	0.194407	Col
64	26	0	Top	-0.85539	Col
65	26	4.5	Bot	-0.85539	Col
66	32	0	Top	-1.90519	Col
67	32	4.5	Bot	-1.90519	Col
68	38	0	Top	-2.95499	Col
69	38	4.5	Bot	-2.95499	Col
70	44	0	Top	-4.00479	Col
71	44	4.5	Bot	-4.00479	Col
72	0	15	Right	14.13185	Beam
73	5	15	Left	14.13185	Beam
74	5	15	Right	-15.1491	Beam
75	10	15	Left	-15.1491	Beam
76	10	15	Right	13.65714	Beam
77	15	15	Left	13.65714	Beam
78	15	15	Right	-15.4494	Beam
79	20	15	Left	-15.4494	Beam
80	20	15	Right	13.33743	Beam
81	26	15	Left	13.33743	Beam
82	26	15	Right	-15.5603	Beam
83	32	15	Left	-15.5603	Beam
84	32	15	Right	13.6676	Beam
85	38	15	Left	13.6676	Beam
86	38	15	Right	-14.979	Beam
87	44	15	Left	-14.979	Beam
88	0	11.5	Right	23.03194	Beam
89	5	11.5	Left	23.03194	Beam
90	5	11.5	Right	-26.3147	Beam

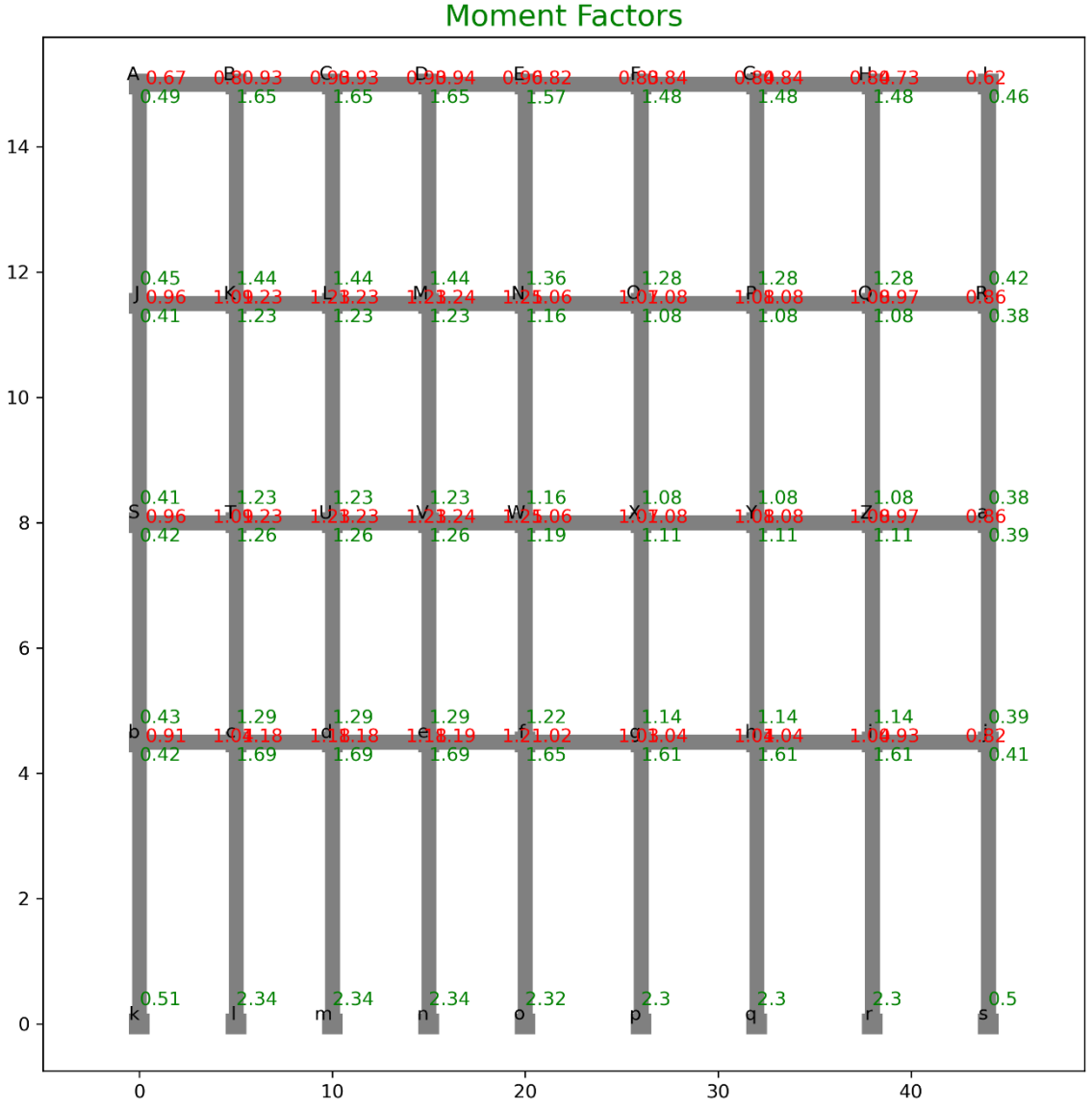
91	10	11.5	Left	-26.3147	Beam
92	10	11.5	Right	21.49998	Beam
93	15	11.5	Left	21.49998	Beam
94	15	11.5	Right	-27.2839	Beam
95	20	11.5	Left	-27.2839	Beam
96	20	11.5	Right	20.46824	Beam
97	26	11.5	Left	20.46824	Beam
98	26	11.5	Right	-27.6416	Beam
99	32	11.5	Left	-27.6416	Beam
100	32	11.5	Right	21.53374	Beam
101	38	11.5	Left	21.53374	Beam
102	38	11.5	Right	-25.7657	Beam
103	44	11.5	Left	-25.7657	Beam
104	0	8	Right	29.11038	Beam
105	5	8	Left	29.11038	Beam
106	5	8	Right	-33.5304	Beam
107	10	8	Left	-33.5304	Beam
108	10	8	Right	27.04771	Beam
109	15	8	Left	27.04771	Beam
110	15	8	Right	-34.8353	Beam
111	20	8	Left	-34.8353	Beam
112	20	8	Right	25.65857	Beam
113	26	8	Left	25.65857	Beam
114	26	8	Right	-35.3169	Beam
115	32	8	Left	-35.3169	Beam
116	32	8	Right	27.09318	Beam
117	38	8	Left	27.09318	Beam
118	38	8	Right	-32.7912	Beam
119	44	8	Left	-32.7912	Beam
120	0	4.5	Right	31.56869	Beam
121	5	4.5	Left	31.56869	Beam
122	5	4.5	Right	-36.7394	Beam
123	10	4.5	Left	-36.7394	Beam
124	10	4.5	Right	29.15569	Beam
125	15	4.5	Left	29.15569	Beam
126	15	4.5	Right	-38.266	Beam
127	20	4.5	Left	-38.266	Beam
128	20	4.5	Right	27.5306	Beam
129	26	4.5	Left	27.5306	Beam
130	26	4.5	Right	-38.8294	Beam
131	32	4.5	Left	-38.8294	Beam
132	32	4.5	Right	29.20887	Beam
133	38	4.5	Left	29.20887	Beam
134	38	4.5	Right	-35.8747	Beam
135	44	4.5	Left	-35.8747	Beam

FACTOR METHOD OF ANALYSIS

CALCULATION:




Distribute c,g
A 0.56 0.97
B 0.64
C 0.64
D 0.64
E 0.61
F 0.58
G 0.58
H 0.58
I 0.91
J 0.89 0.81
K 0.56 0.48
L 0.56 0.48
M 0.56 0.48
N 0.53 0.45
O 0.5 0.42
P 0.5 0.42
Q 0.5 0.42
R 0.83 0.74
S 0.81 0.83
T 0.48 0.49
U 0.48 0.49
V 0.48 0.49
W 0.45 0.46
X 0.42 0.43
Y 0.42 0.43
Z 0.42 0.43
a 0.74 0.76
b 0.84 1.07
c 0.5 0.84
d 0.5 0.84
e 0.5 0.84
f 0.47 0.82
g 0.44 0.8
h 0.44 0.8
i 0.44 0.8
j 0.77 1.03
k 1.29
l 1.17
m 1.17
n 1.17
o 1.16
p 1.15
q 1.15
r 1.15
s 1.26
0
2
4
6
8
10
12
14
0
10
20
30
40


