Earthquake Safety Analysis of Masonry Historical Building

Case Study: Historical Konya Gazi High School

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Abstract. ~~SUMMARY~~

It is substantially significant to ~~protect~~ insulate historical structures, which are an important part of our culture, ~~against~~ for natural disasters such as earthquakes and to be transmitted to future generations. The structural behaviour of historical buildings ~~must be~~is difficult to ~~well known~~characterized ~~to protect such structures. In order to be able to determine how safe the historic buildings are against the earthquake effect,~~ it is necessary to determine the earthquake performance of the historical buildings in order to determine how safe the historical buildings are for the earthquake effect. Nowadays, the most commonly used method for the modelling and structural analysis of historical buildings systems with complex geometries is the finite element method.

In this study, Historical Konya Gazi High School was examined according to the present situation regarding the design and construction features with "Regulations on buildings to be built in earthquake regions" and structural analysis was performed in ETABS program. Graphs showing displacements, moments, shear forces and axial forces are used to interpret the results of the finite element analysis of the Historical Gazi High School. It has been informed about the stresses and damages that may be caused by any earthquake to this building, which has been serving the students for 97 years. It is aimed that this work will be a study to suggest a solution in terms of not losing ~~the our~~our historical values and delivering it to future generations.

Keywords: Earthquake, finite element methods, historical buildings

1. INTRODUCTION

Earthquakes cause damages and loss of lives in urban centres and cause significant losses in rural areas as well. Almost ~~all of the~~whole buildings in the countryside, and also a large part of the old buildings in the city centre are masonry buildings. In addition, many of the historical buildings were built as masonry, wood and a mixture of them. There is no regulation that can be used in analysing the structural systems of such buildings. Today, ~~because of the regulations used in the design of masonry buildings are prepared for new structures,~~ it is substantially difficult to use ~~these~~ current regulations in the study of historical structures ~~,~~because of these regulations used in the design of masonry buildings are prepared for new structures.

Analysis of masonry buildings is rather ~~exhausting~~ complicated compared to reinforced buildings. ~~Analysis made by package~~ Package programmes used to analyse ~~for~~ these ~~kind~~kinds~~s~~ of buildings ~~is~~ are in~~-~~adequate. In recent years, through the use of computer technology, plastic analysis method, ~~-~~which the nonlinear material properties and joints are taken into consideration, has become more and more widely used ~~from~~ than the classical analysis methods ~~on the analysis of~~ for masonry structures. There are two types of approaches in the modelling of masonry structures; micro modelling and macro modelling. ~~In the micro modelling, masonry~~ Masonry units composed of bricks and mortar are modelled by separately in the micro modelling. Therefore, in the micro modelling, the mechanical properties of the materials and binding materials of the structure need to be ~~known~~

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characterized exactly. Micro modelling, which usually involves a large computational load, is suitable for local analysis, but is not preferred for large-scale analysis. (Dabanli, 2008). Applications in this model are done by using finite element methods~~s~~, discrete elements and limit analysis. In the macro model used for plastic analysis, the mechanical material properties of structure are defined by assuming as if the masonry structure materials are homogeneous (~~Çaktı~~ Caktı et al., 2013). The ~~finite element method~~FEM is generally used in the structural analysis of masonry structures. In this analytical method, the structure is modelled and analysed by separating it into finite elements in an appropriate number with regard to purpose of analysis. Package programs such as ETABS and SAP2000 are widely used for the structural analysis done by using ~~finite element methods.~~FEM. In this study, the earthquake safety of the historical Konya Gazi High School was investigated according to the present situation. This article provides information about the stresses and damages that may reveal due to any earthquake in this building. ~~which has been serving the students for 97 years~~ ~~. So that, t~~This study will suggest about protection of our historical values and delivering them to future generations. Earthquake safety of the building was investigated by the ETABS programme which is one of the computer programmes used for nonlinear static analysis. The ETABS program is software of the CSI Company and is especially designed for 3D static analysis of buildings. ~~Structural analysis is done by using finite element method in the program.~~

2. CASE STUDY: HISTORICAL KONYA GAZI HIGH SCHOOL

2.1. I~~nformation about the building~~dentity of the Structure

The architecture of Konya Gazi High School, which is the subject of this study, is Mimar Muzaffer. The construction of the building started in 1914 and was completed in 1917. The building, which was opened in 1917, was used as Military High School until 1923. ~~It was used as~~The name of the school was “Dar'ül Muallim” between 1923-1934, “Konya Idadi” between 1934 and 1972 and Konya High School until 1972. The layout plan of Gazi High School is given in Figure 2.1.

Figure ~~-~~2.1. The layout plan of Gazi High School

2.2. Architectural features

The historical Gazi High School is located in Konya city ~~center~~centre~~, at the intersection of Atatürk Street and Amber Reis Street~~. ~~The building is positioned the south of the school area.~~ There are ~~other~~ schoolhouse, buildings for sports hall, laboratories and conference halls in the school garden. The observed building is positioned the south of the school area. The empty space in the middle of the~~se three~~ buildings is used as a sports and ceremonial space. ~~Because the building is a historical building, there~~ There is no architectural or static project of this historical ~~e~~ building. For this reason, the architectural project of the building was made by taking the relievo. Konya Gazi high school has a basement floor, ground floor and two normal floors. The height of the floors differs from floor to floor. Basement and ground floor heights are 5~~,~~.00 m, first floor and second floor

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heights are 4~~,~~.50 m. In general, the condition of the building is good although some of the bearing walls have local cracks, deterioration of mortar or stone, roof elements.

2.3. Structural System and Material Properties

The building is not exactly symmetric and also is built with masonry structural system. The form of the structural system varies with each floor. It was observed that rubble stone was used as material in the walls~~. It is thought that the rubble stones used in this structure are brought from the Sille region in Konya~~. When the walls of the structural system elements are examined, it is observed that the basement wall thickness is 90 cm, the ground floor wall thickness is 80 cm, the first floor wall thickness is 75 cm and the second floor wall thickness is 70 cm. It is known that the second floor of the building was rebuilt ~~with renovation~~for restoration, but it could not be verified because there were not enough resources.~~.~~ The basement floor, the ground floor and the second floor slabs are not visible from the coatings. However, it has been observed that horizontal beams were used in the first story. Figure 2.2 shows the image of the first floor slab.

