



# 17<sup>th</sup> International Geography Olympiad

Istanbul, Turkey

10-16 August 2021

**Fieldwork Exercise Part I**

**Tasks**

Dear iGEO participant,

Before starting your virtual trip of the Sariyer district of Istanbul city, please read these guidelines.

1. You have the printed Map of the FWE-I area. Use this map to orient yourself and find the location of five topical sites. The sites are marked on the map, but not labelled.
2. The sequence of moving from one site to another is in numeric order: Site 1 (Start) → Site 2 → Site 3 → Site 4 → Site 5 (Finish).
3. The absolute height (elevation) at each site is lower than of the previous one on the route. Always go down!
4. “Leaving” one site and “arriving” at the next one, do not return. Always move forward!
5. At each site you will get tasks you need to complete. For FWE-I you can gain maximum **15 marks**.
6. You are to decide for how long you will be “staying” at each site.
7. Answers should be written in English on the Response Sheet. For answers use a pen with a dark blue tint only. Do not forget to write your participant code in the upper right corner of both pages of the Response Sheet.
8. This presentation will be stopped when **60 minutes** end, regardless of whether you have visited all five sites, or not. Deliver your Response Sheet to the supervisor of your exam immediately then.
9. Keep the Map with you, it can be used as reference for Part II of the Fieldwork exercise (FWE-II).

**Good luck!**



Ağ Haritası QR Kod ile cebinizde!  
Network Map in your pocket with QR code!  
Cep Haritasını Görevlilerden Temin Edebilirsiniz.  
You Can Obtain the Network Map from the Station Staff.

**ARRIVING TO THE STARTING POINT**  
Imagine you to the **Haciosman** metro station (**green line**), located in the Eastern Thrace, 2 km from the Bosphorus.



## Mevcut Hatlar / Lines In Operation

- |   |  |
|---|--|
| <b>M1a</b> Yenikapı-Atatürk Havalimanı Metro Hattı Metro Line               | <b>T1</b> Kabataş-Bağcılar Tramvay Hattı Tram Line                                   |
| <b>M1b</b> Yenikapı-Kirazlı Metro Hattı Metro Line                          | <b>T2</b> Taksim-Tünel Nostaljik Tramvay (İETT) Heritage Tram                        |
| <b>M2</b> Yenikapı-Seyrantepe-Haciosman Metro Hattı Metro Line              | <b>T3</b> Kadıköy-Moda Tramvay Hattı Tram Line                                       |
| <b>M3</b> Kirazlı-Başakşehir/Metrokent Metro Hattı Metro Line               | <b>T4</b> Topkapı-Mescid-i Selam Tramvay Hattı Tram Line                             |
| <b>M4</b> Kadıköy-Taşantepe Metro Hattı Metro Line                          | <b>T5</b> Cibali-Alibeyköy Cep Otogarı Tramvay Hattı Tram Line                       |
| <b>M5</b> Üsküdar-Çekmeköy Metro Hattı Metro Line                           | <b>F1</b> Taksim-Kabataş Füniküler Hattı Funicular Line                              |
| <b>M6</b> Levent-Boğaziçi Ü/Hisarüstü Metro Hattı Metro Line                | <b>F2</b> Karaköy-Beğözü Tüneli (İETT) Tünel (Heritage Funicular)                    |
| <b>M7</b> Mecidiyeköy-Mahmutbey Metro Hattı Metro Line                      | <b>F3</b> Seyrantepe-Vadistanbul Füniküler Hattı Funicular Line                      |
| <b>M9</b> Bahariye-Olimpiyat Metro Hattı Metro Line                         | <b>B</b> Metrobüs Hattı (İETT) Bus Rapid Transit                                     |
| <b>B</b> Halkalı-Gebze (Marmaray-TCDD) Marmaray Tüneli (Heritage Funicular) | <b>MIA</b> Şirinevler-AHL Mekik Otobüs İşletmesi MIA Şirinevler-AHL Shuttle Bus Line |
| <b>TF1</b> Maçka-Taşköprü Teleferik Hattı Cable Car                         | <b>EC1</b> Eminönü-Cibali Mekik Otobüs İşletmesi EC1 Eminönü-Cibali Shuttle Bus Line |
| <b>TF2</b> Eyyüp-Piyer Loti Teleferik Hattı Cable Car                       |  |

