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Plant Location : **SERANG, BANTEN-INDONESIA**

Project Name : **FORMULATION & REPACKING PLANT**

Document Title : **ANALYSIS STRUCTURE HERBISIDA**

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1. BASIS OF CALCULATIO

1.1 CODES AND STANDARDS

SNI 03 1729 2002 - Tata cara perencanaan struktur baja untuk bangunan gedung

SNI 03 1727 1989 - Pedoman Perencanaan Pembebanan untuk Rumah dan Gedung

SNI-03-1726-2002 - Tata cara perencanaan ketahanan gempa untuk bangunan gedung

Peraturan Pembebanan Indonesia Untuk Gedung (1983)

1.2 MATERIALS AND STANDARDS

Steel Construction : JIS G3101 SS–400

Quality of Steel : Fy = 240 Mpa

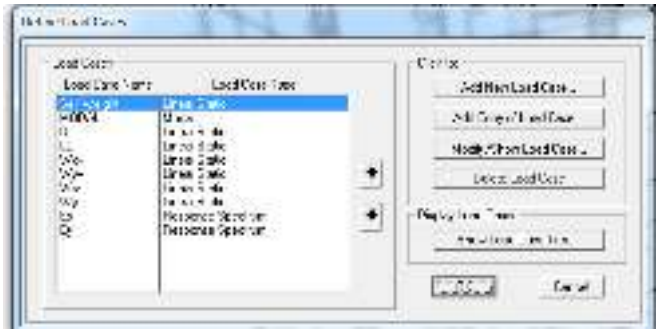
Steel Density : γsteel = 7850 kg/m^3 = 7.698E-05 N/m^3

1.3 WELDING

Welding electrode : AWS A5.1/D1.1 or JIS Z 3211

Quality of weld: AWS E70XX, Fy = 70 ksi

2. LOADING



2.1 DEAD LOAD

For model analysis, dead load are considered as selfweight and automaticaly computed by programs, selfweight factor = -1

Steel : γsteel = 7850 kg /m^3

2.2 LIVE LOAD

Live loads on Roof based on SNI state :

(2) Beban hidup pada atap dan/atau bagian atap yang tidak dapat dicapai dan dibebani oleh orang, harus diambil yang paling menentukan di antara dua macam beban berikut:

a. Beban terbagi rata per m^2 bidang datar berasal dari beban air hujan sebesar $(40 - 0{,}8\ \alpha)$ kg/m^2 di mana α adalah sudut kemiringan atap dalam derajat, dengan ketentuan bahwa beban tersebut tidak perlu diambil lebih besar dari 20 kg/m^2 dan tidak perlu ditinjau bila kemiringan atapnya adalah lebih besar dari 50^0.

b. Beban terpusat berasal dari seorang pekerja atau seorang pemadam kebakaran dengan peralatannya sebesar minimum 100 kg.

" It means that area of roof which unreachable and unloaded by people, have to be defined by one of these conditions :

*a. Distributed load per m2 from rain = (40-0,8*α) kg/m2), where α is slope roof degrees. In this case, load on roof is less than 20 kg/m2 and no need to reviewed if slope of roof moreover than 50◦.*

b. Point Load from people/fireman with their equipments, approximately 100 kg."

In this calculation,

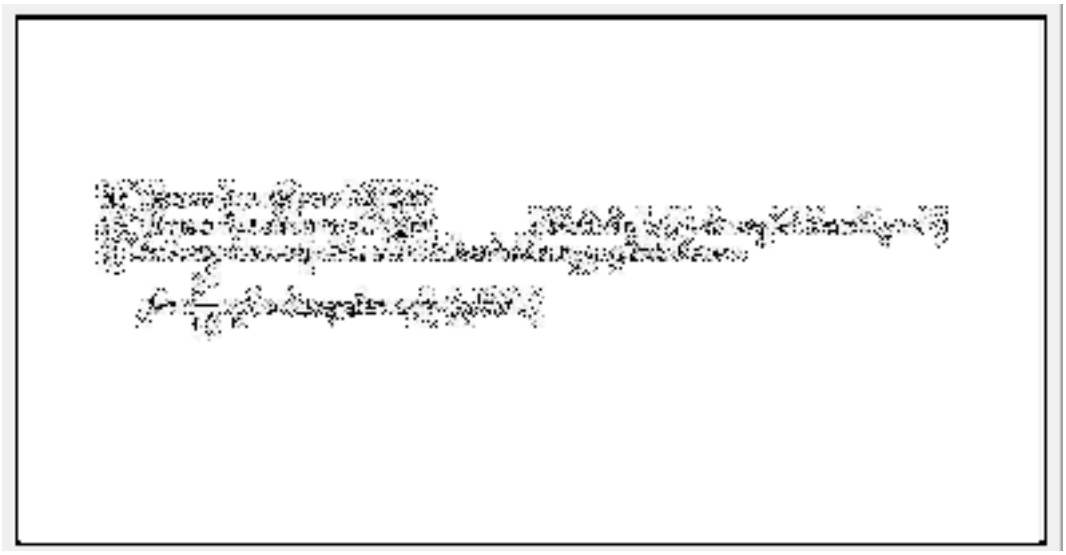
Live Loads on Roof is Rain Load = 20 kg/m2.

Live loads on platform (Checker Plate) : 2,5 kN/m^2

2.3 WIND LOAD

Wind pressure from structure refer to below :

A. Wind Load Pressure



" It means that :

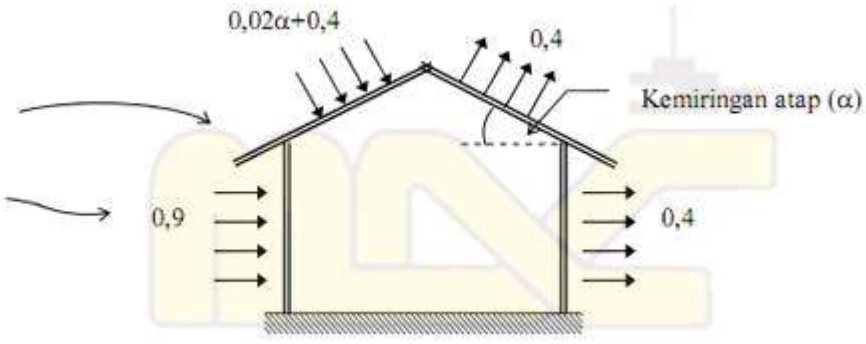
(1) Minimum Wind Pressure is 25 kg/m2

(2) Minimum Wind Pressure is 40 kg/m2 (if location close with coast and tolerance 5 km from coast)

(3) If Wind Pressure assumed more than (1) and (2) conditions, it will defined :

