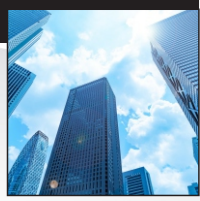


PUSULA

MÜHENDİSLİK

PUSULA
MÜHENDİSLİK

Why Pusula ?

Experienced Dynamic Staff

International business Experiences

World-Class Project Standards

Fast and Reliable Solutions

Professional Software

Vision that upholds ethical values

Mission of Always Aiming for the Better

For...

PUSULA
MÜHENDİSLİK

Founded in 2006, our company has undertaken many important projects at our country and abroad.

Our projects mainly include highway intersection infrastructure, bridge city planning, retaining walls and field measurements made with drones.

Some of the institutions we work with:

State railways

State water works

Ministry of transport

The Istanbul Metropolitan Municipality

Azerbaijan Ministry of Transport

Arnavutkoy Municipality

Başaksehir Municipality

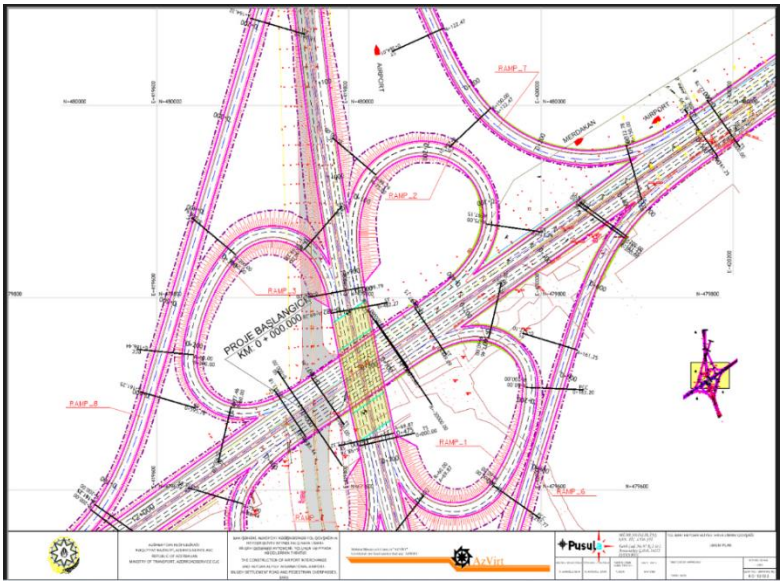
And many contractor companies

AZERBAIJAN BAKU
INTERNATIONAL AIRPORT
HIGHWAYS AND INTERCHANGES

Pusula Engineering opened a branch in Azerbaijan between 2006 and 2009 and prepared many highway intersection and infrastructure projects during this period. SNIP (Russian road standard) was used as the road standard instead of AASTHO, which is used in our country.

Below are some of these projects

Picture 1 HaydarAliyev Interchange

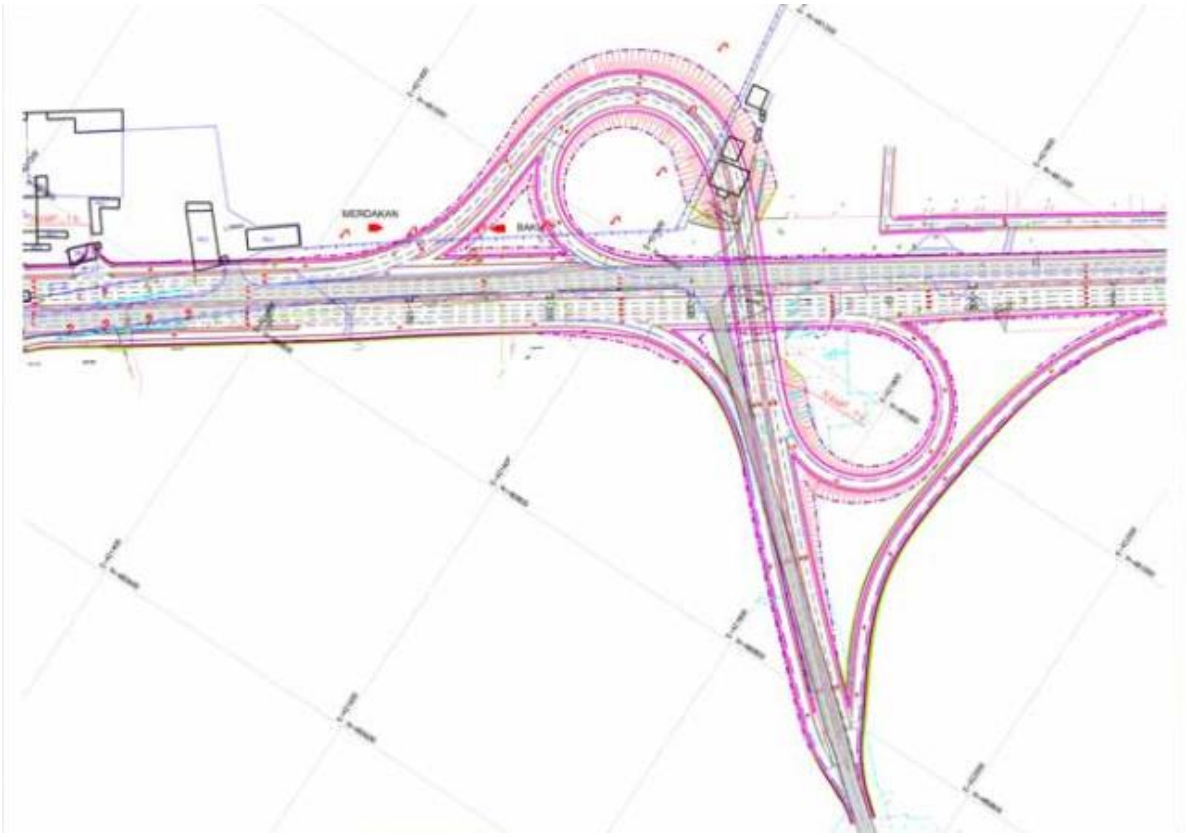


Picture 2 HaydarAliyev Interchange computer modeling

Picture 3-HAYDAR ALLIYEV AIRPORT INTERCHANGE AND HIGHWAYS WERE DONE BY OUR COMPANY. OUR PROJECT WAS SHOWN IN THE BENTLEY INFRASTRUCTURE YEARBOOK IN 2009

Picture 4- Bine and airport Interchange together real photograph

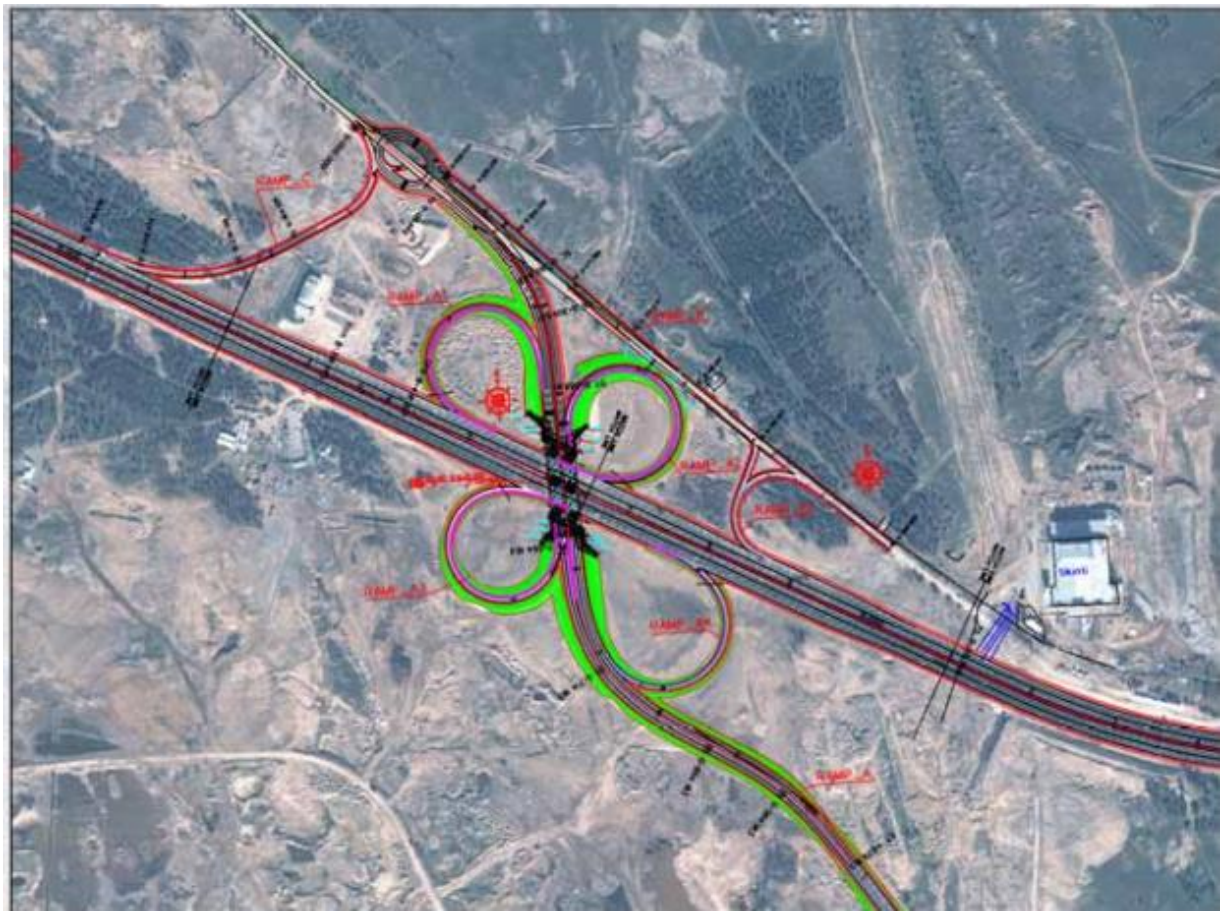
Picture 5 Bine Interchange real photograph



Picture 6 Bine Interchange computer modeling

Picture 7 Airport – Merdekan Highway photograph

Picture 8 Sabuncu Interchange



Picture 9 Surehani Interchange computer modeling

Picture 10 Surehani Interchange real fotograph

REPUBLIC OF TÜRKİYE
ARTVİN ÇORUH UNIVERSITY

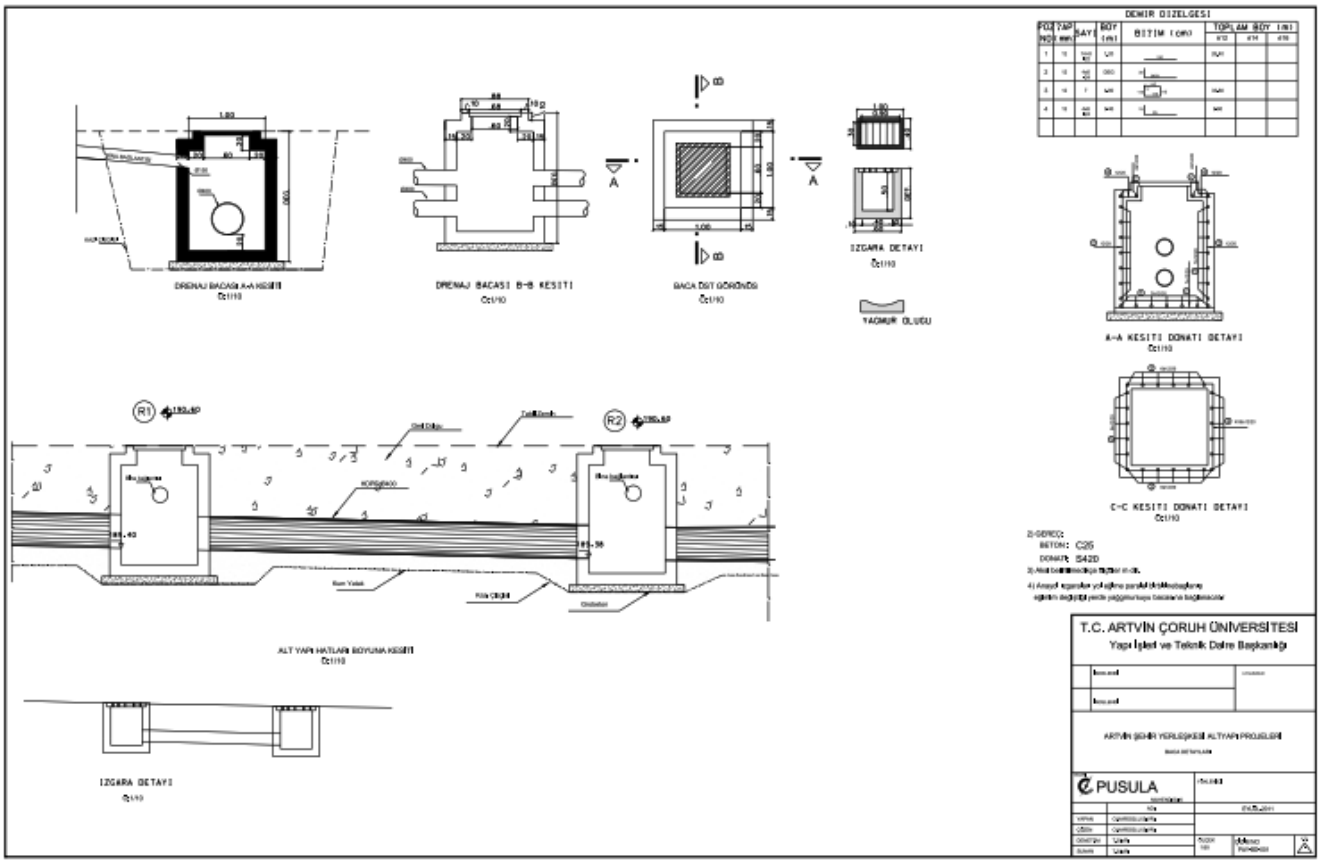
The infrastructure project of Çoruh University, built in Artvin, located in the northeastern part of Turkey, has been prepared by Pusula Engineering.

Two different campuses were designed. As Pusula Engineering, infrastructure works and road projects such as rainwater, wastewater, drinking water and electricity lines were prepared by us.

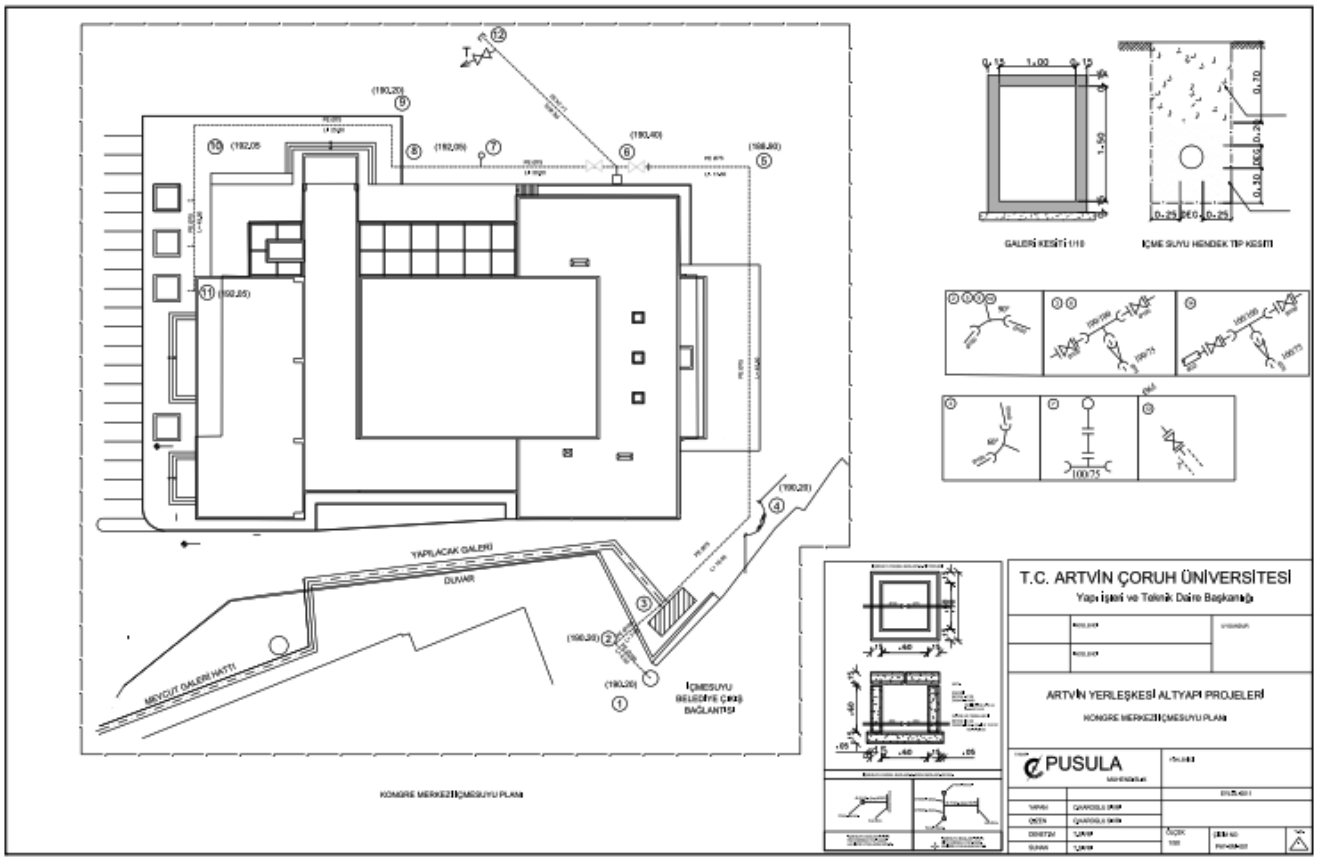
Picture 11 Artvin Çoruh university campus