Moment Factors
A 0.67 B 0.93 C 0.93 D 0.94 E 0.82 F 0.84 G 0.84 H 0.73 I 0.62
0.49 1.65 1.65 1.65 1.57 1.48 1.48 1.48 0.46
J 0.96 K 1.23 L 1.23 M 1.24 N 1.06 O 1.08 P 1.08 Q 0.97 R 0.86
0.41 1.23 1.23 1.23 1.16 1.08 1.08 1.08 0.38
S 0.96 T 1.23 U 1.23 V 1.24 W 1.06 X 1.08 Y 1.08 Z 0.97 a 0.86
0.42 1.26 1.26 1.26 1.19 1.11 1.11 1.11 0.39
b 0.91 c 1.18 d 1.18 e 1.19 f 1.02 g 1.04 h 1.04 i 0.93 j 0.82
0.42 1.69 1.69 1.69 1.65 1.61 1.61 1.61 0.41
k 0.51 l 2.34 m 2.34 n 2.34 o 2.32 p 2.3 q 2.3 r 2.3 s 0.5
0
2
4
6
8
10
12
14
0
10
20
30
40

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([14.50000]) \cdot 3.50000}{\Sigma([0.45351,\ 1.43887,\ 1.43887,\ 1.43887,\ 1.36324,\ 1.28250,\ 1.28250,\ 1.28250,\ 0.42039,\ 0.49441,\ 1.65047,\ 1.65047,\ 1.65047,\ 1.57084,\ 1.48500,\ 1.48500,\ 1.48500,\ 0.46283])}$$

$$= 2.27214$$

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([14.50000,\ 9.72000]) \cdot 3.50000}{\Sigma([0.41261,\ 1.22727,\ 1.22727,\ 1.22727,\ 1.15564,\ 1.08000,\ 1.08000,\ 1.08000,\ 0.37795,\ 0.41261,\ 1.22727,\ 1.22727,\ 1.22727,\ 1.15564,\ 1.08000,\ 1.08000,\ 1.08000,\ 0.37795])}$$

$$= 4.77953$$

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([14.50000,\ 9.72000,\ 6.49000]) \cdot 3.50000}{\Sigma([0.42737,\ 1.29434,\ 1.29434,\ 1.29434,\ 1.22066,\ 1.14261,\ 1.14261,\ 1.14261,\ 0.39290,\ 0.41999,\ 1.26080,\ 1.26080,\ 1.26080,\ 1.18815,\ 1.11130,\ 1.11130,\ 1.11130,\ 0.38543])}$$

$$= 5.82207$$

$$\alpha = \frac{\Sigma(f) \cdot h}{\Sigma(\mathrm{Cm})}$$

$$= \frac{\Sigma([14.50000,\ 9.72000,\ 6.49000,\ 2.73000]) \cdot 4.50000}{\Sigma([0.50778,\ 2.34426,\ 2.34426,\ 2.34426,\ 2.32489,\ 2.30435,\ 2.30435,\ 2.30435,\ 0.49886,\ 0.42296,\ 1.68852,\ 1.68852,\ 1.68852,\ 1.64979,\ 1.60870,\ 1.60870,\ 1.60870,\ 0.40513])}$$

$$= 5.07574$$

NODE-A

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([1.12338])}{\Sigma([0.66722])} = 1.68366$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([3.75010])}{\Sigma([0.79913,\ 0.93103])} = 2.16749$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.66722 \cdot 1.68366 = 1.12338$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.79913 \cdot 2.16749 = 1.73210$$

NODE-B

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([3.75010])}{\Sigma([0.79913,\ 0.93103])} = 2.16749$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([3.75010])}{\Sigma([0.93103,\ 0.93103])} = 2.01394$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.93103 \cdot 2.16749 = 2.01800$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.93103 \cdot 2.01394 = 1.87505$$

NODE-C

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([3.75010])}{\Sigma([0.93103,\ 0.93103])} = 2.01394$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([3.75010])}{\Sigma([0.93103,\ 0.94404])} = 1.99997$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.93103 \cdot 2.01394 = 1.87505$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.93103 \cdot 1.99997 = 1.86204$$

NODE-D

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([3.75010])}{\Sigma([0.93103,\ 0.94404])} = 1.99997$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([3.56918])}{\Sigma([0.95705,\ 0.82017])} = 2.00829$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.94404 \cdot 1.99997 = 1.88806$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.95705 \cdot 2.00829 = 1.92204$$

NODE-E

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([3.56918])}{\Sigma([0.95705,\ 0.82017])} = 2.00829$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([3.37413])}{\Sigma([0.83196,\ 0.84375])} = 2.01355$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.82017 \cdot 2.00829 = 1.64714$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.83196 \cdot 2.01355 = 1.67520$$

NODE-F

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([3.37413])}{\Sigma([0.83196,\ 0.84375])} = 2.01355$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([3.37413])}{\Sigma([0.84375,\ 0.84375])} = 1.99949$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.84375 \cdot 2.01355 = 1.69893$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.84375 \cdot 1.99949 = 1.68707$$

NODE-G

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([3.37413])}{\Sigma([0.84375,\ 0.84375])} = 1.99949$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([3.37413])}{\Sigma([0.84375,\ 0.73092])} = 2.14275$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.84375 \cdot 1.99949 = 1.68707$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.84375 \cdot 2.14275 = 1.80795$$

NODE-H

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma([3.37413])}{\Sigma([0.84375,\ 0.73092])} = 2.14275$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma([1.05161])}{\Sigma([0.61809])} = 1.70138$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.73092 \cdot 2.14275 = 1.56618$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.61809 \cdot 1.70138 = 1.05161$$

NODE-J

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|1.03044,\ 1.97207\right|\right)}{\Sigma\left(\left|0.95923\right|\right)} = 3.13011$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|3.26932,\ 5.86579\right|\right)}{\Sigma\left(\left|1.09325,\ 1.22727\right|\right)} = 3.93666$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.95923 \cdot 3.13011 = 3.00251$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.09325 \cdot 3.93666 = 4.30376$$

NODE-K

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|3.26932,\ 5.86579\right|\right)}{\Sigma\left(\left|1.09325,\ 1.22727\right|\right)} = 3.93666$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|3.26932,\ 5.86579\right|\right)}{\Sigma\left(\left|1.22727,\ 1.22727\right|\right)} = 3.72171$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.22727 \cdot 3.93666 = 4.83135$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.22727 \cdot 3.72171 = 4.56756$$

NODE-L

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|3.26932,\ 5.86579\right|\right)}{\Sigma\left(\left|1.22727,\ 1.22727\right|\right)} = 3.72171$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|3.26932,\ 5.86579\right|\right)}{\Sigma\left(\left|1.22727,\ 1.23842\right|\right)} = 3.70489$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.22727 \cdot 3.72171 = 4.56756$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.22727 \cdot 3.70489 = 4.54691$$

NODE-M

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|3.26932,\ 5.86579\right|\right)}{\Sigma\left(\left|1.22727,\ 1.23842\right|\right)} = 3.70489$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|3.09748,\ 5.52343\right|\right)}{\Sigma\left(\left|1.24956,\ 1.06039\right|\right)} = 3.73208$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.23842 \cdot 3.70489 = 4.58820$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.24956 \cdot 3.73208 = 4.66345$$

NODE-N

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|3.09748,\ 5.52343\right|\right)}{\Sigma\left(\left|1.24956,\ 1.06039\right|\right)} = 3.73208$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|2.91402,\ 5.16190\right|\right)}{\Sigma\left(\left|1.07019,\ 1.08000\right|\right)} = 3.75590$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.06039 \cdot 3.73208 = 3.95746$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.07019 \cdot 3.75590 = 4.01955$$

NODE-O

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|2.91402,\ 5.16190\right|\right)}{\Sigma\left(\left|1.07019,\ 1.08000\right|\right)} = 3.75590$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|2.91402,\ 5.16190\right|\right)}{\Sigma\left(\left|1.08000,\ 1.08000\right|\right)} = 3.73885$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.08000 \cdot 3.75590 = 4.05637$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.08000 \cdot 3.73885 = 4.03796$$