## Geçici Sürece İle Kapalı İşletme / Temporarily Closed Service

**M1a**  
Ataköy/Şirinevler-Atatürk Havalimanı Arası İşletmeye Kapalı Bölüm  
M1 hattı kapasite artırımı çalışması ve M1A Yenikapı -Atatürk Havalimanı ile M9 Ataköy-İkitelli metro hatları entegrasyon çalışması nedeniyle Yenibosna, Dünya Ticaret Merkezi ve Atatürk Havalimanı istasyonları geçici bir süre ile işletmeye kapatılmıştır.  
Closed Service Section Between Ataköy/Şirinevler and Atatürk Airport  
Yenibosna, Dünya Ticaret Merkezi ve Atatürk Airport stations are temporarily closed due to the M1 line capacity enhancement works and M1A Yenikapı-Atatürk Airport and M9 Ataköy-İkitelli metro line integration works.

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## Yapımı Devam Eden Hatlar / Lines Under Construction

- |   |  |  |
|---|--|--|
| <b>M1a</b> Kirazlı Bağcılar-Halkalı Uzatması Metro Line Extension     | <b>M8</b> Bostancı-Dudullu-Parseller Metro Hattı Metro Line        | <b>M13</b> Yenidoğan-Emek Metro Hattı Metro Line         |
| <b>M3</b> Bakırköy İDO ve Kayışehir Uzatmaları Metro Line Extensions  | <b>M9</b> Bahariye-Ataköy Uzatması Metro Line Extension            | <b>F4</b> Hisarüstü-Aşyan Füniküler Hattı Funicular Line |
| <b>M4</b> Taşantepe-SGH ve İçmeler Uzatmaları Metro Line Extensions   | <b>M10</b> Pendik-SGH Metro Hattı Metro Line                       | <b>T5</b> Cibali-Eminönü Uzatması Metro Line Extension   |
| <b>M5</b> Çekmeköy-Sultanbeyli Uzatması Metro Line Extension          | <b>M11</b> Gayrettepe-İstanbul Hvl.-Halkalı Metro Hattı Metro Line |  |
| <b>M7</b> Esenyurt Meydan ve Kabataş Uzatmaları Metro Line Extensions | <b>M12</b> Göztepe-Ümraniye-Kazım Karabekir Metro Hattı Metro Line |  |

## İşaretler / Signs

- İstasyon-Durak / Station-Stop
- Hat Başı-Sonu / Terminus
- ✈ Havalimanı / Airport
- 🚗 Otogar / Coach Station
- 🚆 Aktarma İşaretleri / Transfer Signs
- 🚄 YHT-Hızlı Tren Garı High Speed Rail Transfer Station
- 🌉 Boğaz Köprüleri Bosphorus Bridges
- 🚰 Marmaray Tüp Geçit
- 🚢 Boğaz Su Altı Geçiş Underwater Tunnel

## Bilgilendirme / Information

İşletme saatleri ve yoğun saat sefer aralıklarını Metro İstanbul cep haritalarından, sefer tarifelerini istasyonlarda yer alan bilgilendirme panolarından ve web sitemizden öğrenebilirsiniz.  
You can find about the operating hour and rush hour headways from Metro İstanbul pocket maps and find more information about timetables from our website and information boards at the stations.  
T2 Taksim-Tünel ve T3 Kadıköy-Moda tramvay hatları ile T4 tramvay hattı Cumhuriyet Mahallesi istasyonu haricindeki tüm raylı sistem istasyonları engelli erişimine uygundur.  
All rail lines except for T2 Taksim-Tünel and T3 Kadıköy-Moda line, and all stations except for Cumhuriyet Mahallesi station of T4 Topkapı-Mescid-i Selam tram line are accessible for disabled passengers.