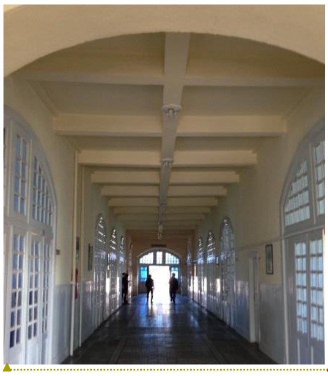

Figure 2.2. Horizontal beams at the ~~first~~ 1^{st} floor

~~3.~~2.4. Structural Modelling~~ANALYSIS PROGRAMME~~

The program used to static analysis of building is the software ETABS 2015, a specialist program for the three dimensional analysis and design of building systems. Finite Element Method model was formed to calculate the response of the structure with this program. The finite element mesh shows the real mass distribution for the ideal concentration of the masses at the nodes.

~~The ETABS program is one of the computer programs used for nonlinear static analysis. The program is software of CSI Company with ISO9001 quality certification and is specially designed for 3D static analysis of building type structures.~~

~~The CSI Company was founded in 1975 and is the manufacturer of programs, which are used in more than 160 countries worldwide. This program is also used in project designs of buildings such as Taipei Finance Centre in Taiwan, One World Trade Centre in New York and Beijing National Stadium. ETABS program analyses by using the finite element method (Sırlıbaş, 2013).~~

~~3.1. Modelling and analysis in ETABS 2015 program~~

~~Structural Modelling~~

~~In order to assessment the earthquake performance of the building, the~~DBYBHY, 2007 (The Regulations on Buildings to be built~~done~~ in Earthquake Regions) ~~(DBYBHY, 2007)~~ was followed in order to assessment the earthquake performance of the building. ~~.~~However, FEMA 356 (Prestandard and Commentary for Seismic Rehabilitation of Buildings) regulation is used in cases where our current earthquake regulations may be

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insufficient. ~~First of all, axes were determined on the floor plans of the building while modelling was doing.~~ Figure 2.3~~3.1~~ shows the axes of the floor plan in the AutoCAD program.

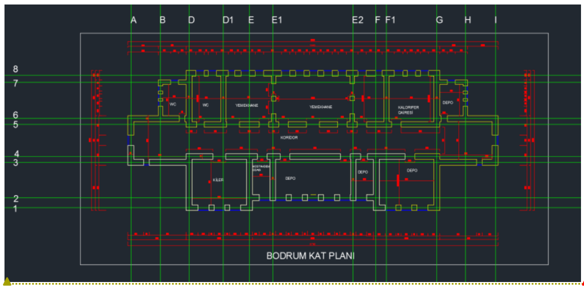

Figure 2.3~~3.1~~. Axes in the basement floor plan

~~Afterwards axes were determined in the ETABS program and the elements coming from those axes were modelled.~~ In literature, macro and micro finite element models can be shown as advanced modelling techniques of masonry structures. In the scope of this study, the structural analysis was carried out with the macro model of the finite element method created by ETABS 2015 software. The front and rear front of the building is shown in Figure 2.4~~3.2.~~

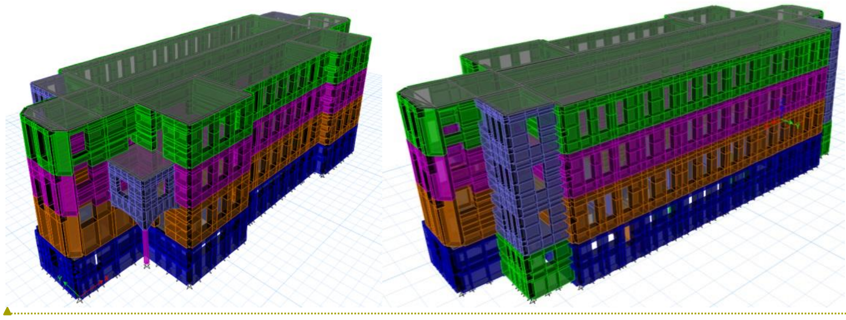

Figure 2.4~~3.2~~. Front and rear front of the building

Static and dynamic loads were taken into account for the analysis of the building. Weight of the materials, permanent and live-loads were added for static loads part. Floors and roofs were considered as dead loads.

The calculation of the Earthquake ~~forces~~Loads

The parameters used in the calculation of earthquake forces are;

- Coefficient of Earthquake Zone (A_0)= 0.1 (IV. Region)
- Ground Class: Unpredicted (S(T)= 2.5 according to DBYBHY-2007)
- Coefficient of Construction Importance (I) = 1.0
    - The conditions given in the seventh section of the earthquake regulations are considered on the determination of earthquake performance of existing or reinforced structures. According to the regulation, the coefficient of building importance is taken 1 in the new school buildings projects.
- Coefficient of Structural System (R)= 2
- Participation Coefficient of Live Load (n) = 0.6 (School)

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Equivalent Seismic Load was chosen as the method of earthquake analysis. Equivalent Seismic Load is defined as the user coefficient in ETABS. The loads are defined separately using positive and negative eccentricity for both X and Y directions.

$C = A_0 \times I \times \frac{S(T)}{R} = 0\cancel{,}.125$ Eq.(1)

In the considered earthquake direction, the seismic mass (wi) to be used in calculating the earthquake loads of the building is given on DBYBHY 2007 as;

wi=gi+nqi Eq. (2)

Here, the live load participation coefficient is given in Table 2~~3~~.1. Since the building is a school building, n is taken as 0.6. Accordingly, seismic mass will affect the structure is defined as G + 0.6Q according to the regulation. Figure 2.5~~3.3~~ shows the definition of the seismic mass defined as G + 0.6Q according to the regulation in program.

Table 2~~3~~.1. Live load participation coefficient (DBYBHY, 2007)

~~Binanın Kullanım Amacı~~Purpose of Building use	***n***
~~Depo, antrepo, vb.~~Warehouse, Storehouse etc.	0~~,~~.80
School, student dormitory, sports facility, cinema, theater, concert hall, garage, restaurants, shops, etc.~~Okul, öğrenci yurdu, spor tesisi, sinema, tiyatro, konser salonu, garaj, lokanta, mağaza, vb.~~	0~~,~~.60
Residential, office, hotel, hospital, etc.~~Konut, işyeri, otel, hastane, vb.~~	0~~,~~.30

~~Figure 3.3 shows the definition of the seismic mass defined as G + 0.6Q according to the regulation in program.~~