Picture 12 Artvin Çoruh university campus other appereance

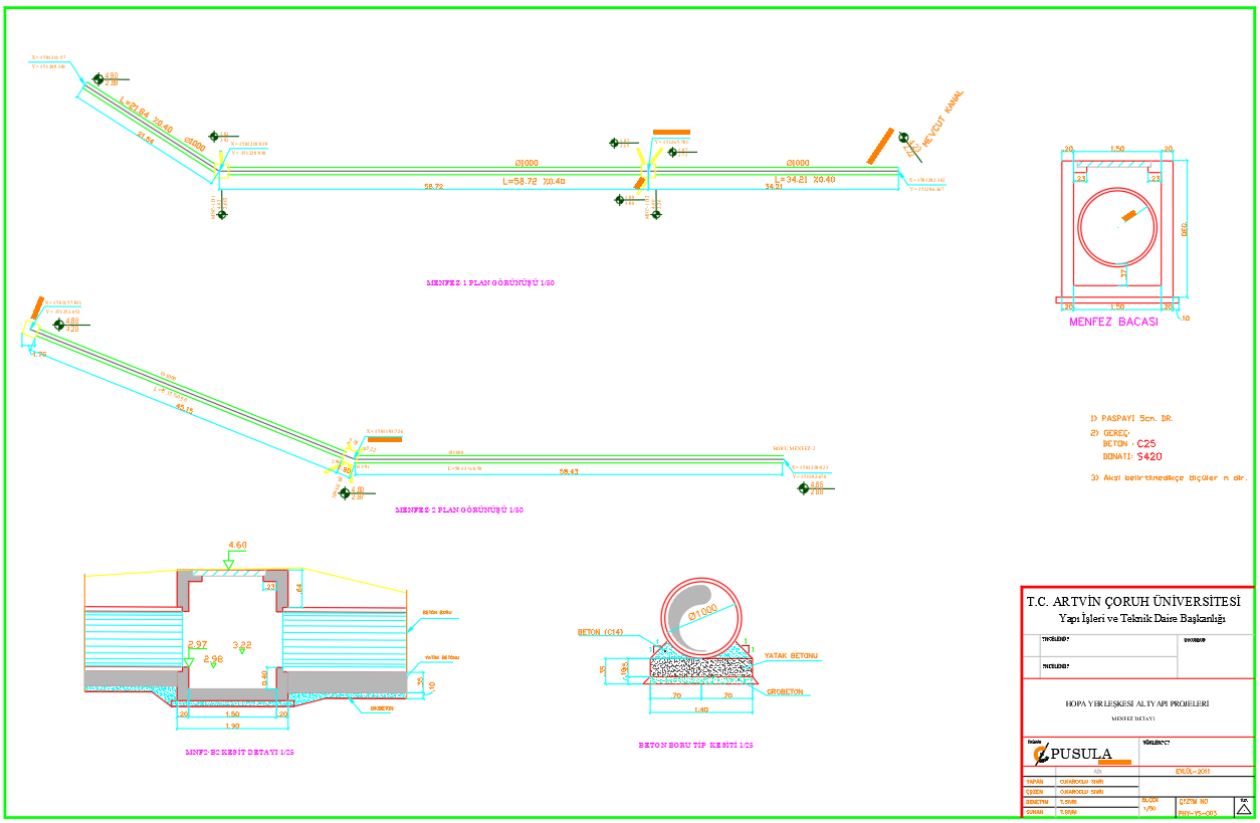
Picture 13 Artvin Çoruh university Seyyitler campus

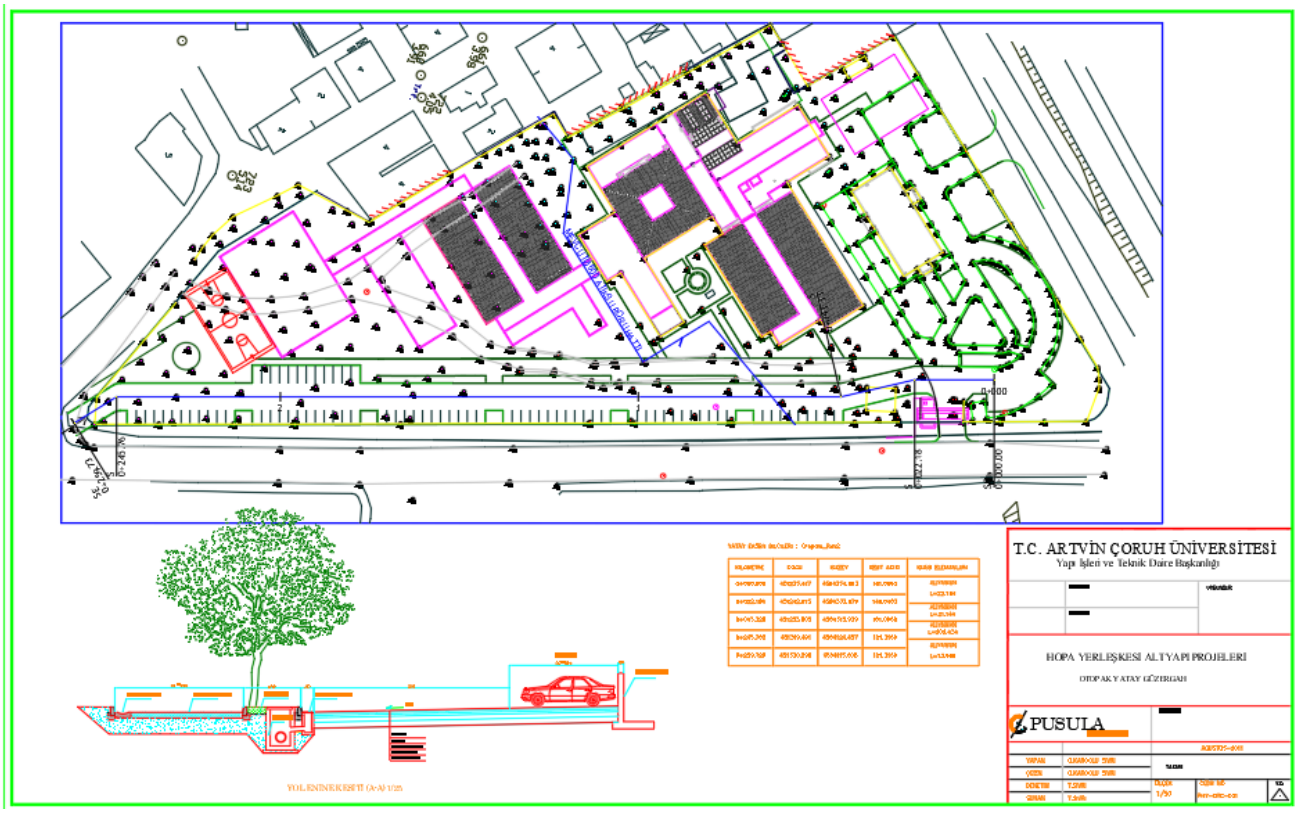


Picture 14 Rainwater supply line detail

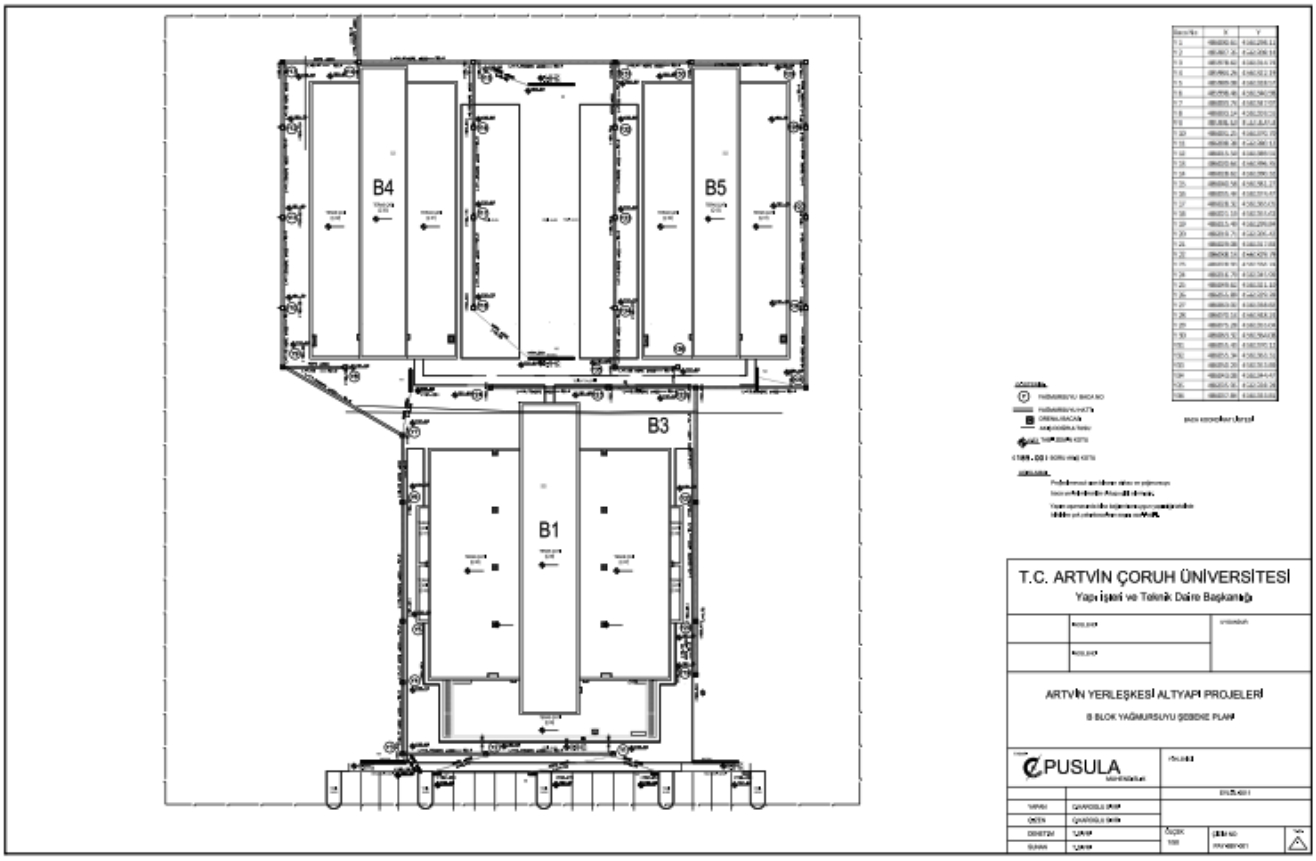


Picture 15 Artvin Çoruh university drinking water details

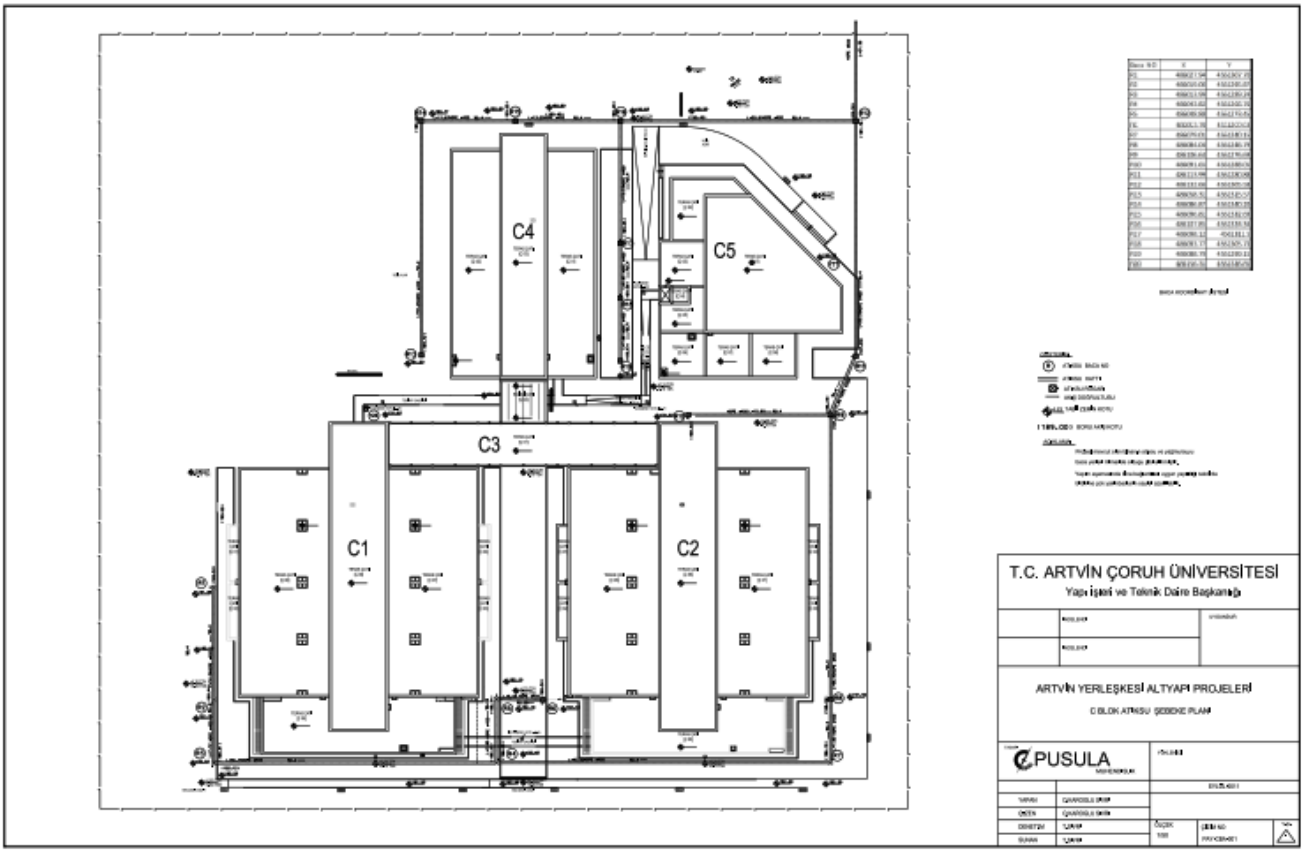




Picture 16 Artvin Çoruh university otopark an road section



Picture 17 B blok rainwater drainage dateails

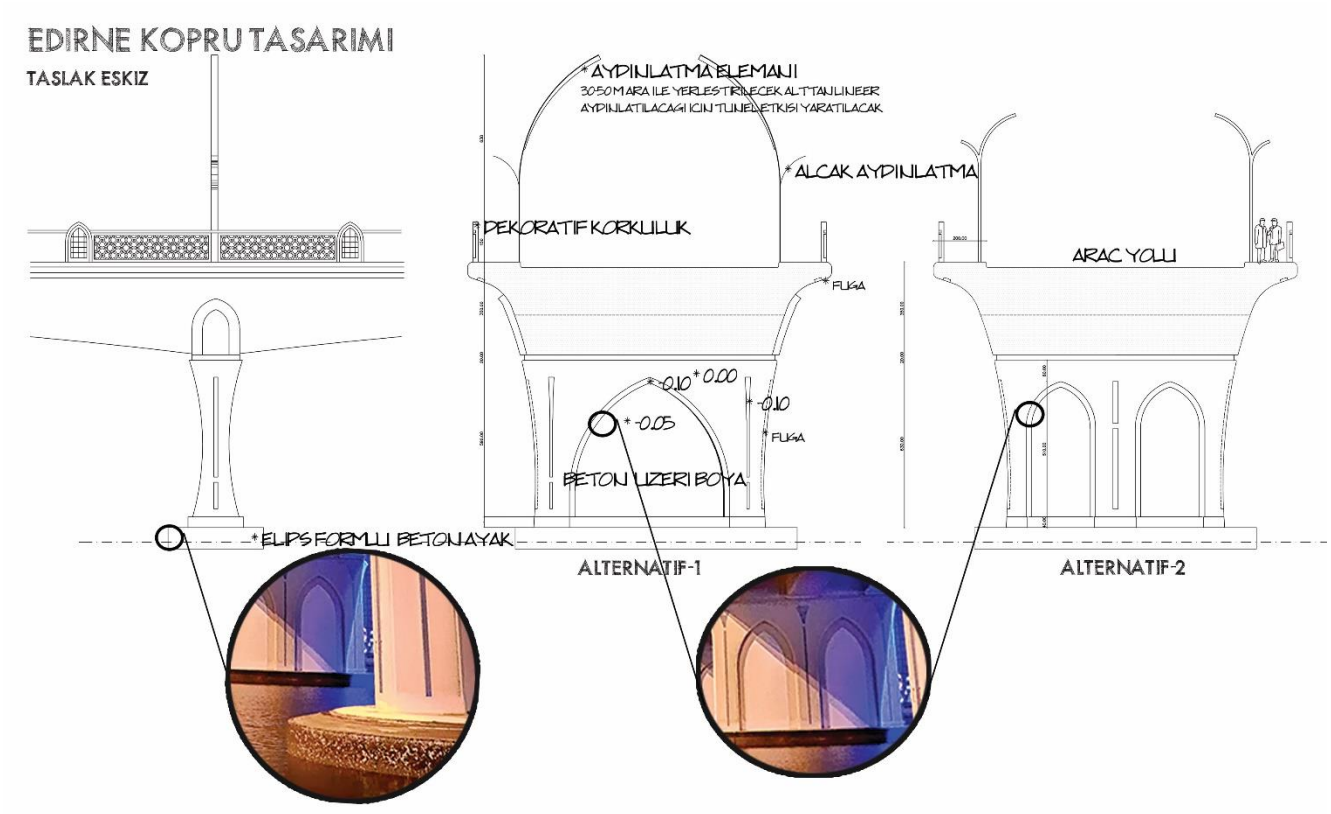


Picture 18 C blok rainwater drainage dateails

Since our area of expertise is roads, bridges and infrastructure, we have completed many projects for the General Directorate of Highways. We have prepared tunnel, bridge, road interchange and overpass projects in different cities of Türkiye.