$P = V^2/16$ *; where is v = wind speed velocity (m/s) or (km/hr)."*

B. Wind Load Coefficient

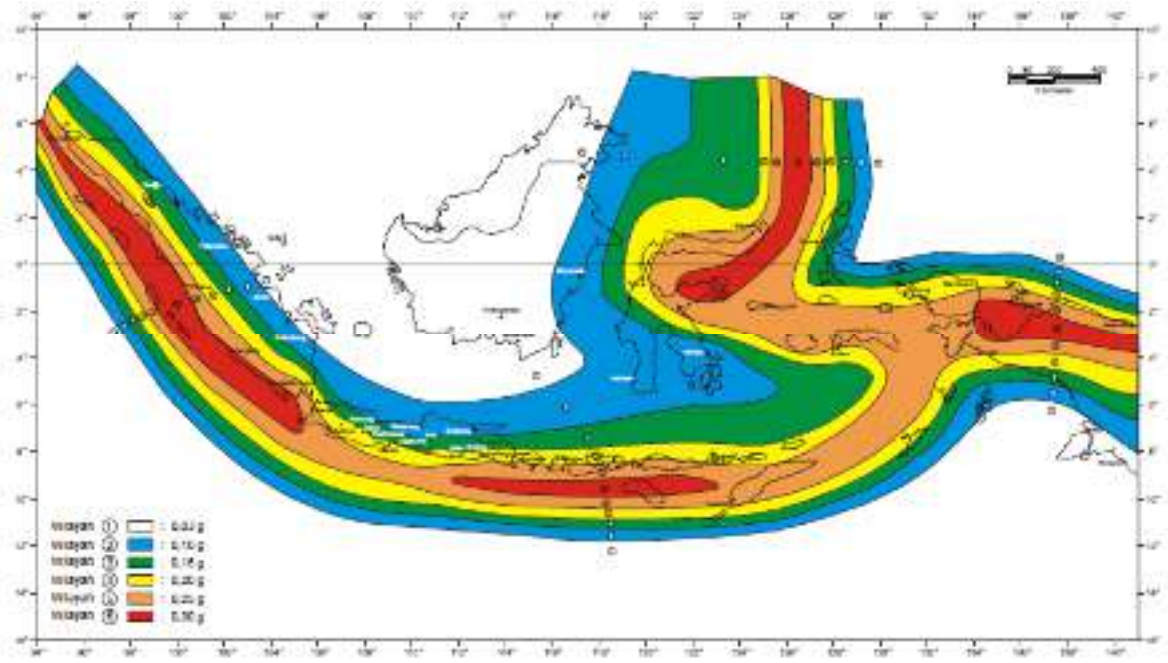


Where is "α" is slope roof

2.4 EARTHQUAKE LOAD

Earthqueke Zone

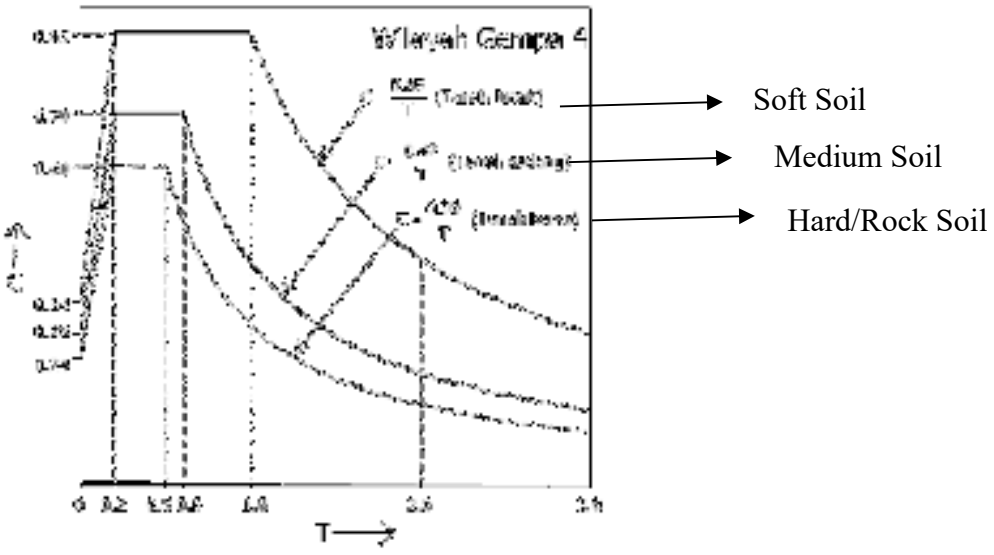
Location Suralaya ; Banten (About 100 km west of Jakarta, Indonesia)



Picture 1. Indonesia Earthquake Zone (SNI-03-1726-2002)

Coefficient Response Spectrum

Earthqueke Zone = Zone 4



Soil Classification = Medium Soil

Scale Factor

Importace Factor (I) = 1

Reduction Factor (R) = 4.5

Gravitational Acceleration = 9.81 m/s^2

Scale = $\frac{g \cdot I}{R}$ = 2.18

3. LOAD COMBINATION

Load Combination for Stell Structure Design (Ultimate Condition)

Group	SW	DL	LL	Wx+	Wy+	Wx-	Wy-	Ex	Ey
DSTL1	*1.4*	*1.4*							
DSTL2	*1.2*	*1.2*	*1.6*						
DSTL3	*1.2*	*1.2*	*0.5*	*1.3*					
DSTL4	*1.2*	*1.2*	*0.5*	*-1.3*					
DSTL5	*1.2*	*1.2*	*0.5*		*1.3*				
DSTL6	*1.2*	*1.2*	*0.5*		*-1.3*				
DSTL7	*1.2*	*1.2*	*0.5*			*1.3*			
DSTL8	*1.2*	*1.2*	*0.5*			*-1.3*			
DSTL9	*1.2*	*1.2*	*0.5*				*1.3*		
DSTL10	*1.2*	*1.2*	*0.5*				*-1.3*		
DSTL11	*1.2*	*1.2*	*0.5*					*1*	
DSTL12	*1.2*	*1.2*	*0.5*						*1*
DSTL13	*0.9*	*0.9*						*1*	
DSTL14	*0.9*	*0.9*							*1*
Defflection	*1.0*	*1.0*	*1.0*						

4. ALLOWABLE DEFLECTION

Maximum allowable deflection of beam shall be as specified in the following :

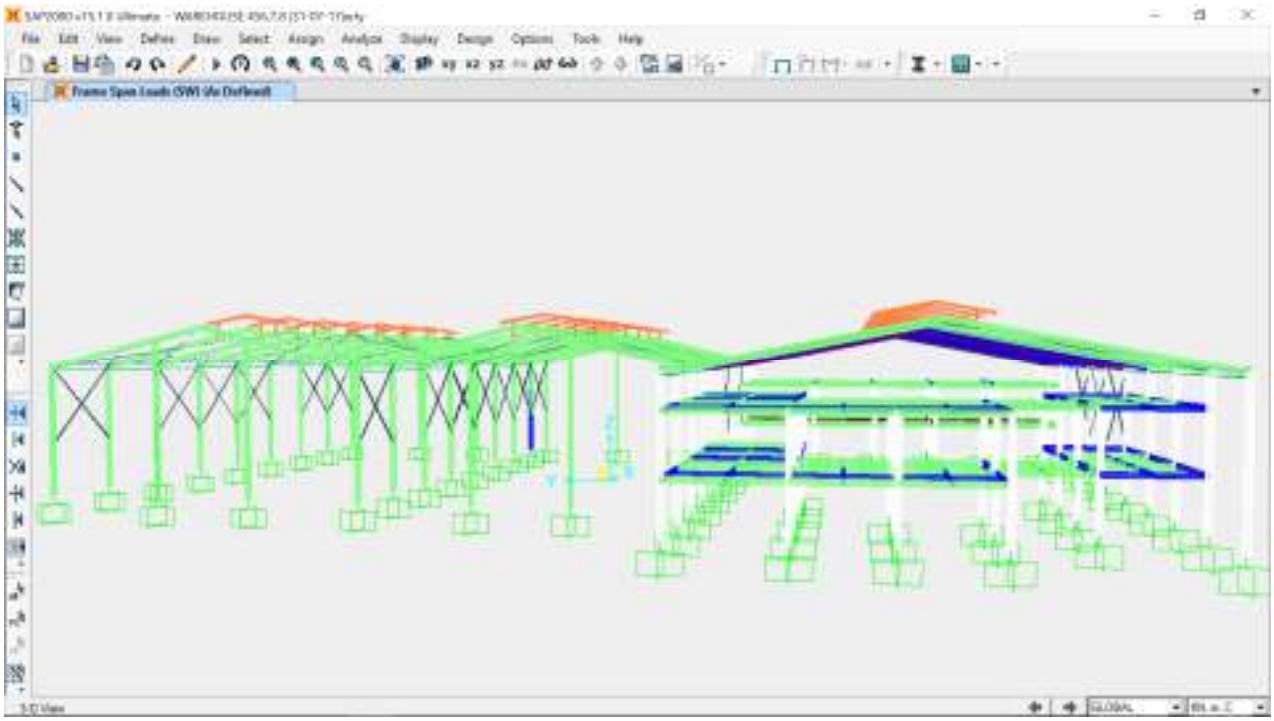
Table 2. Deflection Maximum (SNI-03-1729-2002)

Komponen struktur dengan beban tidak terfaktor	Beban tetap	Beban sementara
Balok pemikul dinding atau finishing yang getas	*L*/360	-
Balok biasa	*L*/240	-
Kolom dengan analisis orde pertama saja	*h*/500	*h*/200
Kolom dengan analisis orde kedua	*h*/300	*h*/200