NODE-P

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|2.91402,\ 5.16190\right|\right)}{\Sigma\left(\left|1.08000,\ 1.08000\right|\right)} = 3.73885$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|2.91402,\ 5.16190\right|\right)}{\Sigma\left(\left|1.08000,\ 0.97197\right|\right)} = 3.93569$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.08000 \cdot 3.73885 = 4.03796$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.08000 \cdot 3.93569 = 4.25055$$

NODE-Q

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|2.91402,\ 5.16190\right|\right)}{\Sigma\left(\left|1.08000,\ 0.97197\right|\right)} = 3.93569$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|0.95518,\ 1.80644\right|\right)}{\Sigma\left(\left|0.86394\right|\right)} = 3.19656$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.97197 \cdot 3.93569 = 3.82537$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.86394 \cdot 3.19656 = 2.76162$$

NODE-S

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|1.97207,\ 2.44521\right|\right)}{\Sigma\left(\left|0.95923\right|\right)} = 4.60500$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|5.86579,\ 7.34049\right|\right)}{\Sigma\left(\left|1.09325,\ 1.22727\right|\right)} = 5.69107$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.95923 \cdot 4.60500 = 4.41728$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.09325 \cdot 5.69107 = 6.22178$$

NODE-T

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|5.86579,\ 7.34049\right|\right)}{\Sigma\left(\left|1.09325,\ 1.22727\right|\right)} = 5.69107$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|5.86579,\ 7.34049\right|\right)}{\Sigma\left(\left|1.22727,\ 1.22727\right|\right)} = 5.38034$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.22727 \cdot 5.69107 = 6.98450$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.22727 \cdot 5.38034 = 6.60314$$

NODE-U

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|5.86579,\ 7.34049\right|\right)}{\Sigma\left(\left|1.22727,\ 1.22727\right|\right)} = 5.38034$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|5.86579,\ 7.34049\right|\right)}{\Sigma\left(\left|1.22727,\ 1.23842\right|\right)} = 5.35602$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.22727 \cdot 5.38034 = 6.60314$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.22727 \cdot 5.35602 = 6.57330$$

NODE-V

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|5.86579,\ 7.34049\right|\right)}{\Sigma\left(\left|1.22727,\ 1.23842\right|\right)} = 5.35602$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|5.52343,\ 6.91749\right|\right)}{\Sigma\left(\left|1.24956,\ 1.06039\right|\right)} = 5.38580$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.23842 \cdot 5.35602 = 6.63298$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.24956 \cdot 5.38580 = 6.72987$$

NODE-W

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|5.52343,\ 6.91749\right|\right)}{\Sigma\left(\left|1.24956,\ 1.06039\right|\right)} = 5.38580$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|5.16190,\ 6.47009\right|\right)}{\Sigma\left(\left|1.07019,\ 1.08000\right|\right)} = 5.40974$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.06039 \cdot 5.38580 = 5.71105$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.07019 \cdot 5.40974 = 5.78947$$

NODE-X

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|5.16190,\ 6.47009\right|\right)}{\Sigma\left(\left|1.07019,\ 1.08000\right|\right)} = 5.40974$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|5.16190,\ 6.47009\right|\right)}{\Sigma\left(\left|1.08000,\ 1.08000\right|\right)} = 5.38518$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.08000 \cdot 5.40974 = 5.84251$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.08000 \cdot 5.38518 = 5.81599$$

NODE-Y

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|5.16190,\ 6.47009\right|\right)}{\Sigma\left(\left|1.08000,\ 1.08000\right|\right)} = 5.38518$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|5.16190,\ 6.47009\right|\right)}{\Sigma\left(\left|1.08000,\ 0.97197\right|\right)} = 5.66870$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.08000 \cdot 5.38518 = 5.81599$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.08000 \cdot 5.66870 = 6.12219$$

NODE-Z

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\left|5.16190,\ 6.47009\right|\right)}{\Sigma\left(\left|1.08000,\ 0.97197\right|\right)} = 5.66870$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\left|1.80644,\ 2.24397\right|\right)}{\Sigma\left(\left|0.86394\right|\right)} = 4.68832$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.97197 \cdot 5.66870 = 5.50979$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.86394 \cdot 4.68832 = 4.05041$$

NODE-b

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 2.48819,\ 2.14683\rvert\right)}{\Sigma\left(\lvert 0.90871\rvert\right)} = 5.10067$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 7.53572,\ 8.57051\rvert\right)}{\Sigma\left(\lvert 1.04452,\ 1.18033\rvert\right)} = 7.23926$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.90871 \cdot 5.10067 = 4.63501$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.04452 \cdot 7.23926 = 7.56153$$

NODE-c

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 7.53572,\ 8.57051\rvert\right)}{\Sigma\left(\lvert 1.04452,\ 1.18033\rvert\right)} = 7.23926$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 7.53572,\ 8.57051\rvert\right)}{\Sigma\left(\lvert 1.18033,\ 1.18033\rvert\right)} = 6.82278$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.18033 \cdot 7.23926 = 8.54470$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.18033 \cdot 6.82278 = 8.05312$$

NODE-d

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 7.53572,\ 8.57051\rvert\right)}{\Sigma\left(\lvert 1.18033,\ 1.18033\rvert\right)} = 6.82278$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 7.53572,\ 8.57051\rvert\right)}{\Sigma\left(\lvert 1.18033,\ 1.19195\rvert\right)} = 6.78936$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.18033 \cdot 6.82278 = 8.05312$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.18033 \cdot 6.78936 = 8.01367$$

NODE-e

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 7.53572,\ 8.57051\rvert\right)}{\Sigma\left(\lvert 1.18033,\ 1.19195\rvert\right)} = 6.78936$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 7.10675,\ 8.37390\rvert\right)}{\Sigma\left(\lvert 1.20357,\ 1.02293\rvert\right)} = 6.95291$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.19195 \cdot 6.78936 = 8.09256$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.20357 \cdot 6.95291 = 8.36830$$

NODE-f

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 7.10675,\ 8.37390\rvert\right)}{\Sigma\left(\lvert 1.20357,\ 1.02293\rvert\right)} = 6.95291$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 6.65234,\ 8.16532\rvert\right)}{\Sigma\left(\lvert 1.03320,\ 1.04348\rvert\right)} = 7.13526$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.02293 \cdot 6.95291 = 7.11235$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.03320 \cdot 7.13526 = 7.37218$$

NODE-g

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 6.65234,\ 8.16532\rvert\right)}{\Sigma\left(\lvert 1.03320,\ 1.04348\rvert\right)} = 7.13526$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 6.65234,\ 8.16532\rvert\right)}{\Sigma\left(\lvert 1.04348,\ 1.04348\rvert\right)} = 7.10013$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.04348 \cdot 7.13526 = 7.44549$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.04348 \cdot 7.10013 = 7.40883$$

NODE-h

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 6.65234,\ 8.16532\rvert\right)}{\Sigma\left(\lvert 1.04348,\ 1.04348\rvert\right)} = 7.10013$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 6.65234,\ 8.16532\rvert\right)}{\Sigma\left(\lvert 1.04348,\ 0.93291\rvert\right)} = 7.49735$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 1.04348 \cdot 7.10013 = 7.40883$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 1.04348 \cdot 7.49735 = 7.82332$$

NODE-i

$$\beta_{left} = \frac{\Sigma\left(\text{ColEndMoments}_{left}\right)}{\Sigma\left(\text{Factor}_{left}\right)} = \frac{\Sigma\left(\lvert 6.65234,\ 8.16532\rvert\right)}{\Sigma\left(\lvert 1.04348,\ 0.93291\rvert\right)} = 7.49735$$

$$\beta_{right} = \frac{\Sigma\left(\text{ColEndMoments}_{right}\right)}{\Sigma\left(\text{Factor}_{right}\right)} = \frac{\Sigma\left(\lvert 2.28748,\ 2.05634\rvert\right)}{\Sigma\left(\lvert 0.82234\rvert\right)} = 5.28227$$

$$\text{MomentEnd}_{Left} = \text{Moment}_{Factor_{left}} \cdot \beta_{left} = 0.93291 \cdot 7.49735 = 6.99435$$

$$\text{MomentEnd}_{Right} = \text{Moment}_{Factor_{right}} \cdot \beta_{right} = 0.82234 \cdot 5.28227 = 4.34382$$

COLUMN-J-A

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{1.03044 + 1.12338}{3.50000} = 0.61538$$

COLUMN-K-B

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{3.26932 + 3.75010}{3.50000} = 2.00555$$

COLUMN-L-C

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{3.26932 + 3.75010}{3.50000} = 2.00555$$