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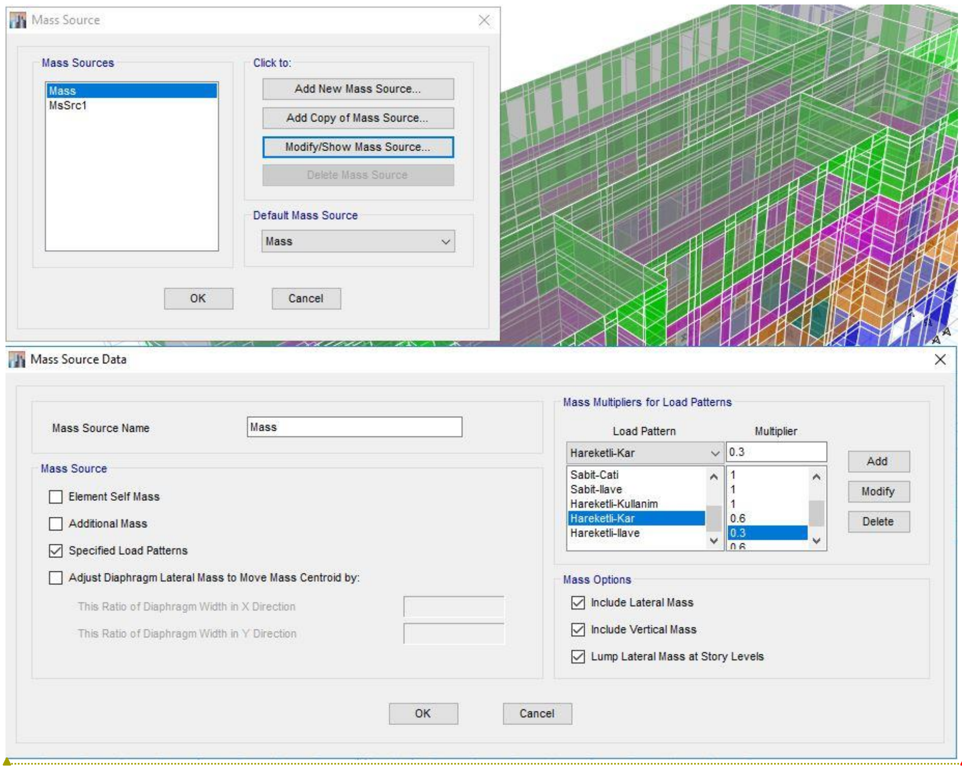

Figure 2.5~~3.3~~. Definition of seismic mass

Vertical Loads

The vertical loads affecting the building are shown in Table 2~~3~~.2 as dead and live loads. Vertical loads were defined as linear load on horizontal beams and distributed load on the slabs. Hereby, the unit volume of the masonry walls in the building is taken as 1800 kg/m^3. For Floor, secondary wall and dead load of roof, the predicted load values were examined in place of the building were taken. Live and snow load are taken according to the values given in TS 498 (Turkish Standards).

Table 2~~3~~**.2.** Equivalent earthquake load values

~~Yükleme Adı~~Load Name	**~~Yükleme Tipi~~Type of Load**	**~~Değer~~Load**
~~Sabit~~Dead-~~Kendi~~Weight	Weights of Structural Elements~~Yapısal Elemanların Kendi Ağırlıkları~~	1800 kg/m^3
~~Sabit~~Dead-~~Kaplama~~Surfacing	Floor Covering Loads~~Döşeme Üzeri Kaplama Yükleri~~	100 kg/m^2
~~Sabit~~Dead-~~Tali Duvar~~Secondary wall	~~Taşıyıcı Olmayan Duvar Yükleri~~Non-Bearing Wall Loads	300 kg/m^2
~~Sabit- Çatı~~Dead-Roof	~~Çatı Sabit Yükü~~Weight of Roof	200 kg/m^2
~~Hareketli- Kullanim~~Live	~~TS 498 Hareketli Yük~~Live Load (TS498)	350 kg/m^2 ve 500 kg/m^2
~~Hareketli- Kar~~Live-Snow	Snow Load for Konya Region (TS498)~~TS 498 Konya Bölgesi Kar Yükü~~	100 /m^2

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The load combinations used for stress control of the beam walls are derived in accordance with the DBYBHY and TS 500 standards.

Definition of Materials and ~~structural~~ Structural ~~sections~~Sections

The walls of the building are constructed with shell elements that allow the formation of finite elements. Critical points are divided into shell elements for creating finite elements (Mesh). Meshes for each element in critical points are by the program itself. Figure 2.6~~3.4~~ shows the definition of a wall of 80 cm thickness on the ground floor of the building.

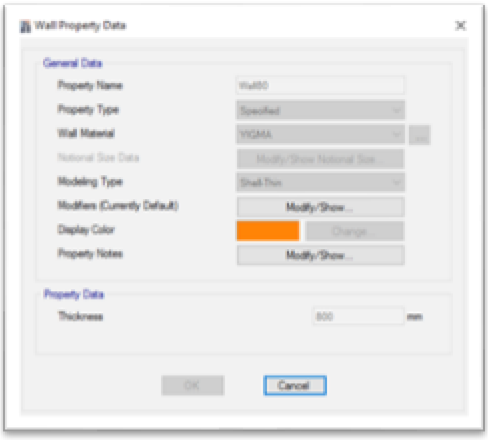

Figure 2.6~~3.4~~. Typical definition of a 80 cm thickness wall on the ground floor

Floor slabs are also modelled with shell elements to create a diaphragm effect. Figure 3.5 shows the names of the internal forces of the shell elements. It is also shown the stress of the plane shell elements. In addition, plane shell elements show to stresses. In any element of the model, stress values at any angle can be converted to principle stresses. The maximum shear stresses are calculated as shown in Figure 2.7.~~3.5.~~

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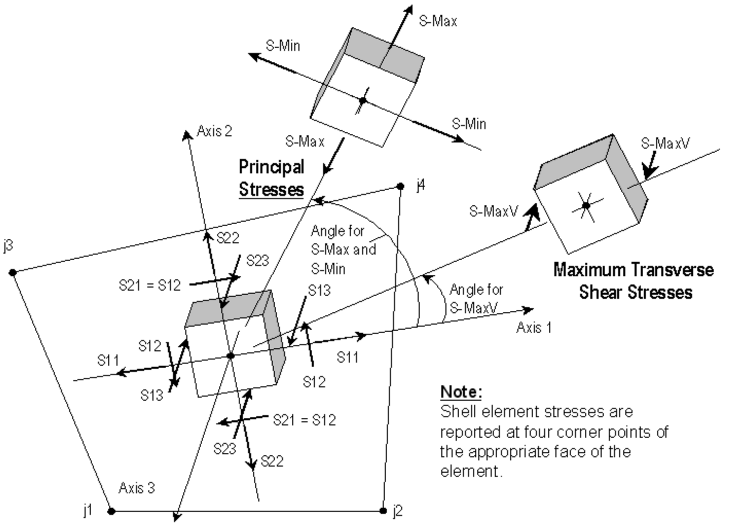