Kantilever Beam L/150
Crane Girder L/500

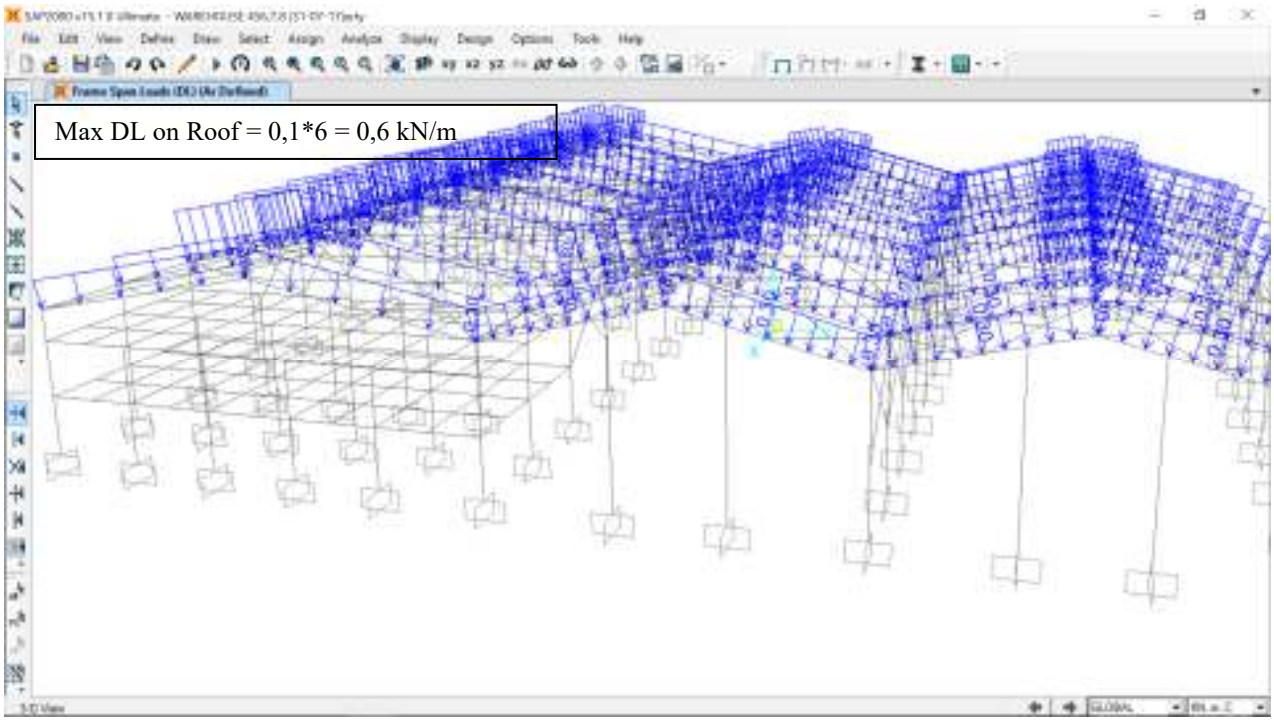
5. CALCULATION SHEET

Modelling 3D

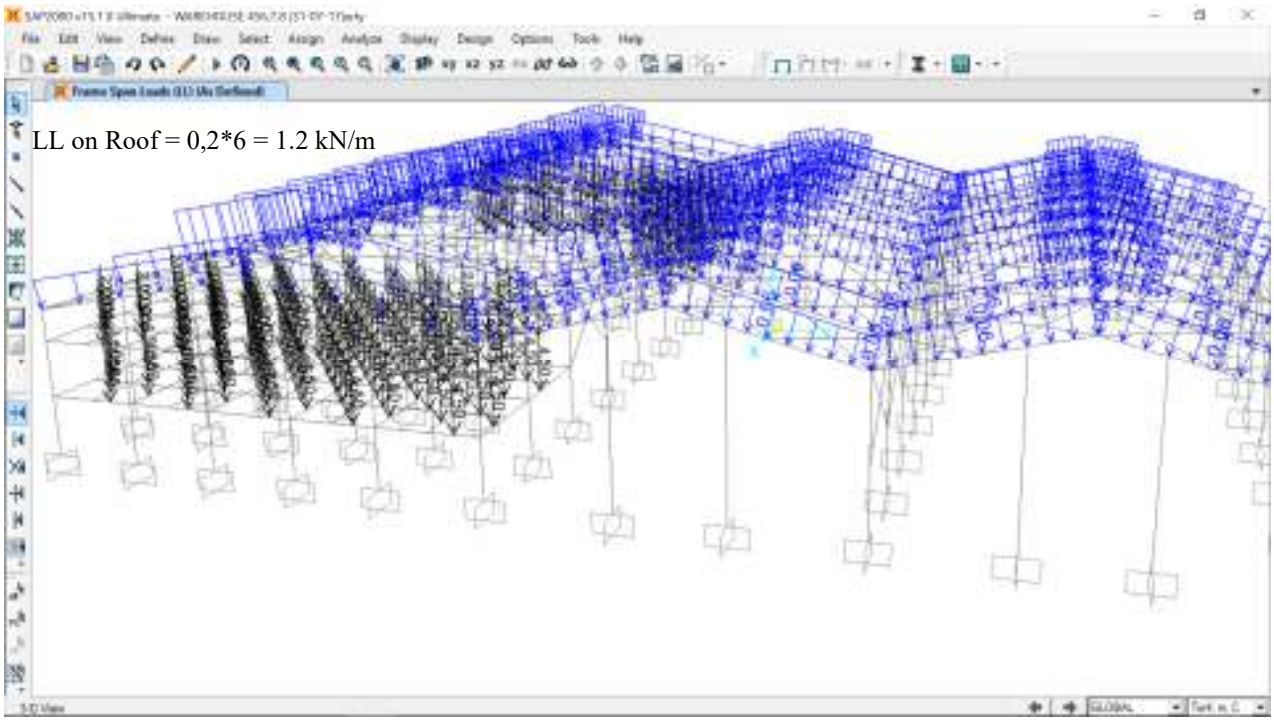


MODEL ANALYSIS STRUCTURE

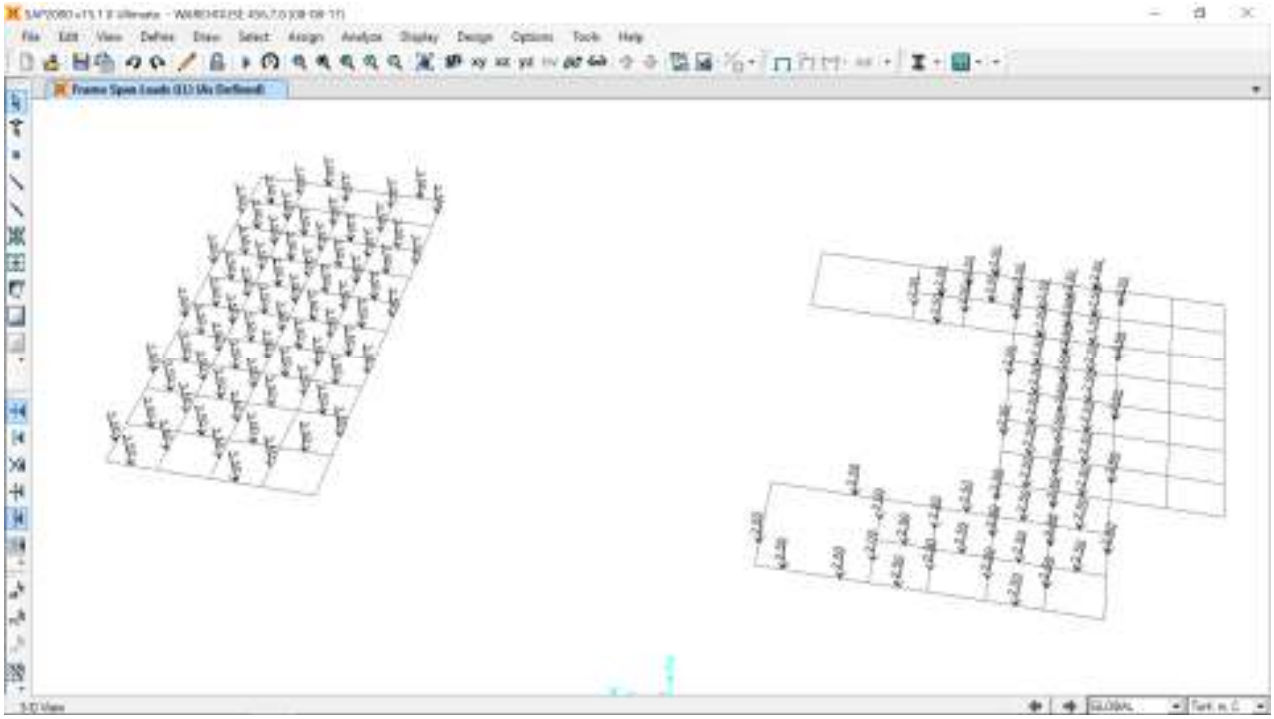
Dead Loading on Rafter



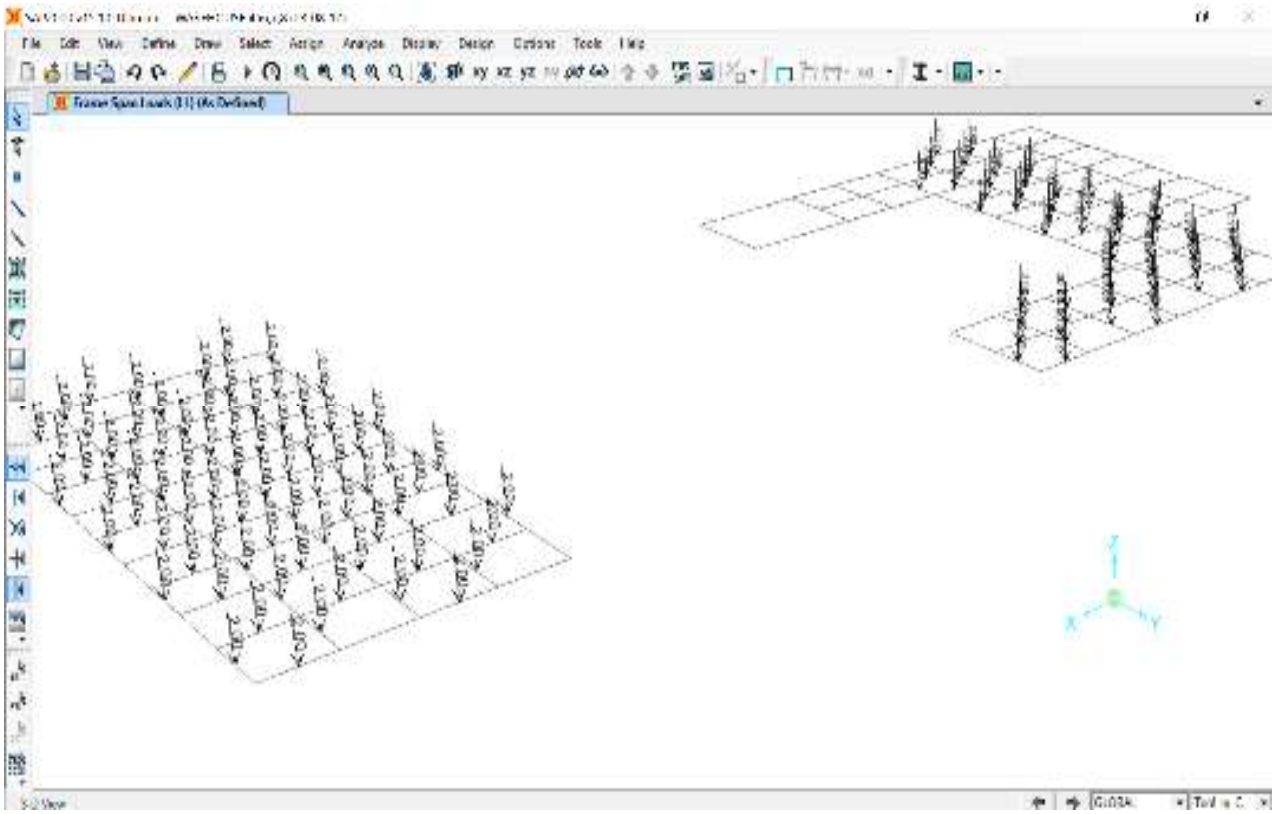
Live Load on Roof & Platform

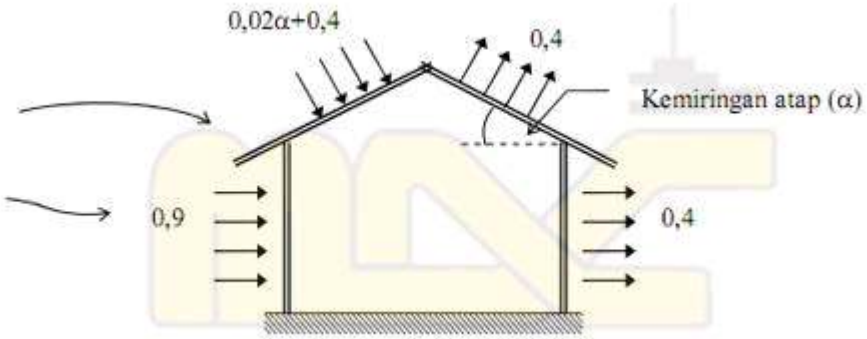


Live Load Platform Elv. 3.00



Live Load Platform Elv. 6.00



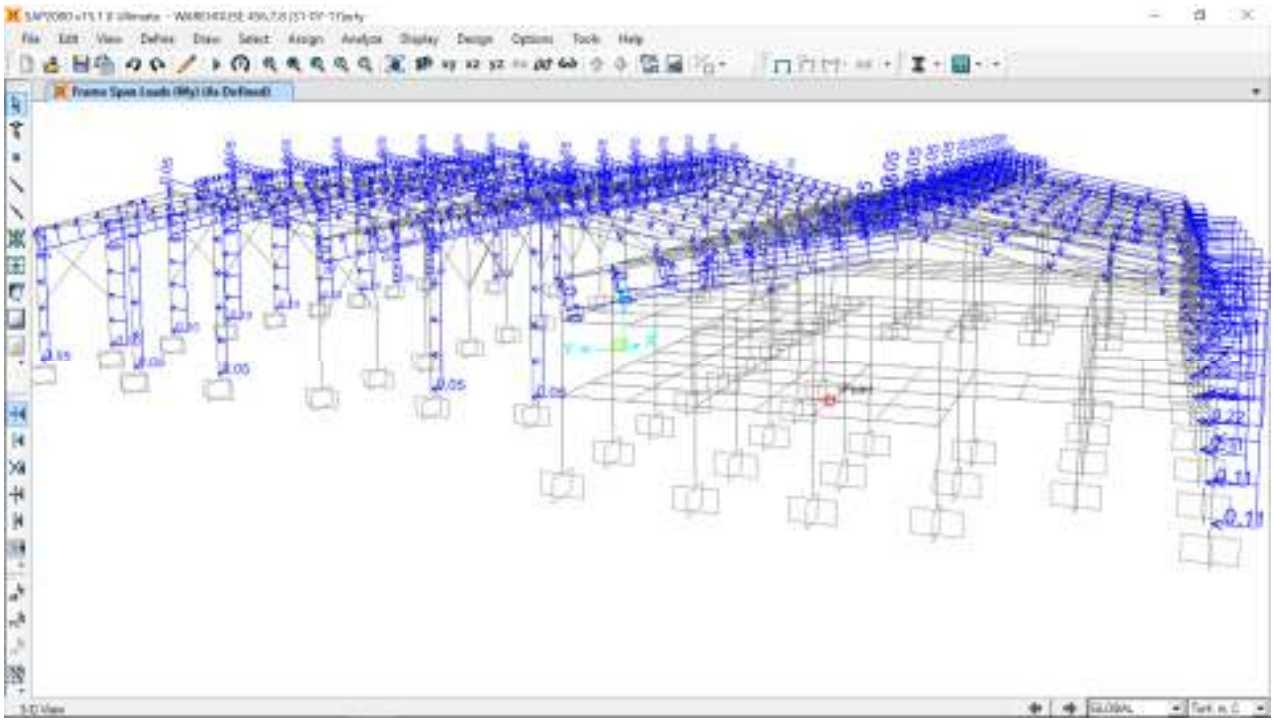