COLUMN-M-D

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{3.26932 + 3.75010}{3.50000} = 2.00555$$

COLUMN-N-E

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{3.09748 + 3.56918}{3.50000} = 1.90476$$

COLUMN-O-F

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{2.91402 + 3.37413}{3.50000} = 1.79662$$

COLUMN-P-G

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{2.91402 + 3.37413}{3.50000} = 1.79662$$

COLUMN-Q-H

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{2.91402 + 3.37413}{3.50000} = 1.79662$$

COLUMN-R-I

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{0.95518 + 1.05161}{3.50000} = 0.57337$$

COLUMN-S-J

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{1.97207 + 1.97207}{3.50000} = 1.12690$$

COLUMN-T-K

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{5.86579 + 5.86579}{3.50000} = 3.35188$$

COLUMN-U-L

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{5.86579 + 5.86579}{3.50000} = 3.35188$$

COLUMN-V-M

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{5.86579 + 5.86579}{3.50000} = 3.35188$$

COLUMN-W-N

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{5.52343 + 5.52343}{3.50000} = 3.15625$$

COLUMN-X-O

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{5.16190 + 5.16190}{3.50000} = 2.94965$$

COLUMN-Y-P

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{5.16190 + 5.16190}{3.50000} = 2.94965$$

COLUMN-Z-Q

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{5.16190 + 5.16190}{3.50000} = 2.94965$$

COLUMN-a-R

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{1.80644 + 1.80644}{3.50000} = 1.03225$$

COLUMN-b-S

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{2.48819 + 2.44521}{3.50000} = 1.40954$$

COLUMN-c-T

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{7.53572 + 7.34049}{3.50000} = 4.25034$$

COLUMN-d-U

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{7.53572 + 7.34049}{3.50000} = 4.25034$$

COLUMN-e-V

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{7.53572 + 7.34049}{3.50000} = 4.25034$$

COLUMN-f-W

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{7.10675 + 6.91749}{3.50000} = 4.00692$$

COLUMN-g-X

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{6.65234 + 6.47009}{3.50000} = 3.74927$$

COLUMN-h-Y

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{6.65234 + 6.47009}{3.50000} = 3.74927$$

COLUMN-i-Z

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{6.65234 + 6.47009}{3.50000} = 3.74927$$

COLUMN-j-a

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{2.28748 + 2.24397}{3.50000} = 1.29470$$

COLUMN-k-b

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{2.57734 + 2.14683}{4.50000} = 1.04981$$

COLUMN-l-c

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{11.89887 + 8.57051}{4.50000} = 4.54875$$

COLUMN-m-d

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{11.89887 + 8.57051}{4.50000} = 4.54875$$

COLUMN-n-e

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{11.89887 + 8.57051}{4.50000} = 4.54875$$

COLUMN-o-f

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{11.80056 + 8.37390}{4.50000} = 4.48321$$

COLUMN-p-g

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{11.69627 + 8.16532}{4.50000} = 4.41369$$

COLUMN-q-h

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{11.69627 + 8.16532}{4.50000} = 4.41369$$

COLUMN-r-i

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{11.69627 + 8.16532}{4.50000} = 4.41369$$

COLUMN-s-j

$$\text{Shear} = \frac{\text{Moment}_{Bot} + \text{Moment}_{Top}}{\text{length}} = \frac{2.53209 + 2.05634}{4.50000} = 1.01965$$

BEAM-A-B

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{1.12338 + 1.73210}{5.00000} = 0.57110$$

BEAM-B-C

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{2.01800 + 1.87505}{5.00000} = 0.77861$$

BEAM-C-D

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{1.87505 + 1.86204}{5.00000} = 0.74742$$

BEAM-D-E

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{1.88806 + 1.92204}{5.00000} = 0.76202$$

BEAM-E-F

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{1.64714 + 1.67520}{6.00000} = 0.55372$$

BEAM-F-G

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{1.69893 + 1.68707}{6.00000} = 0.56433$$

BEAM-G-H

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{1.68707 + 1.80795}{6.00000} = 0.58250$$

BEAM-H-I

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{1.56618 + 1.05161}{6.00000} = 0.43630$$

BEAM-J-K

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{3.00251 + 4.30376}{5.00000} = 1.46125$$

BEAM-K-L

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{4.83135 + 4.56756}{5.00000} = 1.87978$$

BEAM-L-M

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{4.56756 + 4.54691}{5.00000} = 1.82289$$

BEAM-M-N

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{4.58820 + 4.66345}{5.00000} = 1.85033$$

BEAM-N-O

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{3.95746 + 4.01955}{6.00000} = 1.32950$$

BEAM-O-P

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{4.05637 + 4.03796}{6.00000} = 1.34906$$

BEAM-P-Q

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{4.03796 + 4.25055}{6.00000} = 1.38142$$

BEAM-Q-R

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{3.82537 + 2.76162}{6.00000} = 1.09783$$

BEAM-S-T

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{4.41728 + 6.22178}{5.00000} = 2.12781$$

BEAM-T-U

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{6.98450 + 6.60314}{5.00000} = 2.71753$$

BEAM-U-V

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{6.60314 + 6.57330}{5.00000} = 2.63529$$

BEAM-V-W

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{6.63298 + 6.72987}{5.00000} = 2.67257$$

BEAM-W-X

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{5.71105 + 5.78947}{6.00000} = 1.91675$$

BEAM-X-Y

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{5.84251 + 5.81599}{6.00000} = 1.94308$$

BEAM-Y-Z

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{5.81599 + 6.12219}{6.00000} = 1.98970$$

BEAM-Z-a

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{5.50979 + 4.05041}{6.00000} = 1.59337$$

BEAM-b-c

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{4.63501 + 7.56153}{5.00000} = 2.43931$$

BEAM-c-d

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{8.54470 + 8.05312}{5.00000} = 3.31956$$

BEAM-d-e

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{8.05312 + 8.01367}{5.00000} = 3.21336$$

BEAM-e-f

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{8.09256 + 8.36830}{5.00000} = 3.29217$$

BEAM-f-g

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{7.11235 + 7.37218}{6.00000} = 2.41409$$

BEAM-g-h

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{7.44549 + 7.40883}{6.00000} = 2.47572$$