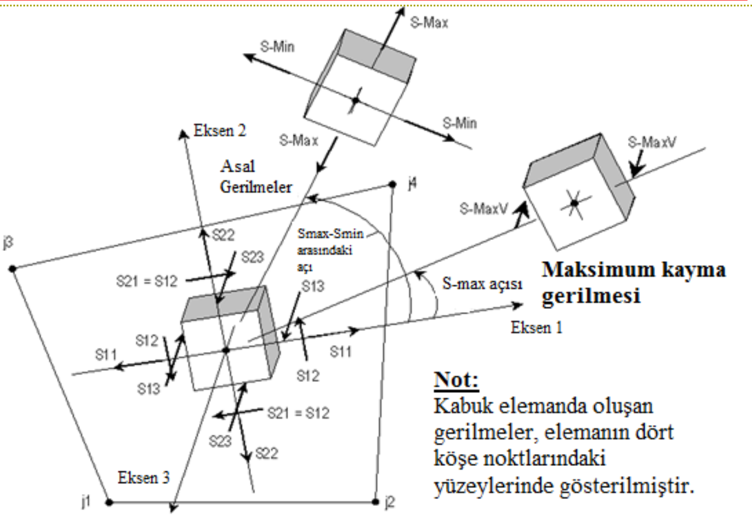

Figure 2.7.~~3.5.~~ Principal axes and stress directions of shell elements (Dabanlı, 2008)

In describing the masonry wall material of the masonry, the Elasticity Module of the masonry units used in ~~the construction of the masonry~~the building ~~according to the regulations~~ is given as Ed = 200fd (DBYBHY2007), which is 200 times the character pressure resistance of the material. However, in the 2016 Earthquake Draft Regulation, the modulus of elasticity modulus of the masonry wall (if not tested) is 750 times the characteristic compressive strength. According to the literature, since the value of 200fd is seen as a small value, the elasticity module is taken as 750 times of the character pressure resistance.

According to this;

E_{wall}= 750fk

E_{wall}=750×1~~,~~.2=900 MPa

The wall shift module is limited to 40% of the elasticity module. Here under;

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$$G_{duvar} = \frac{E}{2\times(1+\gamma)} = \frac{900}{2\times(1+0.25)} = 360\ MPa$$

$$G_{duvar} = \frac{E}{2\times(1+\gamma)} = \frac{900}{2\times(1+0{,}25)} = 360\ Mpa$$

In this equation, E is the modulus of elasticity, and γ is the poisson ratio and is taken as 0.25. The values obtained in the framework of these rules are listed below.

- fk = 1~~,~~.2 MPa (Characteristic Pressure Resistance-DBYBHY 2007)
- E_{wall}= 900 MPa (Elasticity Module)
- G_{wall} = 360 MPa (Shear Module)

~~In the determination of material properties, first the items of~~ DBYBHY 2007 ~~were~~was followed in the determination of material properties. However, the modulus of elasticity ~~of the~~ in DBYBHY is very low because it defines the modulus of elasticity as 200~~ *~~ fd. In this case, it has been found that the structural system resistance falls and accordingly there is a decrease in internal forces (stresses). Figure 2.8~~3.6~~ shows the menu showing material properties in ETABS program.

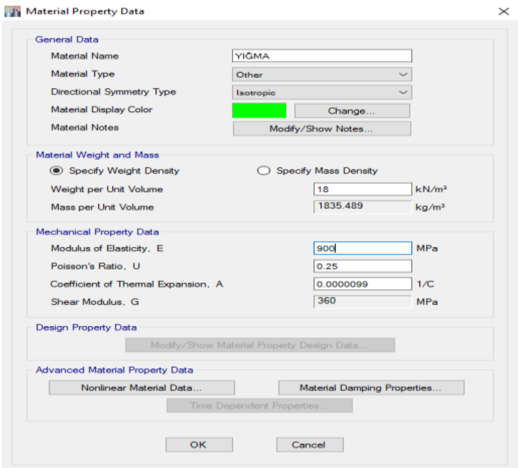

Figure 2.8.~~3.6.~~ Material properties

2.5. STRUCTURAL ANALYSIS

Structural analysis for Finite Element Model of the building is done with linear analyse by using ETABS program. The seismic analysis of the structure studied in this article, is done by using Equivalent Earthquake Load Method as described in the Turkish Codes-2007. Mode shapes of the building have been obtained by modal analysis approach using ETABS program. Modal analysis was performed in 12 modes with Eigen Vectors to determine free vibration periods and mode shapes of the building.

~~4.~~3. RESULTS

3~~4~~.1. Modal analysis results

Modal analysis, known as eigen-value analysis, is an analysis used to determine free vibration periods and mode shapes of a structure. Free vibration periods and modes can be determined by using the mass and stiffness matrices~~ of the building system~~. Modal analysis was performed with the ~~Etabs~~ ETABS program of the ~~finite element model~~FEM~~ of the historical Konya Gazi High School~~. Modal analysis was performed in 12 modes with Eigen Vectors. Vibration in modal form pertaining to a free vibration period implies how much of the total mass

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of the structure influences and incorporates into the resonance motion by the mass participation rate. ~~In the earthquake regulation,~~ Aa ~~lower~~ minimum limit is given for the sum of modal masses in the earthquake regulation.

According to the regulation, it is stated that the number of sufficient vibration modes in each of the x and y earthquake directions, will be determined according to the rule that the sum of the active calculated masses for each mode is never less than 90% of the total building mass. However, if fewer modes are used in the analysis of historical buildings, it is very difficult to catch this limit. As a result of the analysis, the first mode of the building is 0.50 second (the vibration period is in the "Y" direction), the second mode is 0.404 second in buckling, and third mode is 0.314 second in the direction of "X". The modal analysis parameters are given in Figure 3.1 and ~~result~~ mass distributions in the X and Y directions ~~of the modal analysis in the X and Y directions~~ are given in Table 34.1. Accordingly, ~~we see~~it can be seen that the mass participation of the structure in the Y direction exceeds 70% in the first mode and there is a displacement in the Y direction. Similarly, when we look at the mass participation in the X direction, we can see that there is a 70% mass participation in the third mode and a displacement in the X direction ~~is seen~~ (Figure 34.4). ~~Again, when we look at the~~there is no mass participation in the second mode~~, there is no mass participation~~ in either way. As shown in Figure 34.3, there is no displacement in the X and Y directions, but buckling occurs in the structure.

