Asst. Prof. SERKAN ENGIN

Personal Information

Office Phone: <u>+90 262 303 3289</u> Email: serkan.engin@kocaeli.edu.tr

Web: https://avesis.kocaeli.edu.tr/serkan.engin/

International Researcher IDs

ScholarID: PSn3kYIAAAAJ ORCID: 0000-0001-9214-237X

Publons / Web Of Science ResearcherID: AAE-8896-2022

ScopusID: 54796542600 Yoksis Researcher ID: 154076

Education Information

Undergraduate, Anadolu University, Open Education Faculty, Department Of Sogiology, Turkey 2018 - Continues Postgraduate, Kocaeli University, Fen Bilimleri Enstitüsü, İş Sağlığı ve Güvenliği Bölümü, Turkey 2013 - 2018 Associate Degree, Anadolu University, Açıköğretim Fakültesi, Hukuk Bölümü (Aöf), Turkey 2013 - 2015 Doctorate, Kocaeli University, Fen Bilimleri Enstitüsü, İnşaat Mühendisliği Anabilim Dalı, Turkey 2005 - 2014 Postgraduate, Kocaeli University, Fen Bilimleri Enstitüsü, İnşaat Mühendisliği Anabilim Dalı, Turkey 2002 - 2005 Undergraduate, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü, Turkey 1996 - 2000

Dissertations

Postgraduate, Türkiye'de işçi sağlığı ve iş güvenliği mevzuatının gelişimi ve iş kazaları üzerine etkileri, Kocaeli University, Fen Bilimleri Enstitüsü, İş Sağlığı ve Güvenliği Bölümü, 2018

Doctorate, Yakın saha kaynaklı deprem kayıtlarının yüksek yapıların davranışına etkisi, Kocaeli Üniversitesi, Fen Bilimleri Enstitüsü, İnşaat Mühendisliği Anabilim Dalı, 2014

Postgraduate, Çelik lif ile güçlendirilmiş betonarme kirişlerin burulma davranışı, Kocaeli Üniversitesi, Fen Bilimleri Enstitüsü, İnşaat Mühendisliği Anabilim Dalı, 2005

Research Areas

Civil Engineering, Structural Mechanics, Structural Engineering, Performance of Constructed Facilities, Earthquake Engineering, Concrete Structures

Academic Titles / Tasks

Assistant Professor, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2017 - Continues Research Assistant, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2001 - 2017

Academic and Administrative Experience

Fakülte Yönetim Kurulu Üyesi, Kocaeli University, Mühendislik Fakültesi, 2024 - Continues

Fakülte Kurulu Üyesi, Kocaeli University, Mühendislik Fakültesi, 2024 - Continues

Exemption and Adaptation Commission Membership, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2022 - Continues

Member of Education Restructuring and Quality Commission, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2022 - Continues

Civil Engineering Club Advisor, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2021 - Continues Deputy Head of Department, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2019 - Continues Industry Cooperation Commission Membership, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2018 - Continues

Graduation Commission Presidency, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2018 - 2022
Graduation Commission Membership, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2013 - 2018
Research Assistants Representation, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2013 - 2017
Civil Engineering Club Advisor, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2006 - 2014
Curriculum Preparation Committee Member, Kocaeli University, Mühendislik Fakültesi, İnşaat Mühendisliği, 2001 - 2008

Courses

Senaryo Depremler ile Yapısal Dinamik Davranış Simülasyonları, Postgraduate, 2023 - 2024, 2022 - 2023 Characteristics of earthquake ground motions and engineering usage, Postgraduate, 2023 - 2024, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019

Innovation and Project Management, Undergraduate, 2023 - 2024, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018

Turkish Earthquake Code and Building Dynamics, Postgraduate, 2022 - 2023

Depreme Dayanıklı Yapı Tasarımı, Postgraduate, 2023 - 2024

 $Introduction\ to\ the\ Engineering\ Profession,\ Undergraduate,\ 2023-2024,\ 2022-2023,\ 2021-2022$

Introduction to Civil Engineering, Undergraduate, 2023 - 2024, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018