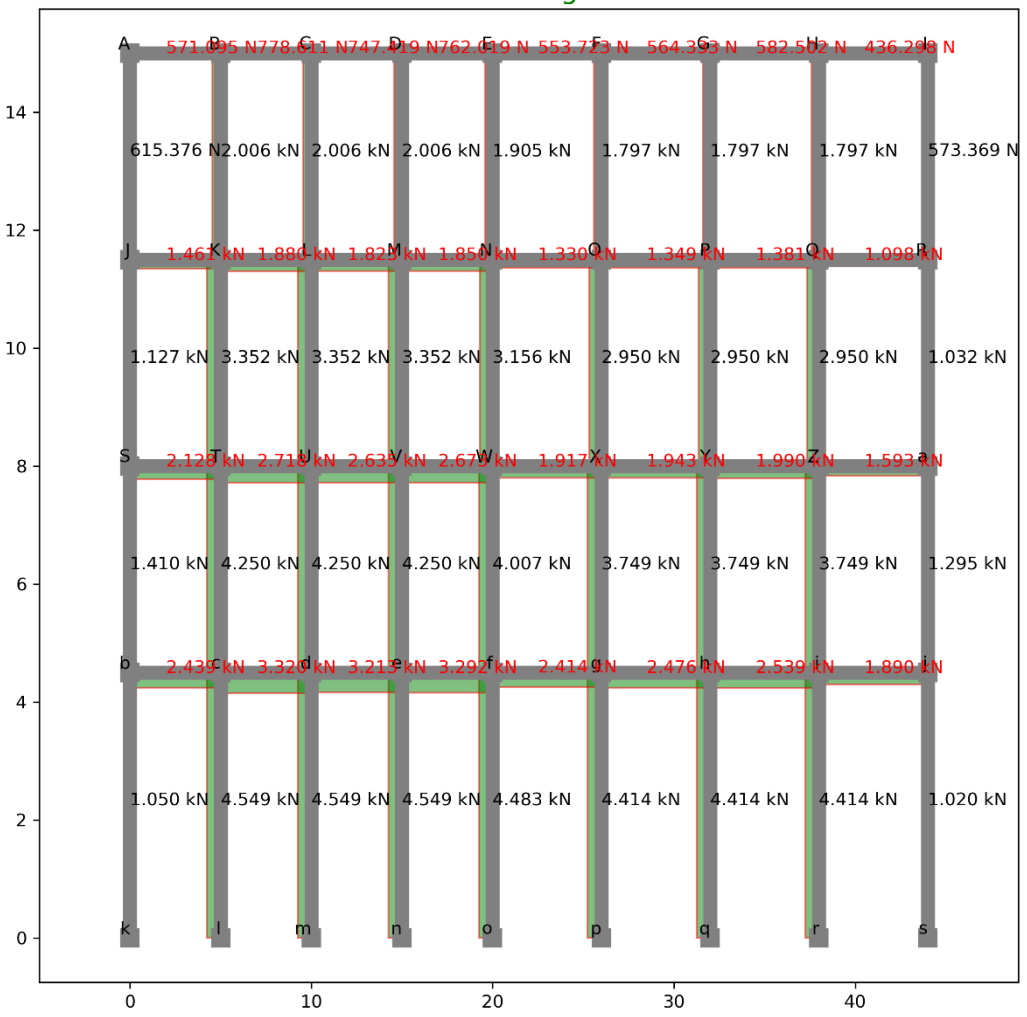
BEAM-h-i

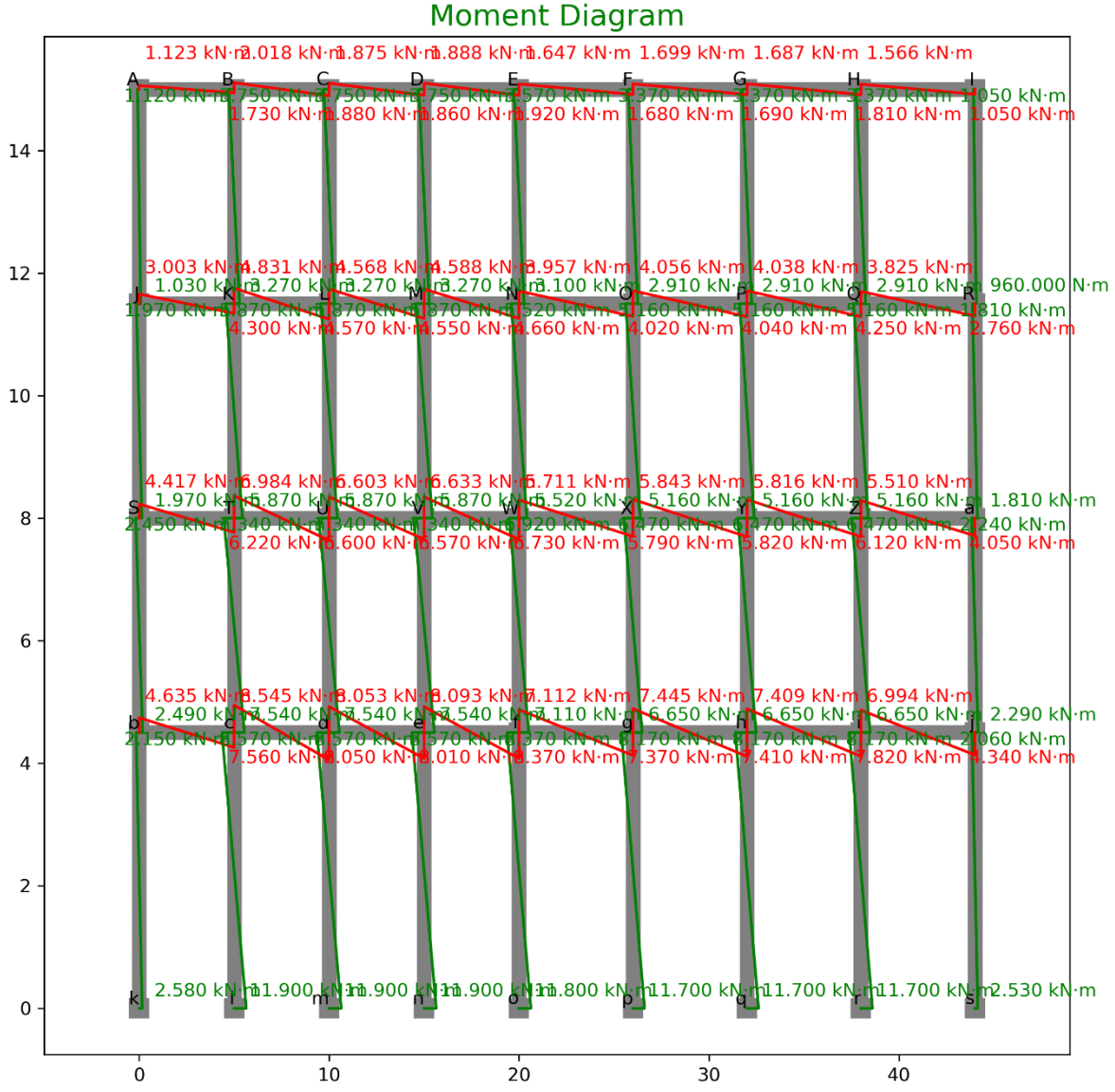
$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{7.40883 + 7.82332}{6.00000} = 2.53869$$

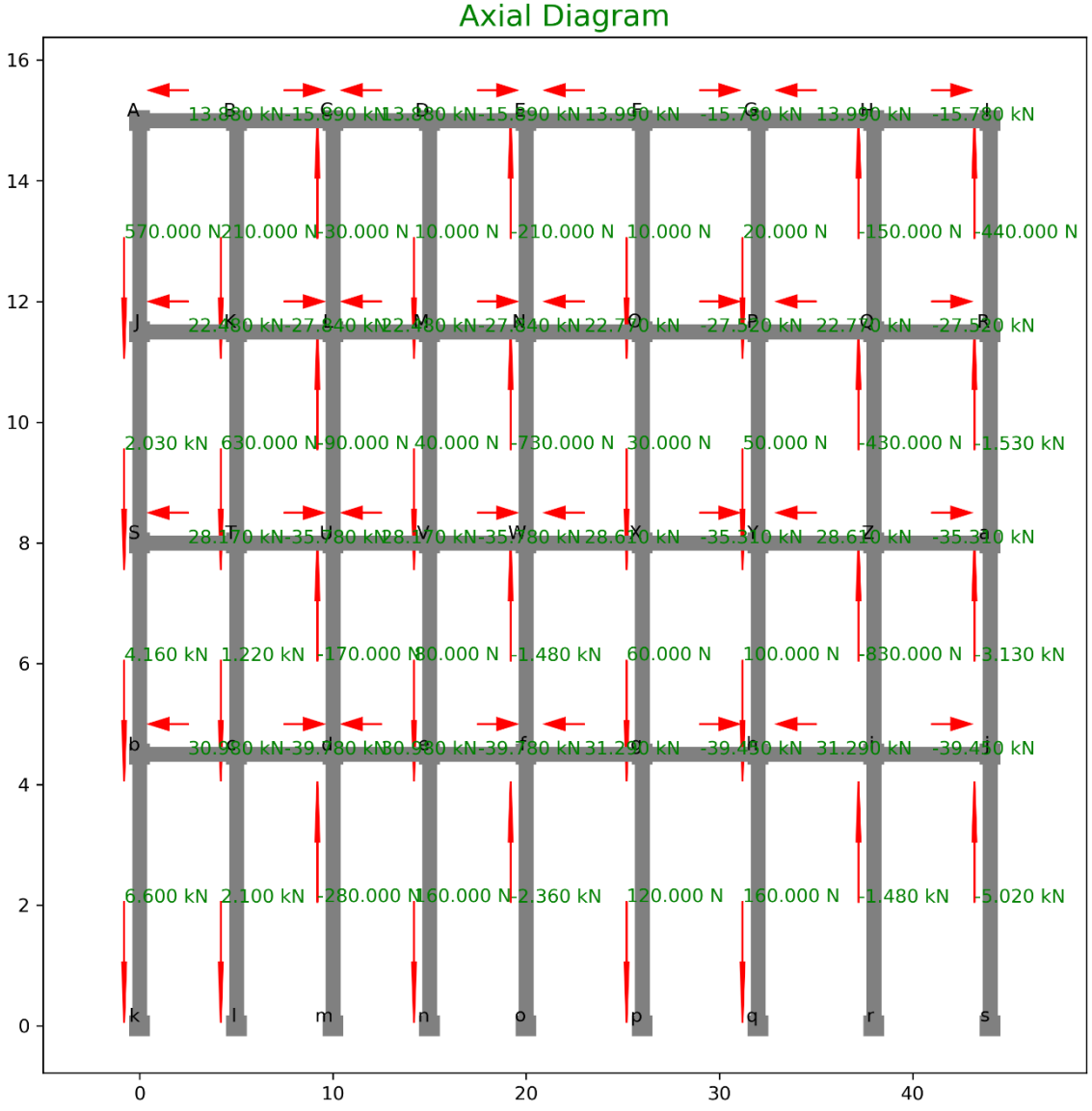
BEAM-i-j

$$\text{Shear} = \frac{\text{Moment}_{Left} + \text{Moment}_{Right}}{\text{Height}} = \frac{6.99435 + 4.34382}{6.00000} = 1.88969$$