Wind Pressure : 40 kg/m^2 (0.4 kN/m^2)
Angle : 10° (0° ≤ α ≤ 20°)
Length of pressure area (B) : 5,5 m

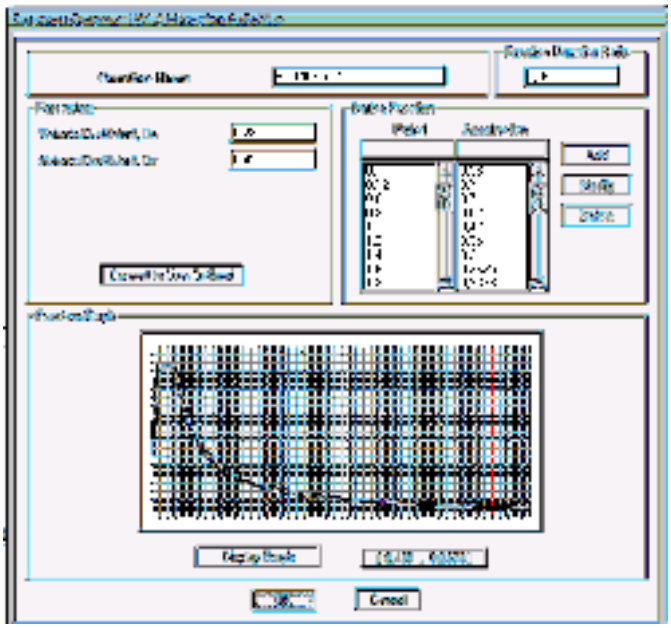
Wind Pressure for column =
Winward Pressure = 0,4 kN/m^2 x 6m x 0,9 = 2,16 kN/m
Leeward Pressure = 0,4 kN/m^2 x 6m x 0,4= 0,96 kN/m

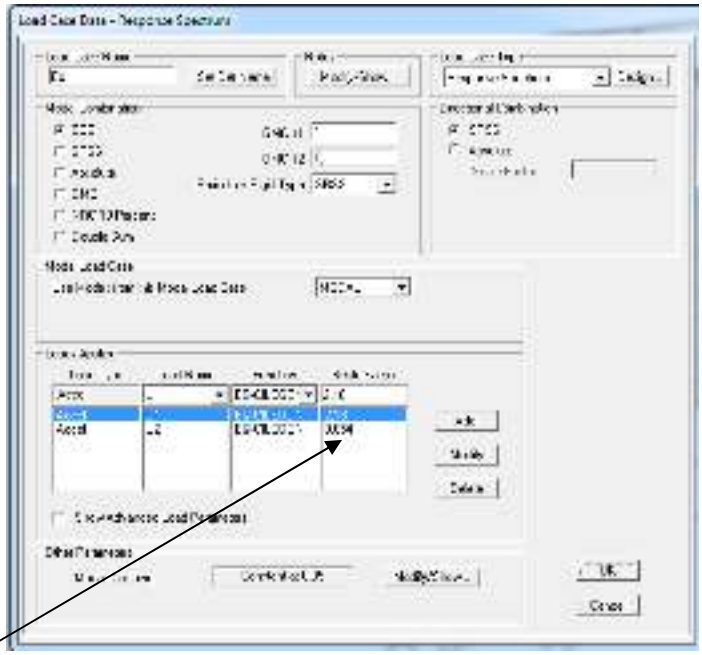
Wind Pressure for Roof =
Winward Pressure = 0,4 kN/m^2 *(0.02*10)-0,4)* 6m = -0,48 kN/m
Leeward Pressure = 0,4 kN/m^2 x 6 m x 0,4= 0,96 kN/m