Among these projects, the Edirne Sırpsınırğı Bridge was determined by a project design competition, as it required a special architecture due to being the capital of the Ottoman Empire. The project, which is close to the distinguished works of Mimar Sinan, was designed in accordance with the Ottoman heritage. Its exterior color is white, its legs are marble and Seljuk motifs are placed. The bridge, designed as post-tensioning, contains tons tendons.(30+60*9+30=600m)

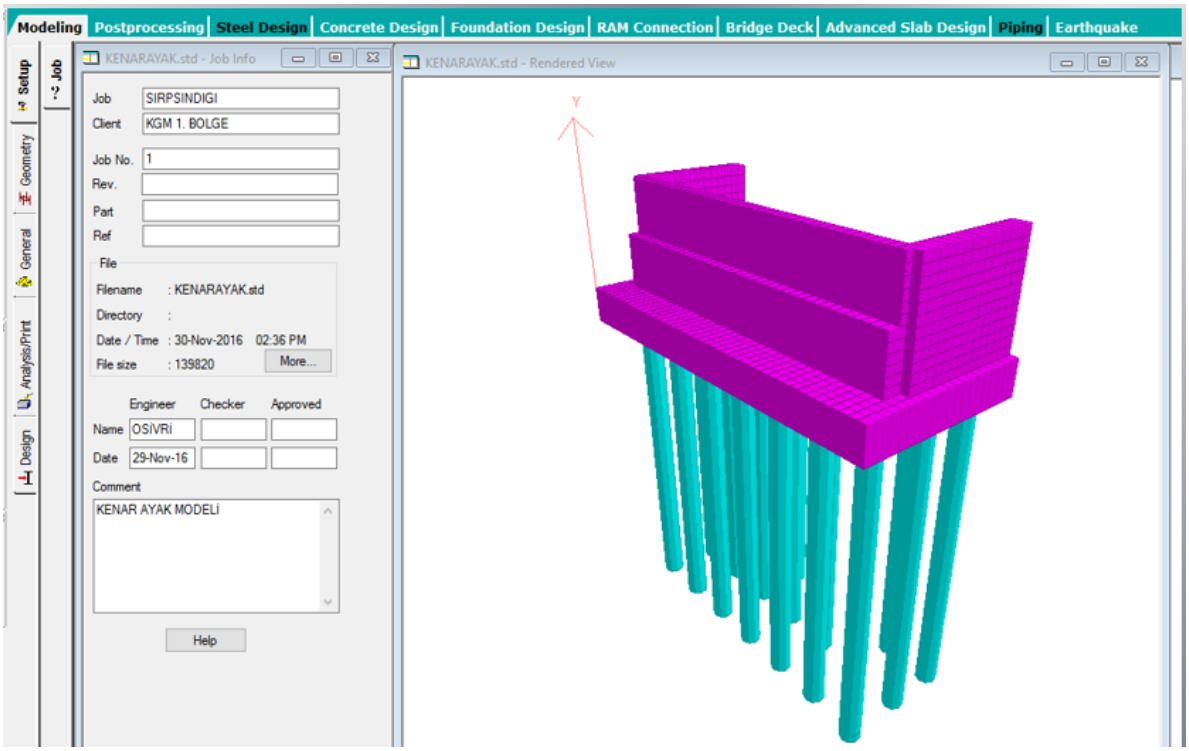
Picture 19 Edirne Sırpsındıgı Bridge



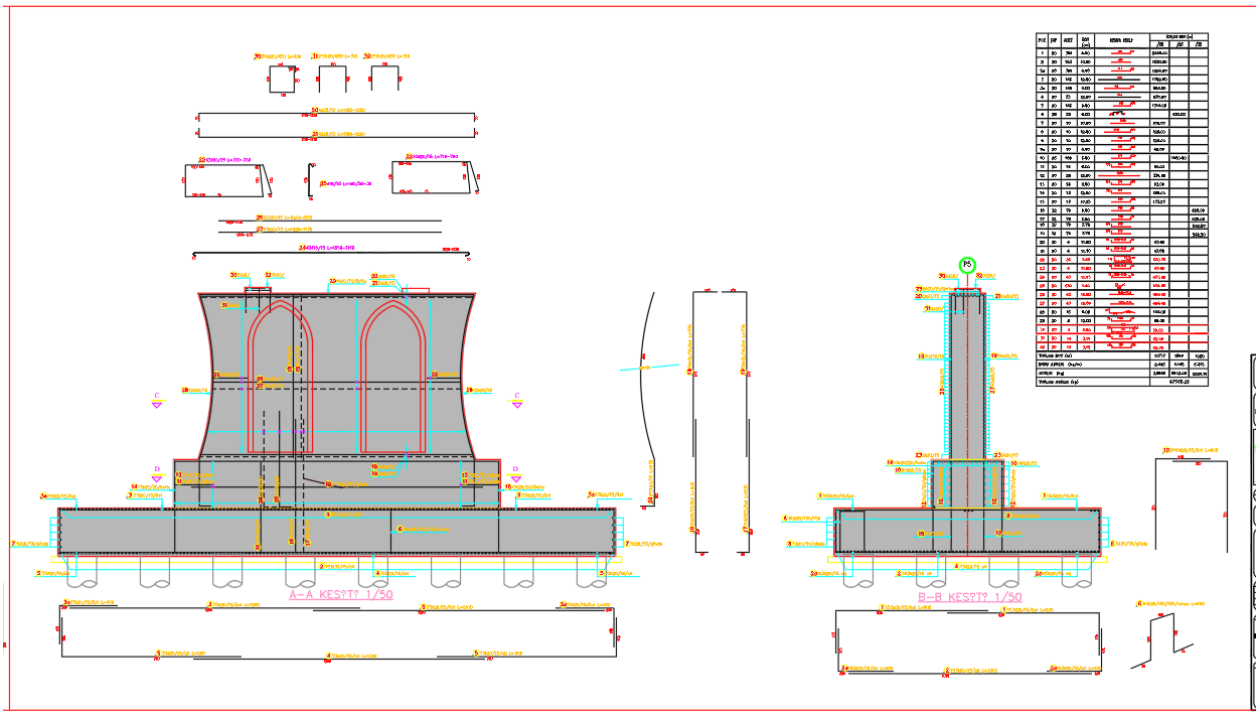
Picture 20 Edirne Sırpsındıgı Bridge designe details

Picture 21 Edirne Sırpsındıgı Bridge other view

Picture 22 Edirne Sırpsındığı Bridge cross section view view



Picture 23 Edirne Sırpsındığı Bridge abutment static modeling



Picture 24 Edirne Sırpsındıgı Bridge pier reinforcement details

PT. PP (Persero) Tbk.

Pantai Indah Kapuk Bridge of Jakarta

Jakarta, DKI Jakarta, Indonesia

The Pantai Indah Kapuk Bridge is an IDR 2.13 billion design and construction project connecting the golf island to the river walk island in Jakarta. Consisting of two abutments and eight piers, the steel, precast girder bridge required detailed design and fast information sharing. The new bridge structure will improve transportation infrastructure and support development of the urban and regional areas.

The project team implemented a collaborative BIM approach using Bentley's design, analysis, and visualization applications. OpenBridge Modeler simplified modeling of the uniquely shaped piers, reducing design time while ensuring design accuracy. LumenRT enabled the delivery of an interactive visual simulation of the proposed bridge structure, improving communication. Bentley applications facilitated clash detection and real-time collaboration, minimizing changes and avoiding rework. The 3D intelligent model allowed for asset management throughout operations and maintenance. **Project Playbook:** LumenRT, OpenBridge Modeler

Pusula Muhendislik Insaat Sanayi Ticaret Limited Sirketi

Edirne Sirpsindigi Bridge

Edirne, Trachia, Turkey

To help with transportation disruption in the city of Edirne, Turkey from extreme flooding during the rainy season, the General Directorate of Highways in Turkey is constructing the TRY 100 million Edirne Bridge on the Tunca River border between Turkey and Bulgaria. Pusula Muhendislik was responsible for designing the 600-meter post-tensioned bridge amid geological site constraints and complex traffic flows. The team also needed to aesthetically complement an existing 500-year-old historic bridge. The new bridge will improve the region's transportation and prevent flood-related isolation for Edirne.

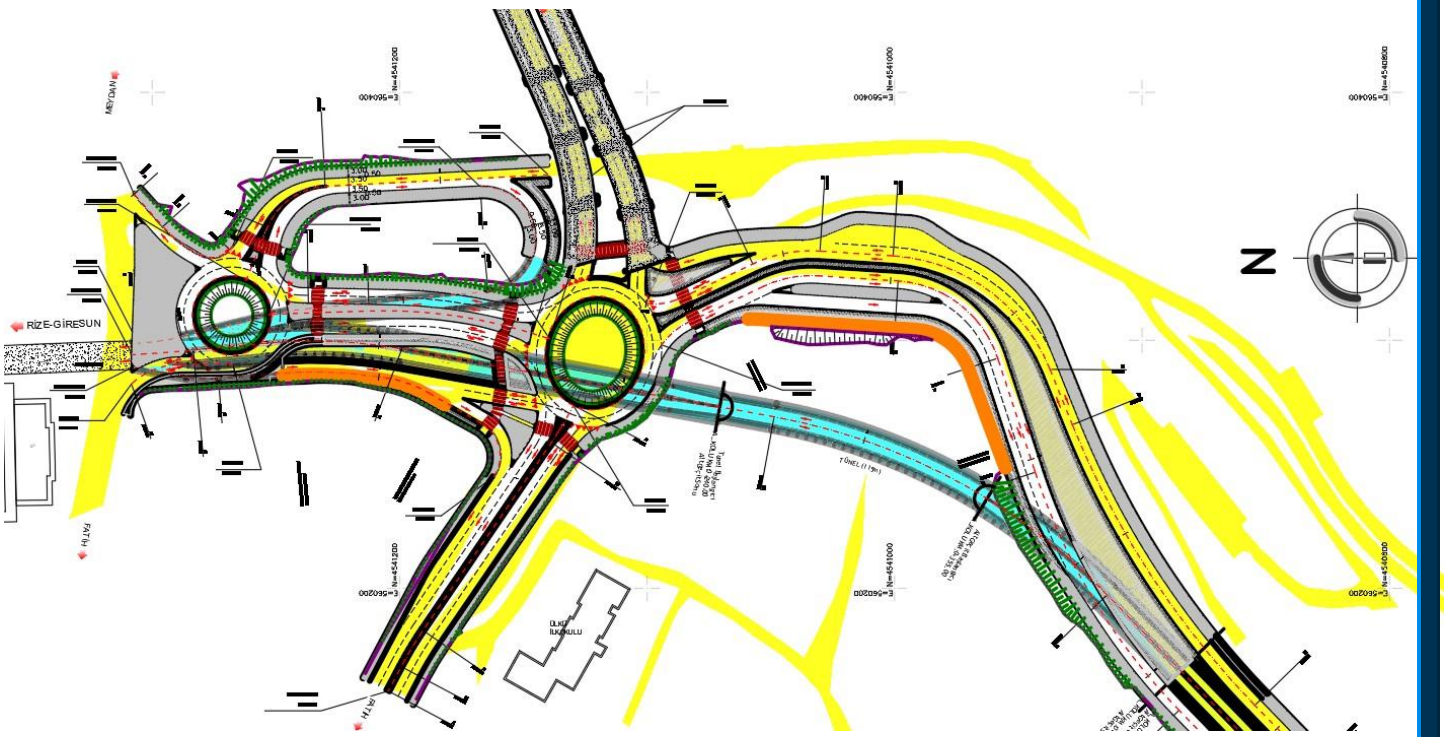
The project team used RM Bridge to optimize bridge geometry, making it high enough to prevent the road from flooding. The applications facilitated and simplified bridge design, decreasing manual labor and significantly reducing project costs. The interoperability of RM Bridge with other Bentley applications saved one month in design and engineering costs. Bentley's flexible, integrated technology accommodated the many design changes, minimizing errors during construction. **Project Playbook:** MicroStation, OpenBridge, OpenRoads, RM Bridge

Picture 25 Edirne Sırpsındıgı Bridge in Bentley Infrastructure 2018

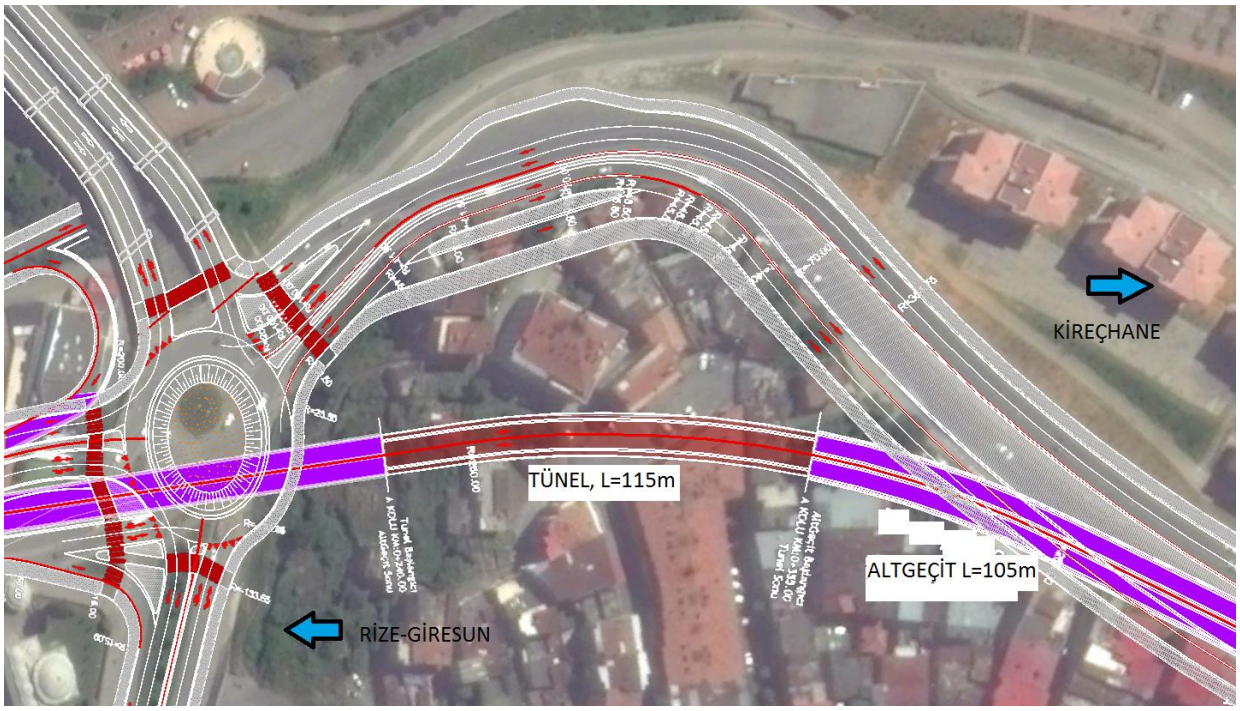
General Directorate of Highways

Trabzon Gundogdu Intersectıon and Tunnels project

The city of Trabzon has a mountainous structure geographically. The housing need that emerged with the increasing population over time resulted in the widening of roads. However, tunnels and underpasses have become solutions for roads that cannot be built to the desired geometry and standards.