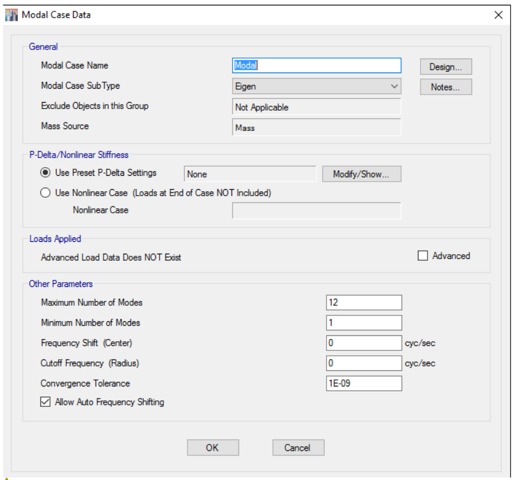

Figure 34.1. Modal Analysis Parameters

Table 34.1. X-Y mass participation of modal analysis

Mode Numbers	Period (sn)	Mass Participation in X direction	Mass Participation in Y direction
1	0.501	0.000	0.725
2	0.404	0.001	0.000
3	0.314	0.769	0.000

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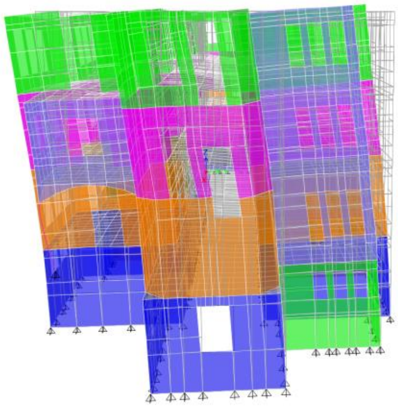

Figure 34.2. First mode (Y direction)

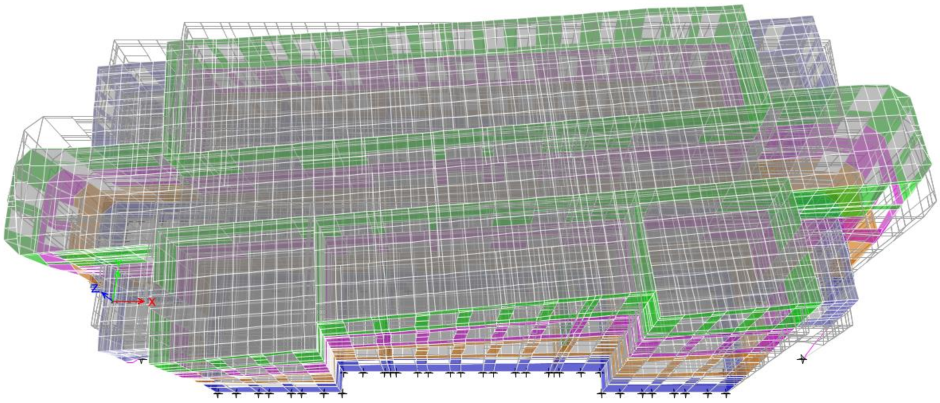

Figure 34.3. Second mode (Buckling)

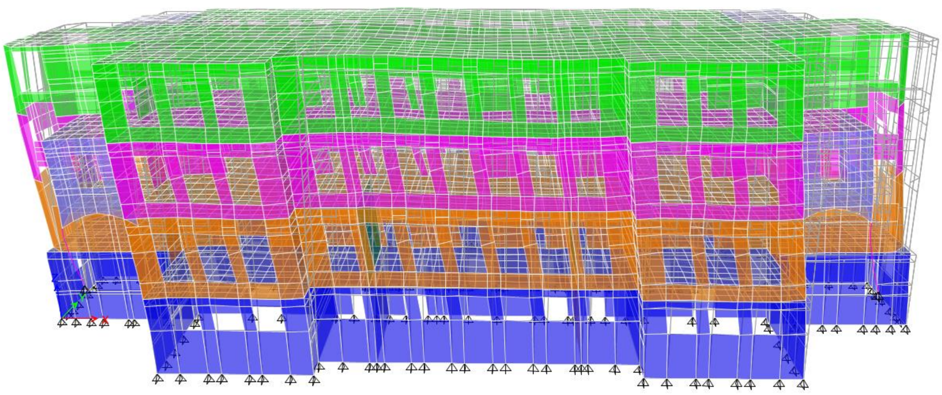

Figure 34.4. Third mode (X direction)

34.2. Axial stress results

Axial stresses are occurred the result of combination of vertical (~~static and moving~~dead and live) loads acting on the building and tensile and compressive loads occurring during the earthquake. As it can be seen in Figure 4.5,

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the Axial Axis (Z Direction) in the ETABS software is shown in green. Thus, axial stress controls were carried out for the "S22" stresses named in the ETABS program. Figure 34.6 shows the local axes of the model.

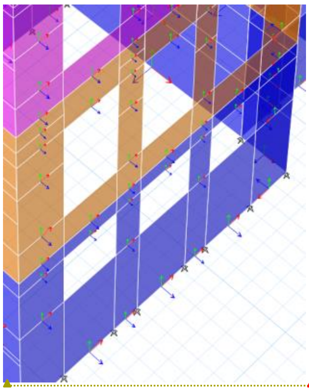

Figure 34.5. Local axles

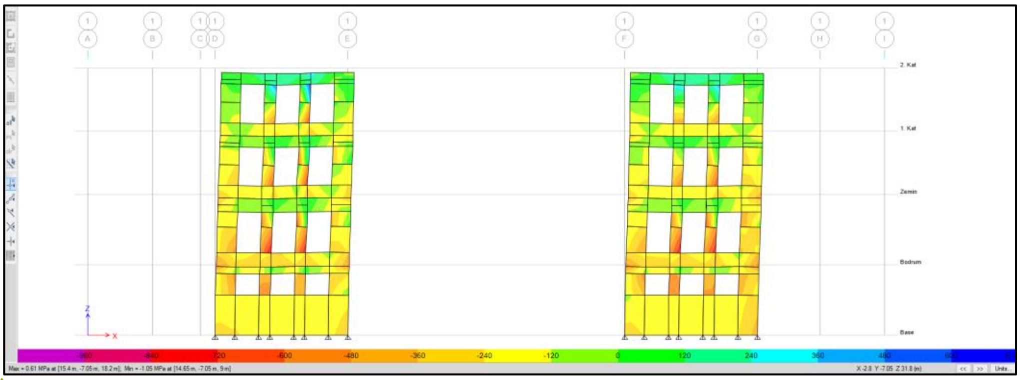

Figure 34.6. Axial stresses for 1-1 axis

Compressive stresses occurring in walls need to be compared with permissible stresses according to the type of masonry wall. In this calculation, the loads from the walls and floors will be taken into consideration. These stresses cannot be greater than the value of permissible value when ruled according to wall type (DBYBHY, 2007). Permissible wall pressure strengths are taken from the wall safety stress table given in the regulations, depending on the class of mortar used in the wall and the average unconfined compressive strength of the wall material. Stone was used as wall material in Konya Gazi High School. The pressure resistance of the material used in the wall could not be determined when the wall part strength test was not carried out in the study. Therefore, the pressure safety stress (0.3 MPa) given for the stone wall material in the regulation is used. The maximum pressure stress values specified in DBYBHY-2007 are not exceeded throughout the system. However, as it can be observed from the ~~forms~~ figures~~presented above~~, the axial stresses in the local regions (especially around the voids) are ~~found to be in the order of 0.6~~exceeding 0.6 to 0.8 to 1.0 MPa.