Shear Diagram




Moment Diagram
1.123 kN·m 2.018 kN·m 1.875 kN·m 1.888 kN·m 1.647 kN·m 1.699 kN·m 1.687 kN·m 1.566 kN·m
A B C D E F G H I
1.120 kN·m 3.750 kN·m 3.750 kN·m 3.750 kN·m 3.370 kN·m 3.370 kN·m 3.370 kN·m 3.370 kN·m 1.050 kN·m
1.730 kN·m 1.880 kN·m 1.860 kN·m 1.920 kN·m 1.680 kN·m 1.690 kN·m 1.810 kN·m 1.050 kN·m
3.003 kN·m 4.831 kN·m 4.568 kN·m 4.588 kN·m 3.957 kN·m 4.056 kN·m 4.038 kN·m 3.825 kN·m
1.030 kN·m 3.270 kN·m 3.270 kN·m 3.270 kN·m 3.100 kN·m 2.910 kN·m 2.910 kN·m 2.910 kN·m 960.000 N·m
J K L M N O P Q R
1.970 kN·m 5.870 kN·m 5.870 kN·m 5.870 kN·m 5.520 kN·m 5.160 kN·m 5.160 kN·m 5.160 kN·m 1.810 kN·m
4.300 kN·m 4.570 kN·m 4.550 kN·m 4.660 kN·m 4.020 kN·m 4.040 kN·m 4.250 kN·m 2.760 kN·m
4.417 kN·m 6.984 kN·m 6.603 kN·m 6.633 kN·m 5.711 kN·m 5.843 kN·m 5.816 kN·m 5.510 kN·m
1.970 kN·m 5.870 kN·m 5.870 kN·m 5.870 kN·m 5.520 kN·m 5.160 kN·m 5.160 kN·m 5.160 kN·m 1.810 kN·m
S T U V W X Y Z a
2.450 kN·m 6.340 kN·m 6.340 kN·m 6.340 kN·m 6.920 kN·m 6.470 kN·m 6.470 kN·m 6.470 kN·m 2.240 kN·m
6.220 kN·m 6.600 kN·m 6.570 kN·m 6.730 kN·m 5.790 kN·m 5.820 kN·m 6.120 kN·m 4.050 kN·m
4.635 kN·m 8.545 kN·m 8.053 kN·m 8.093 kN·m 7.112 kN·m 7.445 kN·m 7.409 kN·m 6.994 kN·m
2.490 kN·m 7.540 kN·m 7.540 kN·m 7.540 kN·m 7.110 kN·m 6.650 kN·m 6.650 kN·m 6.650 kN·m 2.290 kN·m
b c d e f g h i j
2.150 kN·m 8.570 kN·m 8.570 kN·m 8.570 kN·m 8.370 kN·m 8.170 kN·m 8.170 kN·m 8.170 kN·m 2.060 kN·m
7.560 kN·m 8.050 kN·m 8.010 kN·m 8.370 kN·m 7.370 kN·m 7.410 kN·m 7.820 kN·m 4.340 kN·m
k l m n o p q r s
2.580 kN·m 11.900 kN·m 11.900 kN·m 11.900 kN·m 11.800 kN·m 11.700 kN·m 11.700 kN·m 11.700 kN·m 2.530 kN·m
0 2 4 6 8 10 12 14
0 10 20 30 40


Axial Diagram
A
B
C
D
E
F
G
H
I
13.880 kN -15.890 kN 13.880 kN -15.890 kN 13.990 kN -15.780 kN 13.990 kN -15.780 kN
570.000 N 210.000 N -30.000 N 10.000 N -210.000 N 10.000 N 20.000 N -150.000 N -440.000 N
J
K
L
M
N
O
P
Q
R
22.480 kN -27.840 kN 22.480 kN -27.840 kN 22.770 kN -27.520 kN 22.770 kN -27.520 kN
2.030 kN 630.000 N -90.000 N 40.000 N -730.000 N 30.000 N 50.000 N -430.000 N -1.530 kN
S
T
U
V
W
X
Y
Z
a
28.170 kN -35.980 kN 28.170 kN -35.980 kN 28.610 kN -35.310 kN 28.610 kN -35.310 kN
4.160 kN 1.220 kN -170.000 N 80.000 N -1.480 kN 60.000 N 100.000 N -830.000 N -3.130 kN
b
c
d
e
f
g
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i
j
30.980 kN -39.780 kN 30.980 kN -39.780 kN 31.290 kN -39.470 kN 31.290 kN -39.470 kN
6.600 kN 2.100 kN -280.000 N 160.000 N -2.360 kN 120.000 N 160.000 N -1.480 kN -5.020 kN
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TABULATION OF FORCES:

SHEAR

INDEX	X	Y	Loc	Shear	Type
0	0	15	Right	0.571095	Beam
1	5	15	Left	0.571095	Beam
2	5	15	Right	0.778611	Beam
3	10	15	Left	0.778611	Beam
4	10	15	Right	0.747419	Beam
5	15	15	Left	0.747419	Beam
6	15	15	Right	0.762019	Beam
7	20	15	Left	0.762019	Beam
8	20	15	Right	0.553723	Beam
9	26	15	Left	0.553723	Beam
10	26	15	Right	0.564333	Beam
11	32	15	Left	0.564333	Beam
12	32	15	Right	0.582502	Beam
13	38	15	Left	0.582502	Beam
14	38	15	Right	0.436298	Beam
15	44	15	Left	0.436298	Beam
16	0	11.5	Right	1.461255	Beam
17	5	11.5	Left	1.461255	Beam
18	5	11.5	Right	1.879781	Beam
19	10	11.5	Left	1.879781	Beam
20	10	11.5	Right	1.822894	Beam
21	15	11.5	Left	1.822894	Beam
22	15	11.5	Right	1.85033	Beam
23	20	11.5	Left	1.85033	Beam
24	20	11.5	Right	1.329501	Beam
25	26	11.5	Left	1.329501	Beam
26	26	11.5	Right	1.349055	Beam
27	32	11.5	Left	1.349055	Beam
28	32	11.5	Right	1.381418	Beam
29	38	11.5	Left	1.381418	Beam
30	38	11.5	Right	1.097832	Beam
31	44	11.5	Left	1.097832	Beam
32	0	8	Right	2.127812	Beam
33	5	8	Left	2.127812	Beam
34	5	8	Right	2.717528	Beam
35	10	8	Left	2.717528	Beam
36	10	8	Right	2.635288	Beam
37	15	8	Left	2.635288	Beam
38	15	8	Right	2.67257	Beam
39	20	8	Left	2.67257	Beam
40	20	8	Right	1.916753	Beam
41	26	8	Left	1.916753	Beam
42	26	8	Right	1.943085	Beam
43	32	8	Left	1.943085	Beam
44	32	8	Right	1.989697	Beam
45	38	8	Left	1.989697	Beam
46	38	8	Right	1.593367	Beam
47	44	8	Left	1.593367	Beam
48	0	4.5	Right	2.439309	Beam
49	5	4.5	Left	2.439309	Beam
50	5	4.5	Right	3.319563	Beam
51	10	4.5	Left	3.319563	Beam
52	10	4.5	Right	3.213356	Beam
53	15	4.5	Left	3.213356	Beam
54	15	4.5	Right	3.292173	Beam
55	20	4.5	Left	3.292173	Beam
56	20	4.5	Right	2.414088	Beam
57	26	4.5	Left	2.414088	Beam
58	26	4.5	Right	2.47572	Beam
59	32	4.5	Left	2.47572	Beam
60	32	4.5	Right	2.538693	Beam
61	38	4.5	Left	2.538693	Beam
62	38	4.5	Right	1.889694	Beam
63	44	4.5	Left	1.889694	Beam
64	0	11.5	Top	0.615376	Col
65	0	15	Bot	0.615376	Col
66	5	11.5	Top	2.00555	Col
67	5	15	Bot	2.00555	Col
68	10	11.5	Top	2.00555	Col
69	10	15	Bot	2.00555	Col
70	15	11.5	Top	2.00555	Col
71	15	15	Bot	2.00555	Col
72	20	11.5	Top	1.90476	Col
73	20	15	Bot	1.90476	Col
74	26	11.5	Top	1.796615	Col
75	26	15	Bot	1.796615	Col
76	32	11.5	Top	1.796615	Col
77	32	15	Bot	1.796615	Col
78	38	11.5	Top	1.796615	Col
79	38	15	Bot	1.796615	Col
80	44	11.5	Top	0.573369	Col
81	44	15	Bot	0.573369	Col
82	0	8	Top	1.126898	Col
83	0	11.5	Bot	1.126898	Col
84	5	8	Top	3.351881	Col
85	5	11.5	Bot	3.351881	Col
86	10	8	Top	3.351881	Col
87	10	11.5	Bot	3.351881	Col
88	15	8	Top	3.351881	Col
89	15	11.5	Bot	3.351881	Col