Organizational Communication, Undergraduate, 2021 - 2022, 2020 - 2021, 2019 - 2020

Structural Analysis, Undergraduate, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019, 2017 - 2018

Statics-Strength of Materials, Undergraduate, 2022 - 2023, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019

Introduction to Design in Civil Engineering I, Undergraduate, 2019 - 2020, 2018 - 2019

İnşaat Mühendisliğinde Özel Konular I, Doctorate, 2019 - 2020

Introduction to Design in Civil Engineering II, Undergraduate, 2018 - 2019, 2017 - 2018

Cost Management, Undergraduate, 2018 - 2019, 2017 - 2018

Energy Methods in Engineering Mechanics, Undergraduate, 2017 - 2018

Construction Materials, Undergraduate, 2017 - 2018

Advising Theses

Engin S., Plastik Mafsal Boyunun Betonarme Yapıların Sismik Davranışına Etkisi, Postgraduate, A.ÖZGER(Student), 2024 Engin S., The effect of distributed and concentrated nonlinear section behavior properties on the performance of reinforced concrete buildings, Postgraduate, H.Can(Student), 2023

Engin S., The effect of earthquake record scaling method on the analysis results of reinforced concrete structures, Postgraduate, Ö.Ölçer(Student), 2022

Advising Graduates (Non-Thesis)

Engin S., Comparison of 2007 and 2018 Earthquake Regulations and Examining Their Effect on Design , Masters (Non-Thesis, Evening Education), Ü.Temür (Student), 2024

Engin S., Comparison of 2018 and 2007 Turkish Earthquake Code in Terms of Earthquake Loads and Its Effect on Low-Storey Reinforced Concrete Structures, Masters (Non-Thesis, Evening Education), Y.Öner (Student), 2024

Engin S., The Effects of Changes in Local Ground Coefficients with Spectral Acceleration Values on Structures, Masters (Non-Thesis, Evening Education), Z.Ersoy(Student), 2024

Engin S., Statistical Evaluation of Construction Occupational Accidents Occuring in Turkey, Masters (Non-Thesis, Evening Education), N.Özgün (Student), 2023

Jury Memberships

Doctorate, Doctorate, Kocaeli Üniversitesi, June, 2024

Post Graduate, Post Graduate, Kocaeli Üniversitesi, June, 2024

Post Graduate, Post Graduate, Kocaeli Üniversitesi, February, 2024

Doctorate, Doctorate, Eskişehir Teknik Üniversitesi, July, 2023

Doctorate, Doctorate, Kocaeli Üniversitesi, June, 2023

PhD Thesis Monitoring Committee Member, PhD Thesis Monitoring Committee Member, Kocaeli Üniversitesi, June, 2023

PhD Thesis Monitoring Committee Member, PhD Thesis Monitoring Committee Member, Kocaeli Üniversitesi, June, 2023

Post Graduate, Post Graduate, Kocaeli Üniversitesi, June, 2023

Doctoral Examination, Doctoral Examination, Kocaeli Üniversitesi, May, 2023

Post Graduate, Post Graduate, Kocaeli Üniversitesi, April, 2023

Post Graduate, Post Graduate, Kocaeli Üniversitesi, April, 2023

Post Graduate, Post Graduate, Kocaeli Üniversitesi, January, 2023

Post Graduate, Post Graduate, Kocaeli Üniversitesi, January, 2023

PhD Thesis Monitoring Committee Member, PhD Thesis Monitoring Committee Member, Kocaeli Üniversitesi, January, 2023