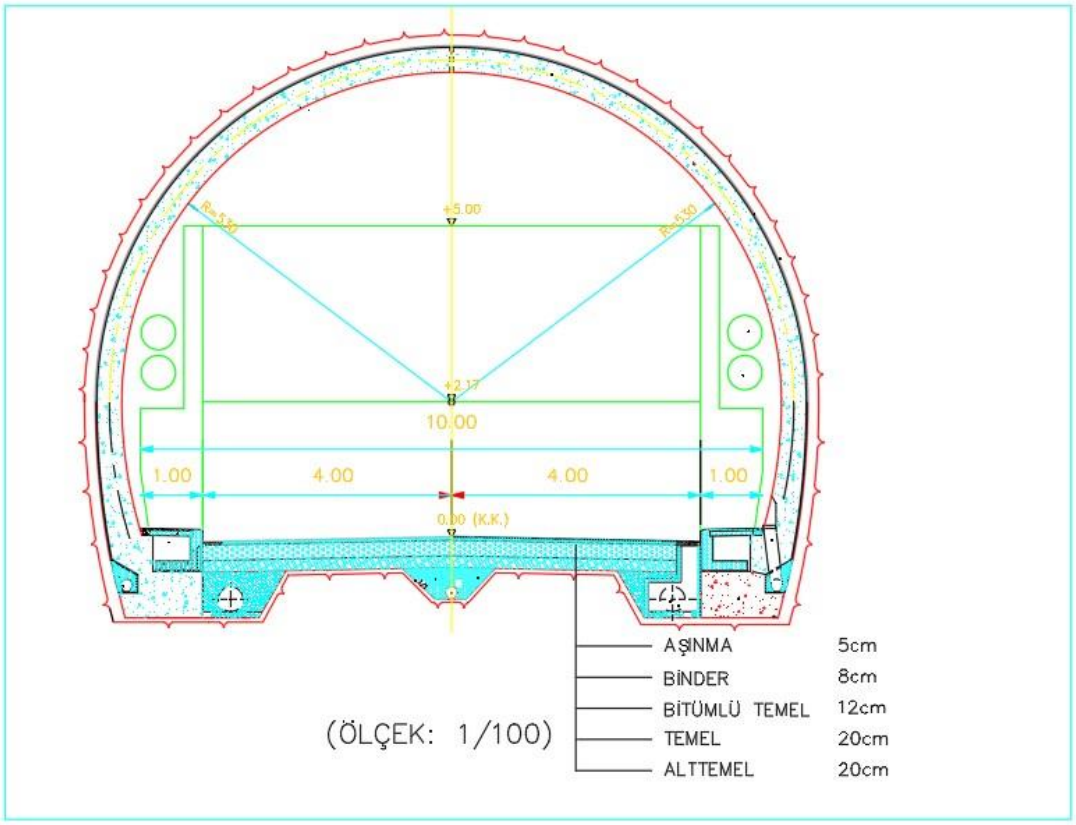


Picture 26 Trabzon Gündoğdu Project Computer Modeling in MicroStation

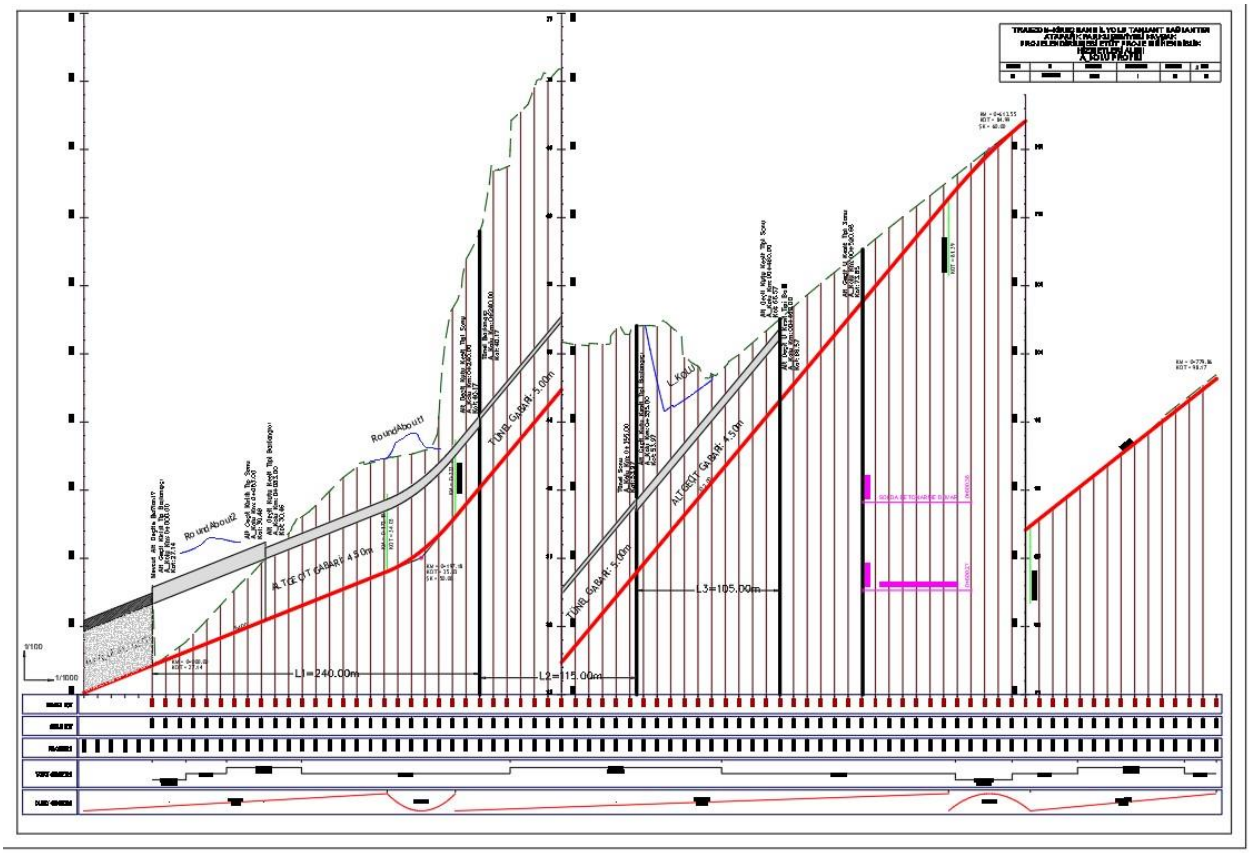


Picture 27 Trabzon Gündoğdu Project Computer Modeling with real view

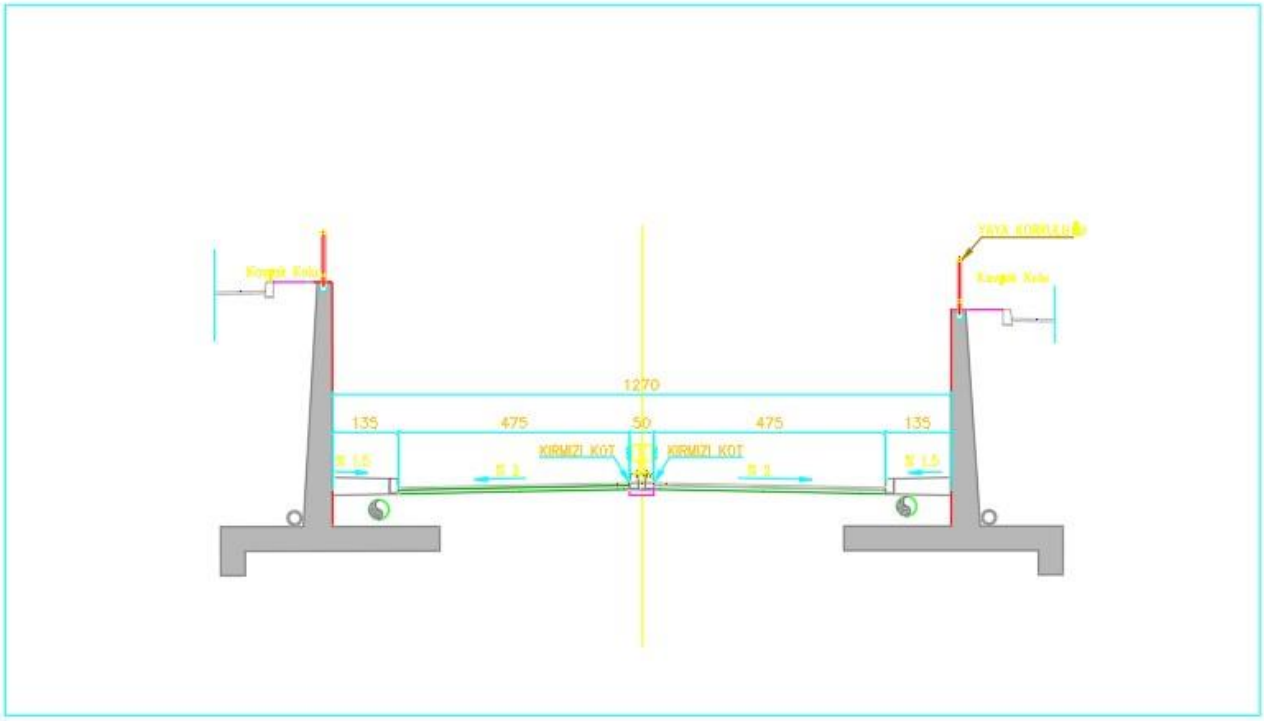
Picture 26 Trabzon Gündoğdu Project Drone photograph



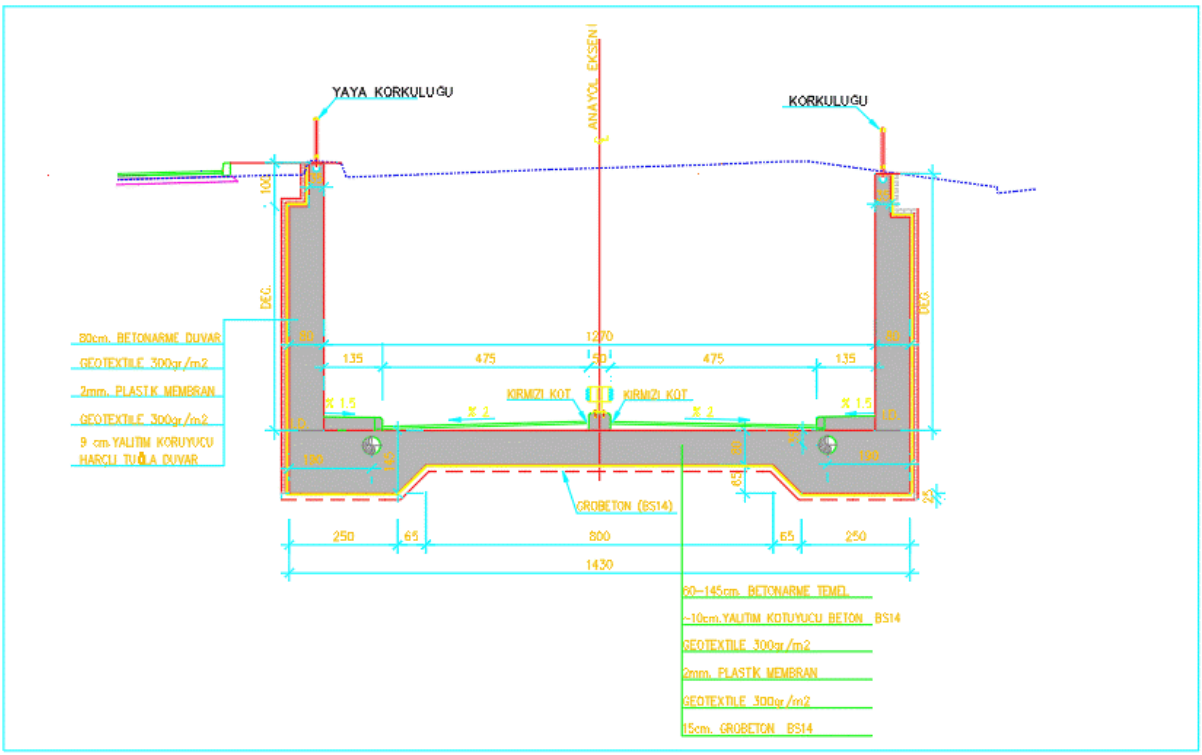
Picture 27 Trabzon Gündoğdu Project tunnel section



Picture 28 Trabzon Gündoğdu Project road crosssection



Picture 29 Trabzon Gündoğdu Project reainwall section



Picture 28 Trabzon Gündoğdu Project concrete U section details

Republic of Turkey

Ministry of Transport and Infrastructure

General Directorate of Railways

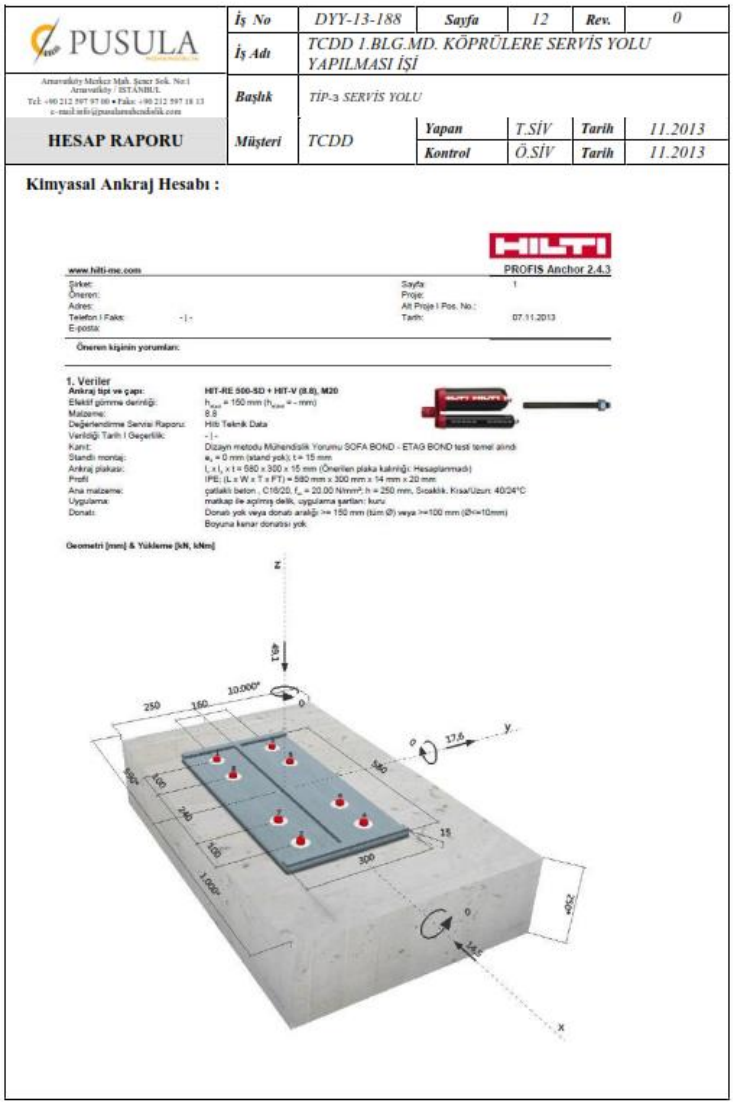
Steel construction pedestrian crossings were made on 55 steel bridges of the State Railways in the Marmara region.

The existing bridges were in areas where there was no road transportation and people did not have the opportunity to cross them. To solve this problem, models of each bridge were created by surveying the terrain and 8 different types of pedestrian crossings were built that are robust and compatible with today's technology.