90	20	8	Top	3.156246	Col
91	20	11.5	Bot	3.156246	Col
92	26	8	Top	2.949655	Col
93	26	11.5	Bot	2.949655	Col
94	32	8	Top	2.949655	Col
95	32	11.5	Bot	2.949655	Col
96	38	8	Top	2.949655	Col
97	38	11.5	Bot	2.949655	Col
98	44	8	Top	1.03225	Col
99	44	11.5	Bot	1.03225	Col
100	0	4.5	Top	1.409541	Col
101	0	8	Bot	1.409541	Col
102	5	4.5	Top	4.250345	Col
103	5	8	Bot	4.250345	Col
104	10	4.5	Top	4.250345	Col
105	10	8	Bot	4.250345	Col
106	15	4.5	Top	4.250345	Col
107	15	8	Bot	4.250345	Col
108	20	4.5	Top	4.006924	Col
109	20	8	Bot	4.006924	Col
110	26	4.5	Top	3.749267	Col
111	26	8	Bot	3.749267	Col
112	32	4.5	Top	3.749267	Col
113	32	8	Bot	3.749267	Col
114	38	4.5	Top	3.749267	Col
115	38	8	Bot	3.749267	Col
116	44	4.5	Top	1.294701	Col
117	44	8	Bot	1.294701	Col
118	0	0	Top	1.049815	Col
119	0	4.5	Bot	1.049815	Col
120	5	0	Top	4.548752	Col
121	5	4.5	Bot	4.548752	Col
122	10	0	Top	4.548752	Col
123	10	4.5	Bot	4.548752	Col
124	15	0	Top	4.548752	Col
125	15	4.5	Bot	4.548752	Col
126	20	0	Top	4.483215	Col
127	20	4.5	Bot	4.483215	Col
128	26	0	Top	4.413688	Col
129	26	4.5	Bot	4.413688	Col
130	32	0	Top	4.413688	Col
131	32	4.5	Bot	4.413688	Col
132	38	0	Top	4.413688	Col
133	38	4.5	Bot	4.413688	Col
134	44	0	Top	1.019651	Col
135	44	4.5	Bot	1.019651	Col

MOMENT

INDEX	X	Y	Loc	Moment	Type
0	0	11.5	Top	1.0304399	Col
1	0	15	Bot	1.12337698	Col
2	5	11.5	Top	3.26932065	Col
3	5	15	Bot	3.7501031	Col
4	10	11.5	Top	3.26932065	Col
5	10	15	Bot	3.7501031	Col
6	15	11.5	Top	3.26932065	Col
7	15	15	Bot	3.7501031	Col
8	20	11.5	Top	3.09748061	Col
9	20	15	Bot	3.56917816	Col
10	26	11.5	Top	2.91402242	Col
11	26	15	Bot	3.37413122	Col
12	32	11.5	Top	2.91402242	Col
13	32	15	Bot	3.37413122	Col
14	38	11.5	Top	2.91402242	Col
15	38	15	Bot	3.37413122	Col
16	44	11.5	Top	0.95518487	Col
17	44	15	Bot	1.05160732	Col
18	0	8	Top	1.9720711	Col
19	0	11.5	Bot	1.9720711	Col
20	5	8	Top	5.86579103	Col
21	5	11.5	Bot	5.86579103	Col
22	10	8	Top	5.86579103	Col
23	10	11.5	Bot	5.86579103	Col
24	15	8	Top	5.86579103	Col
25	15	11.5	Bot	5.86579103	Col
26	20	8	Top	5.52342968	Col
27	20	11.5	Bot	5.52342968	Col
28	26	8	Top	5.1618961	Col
29	26	11.5	Bot	5.1618961	Col
30	32	8	Top	5.1618961	Col
31	32	11.5	Bot	5.1618961	Col
32	38	8	Top	5.1618961	Col
33	38	11.5	Bot	5.1618961	Col
34	44	8	Top	1.80643783	Col
35	44	11.5	Bot	1.80643783	Col
36	0	4.5	Top	2.48818537	Col
37	0	8	Bot	2.44520689	Col
38	5	4.5	Top	7.53571625	Col
39	5	8	Bot	7.34049044	Col
40	10	4.5	Top	7.53571625	Col
41	10	8	Bot	7.34049044	Col
42	15	4.5	Top	7.53571625	Col
43	15	8	Bot	7.34049044	Col

44	20	4.5	Top	7.10674768	Col
45	20	8	Bot	6.91748676	Col
46	26	4.5	Top	6.65234492	Col
47	26	8	Bot	6.4700889	Col
48	32	4.5	Top	6.65234492	Col
49	32	8	Bot	6.4700889	Col
50	38	4.5	Top	6.65234492	Col
51	38	8	Bot	6.4700889	Col
52	44	4.5	Top	2.28747902	Col
53	44	8	Bot	2.24397273	Col
54	0	0	Top	2.57733751	Col
55	0	4.5	Bot	2.14682831	Col
56	5	0	Top	11.898869	Col
57	5	4.5	Bot	8.57051406	Col
58	10	0	Top	11.898869	Col
59	10	4.5	Bot	8.57051406	Col
60	15	0	Top	11.898869	Col
61	15	4.5	Bot	8.57051406	Col
62	20	0	Top	11.8005632	Col
63	20	4.5	Bot	8.37390237	Col
64	26	0	Top	11.6962735	Col
65	26	4.5	Bot	8.16532302	Col
66	32	0	Top	11.6962735	Col
67	32	4.5	Bot	8.16532302	Col
68	38	0	Top	11.6962735	Col
69	38	4.5	Bot	8.16532302	Col
70	44	0	Top	2.53209215	Col
71	44	4.5	Bot	2.05633759	Col
72	0	15	Right	1.12337698	Beam
73	5	15	Left	1.73209919	Beam
74	5	15	Right	2.01800391	Beam
75	10	15	Left	1.87505155	Beam
76	10	15	Right	1.87505155	Beam
77	15	15	Left	1.86204326	Beam
78	15	15	Right	1.88805984	Beam
79	20	15	Left	1.92203562	Beam
80	20	15	Right	1.64714254	Beam
81	26	15	Left	1.67519681	Beam
82	26	15	Right	1.69893441	Beam
83	32	15	Left	1.68706561	Beam
84	32	15	Right	1.68706561	Beam
85	38	15	Left	1.8079479	Beam
86	38	15	Right	1.56618333	Beam
87	44	15	Left	1.05160732	Beam
88	0	11.5	Right	3.002511	Beam
89	5	11.5	Left	4.30376199	Beam
90	5	11.5	Right	4.83134968	Beam
91	10	11.5	Left	4.56755584	Beam
92	10	11.5	Right	4.56755584	Beam
93	15	11.5	Left	4.54691485	Beam
94	15	11.5	Right	4.58819683	Beam
95	20	11.5	Left	4.66345171	Beam
96	20	11.5	Right	3.95745858	Beam
97	26	11.5	Left	4.01954512	Beam
98	26	11.5	Right	4.05637341	Beam
99	32	11.5	Left	4.03795926	Beam
100	32	11.5	Right	4.03795926	Beam
101	38	11.5	Left	4.25054867	Beam
102	38	11.5	Right	3.82536985	Beam
103	44	11.5	Left	2.7616227	Beam
104	0	8	Right	4.41727799	Beam
105	5	8	Left	6.22178406	Beam
106	5	8	Right	6.9844974	Beam
107	10	8	Left	6.60314073	Beam
108	10	8	Right	6.60314073	Beam
109	15	8	Left	6.57330085	Beam
110	15	8	Right	6.63298062	Beam
111	20	8	Left	6.72987087	Beam
112	20	8	Right	5.71104558	Beam
113	26	8	Left	5.78947006	Beam
114	26	8	Right	5.84251494	Beam
115	32	8	Left	5.8159925	Beam
116	32	8	Right	5.8159925	Beam
117	38	8	Left	6.12219134	Beam
118	38	8	Right	5.50979366	Beam
119	44	8	Left	4.05041057	Beam
120	0	4.5	Right	4.63501369	Beam
121	5	4.5	Left	7.56152973	Beam
122	5	4.5	Right	8.54470058	Beam
123	10	4.5	Left	8.05311515	Beam
124	10	4.5	Right	8.05311515	Beam
125	15	4.5	Left	8.01366672	Beam
126	15	4.5	Right	8.09256358	Beam
127	20	4.5	Left	8.36830325	Beam
128	20	4.5	Right	7.11234681	Beam
129	26	4.5	Left	7.3721825	Beam
130	26	4.5	Right	7.44548545	Beam
131	32	4.5	Left	7.40883397	Beam
132	32	4.5	Right	7.40883397	Beam
133	38	4.5	Left	7.82332264	Beam
134	38	4.5	Right	6.9943453	Beam
135	44	4.5	Left	4.34381661	Beam