34.3. Shear stress results

The shear stresses acting on the building are caused by the horizontal loads caused by the earthquake effect. ~~In accordance with the above figures and local axes, shear~~Shear stresses were followed by "S11" values in

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accordance with the above figures and local axes. According to DBYBHY-2007, Safe shear stress is calculated according to the following equation;

$$\tau_{em} = \tau_0 + \mu\sigma$$

$$\tau_{em} = \tau_0 + \mu\sigma$$

Where; σ is the axial stress due to the vertical loads, and μ is the friction coefficient. ~~In our earthquake regulations,~~ it is clear that the coefficient of friction can be taken as 0.5 in head 5.3.3.4 in Turkish Earthquake Regulations,. In the calculation of vertical tension, G + 0.6Q was taken into account in accordance with earthquake mass.

Average axial stress due to vertical load = 0.13 MPa

Found as;

$$\tau_{em} = 0.1 + 0.5 \times 0.13 = 0.165\ MPa$$

$$\tau_{em} = 0{,}1 + 0{,}5 \times 0{,}13 = 0{,}165\ Mpa$$

As it can be seen from the figures given above, it is seen that the shear stresses in the local regions (especially around the spaces) reach to 0.3 MPa. However, ~~it is seen that~~ the maximum shear stress (0.165 MPa) calculated by the formula in DBYBHY is not exceeded throughout the system.

34.4. ~~Relocation~~ Displacement results

Since DBYBHY 2007 did not observe the displacement criterion for masonry structures, displacement controls were carried out in accordance with FEMA 356 regulation. ~~In FEMA 356, performance~~Performance aim~~target~~s, ~~performance l~~performance levels and ranges of structural and non-structural elements, earthquake impact levels are defined in FEMA 356. ~~In this regulation,~~ There are essential explanations ~~are made~~ about the modelling of masonry structures in this regulation. In Turkey, FEMA 273/356 standards are used in evaluating existing structures in addition to DBYBHY 2007 ~~in evaluating existing structures in our country~~. Figures 34.7-34.8-34.9-34.10 show the maximum displacements in the X and Y directions of the model.

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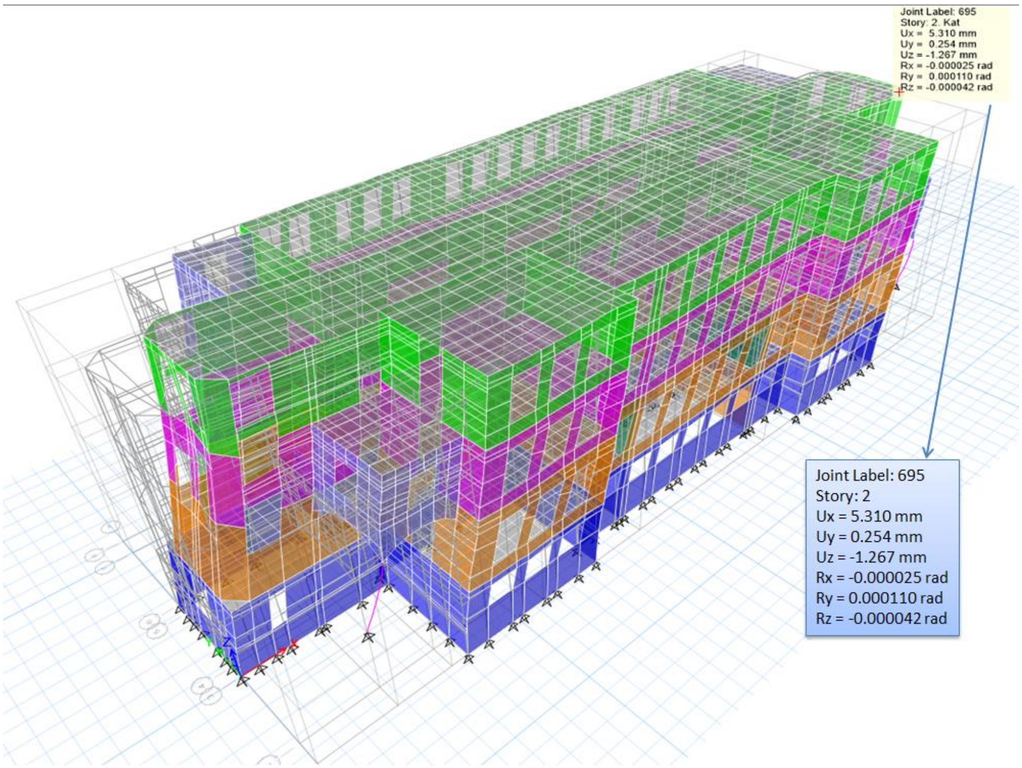

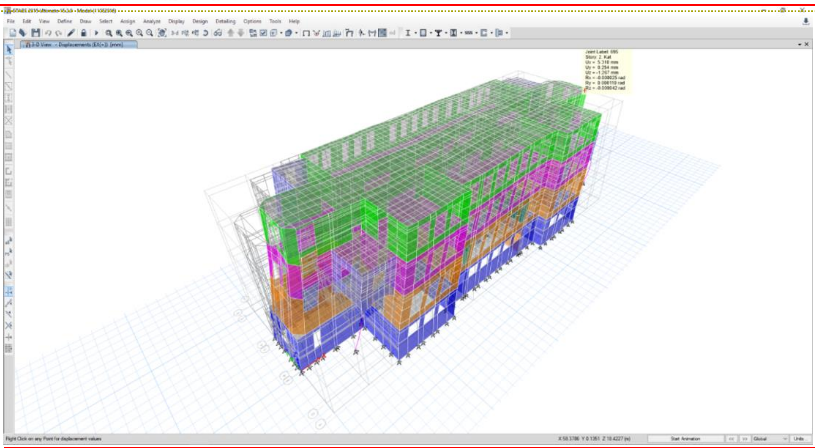

Figure 34.7. Maximum displacement in X direction (mm)