Picture 29 Steel Bridge type-I

Picture 29 Steel Bridge type-II

Picture 29 Steel Bridge type-III



PUSULA	İş No	DYY-13-188	Sayfa	12	Rev. 0
	İş Adı	TCDD 1.BLG.MD. KÖPRÜLERE SERVİS YOLU YAPILMASI İŞİ			
	Başlık	TİP-3 SERVİS YOLU			
HESAP RAPORU	Müşteri	TCDD	Yapan T.SİV	Tarih	11.2013
			Kontrol Ö.SİV	Tarih	11.2013

Kimyasal Ankraj Hesabı :

HILTI

www.hilti-me.com — PROFIS Anchor 2.4.3

Şirket: Sayfa: 1
Öneren: Proje:
Adres: Alt Proje I Pos. No.:
Telefon I Faks: - | - Tarih: 07.11.2013
E-posta:

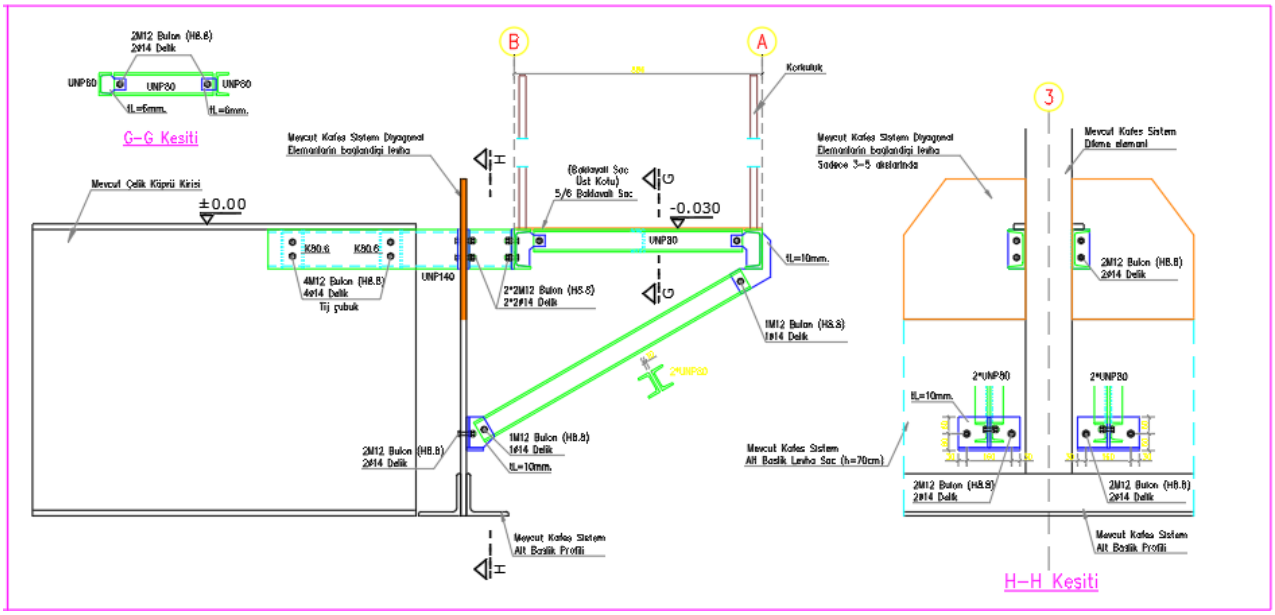
Öneren kişinin yorumları:

1. Veriler

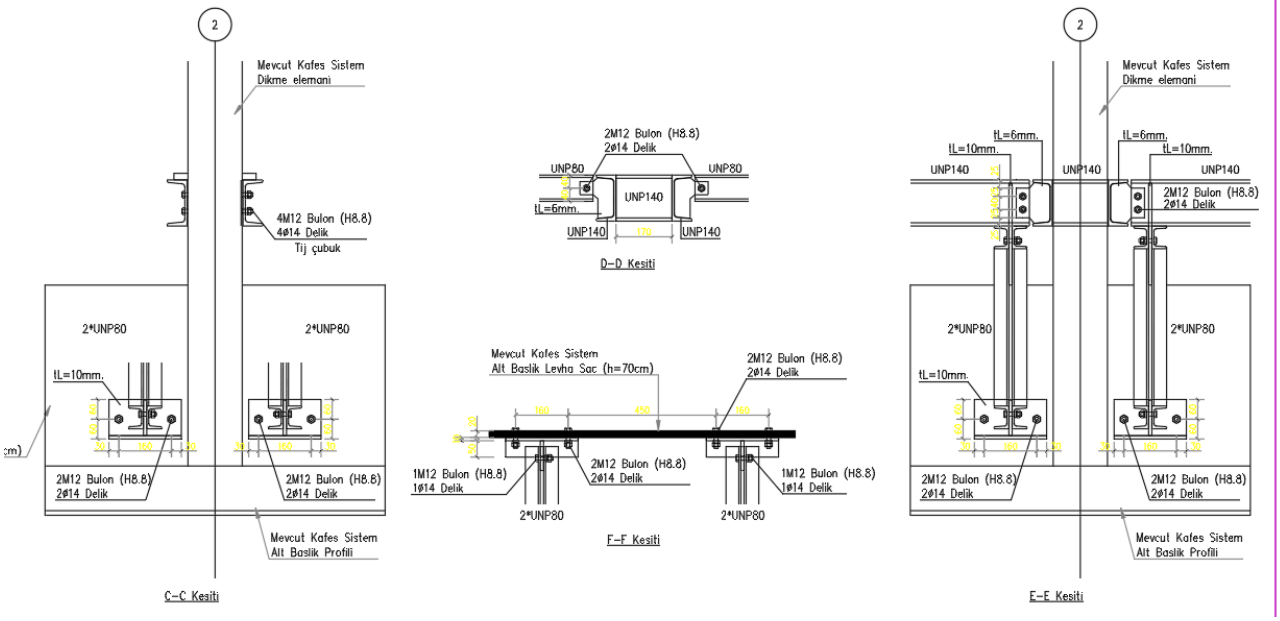
Ankraj tipi ve çapı: HIT-RE 500-SD + HIT-V (8.8), M20
Efektif gömme derinliği: h_{ef} = 150 mm (h_{nom} = - mm)
Malzeme: 8.8
Değerlendirme Servisi Raporu: Hilti Teknik Data
Verilediği Tarih I Geçerlilik: - | -
Kanıt: Dizayn metodu Mühendislik Yorumu SOFA BOND - ETAG BOND test temel alındı
Standı montaj: e_b = 0 mm (stand yok); t = 15 mm
Ankraj plakası: l, x l, x t = 580 x 300 x 15 mm (Önerilen plaka kalınlığı: Hesaplanmadı)
Profil: IPE; (L x W x T x FT) = 580 mm x 300 mm x 14 mm x 20 mm
Ana malzeme: çatlaklı beton , C16/20, f_c = 20,00 N/mm²; h = 250 mm, Sıcaklık: Kısa/Uzun: 40/24°C
Uygulama: matkap ile açılmış delik, uygulama şartları: kuru
Donatı: Donatı yok veya donatı aralığı >= 150 mm (tüm Ø) veya >=100 mm (Ø<=10mm)
Boyuna kenar donatısı yok

Geometri [mm] & Yükleme [kN, kNm]

Picture30 Steel Bridge Anchor details computer modeling



Picture 31 Steel pedestrian crossection deaits



Picture 32 Steel pedestrian crosssection other view

T.C.
DEVLET DEMİRYOLLARI
1.BÖLGE MÜDÜRLÜĞÜ

İDARE

İŞİN ADI: 1. BÖLGE MÜDÜRLÜĞÜ MINTIKASINDA KÖPRÜLERE SERVİS YOLU YAPILMASI

PROJENİN ADI: UYGULAMA PROJESİ TİP-7
KM: 2+323

PAFTA ADI	Plan ve kesit detayları	ÖLÇEK: 1/20 1/10
PAFTA NO	TCDD-TPKST-UP-009	

PUSULA MÜHENDİSLİK
PUSULA MÜHENDİSLİK İNŞ. SAN.TİC. LTD. ŞTİ.
Merkez Mah. Şener sok. no:1 Arnavutköy/İstanbul
Tel:0 212 597 97 00 Fax : 0212 597 18 13
e-mail : info@pusulamühendislik.com

PROJE GRUBU

	ÜNVANI	ADI SOYADI	ODA SİCİL NO	İMZA
YAPAN	İnşaat Mühendisi	Özgül KAROĞLU SİVRİ	56036	
ÇİZEN	İnşaat Mühendisi	Alican SİVRİ	89693	
KONTROL	Harita Yük. Müh.	Tayfur SİVRİ	6506	

KONTROL GÖR.	KONTROL MÜHENDİSİ	KONTROL MÜHENDİSİ	KONTROL AMİRİ	ONAY
Tunçer KAHRAMAN 17. YBOM Serdar CEYLAN 12. YBOM ../12../ 2013	Tarık ÇAKIR 1/I Müh. ...../...../ 2013	Deniz PARLAK 1/I Müh. 9.../12../ 2013	Nizamettin ARAS Yol Müdür Yrd. 24/12/ 2013	...../...../ 2013

Picture 32 Signed project

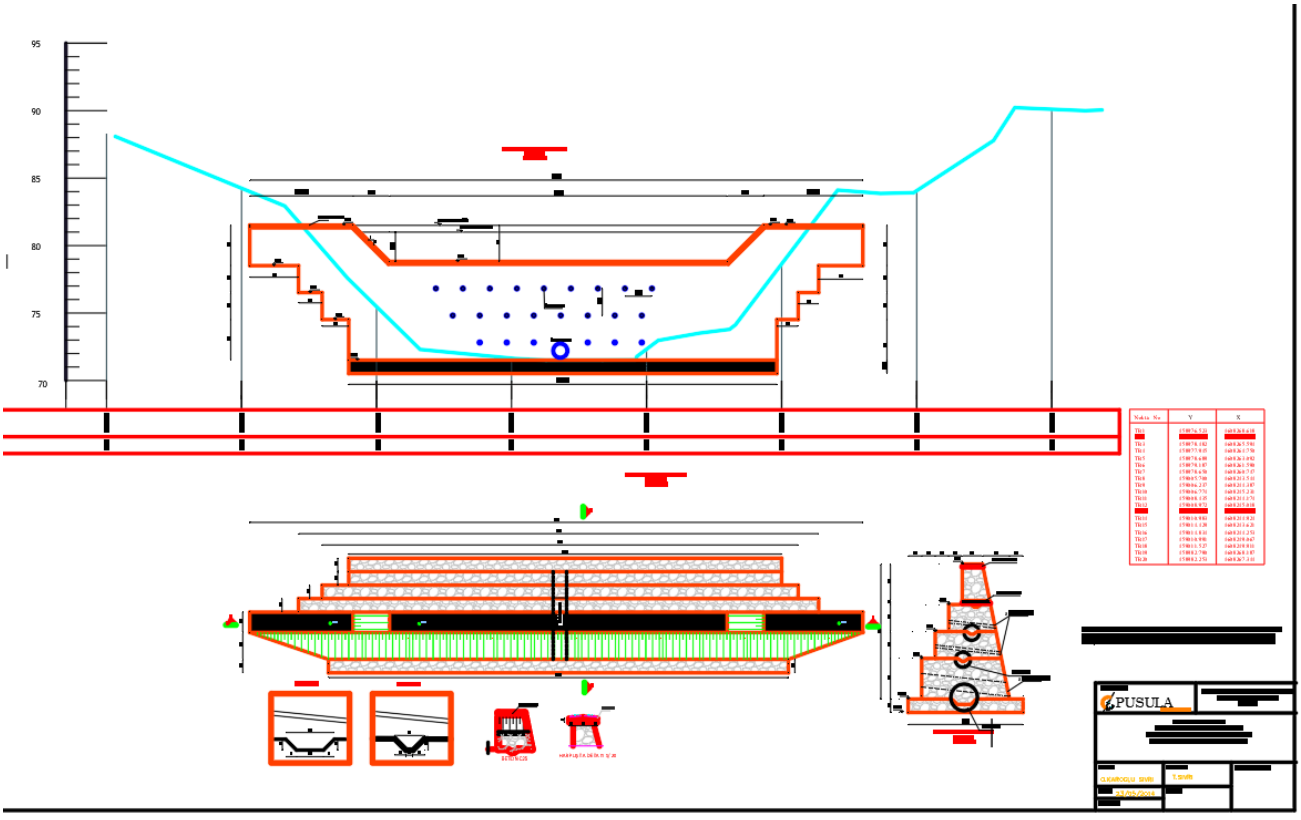
Republic of Türkiye

Ministry of Agriculture and Forestry

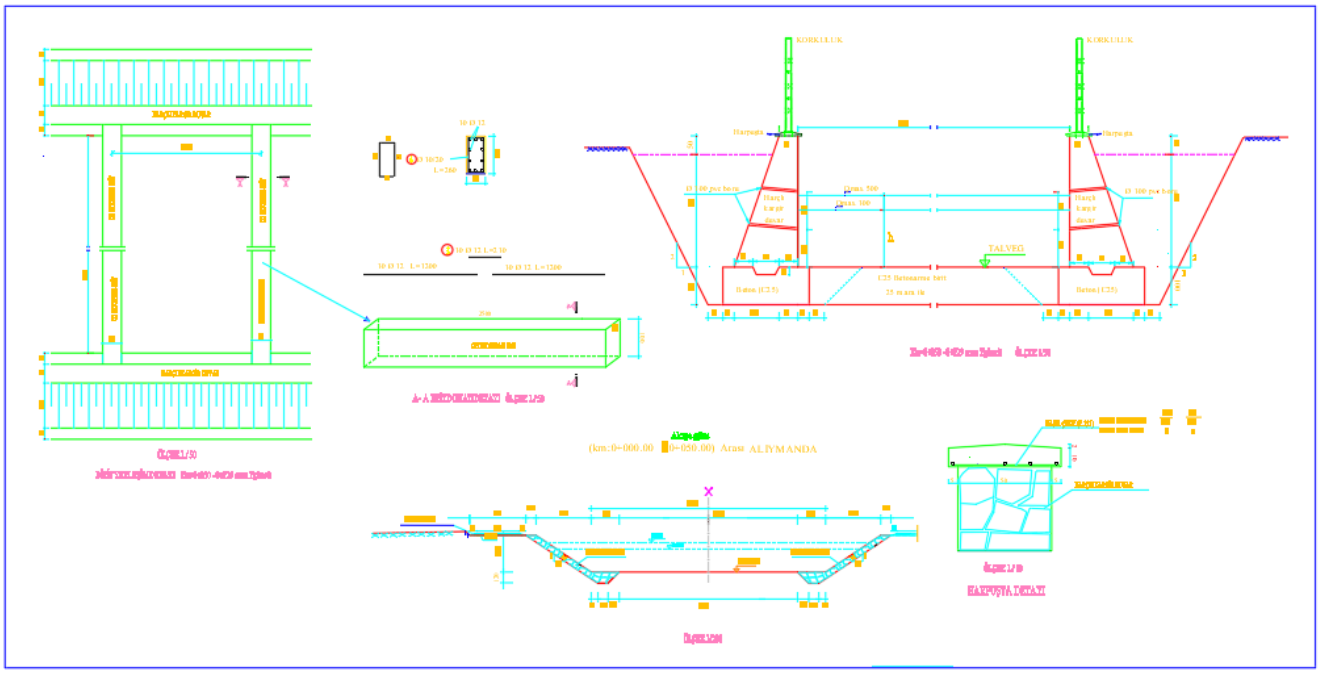
State Hydraulic Works

There are many rivers in our city of Samsun, located in the Black Sea region. Regulatory reinforced concrete structures projects were carried out by Pusula Engineering in order to prevent floods and floods during periods of heavy rainfall.