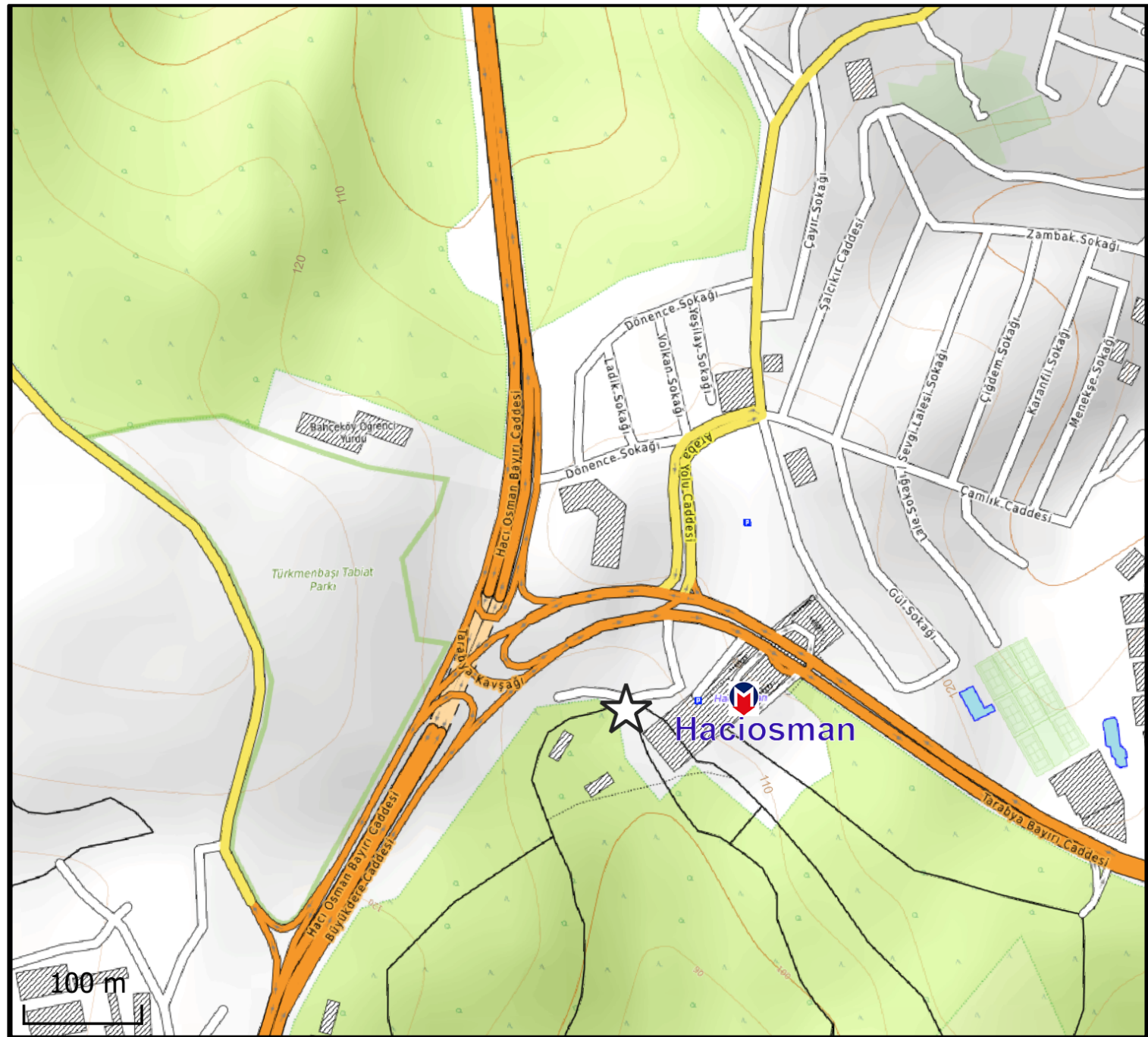
## İletişim / Contact

- ALO 153** **SMS 1530**
- metroistanbul metroistanbulas  
metroistanbul\_ 0552 153 00 34  
metroistanbul metro.istanbul

# SITE 1. ISTANBUL HEIGHTS

**Site 1** is right across the road from an unfinished building of a hotel.

Analyze the map extract and assuming that each floor of this building is 2.5 meters in height and the terrace on its roof is the same height, answer the questions from the next slide.



# SITE 1. ISTANBUL HEIGHTS

**1.A.** Is the absolute height (elevation) of the hotel building higher than pillars of bridges over The Bosphorus strait?

**1.B.** Estimate the difference (in meters) of the height of this building and the pillars of the highest bridge over The Bosphorus.

**Write your answers on the Response Sheet and move to the next site.**



Fig. 1a. Hotel building near Site 1.