Doctorate, Doctorate, Kocaeli Üniversitesi, June, 2022

Doctoral Examination, Doctoral Examination, Kocaeli Üniversitesi, June, 2022

Doctoral Examination, Doctoral Examination, Kocaeli Üniversitesi, May, 2022

Doctoral Examination, Doctoral Examination, Kocaeli Üniversitesi, May, 2022

Post Graduate, Post Graduate, Kocaeli Üniversitesi, May, 2022

Post Graduate, Post Graduate, Kocaeli Üniversitesi, January, 2022

Doctoral Examination, Doctoral Examination, Kocaeli Üniversitesi, June, 2021

Post Graduate, Post Graduate, Kocaeli Üniversitesi, June, 2021

Doctoral Examination, Doctoral Examination, Kocaeli Üniversitesi, June, 2021

Doctoral Examination, Doctoral Examination, Kocaeli Üniversitesi, June, 2021

Doctorate, Doctorate, Kocaeli Üniversitesi, February, 2021

Post Graduate, Post Graduate, Eskişehir Teknik Üniversitesi, May, 2019

Post Graduate, Post Graduate, Kocaeli Üniversitesi, April, 2019

Post Graduate, Post Graduate, Kocaeli Üniversitesi, February, 2019

Post Graduate, Post Graduate, Kocaeli Üniversitesi, February, 2019

Published journal articles indexed by SCI, SSCI, and AHCI

I. Estimation of ultimate torque capacity of the SFRC beams using ANN Engin S., Öztürk O., Okay F.
STRUCTURAL ENGINEERING AND MECHANICS, vol.53, no.5, pp.939-956, 2015 (SCI-Expanded)

I. Torsional behavior of steel fiber reinforced concrete beams

Okay F., Engin S.

Articles Published in Other Journals

I. Effect of Shear Wave Velocity of Soil on Behavior of Mid-Rise Reinforced Concrete Frame Structures Engin S.

Celal Bayar Üniversitesi Fen Bilimleri Dergisi, vol.13, no.3, pp.695-705, 2017 (Peer-Reviewed Journal)

Refereed Congress / Symposium Publications in Proceedings

I. Betonarme Yapıların Hızlı Değerlendirilmesinde Uygulanan Yöntemlerde Teknolojik Olanakların Kullanılması

Kaya M., ENGIN S.

Akdeniz 11. Uygulamalı Bilimler Kongresi, Mersin, Turkey, 23 - 25 February 2024

- II. 1998, 2007, 2018 Deprem Yönetmeliklerinin Eşdeğer Deprem Yükleri Açısından Kıyaslanması Ersoy Z., ENGİN S.
 - 3. Uluslararası Boğaziçi Bilimsel Çalışmalar Kongresi, İstanbul, Turkey, 21 22 January 2024
- III. Effect of Plastic Hinge Length on Seismic Behavior of Reinforced Concrete Structures Özger A., Engin S.

Uluslararası Marmara Fen Bilimleri Kongresi, Kocaeli, Turkey, 15 - 16 December 2023, pp.425-430

IV. Evaluation of the Damages Observed in Reinforced Concrete Structures in The February 6 Kahramanmaraş Earthquakes

Engin S., Meydanlı Atalay H.

International Marmara Sciences Congress (IMASCON 2023), Kocaeli, Turkey, 15 - 16 December 2023, pp.445-449

V. The Effect of Different Earthquake Records on the Seismic Behavior of Reinforced Concrete Buildings

Engin S., Yıldırım E.

International Marmara Sciences Congress, Kocaeli, Turkey, 9 - 10 June 2023, pp.57

VI. The Effect of Earthquake Record Quality Used in Time History Analysis on the Behavior of Residential Buildings

Engin S., Karadağ H. C.

Uluslararası Marmara Fen Bilimleri Kongresi, Kocaeli, Turkey, 9 - 10 December 2022, pp.319-328

VII. Analysis of Failures in Drinking Water Distribution Systems

Alptekin İ., Kızılöz B., Engin S.

Uluslararası Marmara Fen Bilimleri Kongresi, Kocaeli, Turkey, 21 - 22 May 2021, pp.452-463

VIII. Comparison of Scaling Methods to the Design Spectrum of Earthquake Records Engin S., Ölçer Ö.

International Marmara Sciences Congress, Kocaeli, Turkey, 21 - 22 May 2021, pp.24

IX. Methods for Determining Earthquake Safety of Existing Buildings

Meydanlı Atalay H., Engin S.