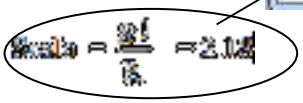
WIND LOAD Y+ DIRECTION



Earthquake Load





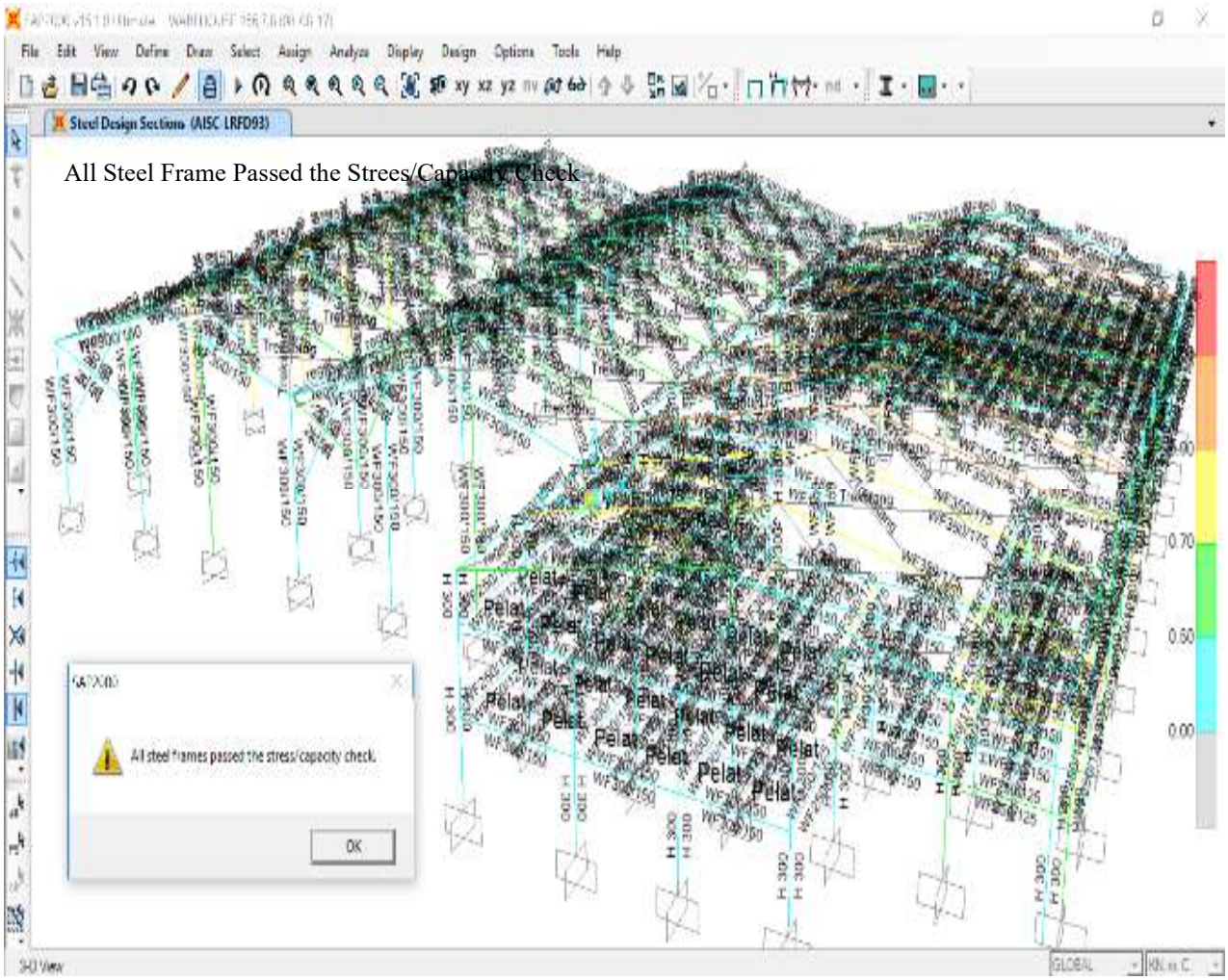


Note :

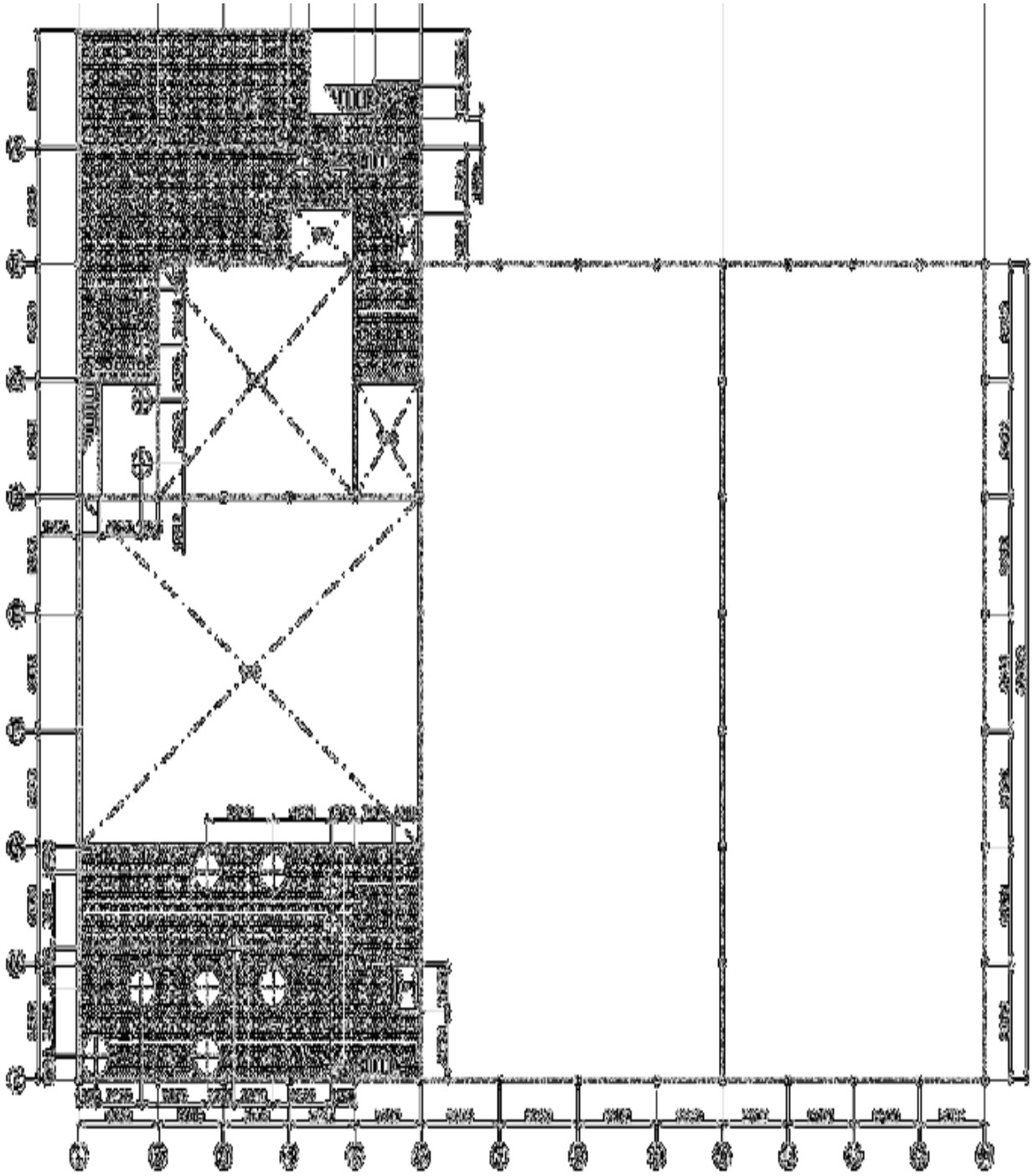
- For Values of members forces due to earthquake, please see steel summary data