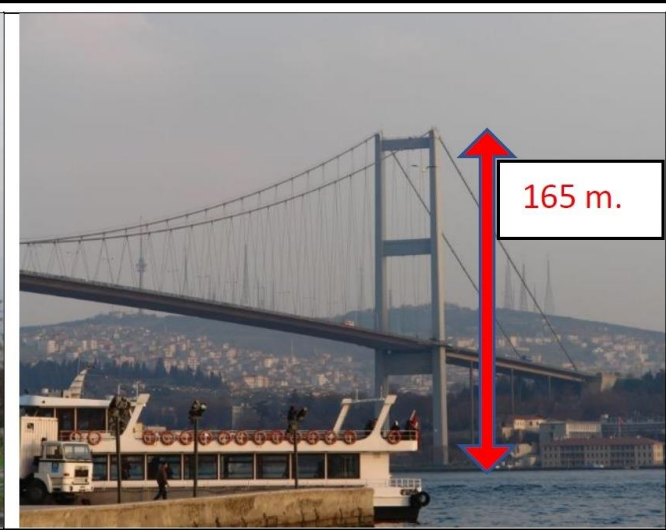


Fig. 1b. The 15 July Martyrs Bridge.



Fig.1c. The Fatih Sultan Mehmet Bridge.



Fig.1d. The Yavuz Sultan Selim Bridge.

## SITE 2 – MEDITERRANEAN VEGETATION

**Site 2** is in the middle of the Ataturk urban forest, established in 2021. This is a park with native and planted trees, developed on the unbuilt area in Sariyer district. Be an expert in Mediterranean vegetation and answer the questions 2.A. (this slide) and 2.B. (next slide).



**2.A.** The Mediterranean forests, woodlands and shrubs biome is spread worldwide. Provide the common names of five different Mediterranean types of vegetation and specify the continents where each of these types is represented.

**2.B.** Select the species from the photos which are NOT native for the forests of modern Istanbul city area and write down on the Response Sheet the corresponding letter codes (A-F).



**A.** *Quercus frainetto*



**B.** *Pinus brutia*



**C.** *Ficus carica*



**D.** *Acer mandshuricum*



**E.** *Juglans regia*



**F.** *Araucaria araucana*

**Write your answers on the Response Sheet and move to the next site.**

# SITE 3 – GEOLOGY OF EASTERN THRACE



Fig. 1. Site 3.



Fig. 2. Rock outcrop at Site 3.

**Site 3** is near a rock outcrop.

**3.A.** Identify the exposed rock and its origin.

**3.B.** The chronostratigraphic chart below contains the results from drilling a geological borehole here. Which geological system (period) name is omitted in Column 1?

**3.C.** Match the rocks, shown on figures 3.A.-3.F. of the next slide, to the layers 2-6 in the Chronostratigraphic chart.

**3.D.** Identify the rock from the Figure 3 NOT found in this borehole and give their origin.

| Chronostratigraphic chart |                  |   |
|---------------------------|------------------|---|
| System/<br>Period         | Series/<br>Epoch | Rocks names   |
| 1                         | 2                | 3   |
| Devonian                  | Middle-Upper     | 1. The rock from photo on figure 2                  |
|                           | Lower-Middle     | 2. Shales with calciturbidite intercalations        |
| ?                         |                  | 3. Limestones (biogenic)                            |
| Ordovician                | Middle           | 4. Laminated grey shales with quartz arenite lenses |
|                           | Middle           | 5. Quartz arenites                                  |
|                           | Lower            | 6. Lensoidal conglomerates- sandstone shale         |



**Write your answers on the Response Sheet and move to the next site.**



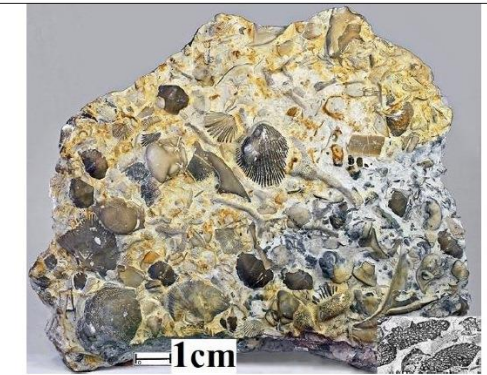
A.



B.



C.



D.



E.



F.

Figure 3. Rocks

## SITE 4 – RIVER



Fig.1. Dam on the river in the Ataturk urban forest.



Fig.2. Mean annual river runoff (surface runoff) near Bosphorus, mm.