Uluslararası Marmara Fen ve Sosyal Bilimler Kongresi, Kocaeli, Turkey, 1 - 03 November 2019, pp.55

X. Investigation of Structure Soil Interaction in Seismic Behavior of Reinforced Concrete Structures Engin S.

Uluslararası Marmara Fen ve Sosyal Bilimler Kongresi, Kocaeli, Turkey, 1 - 03 November 2019, pp.54

XI. Evaluation of a Reinforced Concrete Building According to the Regulation on Buildings to be Built in Earthquake Zones (DBYBHY-2007) and Turkish Building Earthquake Regulation (TBDY-2019) Engin S.

VI. International Earthquake Symposium, Kocaeli, Turkey, 25 - 27 September 2019, pp.663-668

XII. Strong Ground Motion Amplitude Parameters and Effect of Frequency Content on Structure

Response

Engin S.

Uluslararası Mühendislik Doğal Bilimler ve Mimarlık Sempozyumu, Kocaeli, Turkey, 2 - 04 May 2019, pp.23-28

XIII. Is Civil Engineering Education at Kocaeli University Helping Students Realize Their Potentialities? Erdoğan H., Gazeloğlu C., Engin S., Coşkun S. B., Atay M. T., Mert Kutsal S.

13th International Congress on Advances in Civil Engineering (ACE2018), İzmir, Turkey, 12 - 14 September 2018, pp.1-8

- XIV. A Quantitative Analysis of the Recent Capacity Increases in Civil Engineering Education in Turkey Engin S.
 - 4. İnşaat Mühendisliği Eğitimi Sempozyumu, İzmir, Turkey, 17 18 November 2017, pp.1-12
- XV. Investigation of Shear Wall Ratio Required for Buildings for Different Earthquakes Engin S.
 - 4. Uluslararası Deprem Mühendisliği ve Sismoloji Konferansı, Eskişehir, Turkey, 11 13 October 2017, pp.1-8
- XVI. Effect of Steel Fiber Additive on Adherence Strength of Normal and High Strength Concrete Engin S., Öztürk O., Öner A., Üretürk B.
 - Prof. Dr. Hasan Boduroğlu Sempozyumu, İstanbul, Turkey, 9 10 May 2016, pp.229-236
- XVII. Effect of Addition of Steel Fiber to Bonding Strength of Concrete

Engin S., Öztürk O., Öner A.

Uluslararası Doğal Afet ve Afet Yönetimi Sempozyumu, Karabük, Turkey, 2 - 04 March 2016, pp.222-226

XVIII. The Effect of High Temperature on the Flexural Strength of the Mortars Containing Colemanite Öztürk O., Engin S., Öner A., Güzide B. Ç.

International Symposium on Natural Hazards and Hazard Management, Karabük, Turkey, 2 - 04 March 2016, pp.216-221

XIX. Earthquake Levels Used in Performance-Based Design of Tall Buildings

Engin S., Okay F., Beyen K.

3. Türkiye Deprem Mühendisliği ve Sismoloji Konferansı, İzmir, Turkey, 14 - 16 October 2015, pp.1-9

XX. Effects of Near Field Earthquakes on High-Rise Reinforced Concrete Buildings with Different Ground Properties

Engin S., Okay F., Beyen K.

5. Uluslararası Deprem Sempozyumu, Kocaeli, Turkey, 10 - 12 July 2015, pp.333-337

XXI. Effect of Peak Ground Velocity (PGV) Variation of Near Field Recorded Earthquakes on Reinforced Concrete High-Rise Structures

Engin S., Okay F., Beyen K.

8. Ulusal Deprem Mühendisliği Konferansı, İstanbul, Turkey, 11 May - 15 October 2015, pp.1391-1401

XXII. Effects of Near Field Earthquakes Forward Directivity Effects on High-Rise Reinforced Concrete Buildings

Beyen K., Okay F., Engin S.

8. Ulusal Deprem Mühendisliği Konferansı, İstanbul, Turkey, 11 - 15 May 2015, pp.537-547

XXIII. Development of Occupational Safety Legislation in Mining Works in Turkey and Its Effects on Occupational Accidents

Engin S., Çınar M. A.