STRESS RATIO & PROFILE

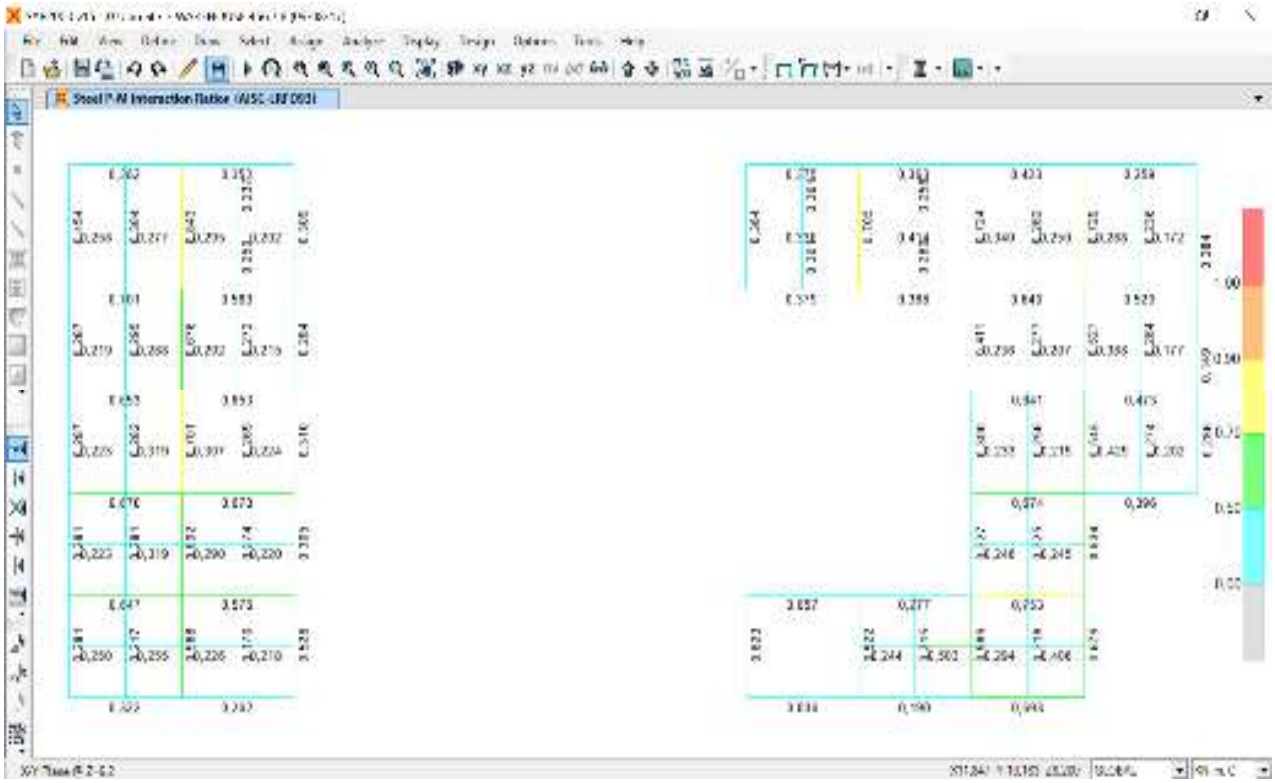
Overall checking stress ratio



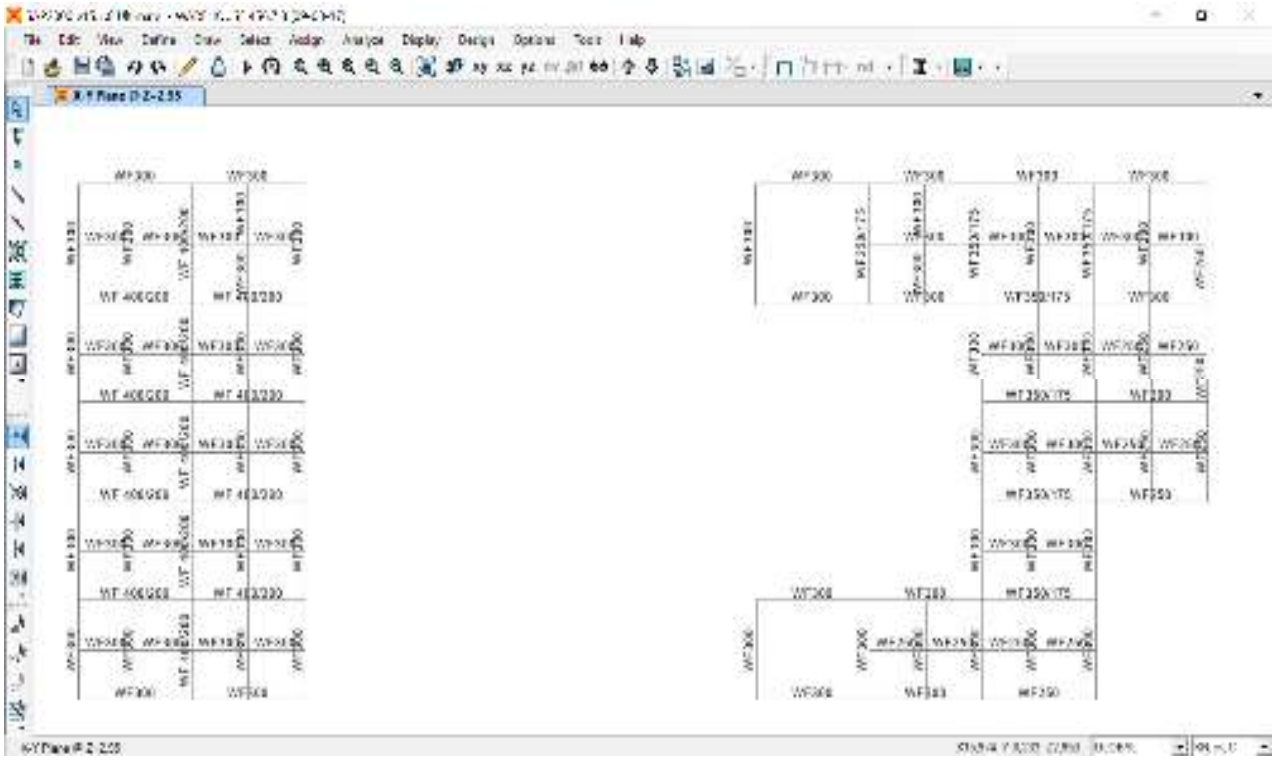
LAYOUT BUILDING



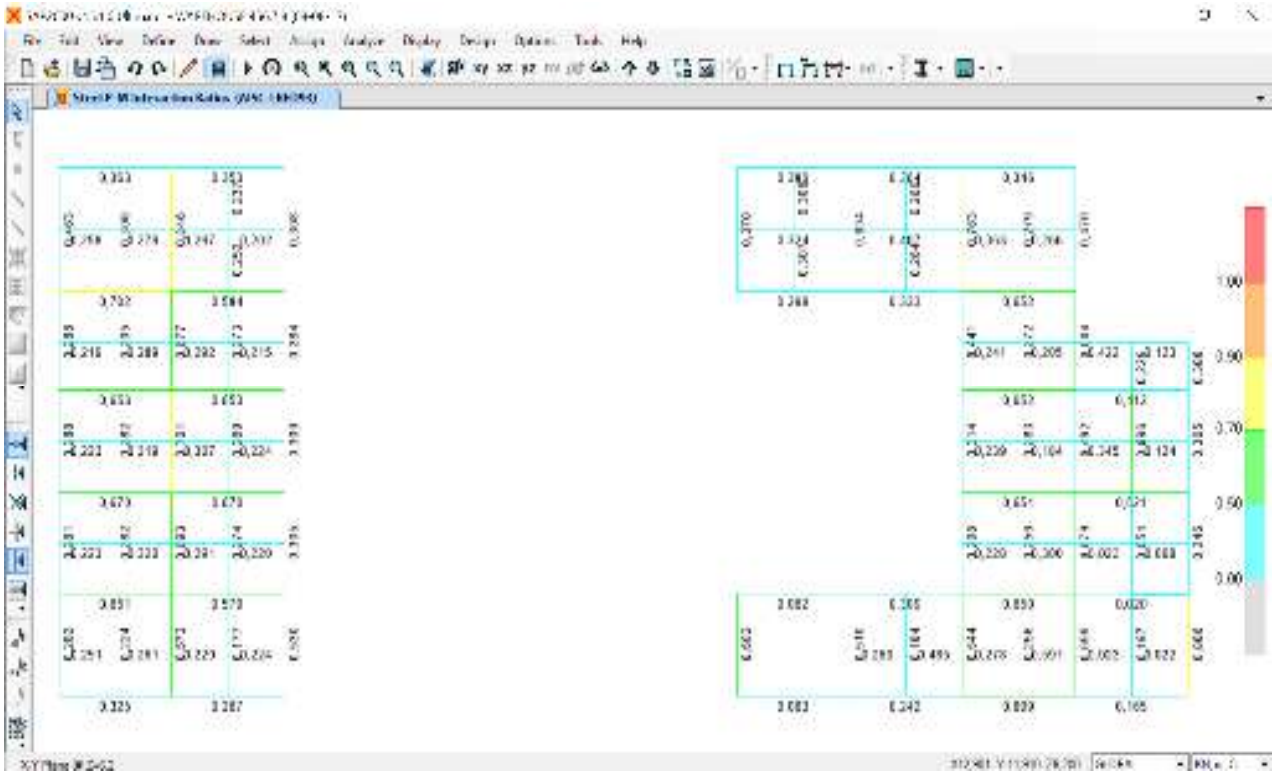
STRESS RATIO PLATFORM +3.00



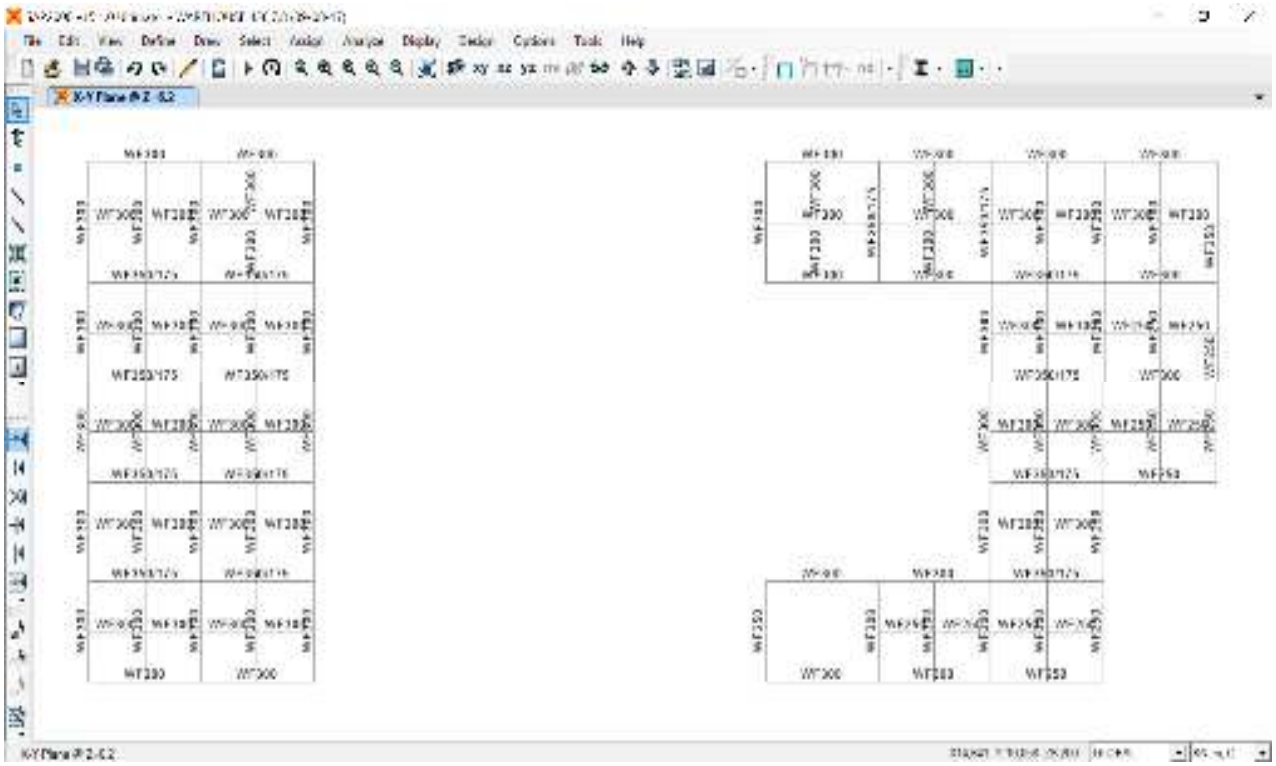