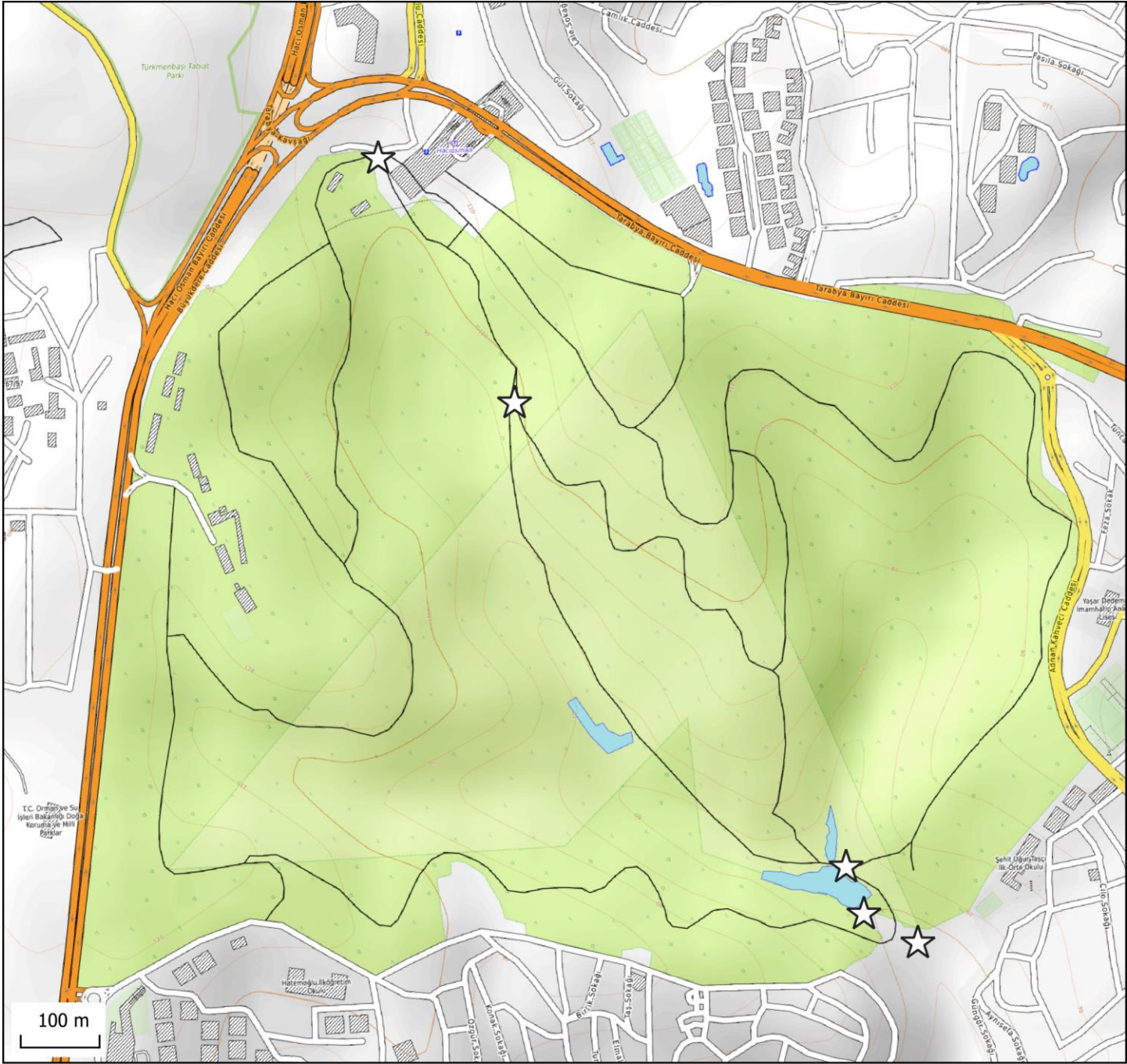
**Site 4** is located on the dam over a small river running through the Ataturk urban forest.

Consult the map extract on the next page and circle on the printed map the catchment area of this river.

**4.A.** Estimate the annual runoff of this river ( $m^3$ ).

**4.B.** In urban households equipped with water pipe and sanitation systems, the water consumption norm per capita is 150 liters. How many people could hypothetically get all the water they need from this river? (provide a number)

**4.C.** Why in real life, is this number much lower, and what are the options for make it closer to the hypothetic number?



**Write your answers on the Response Sheet and move to the next site.**

# SITE 5 – BUILDING ON SLOPES

**Site 5** corresponds to the spot marked with 'X' on the map extract in the Response Sheet.

**5.A.** Mark Spot 'Y' on this fragment, which is located 40 meters from Spot X on a bearing of 60 degrees (in azimuth 60 degrees).