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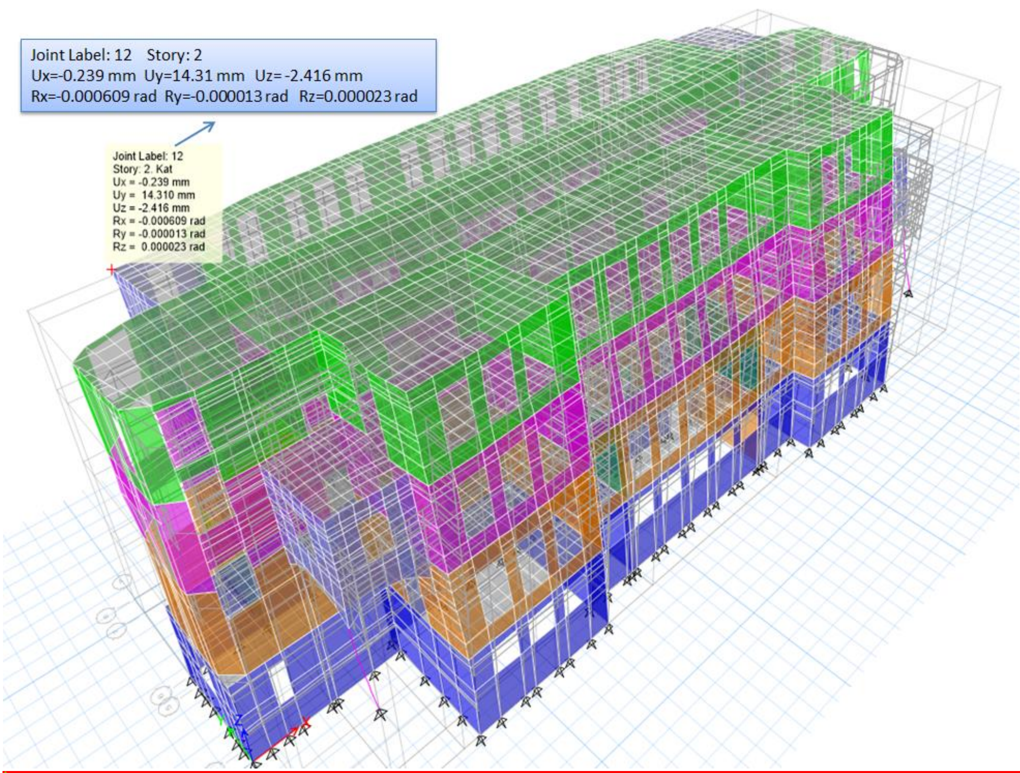

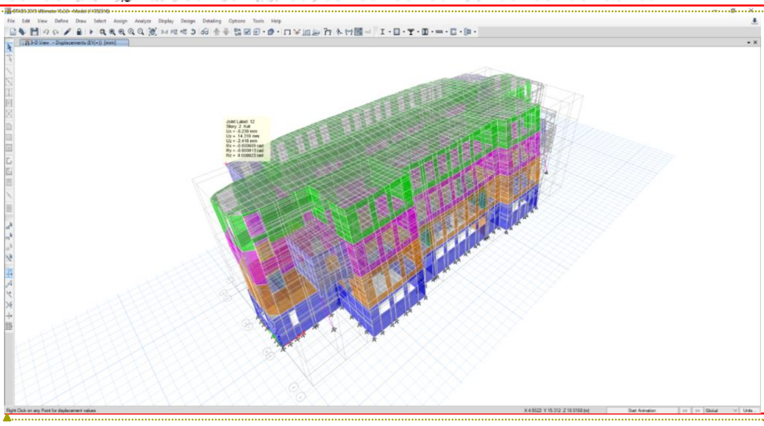

Figure 34.8~~7~~. Maximum displacement in Y direction (mm)

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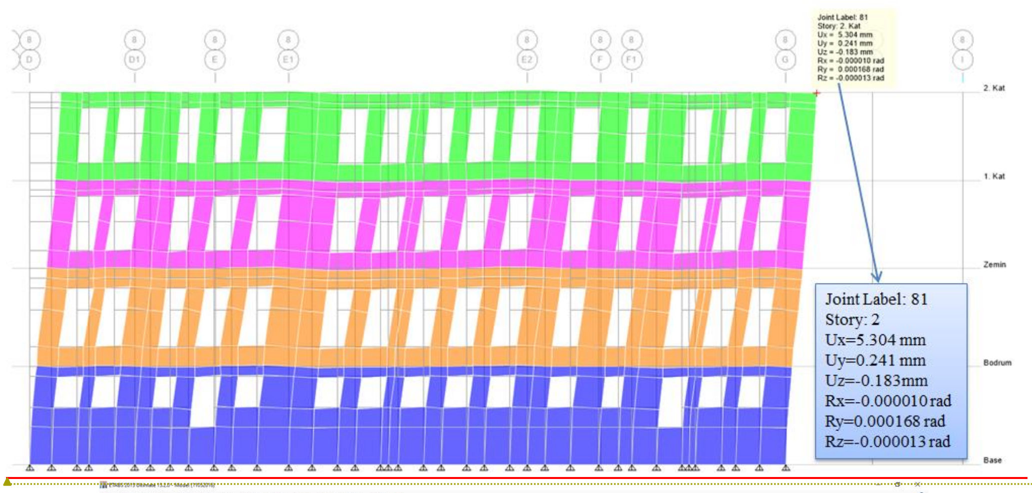

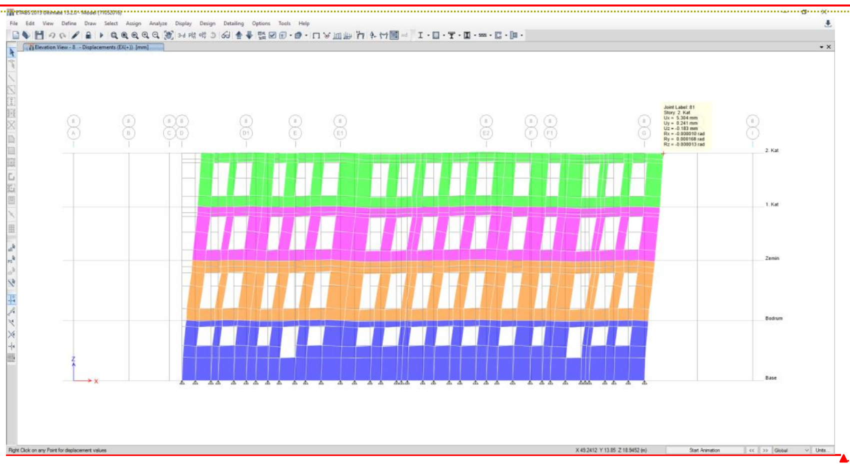

Figure 34.~~98~~. Maximum displacement in 8-8 axis (mm)