PROFILE MATERIAL PLATFORM +3.00



STRESS RATIO PLATFORM +7.00



PROFILE MATERIAL PLATFORM +7.00



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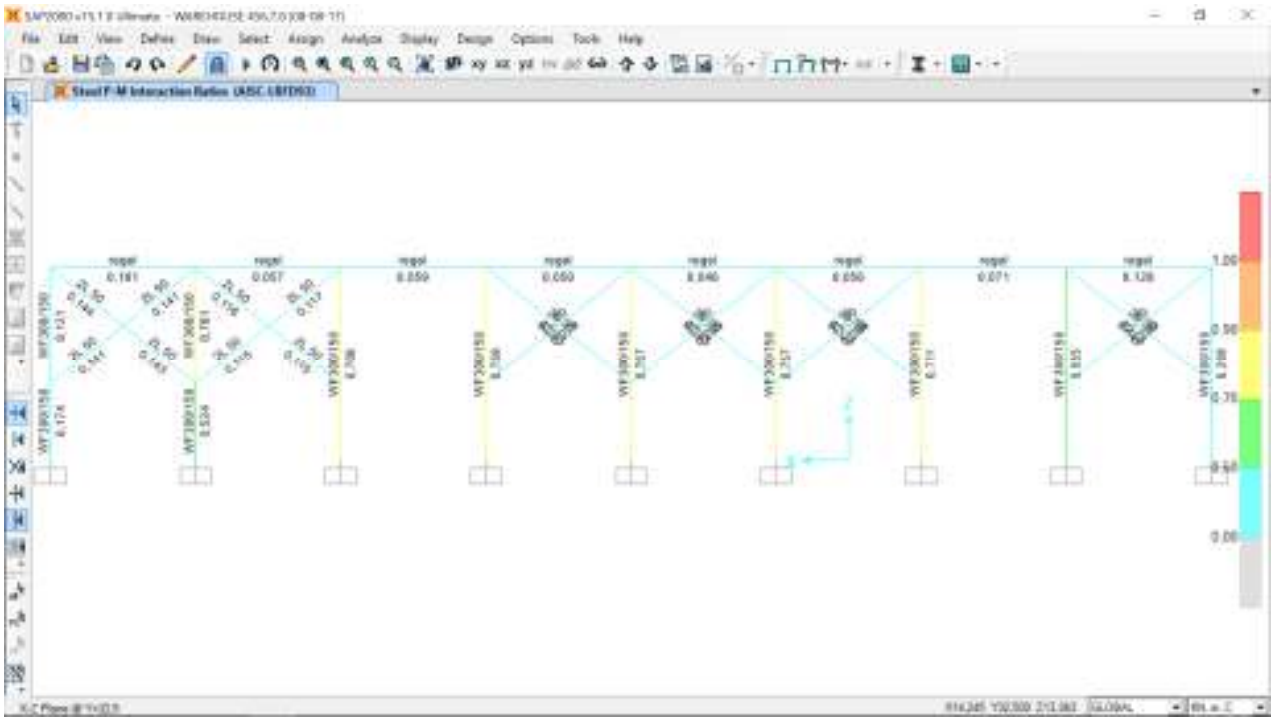

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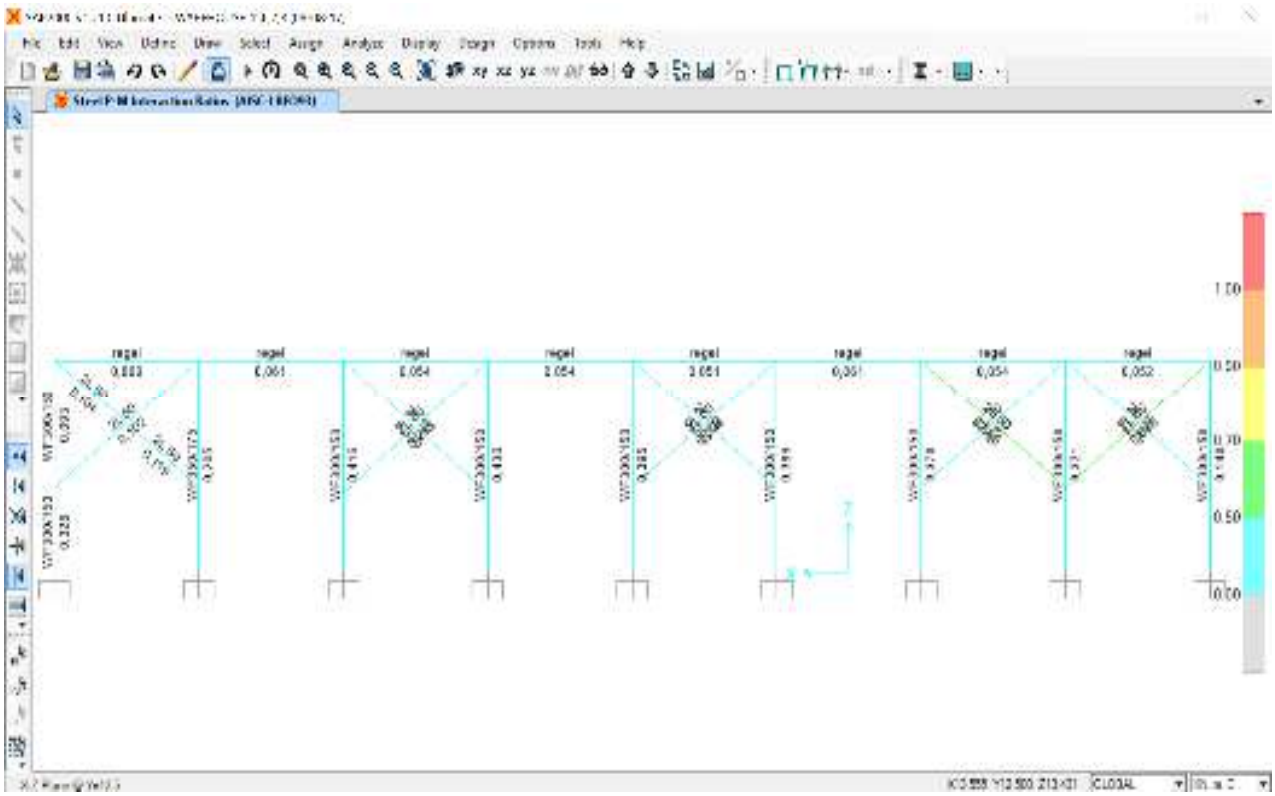