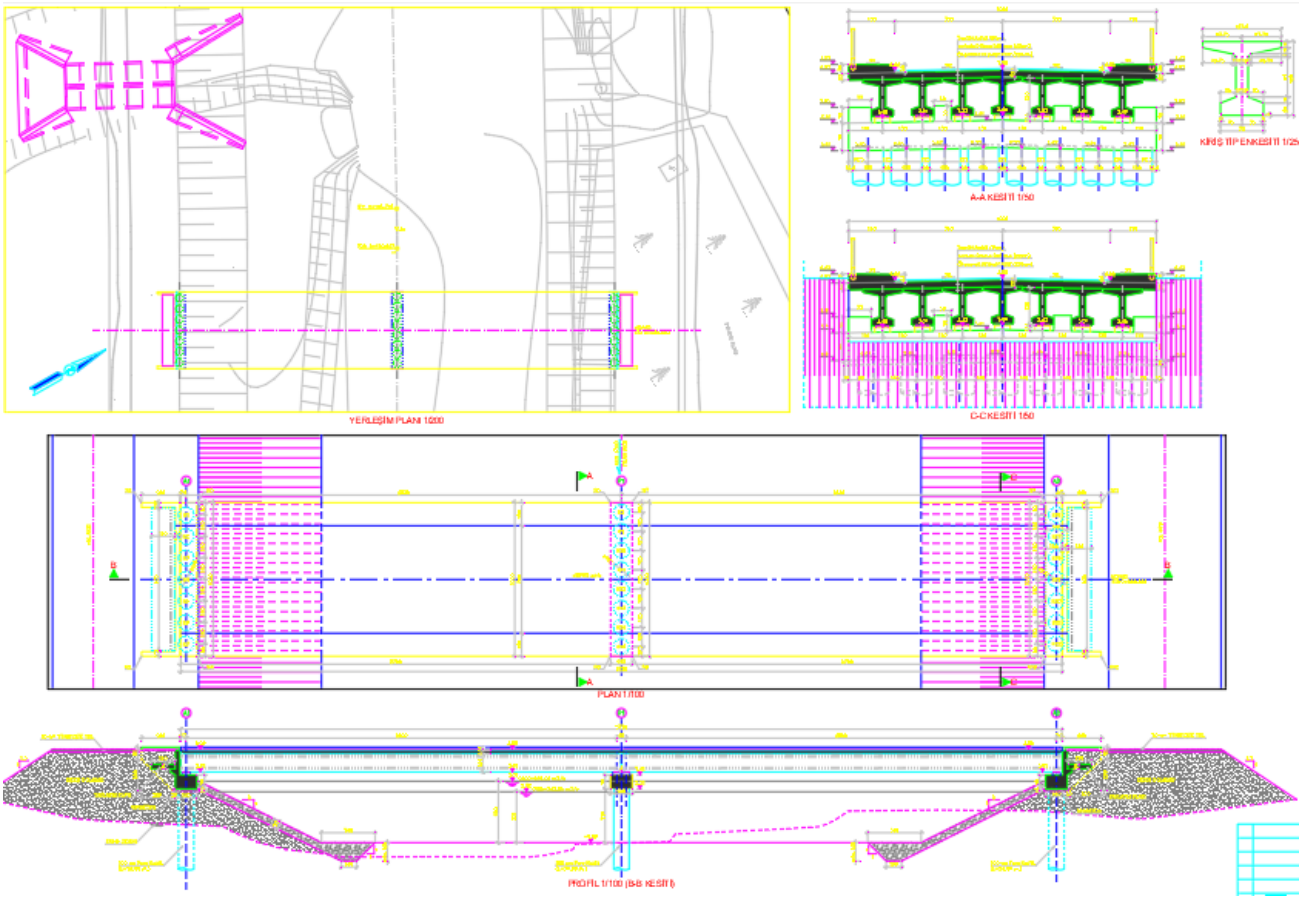
Picture 33 Gümenez project Real Photograph



Picture 34 Gümenez project computer detailin



Picture 35 Yakacık project details



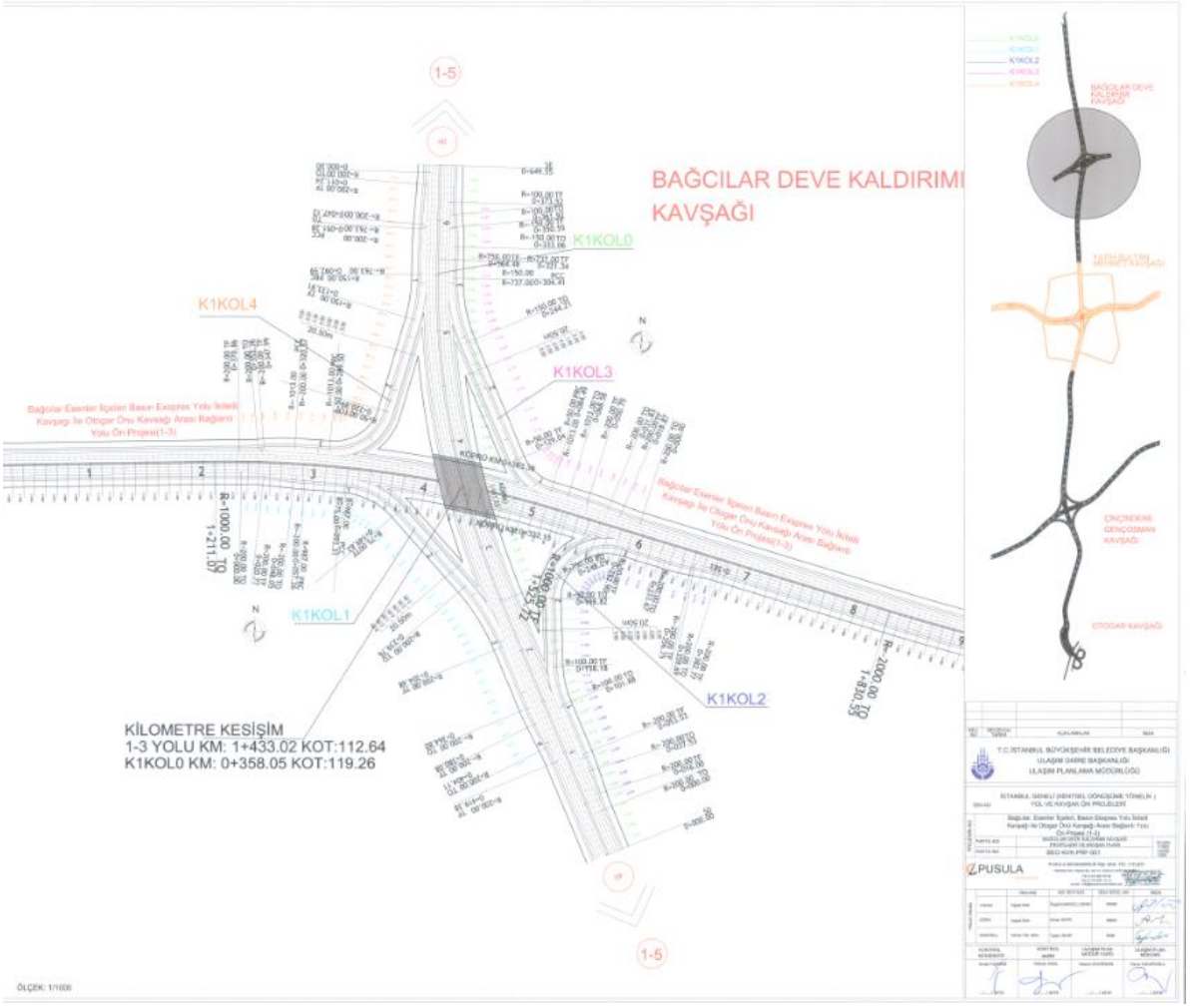
Picture 36 Zeytinsuyu Çayı köprüsü section and general view

The Istanbul Metropolitan Municipality

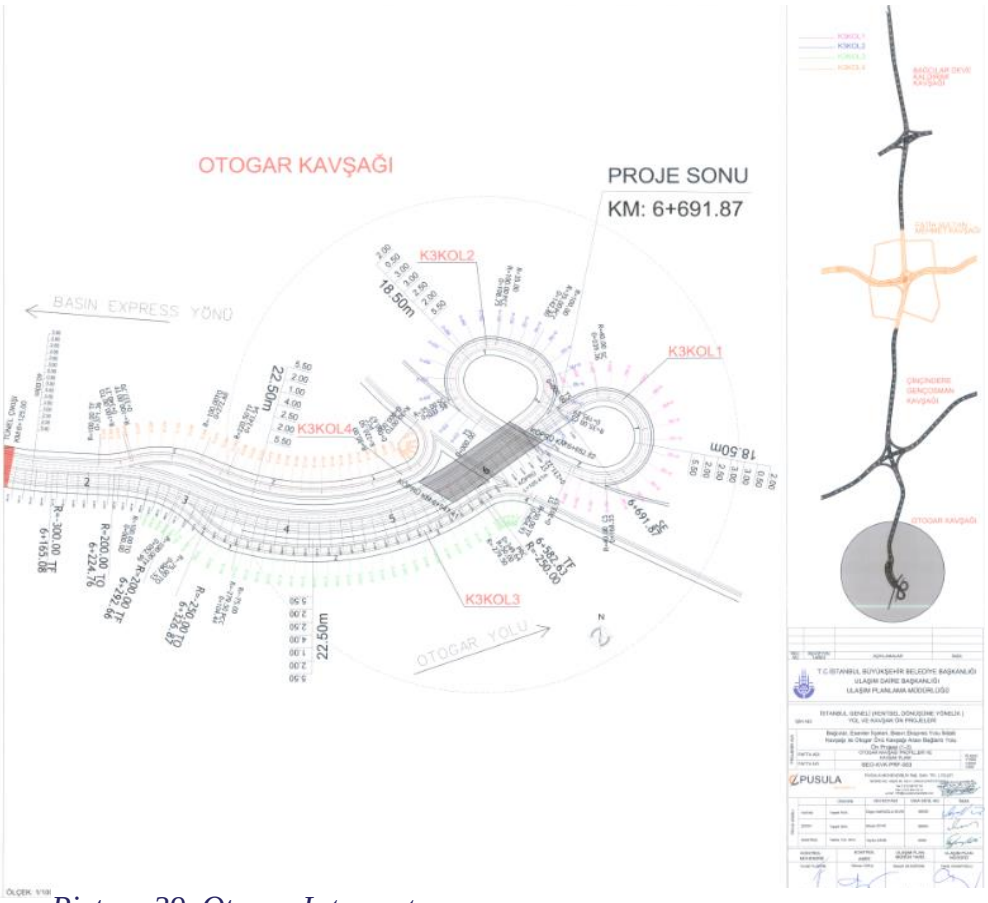
Istanbul is the city we live in, the cradle of history and civilization.

As Pusula Engineering, we have carried out dozens of projects in our city. We have produced solutions to the traffic problem in the middle of construction. We built roads, intersections and infrastructures. In our city, whose population and number of vehicles are increasing day by day.

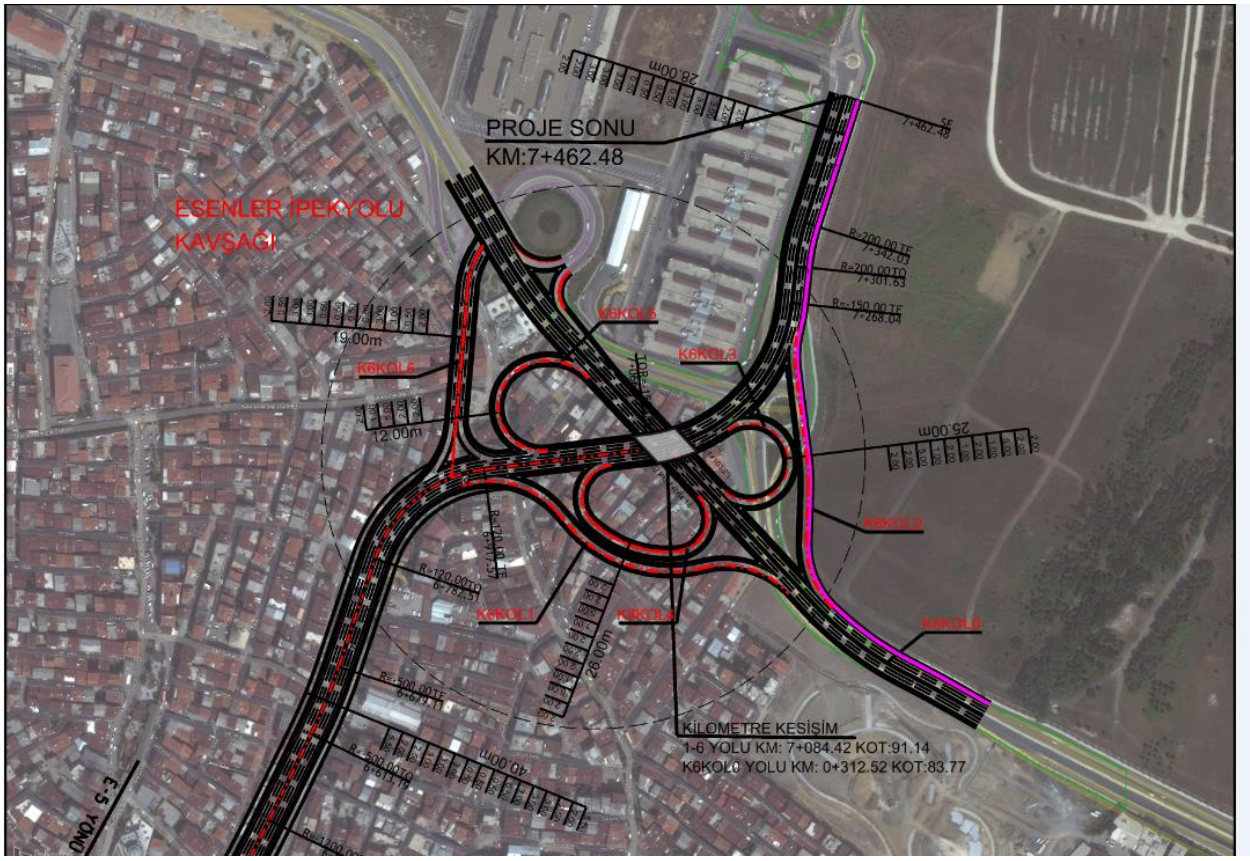
Picture 37 One of the dozens of reports we prepared for the Istanbul Metropolitan Municipality