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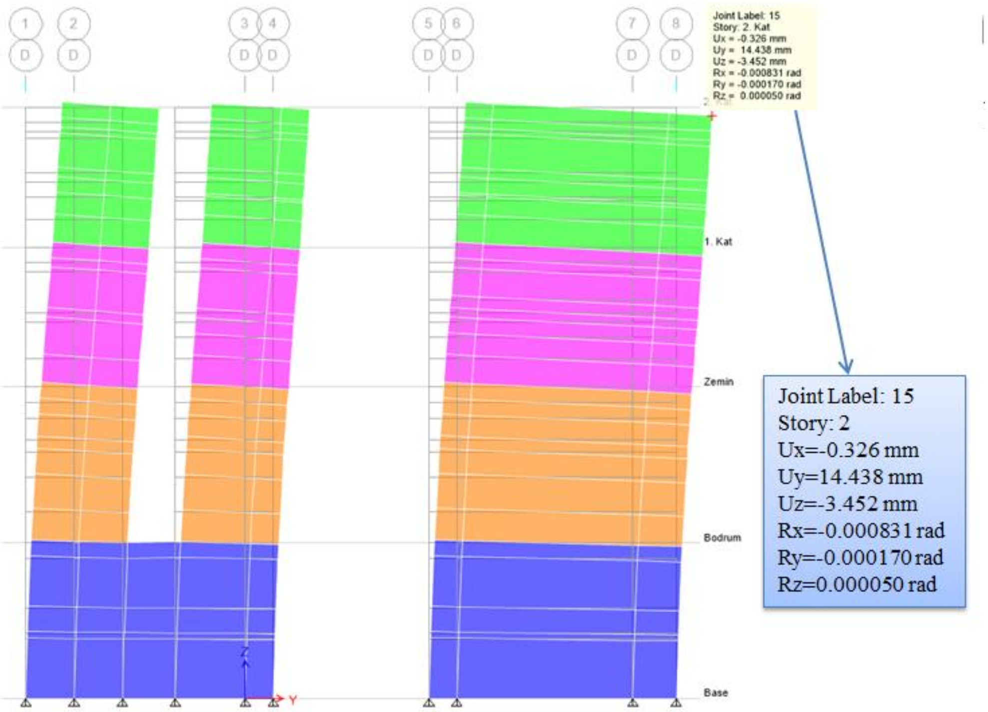

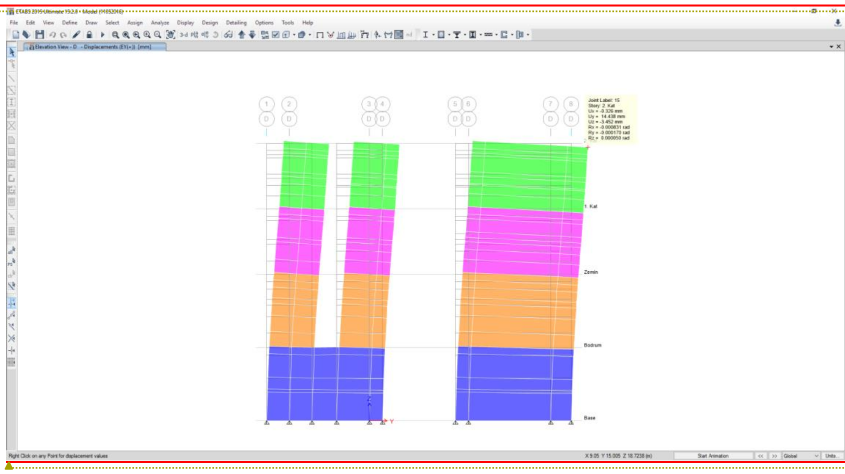

Figure 34.-10~~9~~. Maximum displacement in D-D Axis (mm)

As it can be seen from the figures shown above, the maximum displacement is 14.438~~5~~ mm in the Y direction. Since R = 2 is used in this analysis, the elastic displacement must be calculated as 15 mm × 2 = 30 mm. In this case, maximum relative displacement is;

$$\delta_{imax} = 30\ mm < 19\ mm \times 0.004 = 76\ mm$$

$$\delta_{imax} = 30\ mm < 19\ mm \times 0{,}004 = 76\ mm$$

*0.4% specified in this formula is taken from FEMA 356 regulation.

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~~5.~~4. ~~DISCUSSION~~CONCLUSION

In this study, performance ~~analysis and static~~ analysis of historical Konya Gazi High School, ~~building~~ constructed as masonry structure, ~~and~~ was investigated by static analyse. As a result of the ~~analyse~~study~~s made~~, it has been determined that the most ~~forced~~ stressed parts of the building in the static condition are the edges of the window and door openings. The bearing wall lengths, floor heights, void ratios in the building do not provide the regulation requirements when the present state of the structure is examined according to the requirements of today's regulations. Moreover, ~~it is seen that~~ the most ~~difficult~~ stressed parts of the construction are the edges of windows and ~~door~~ doors~~edges~~ according the results of ~~analysis of~~analysis on ETABS. Thin and deep cracks on the edges of the doors and windows were also observed in the buildings, it is recommended to repair of cracks in these areas.

The detailed results of analyses carried out in order to determine the performance of the building under the effects of earthquake loads are presented in the above sections. The summaries of the results obtained are indicated below.

- The lateral displacement of the structural system is 30mm / 19000mm = 0.16% and provides the criteria of FEMA 356 regulation.
- The axial pressure stresses in the structural system are lower than 0.3 MPa on average.
- Although the axial stresses reach 1.0 MPa in local areas, they are below the characteristic compressive strength (1.2 MPa).
- The shear stresses in the structural system are less than 0.15 MPa on average. Although the shear stresses reach 0.3 MPa in the local regions, they are below the shear stress (0.7 MPa) calculated according to the characteristic compressive strength.
- It is thought that some of the cracks seen in the building may originate in the settlement of the building. Therefore, it is considered appropriate to take precautions related to the foundation of the building.
- And also, it will be useful for the next lifetime of the building if the cracks observed in the building are repaired according to the strengthening methods.
- Since the back wall of building is painted with ~~complex~~ plaster, the historic texture of the building is distorted~~and ruins the historical texture of building~~, It is suggested that such applications should not be repeated.

It is thought that the analyses made in the scope of the study and the results obtained are very important for carrying out similar studies related to such subjects in future ~~works related to such subjects~~ and also for the other historical structures ~~having different carrier system characteristics in our country.~~ in Turkey.

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Biçimlendirilmiş: Yazı tipi: (Varsayılan)Times New Roman, 10 nk

Biçimlendirilmiş: Aralık Sonra: 0 nk, Satır aralığı: 1,5 satır