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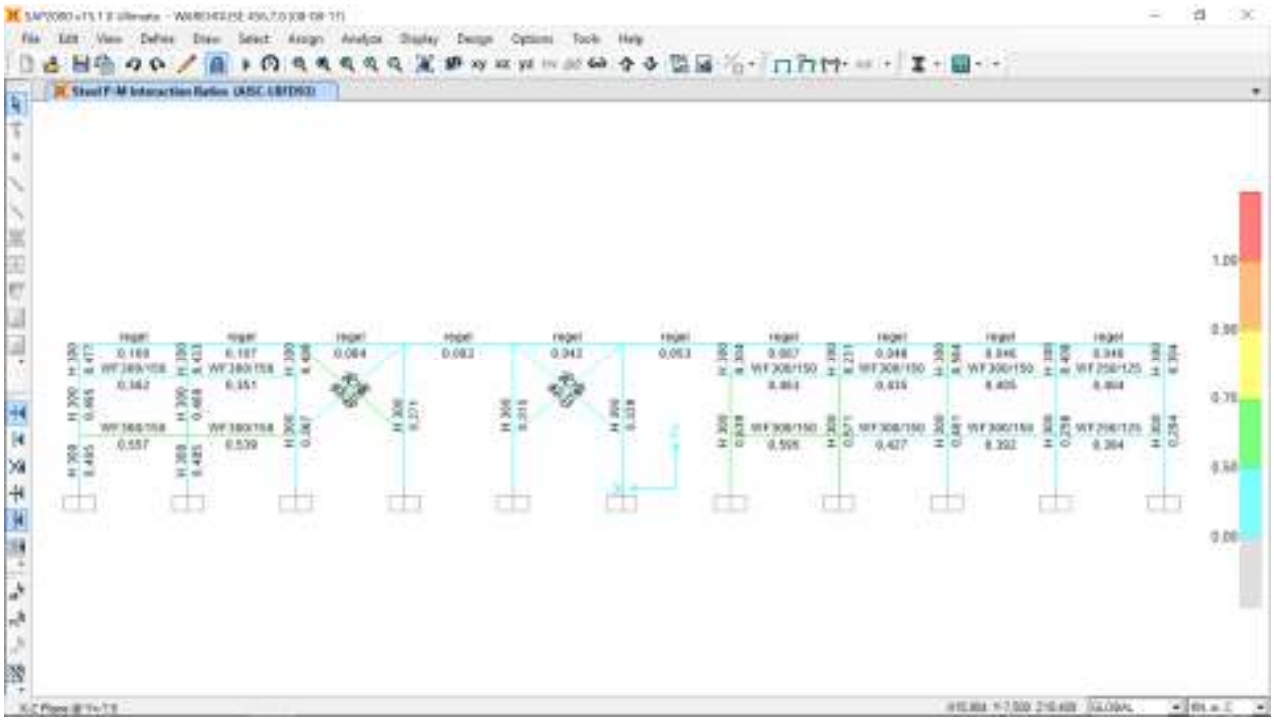
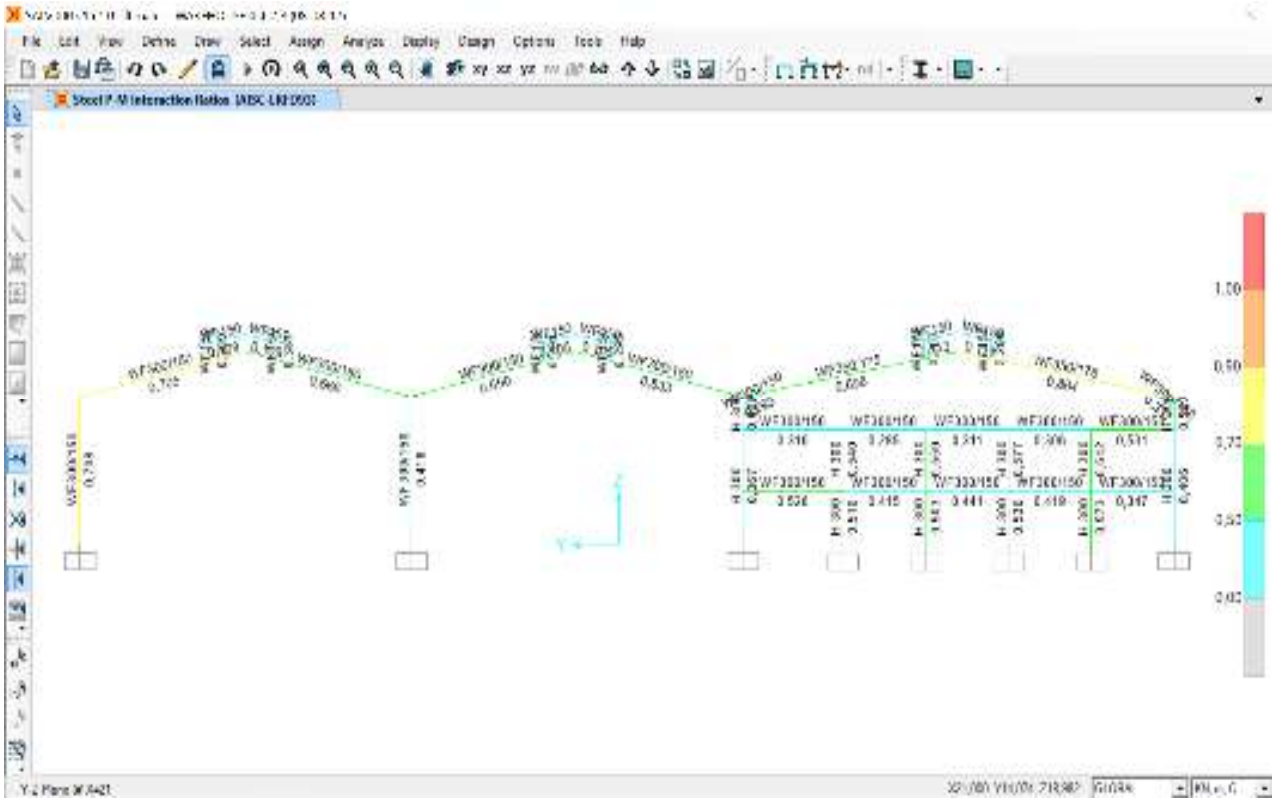
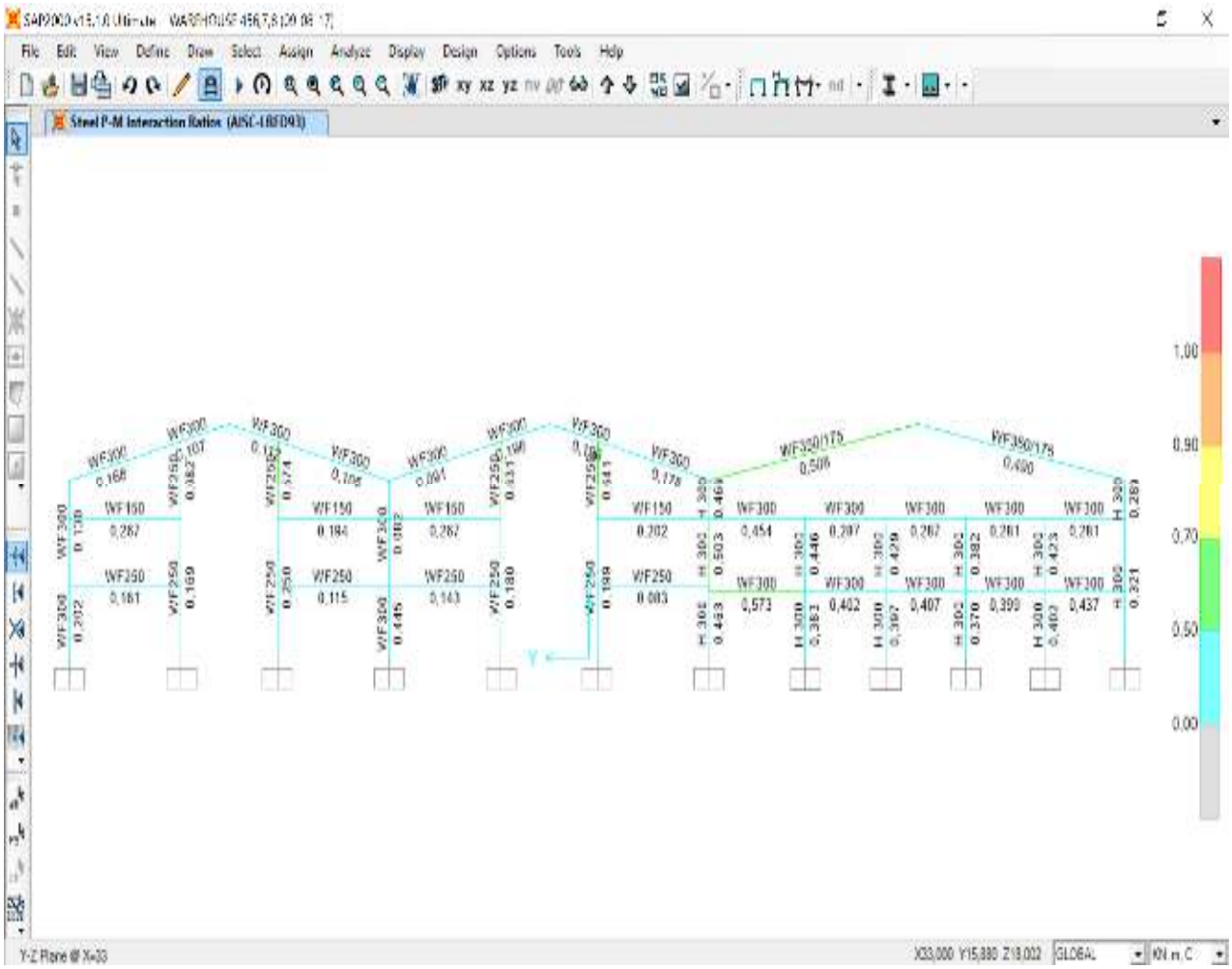


TYPICAL SECTION



GRID I


File Edit View Define Draw Select Assign Analyze Display Design Options Tools Help
Steel P-M Interaction Ratios (AISC-LRFD93)
1.00
0.90
0.70
0.50
0.00
Y-Z Plane @ X=33
GLOBAL
KN m C