Picture 38 Bağcılar Deve Kaldırımı Intersectıon

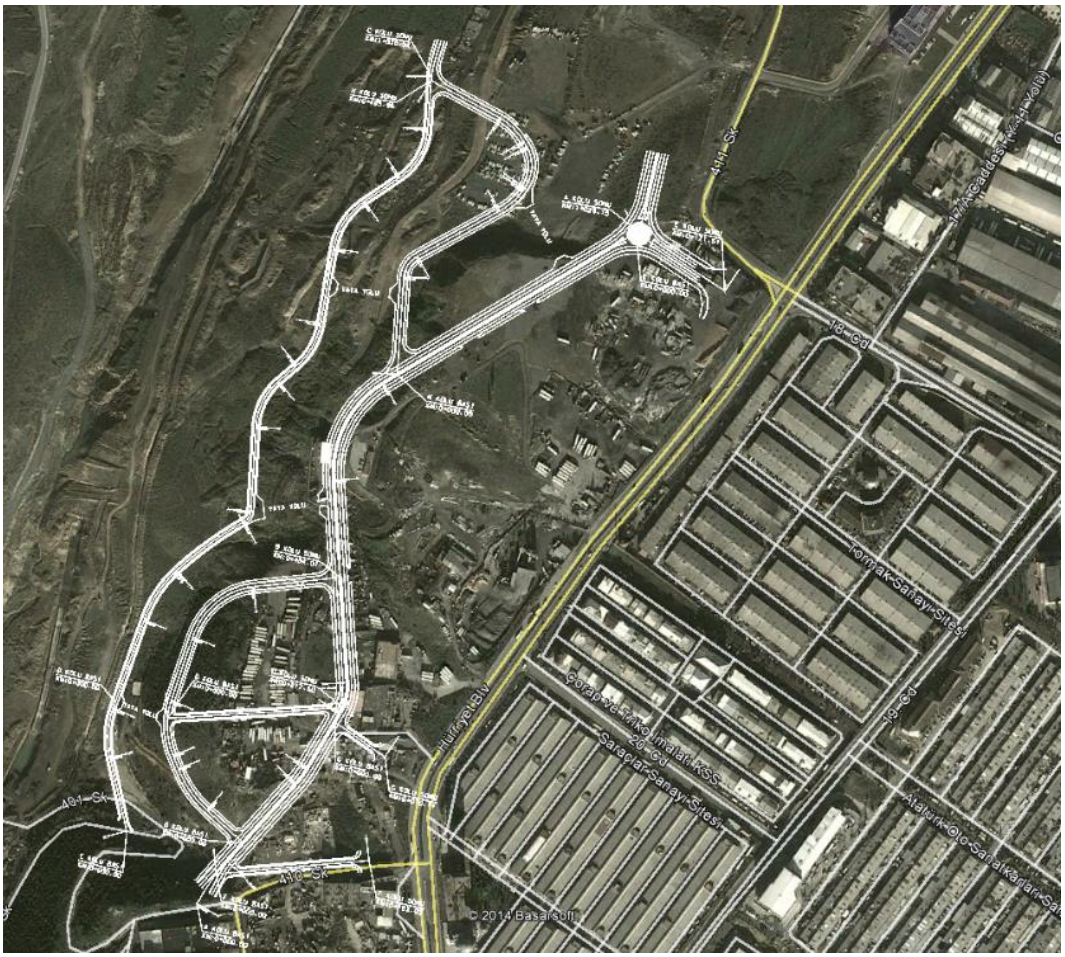


Picture 39 Otogar Intersectıon

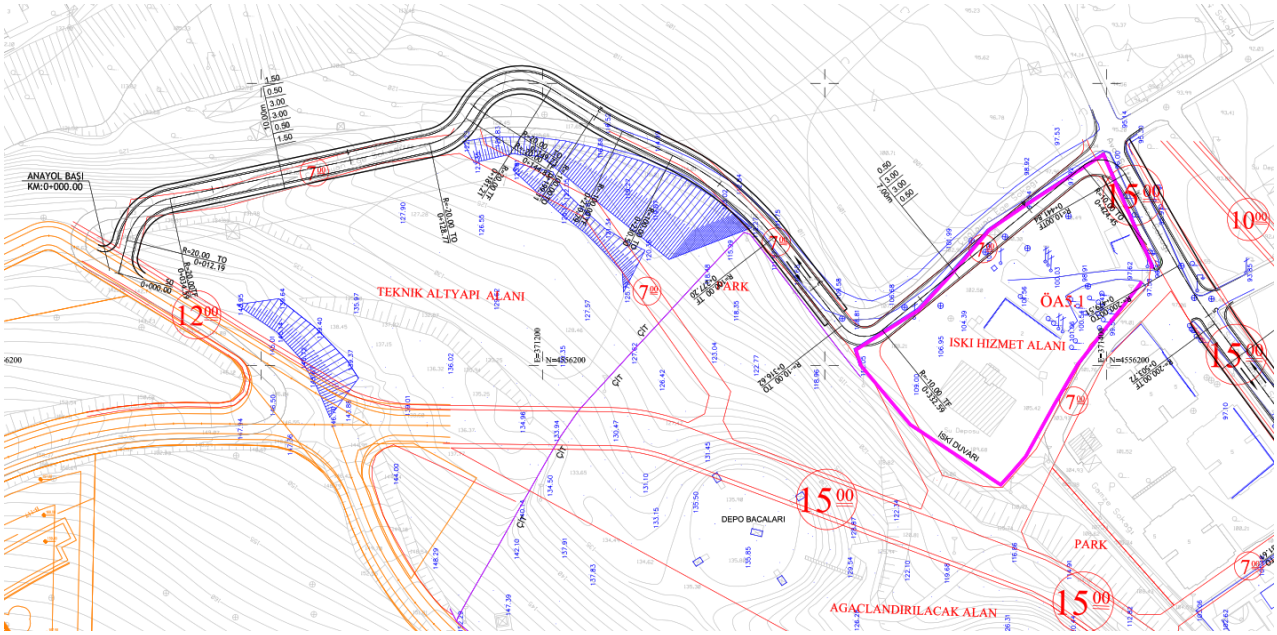


Picture 40 Esenler İpekyolu Intersectıon

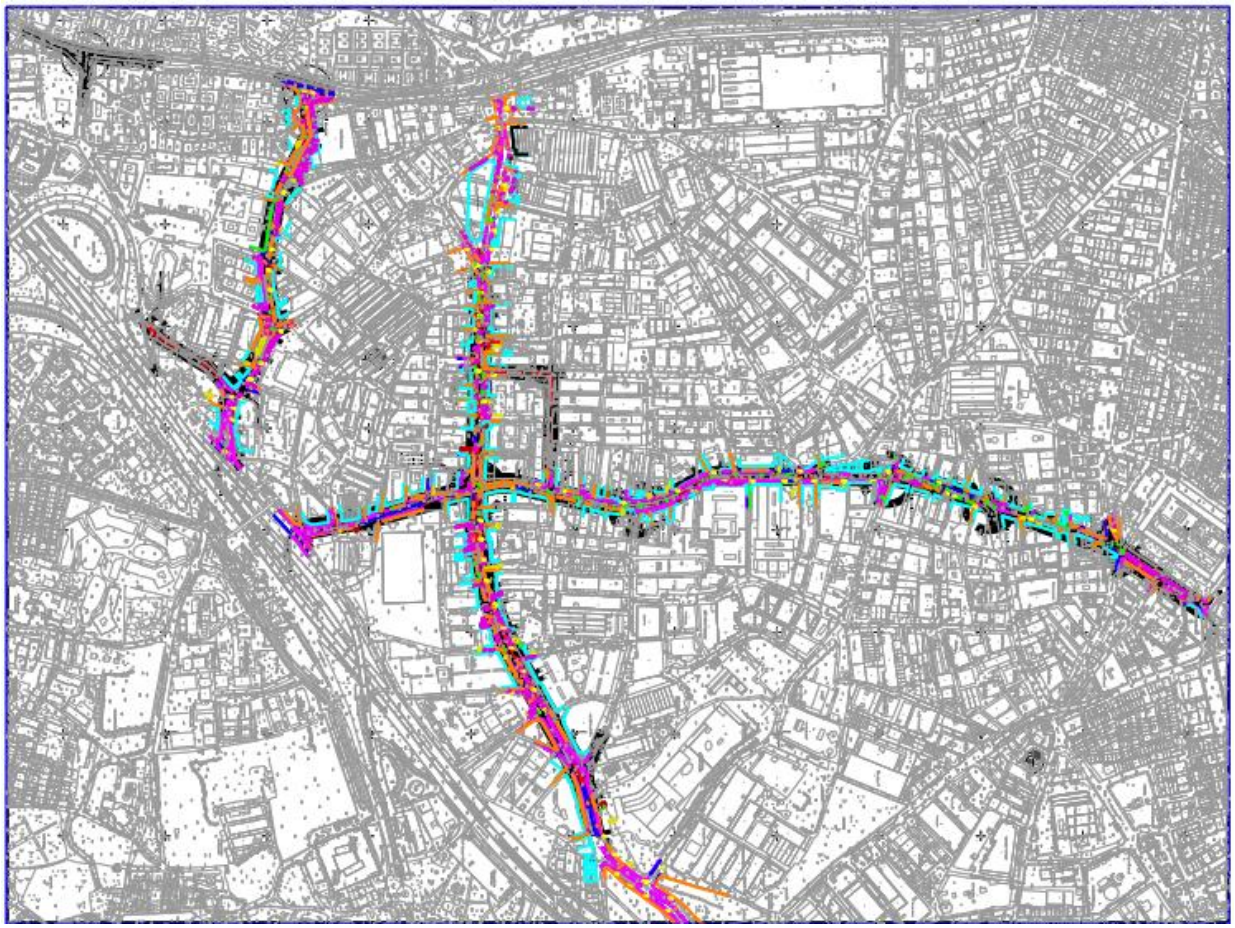
Picture 41 TEM Kuzey-Güney intersection



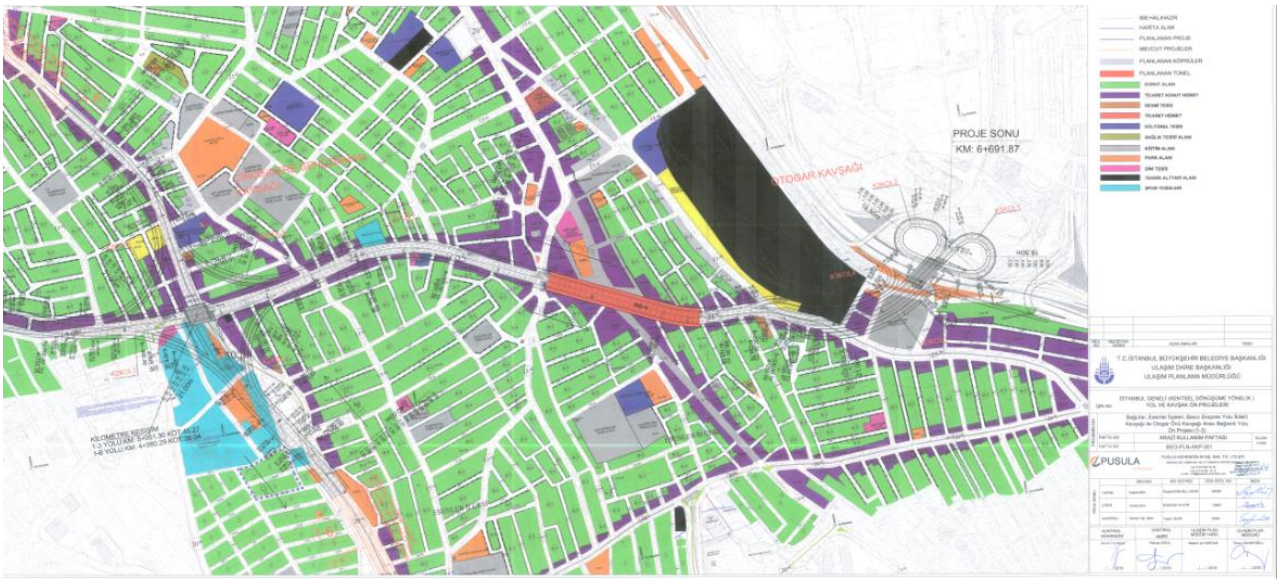
Picture42 Beylikdüzü Hürriyet Bulvarı road design



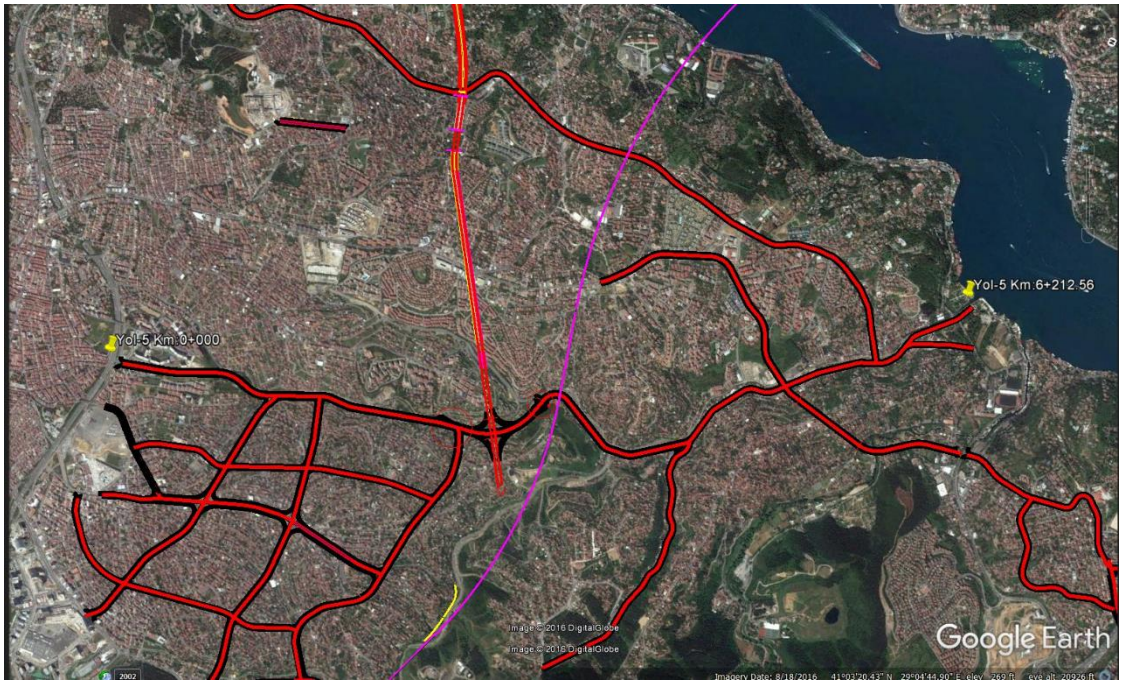
Picture43 Çatalca Erguvankent road design



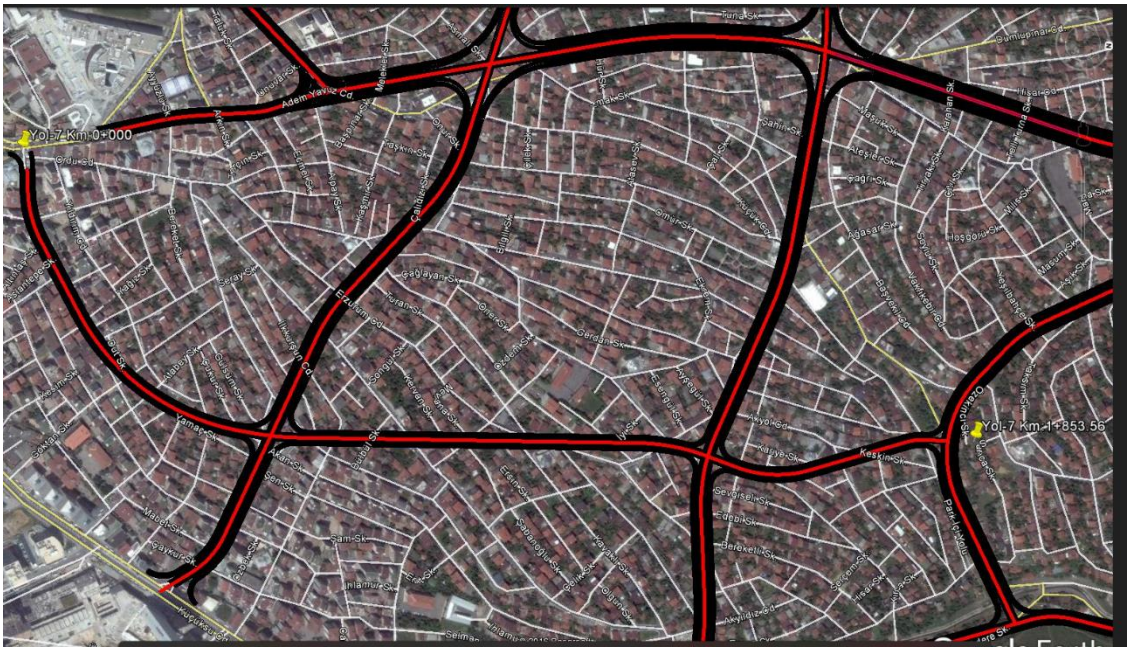
Picture44 Zeytinburnu and Topkapı Intersection and road design



Picture44 Urban Renewal Road project Work-I



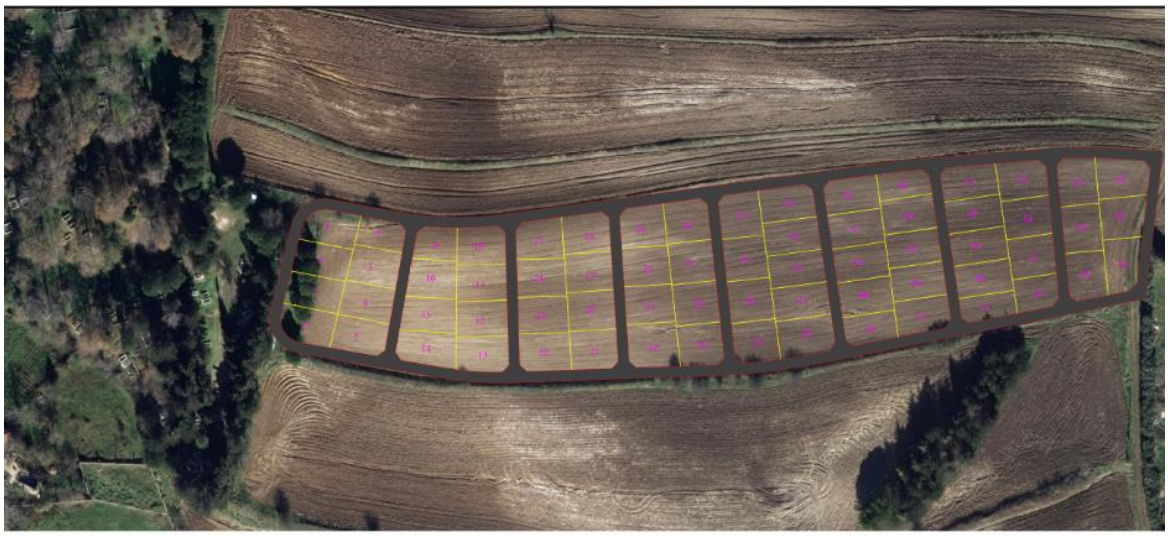
Picture45 In Bosphorus Urban Renewal Road project Work-IV



Picture46 The ring roads of many districts were renewed and expanded

LAND PARCELATION

Pusula Engineering provides subdivision services in many cities of Turkey, in areas without zoning plans. Some of these are shown below.