**5.B.** Estimate the steepness of the slope (inclination angle in degrees) between spots X and Y.

**5.C.** Which types of mass wasting (slope movement) represent danger for building on slopes with similar steepness near the Ataturk Urban Forest:

- a) *avalanche*, b) *creep*, c) *lahar*,
- d) *landslide*, e) *rock-fall*, f) *solifluction*?



Fig.1. Housing near Site 5.

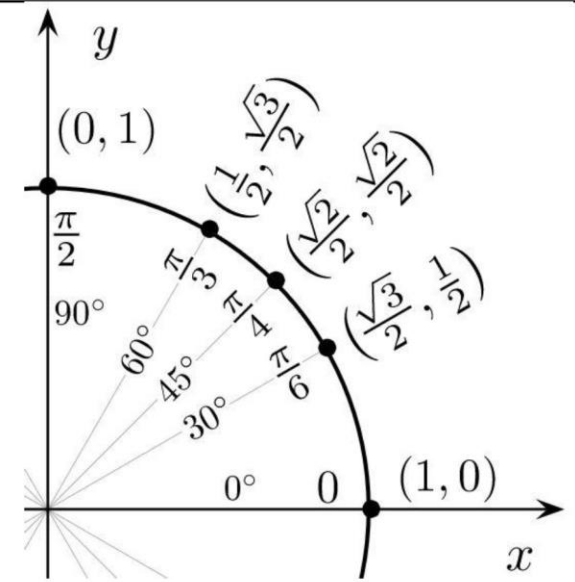


Fig.2.

**Write your answers on the Response Sheet and move to the next slide.**

# CONCLUDING QUESTION

Near the Ataturk urban forest several traditional rural style houses can be found. Until 1937, there was a settlement here, named *Çamlıtepe Village*.

- Which features of this geographical location have benefited the development of this settlement?



Fig. 1a. Historical photo of Çamlıtepe Village



Fig. 2b. Old country style house (slum) near the park

**This was the last task.**

# Authors of FWE Part I: Alexey Naumov, Eyup Artvinli, contribution: Mikhail Drugov Natalia Frolova, Oxana Klimanova, Alexander Zherenkov

## Sources of images and data:

**Photos:** E. Artvinli, A. Naumov

**Site 2.** “Quercus frainetto, Botanical Garden in Poznań” by [Radomil](#) is licensed under CC BY-SA 3.0. [Файл:Quercus frainetto RB2.JPG — Википедия \(wikipedia.org\)](#)

[https://ies-ows.jrc.ec.europa.eu/efdac/download/Atlas/pdf/Pinus\\_halepensis\\_brutia.pdf](https://ies-ows.jrc.ec.europa.eu/efdac/download/Atlas/pdf/Pinus_halepensis_brutia.pdf)

[Ficus carica \(plantsam.com\)](#); D. Semeikin Yu. 2012. Image of Acer mandshuricum Maxim. // Plantarium. Plants and lichens of Russia and neighboring countries: open online galleries and plant identification guide. 2007—2021. <https://www.plantarium.ru/lang/en/page/image/id/135063.html>; E. Kishinevsky V. 2020. Image of Juglans regia L. // Plantarium. Plants and lichens of Russia and neighboring countries: open online galleries and plant identification guide. 2007—2021. <https://www.plantarium.ru/lang/en/page/image/id/671177.html>; “Disposición de hojas y ramas de un ejemplar joven de pehuén (Araucaria araucana)” by [CARLOS TEIXIDOR CADENAS](#) is licensed under CC BY-SA 3.0. [Hojas y ramas de pehuén \(Araucaria araucana\). Icalma, Región de La Araucanía, Chile.jpg \(4896x3672\) \(wikimedia.org\)](#)

**Site 3.** [http://rockref.vsegei.ru/petro/https://openjicareport.jica.go.jp/pdf/11707833\\_03.pdf/](http://rockref.vsegei.ru/petro/https://openjicareport.jica.go.jp/pdf/11707833_03.pdf/) Chapter 6. Urban Conditions for Earthquake Disaster Management Consideration

**Site 4.** Mean annual runoff map, 1 : 10 000 000.

**Site 5.** Автор: Gustavb (обсуждение · вклад) - Собственная работа, используя: Eukleides, Общественное достояние, <https://commons.wikimedia.org/w/index.php?curid=584159>

Unit circle angles.svg