VIII. Ulusal İşçi Sağlığı ve İş Güvenliği Kongresi, Adana, Turkey, 16 - 18 April 2015, pp.586

XXIV. Occupational Health and Safety No. 6331 and Occupational Safety in Building Inspection According to Labor Law No. 4857

Engin S., Meydanlı Atalay H.

4. İşçi Sağlığı ve İş Güvenliği Sempozyumu, Konya, Turkey, 1 - 03 November 2013, pp.127-138

XXV. Responsibilities of Building Inspection Organizations in terms of Occupational Health and Safety Meydanlı Atalay H., Engin S.

3. Yapı Denetimi Sempozyumu, Diyarbakır, Turkey, 5 - 06 October 2013, pp.297-305

XXVI. Contribution of Building Inspection to Employment

Meydanlı Atalay H., Engin S.

3. Yapı Denetimi Sempozyumu, Diyarbakır, Turkey, 5 - 06 October 2013, pp.331-340

XXVII. Predicting of the Compressive and Flexural Strength of Ground Granulated Blast Furnace Slag Concrete by Using Artificial Neural network

Öztürk O., Engin S., Temiz T., Opan M., Öner A.

9th International Congress on Advances in Civil Engineering (ACE 2010), Trabzon, Turkey, 27 - 30 September 2010, pp.1-9

XXVIII. Investigation of the Causes and Consequences of Occupational Accidents Occurring in Construction Works

Engin S., Öztürk O., Öner A.

İş Sağlığı ve Güvenliği Sempozyumu, Sakarya, Turkey, 13 - 14 November 2009, pp.120-128

XXIX. Evaluation of Factors Affecting the Performance of Civil Engineering Students
Engin S., Meydanlı Atalay H., Okay F.

1. İnşaat Mühendisliği Eğitimi Sempozyumu, Antalya, Turkey, 6 - 07 November 2009, pp.393-401

XXX. A Study on the Variation of Cracks and Cross Sectional Capacities of Fiber Added Reinforced Concrete Beams Under the Effect of Simple Torsion

Okay F., Engin S.

International Sakarya Earthquake Symposium, Sakarya, Turkey, 1 - 03 October 2009, pp.475-485

XXXI. Effect of Addition of Steel Fibers on Cracking Load of Reinforced Concrete Beams Under the Effect of Torsion

Öner A., Öztürk O., Engin S.

International Earthquake Symposium, Kocaeli, Turkey, 17 - 19 August 2009, pp.391-397

XXXII. Examination of Reliability of Linear Dynamic Analysis on Structures of Different Heights Okay F., Beyen K., Engin S.

International Earthquake Symposium, Kocaeli, Turkey, 17 - 19 August 2009, pp.159

XXXIII. Fire Performance of Chemical Admixtures In Cement Mortars

Öner A., Öztürk O., Engin S.

International Earthquake Symposium, Kocaeli, Turkey, 17 - 19 August 2009, pp.398-405

XXXIV. Effect of Longitudinal Reinforcement Variation on Torsional Capacity of Steel Fiber Reinforced Concrete Beams

Engin S., Okay F.

XVI. Ulusal Mekanik Kongresi, Kayseri, Turkey, 22 - 26 June 2009, pp.1-9

XXXV. Parametric Evaluation Of Temperature Variations Of A Jointless Bridge Resting In A Clayey Soil Arsoy S., Engin S., Keskin E.

1. Köprü ve Viyadükler Sempozyumu, Antalya, Turkey, 6 - 07 November 2007, pp.175-185

XXXVI. Historic Kocaeli Prosecutor's Office Building Analysis and Strengthening
Çukdar A., Meydanlı Atalay H., Akpınar E., Engin S., Öztürk O., Okay F., Özden Ş.
Yapısal Onarım ve Güçlendirme Sempozyumu (YOGS 2006), Denizli, Turkey, 7 - 08 December 2006, pp.1-9

XXXVII. Torsional Behavior of Reinforced Concrete Beams Produced with Normal Strength Concrete with Steel Fiber Additives

Okay F., Özden Ş., Engin S.