AXIAL

INDEX	X	Y	Loc	Axial	Type
0	0	11.5	Top	0.571095	Col
1	0	15	Bot	0.571095	Col
2	5	11.5	Top	0.207516	Col
3	5	15	Bot	0.207516	Col
4	10	11.5	Top	-0.03119	Col
5	10	15	Bot	-0.03119	Col
6	15	11.5	Top	0.0146	Col
7	15	15	Bot	0.0146	Col
8	20	11.5	Top	-0.2083	Col
9	20	15	Bot	-0.2083	Col
10	26	11.5	Top	0.01061	Col
11	26	15	Bot	0.01061	Col
12	32	11.5	Top	0.018169	Col
13	32	15	Bot	0.018169	Col
14	38	11.5	Top	-0.1462	Col
15	38	15	Bot	-0.1462	Col
16	44	11.5	Top	-0.4363	Col
17	44	15	Bot	-0.4363	Col
18	0	8	Top	2.03235	Col
19	0	11.5	Bot	2.03235	Col
20	5	8	Top	0.626042	Col
21	5	11.5	Bot	0.626042	Col
22	10	8	Top	-0.08808	Col
23	10	11.5	Bot	-0.08808	Col
24	15	8	Top	0.042036	Col
25	15	11.5	Bot	0.042036	Col
26	20	8	Top	-0.72912	Col
27	20	11.5	Bot	-0.72912	Col
28	26	8	Top	0.030165	Col
29	26	11.5	Bot	0.030165	Col
30	32	8	Top	0.050531	Col
31	32	11.5	Bot	0.050531	Col
32	38	8	Top	-0.42979	Col
33	38	11.5	Bot	-0.42979	Col
34	44	8	Top	-1.53413	Col
35	44	11.5	Bot	-1.53413	Col
36	0	4.5	Top	4.160162	Col
37	0	8	Bot	4.160162	Col
38	5	4.5	Top	1.215758	Col
39	5	8	Bot	1.215758	Col
40	10	4.5	Top	-0.17032	Col
41	10	8	Bot	-0.17032	Col
42	15	4.5	Top	0.079318	Col
43	15	8	Bot	0.079318	Col
44	20	4.5	Top	-1.48494	Col
45	20	8	Bot	-1.48494	Col
46	26	4.5	Top	0.056497	Col
47	26	8	Bot	0.056497	Col
48	32	4.5	Top	0.097144	Col
49	32	8	Bot	0.097144	Col
50	38	4.5	Top	-0.82612	Col
51	38	8	Bot	-0.82612	Col
52	44	4.5	Top	-3.1275	Col
53	44	8	Bot	-3.1275	Col
54	0	0	Top	6.599471	Col
55	0	4.5	Bot	6.599471	Col
56	5	0	Top	2.096012	Col
57	5	4.5	Bot	2.096012	Col
58	10	0	Top	-0.27653	Col
59	10	4.5	Bot	-0.27653	Col
60	15	0	Top	0.158135	Col
61	15	4.5	Bot	0.158135	Col
62	20	0	Top	-2.36303	Col
63	20	4.5	Bot	-2.36303	Col
64	26	0	Top	0.118129	Col
65	26	4.5	Bot	0.118129	Col
66	32	0	Top	0.160117	Col
67	32	4.5	Bot	0.160117	Col
68	38	0	Top	-1.47512	Col
69	38	4.5	Bot	-1.47512	Col
70	44	0	Top	-5.01719	Col
71	44	4.5	Bot	-5.01719	Col
72	0	15	Right	13.88462	Beam
73	5	15	Left	13.88462	Beam
74	5	15	Right	-15.8902	Beam
75	10	15	Left	-15.8902	Beam
76	10	15	Right	13.88462	Beam
77	15	15	Left	13.88462	Beam
78	15	15	Right	-15.8902	Beam
79	20	15	Left	-15.8902	Beam
80	20	15	Right	13.98541	Beam
81	26	15	Left	13.98541	Beam
82	26	15	Right	-15.782	Beam
83	32	15	Left	-15.782	Beam
84	32	15	Right	13.98541	Beam
85	38	15	Left	13.98541	Beam
86	38	15	Right	-15.782	Beam
87	44	15	Left	-15.782	Beam
88	0	11.5	Right	22.47773	Beam
89	5	11.5	Left	22.47773	Beam
90	5	11.5	Right	-27.8352	Beam

91	10	11.5	Left	-27.8352	Beam
92	10	11.5	Right	22.47773	Beam
93	15	11.5	Left	22.47773	Beam
94	15	11.5	Right	-27.8352	Beam
95	20	11.5	Left	-27.8352	Beam
96	20	11.5	Right	22.77415	Beam
97	26	11.5	Left	22.77415	Beam
98	26	11.5	Right	-27.5204	Beam
99	32	11.5	Left	-27.5204	Beam
100	32	11.5	Right	22.77415	Beam
101	38	11.5	Left	22.77415	Beam
102	38	11.5	Right	-27.5204	Beam
103	44	11.5	Left	-27.5204	Beam
104	0	8	Right	28.17356	Beam
105	5	8	Left	28.17356	Beam
106	5	8	Right	-35.7758	Beam
107	10	8	Left	-35.7758	Beam
108	10	8	Right	28.17356	Beam
109	15	8	Left	28.17356	Beam
110	15	8	Right	-35.7758	Beam
111	20	8	Left	-35.7758	Beam
112	20	8	Right	28.61262	Beam
113	26	8	Left	28.61262	Beam
114	26	8	Right	-35.3115	Beam
115	32	8	Left	-35.3115	Beam
116	32	8	Right	28.61262	Beam
117	38	8	Left	28.61262	Beam
118	38	8	Right	-35.3115	Beam
119	44	8	Left	-35.3115	Beam
120	0	4.5	Right	30.98064	Beam
121	5	4.5	Left	30.98064	Beam
122	5	4.5	Right	-39.7797	Beam
123	10	4.5	Left	-39.7797	Beam
124	10	4.5	Right	30.98064	Beam
125	15	4.5	Left	30.98064	Beam
126	15	4.5	Right	-39.7797	Beam
127	20	4.5	Left	-39.7797	Beam
128	20	4.5	Right	31.2896	Beam
129	26	4.5	Left	31.2896	Beam
130	26	4.5	Right	-39.4526	Beam
131	32	4.5	Left	-39.4526	Beam
132	32	4.5	Right	31.2896	Beam
133	38	4.5	Left	31.2896	Beam
134	38	4.5	Right	-39.4526	Beam
135	44	4.5	Left	-39.4526	Beam