7. Uluslararası İnşaat Mühendisliğinde Gelişmeler Kongresi, İstanbul, Turkey, 11 - 13 October 2006, pp.194-204

Other Publications

I. February 6, 2023 Kahramanmaraş (Pazarcık Mw:7.7 and Elbistan Mw:7.6) Earthquakes Field Investigation Report, Kocaeli University Foundation Publications, ISBN: 978-605-71873-3-81 Sertçelik F., Opan M., Ulutaş E., Irmak T. S., Tunç B., Akpınar E., Meydanlı Atalay H., Engin S., Temiz T., Öztürk O., et al. Technical Report, pp.1-99, 2023

Supported Projects

Engin S., Öner A., Öztürk O., Üretürk B., Project Supported by Higher Education Institutions, Investigation of Torsion, Adherence Strength and Mechanical Properties of Fiber-Added Concretes According to Fiber Content, 2008 - 2010 Engin S., Okay F., Project Supported by Higher Education Institutions, Investigation of the Behavior of High-Rise Buildings against Earthquake, 2008 - 2010

Engin S., Okay F., Project Supported by Higher Education Institutions, Investigation of Torsional Behavior of Steel Fiber Reinforced Concrete Beams, 2004 - 2006

Contractual Researches

Opan M., Engin S., Öztürk O., Kocaeli University Technopark Inc. & Knauf Construction Building Elements Industry and Trade Inc., Modeling, Establishment and Development of a Holistic Performance Management System for Increasing Organizational Agility, 2023 - 2024

Opan M., Engin S., Meydanlı Atalay H., Öztürk O., Kocaeli University Technopark Inc. & Kocaeli Metropolitan Municipality, Creating Building Stock Inventory with Rapid Assessment Techniques, 2023 - 2024

Scientific Refereeing

TEKNIK DERGI/TECHNICAL JOURNAL OF TURKISH CHAMBER OF CIVIL ENGINEERS, Journal Indexed in SSCI, December 2023

Journal of innovative engineering and natural science (Online), Other Indexed Journal, January 2023

Tasks In Event Organizations

Engin S., Eren M., Gümüş M., Çuhadar A., Çelik Ö. F., Güven İ. T., Sancılı M., Erenkaya U., Güngör B., Hacet Aşar A., et al., Overview of Maraş Earthquakes on Day 120 from Kocaeli, Workshop Organization, Kocaeli, Turkey, Haziran 2023

Congress and Symposium Activities

International Marmara Science Congress, Session Moderator, Kocaeli, Turkey, 2023
International Marmara Science Congress, Session Moderator, Kocaeli, Turkey, 2019
VI. International Earthquake Symposium, Session Moderator, Kocaeli, Turkey, 2019
International Symposium on Natural Sciences and Architecture, Session Moderator, Kocaeli, Turkey, 2019
International Marmara Science and Social Sciences Congress, Session Moderator, Kocaeli, Turkey, 2018

Invited Talks

Earthquake Awareness Seminar, Seminar, Hyundai Assan Automotive Industry, Turkey, April 2023 Understanding the February 6 Kahramanmaraş Earthquakes for a Resilient Kocaeli, Seminar, Kocaeli Üniversitesi, Turkey, April 2023

Kahramanmaras Earthquakes, Seminar, Körfez Chamber of Commerce, Turkey, April 2023

Earthquake Awareness Panel, Seminar, Kocaeli Chamber of Commerce Women Entrepreneurs Board, Turkey, March 2023

Kahramanmaras Earthquakes and Kocaeli University, Seminar, Kocaeli Üniversitesi, Turkey, March 2023 Lessons We Haven't Learned from Earthquakes, Seminar, Kocaeli Union of National Organizations, Turkey, February 2023 Elazig and Malatya Earthquake Impressions, Seminar, Chamber of Civil Engineers Kocaeli Branch, Turkey, February 2020

Non Academic Experience

Municipality, Saraybahce Municipality, License Unit