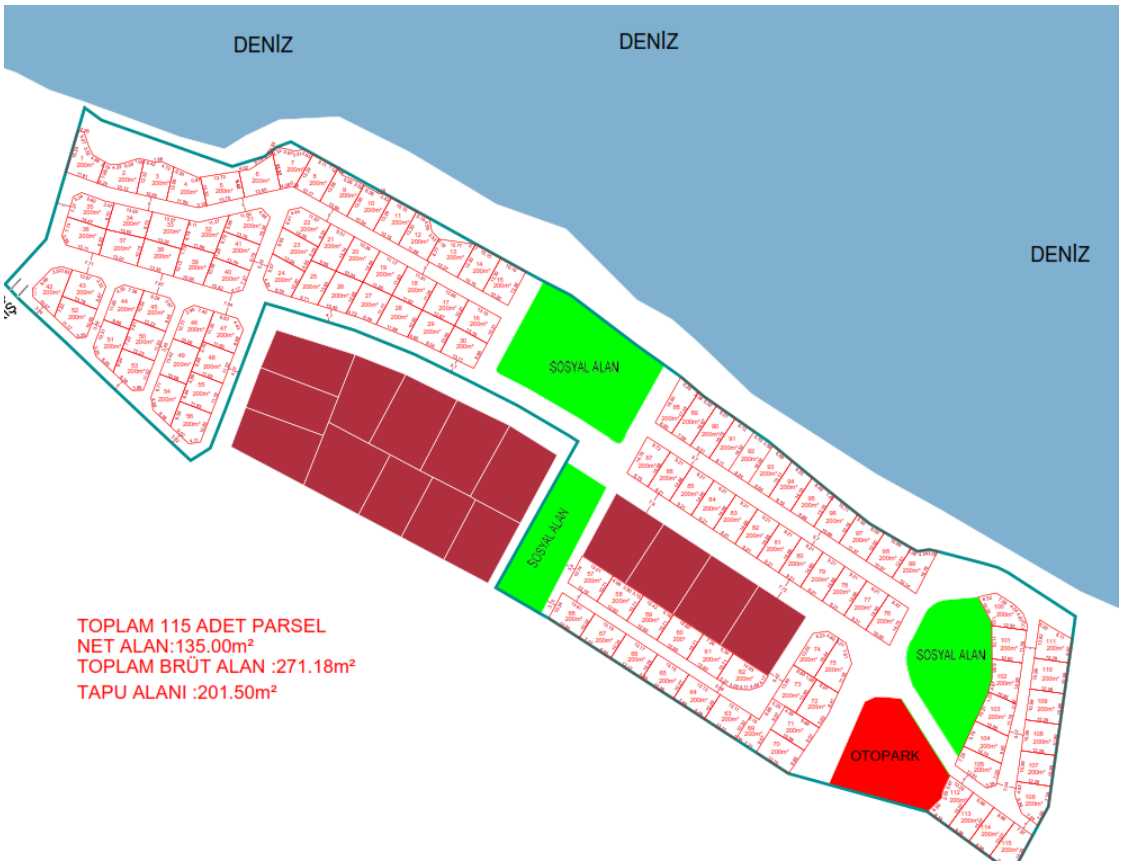
SEL	TAPU ALANI	YOL PAYI	HESAP ALANI
1	200.00	45.90	154.10
2	150.00	34.42	113.58
3	200.92	46.11	154.81
4	200.00	45.90	154.10
5	200.00	45.90	154.10
6	200.00	45.90	154.10
7	200.00	45.90	154.10
8	200.00	45.90	154.10
9	150.00	34.42	115.58
10	200.00	45.90	154.10
11	200.00	45.90	154.10

PARSEL NO	TAPU ALANI	YOL PAYI	HESAP ALANI
21	200.00	45.90	154.10
22	207.57	47.63	159.94
23	200.00	45.90	154.10
24	200.00	45.90	154.10
25	200.00	45.90	154.10
26	200.00	45.90	154.10
27	200.00	45.90	154.10
28	200.00	45.90	154.10
29	200.00	45.90	154.10
30	241.60	55.44	186.16
31	200.00	45.90	154.10

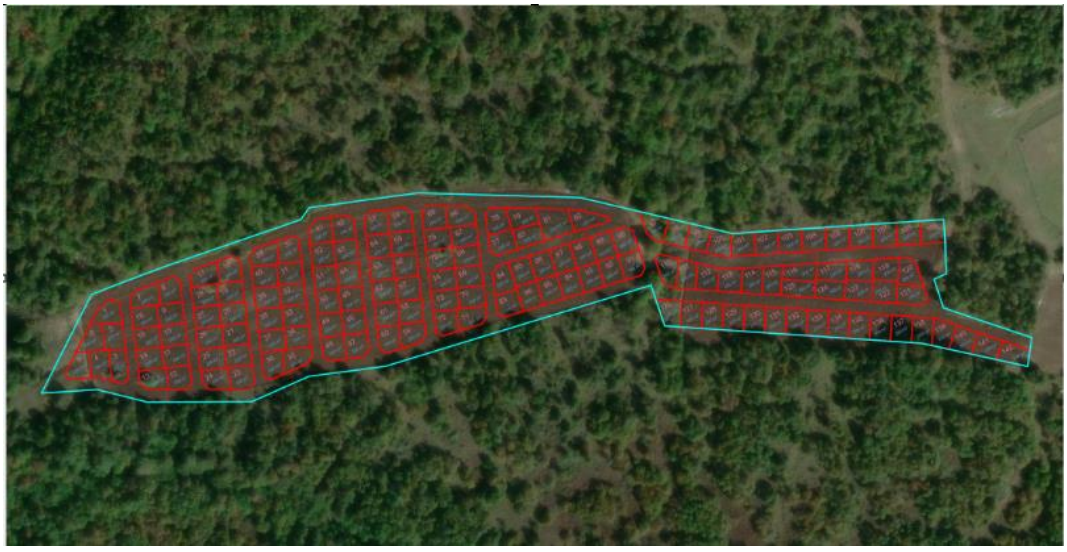
PARSEL NO	TAPU ALANI	YOL PAYI	HESAP ALANI
41	200.00	45.90	154.10
42	200.00	43.90	134.10
43	150.00	34.42	115.58
44	200.00	45.90	154.10
45	200.00	45.90	154.10
46	200.00	45.90	154.10
47	200.00	45.90	154.10
48	163.90	37.61	126.29
49	200.00	45.90	154.10
50	200.00	45.90	154.10
51	200.00	45.90	154.10

PARSEL NO	TAPU ALANI	YOL PAYI	HESAP ALANI
61	200.00	45.90	154.10
62	213.61	49.48	166.13
63	200.00	45.90	154.10
64	200.00	45.90	154.10
65	200.00	45.90	154.10
66	200.00	45.90	154.10

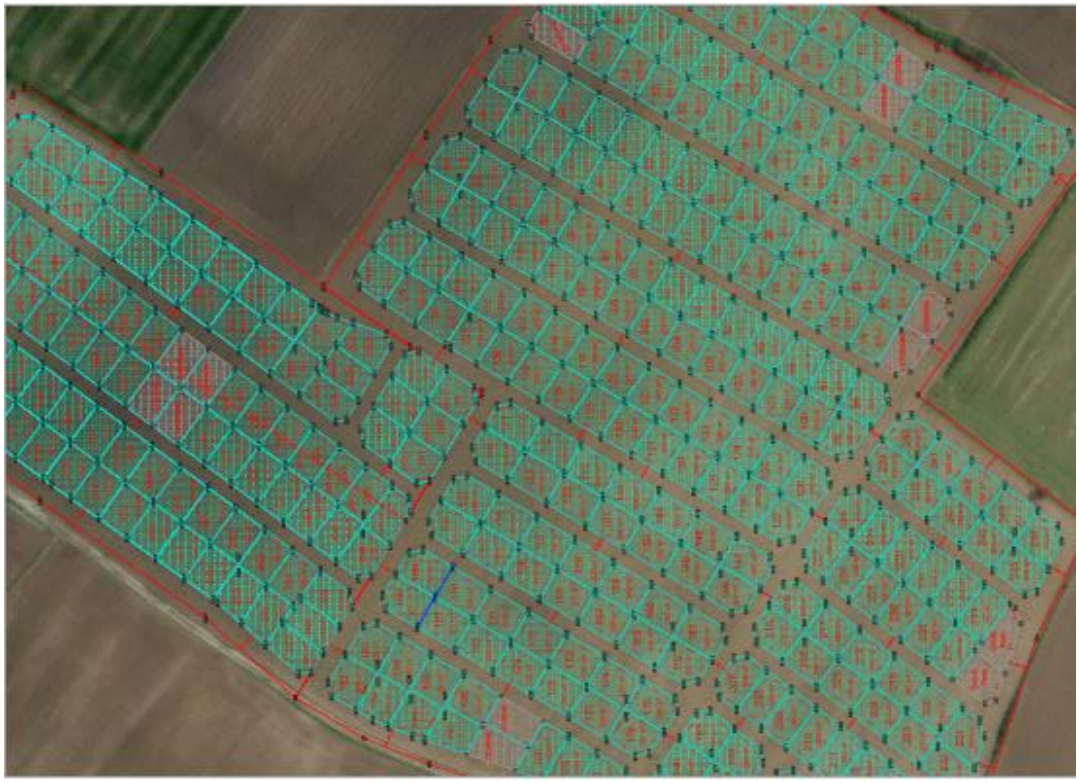
Picture47 In İzmit



Picture48 In Çanakkale



Picture49 In Kırklareli



Picture50 In Çatalca

Picture51 In Istanbul

MEASURING AND IMAGING WITH DRONE

Pusula Engineering has a drone flight license and we take weekly shots of the field work of the contractor companies we serve. In this way, it becomes easier to follow up the work and we have data that we can see throughout the process.

The measurements we made were not video recordings, but 3D shots. In this way, we have the opportunity to read the jeans and size we want on the shots.

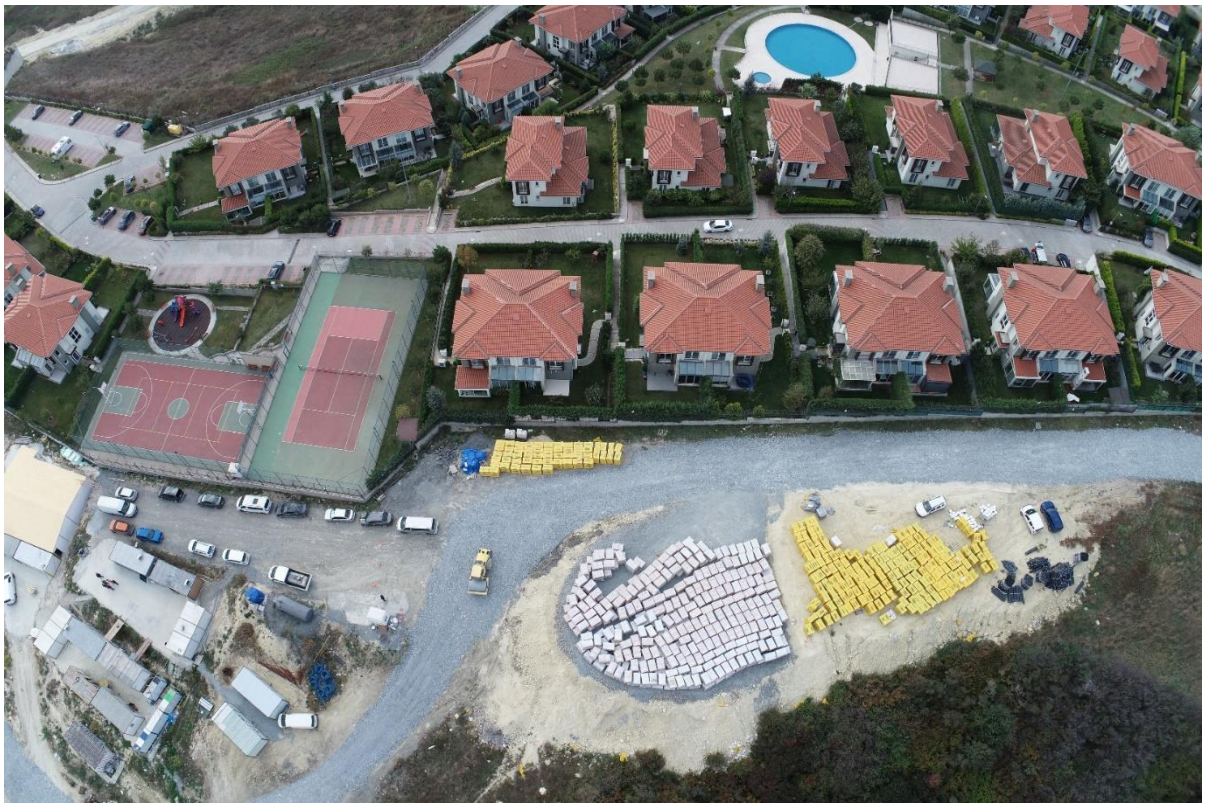
We work with DJI, one of the best companies in this field.

Picture52 The drone we used for measurements

Picture53 While foundation is being poured from the construction site

Picture54 while excavating

Picture55 Building site pile foundation construction



Picture56 villa construction site in Istanbul

Picture57 Hotel constructionin Istanbul

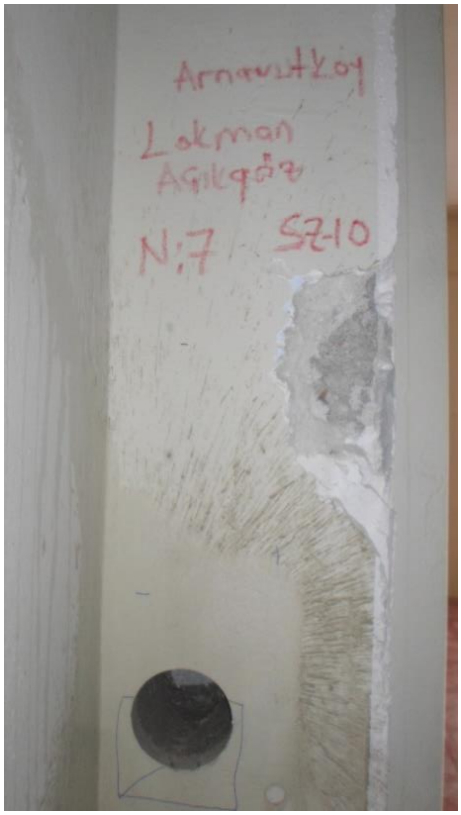
Picture56 Land arrangament

RISKY STRUCTURE DETECTION

Pusula Muhendislik is a licensed company authorized by the Ministry of Environment and Urbanization. By analyzing old buildings, it determines whether the buildings are earthquake resistant or not.

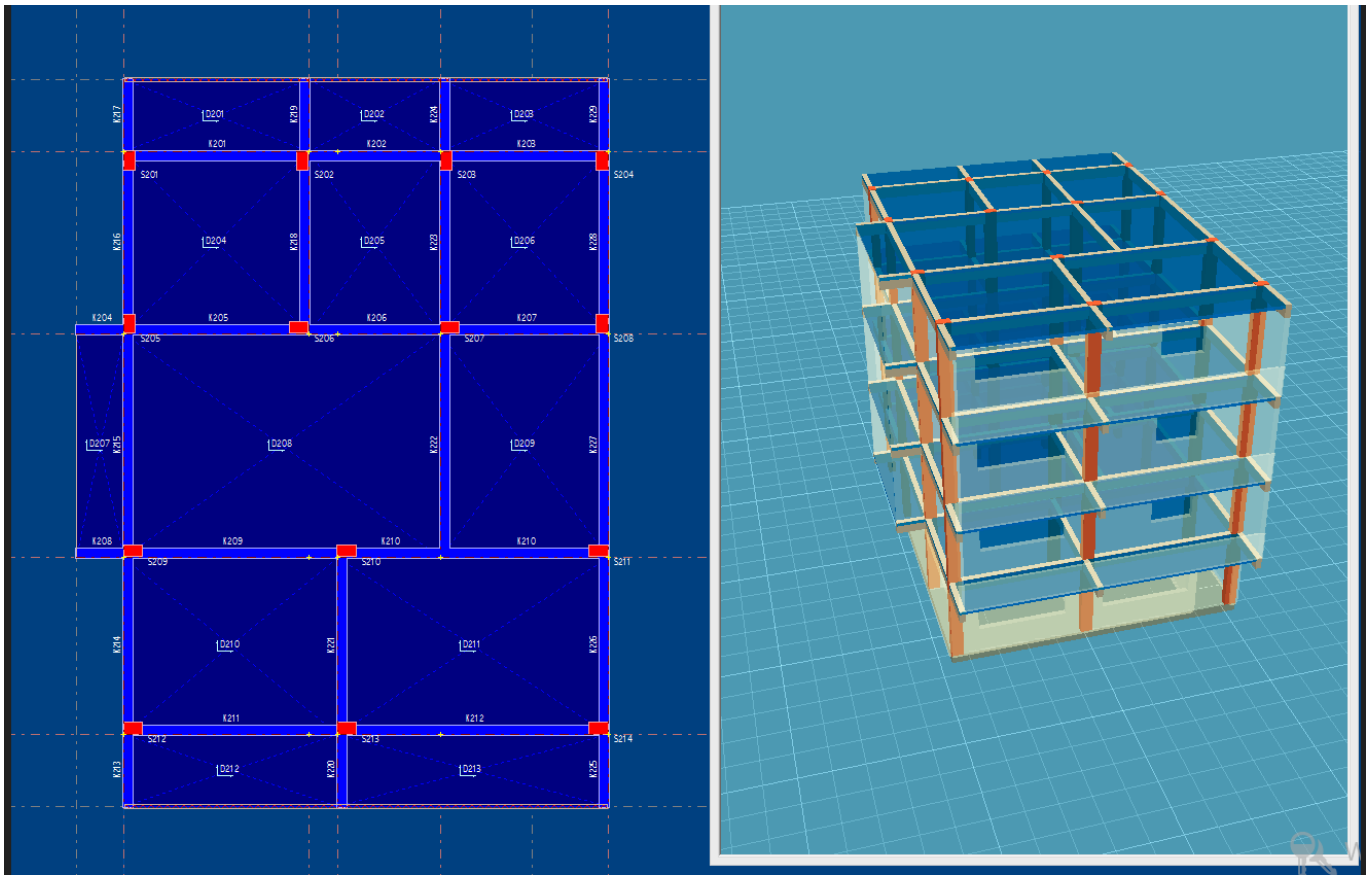
For this purpose, starting from the geotechnical evaluation, we create the same model of the building on the computer with operations such as surveying, core taking, X-raying of columns and beams and stripping. Then we determine the strength by analysis. Risky structures must be demolished or strengthened. Below are examples of work we have done.

Picture59 A building with a risk analysis in Istanbul

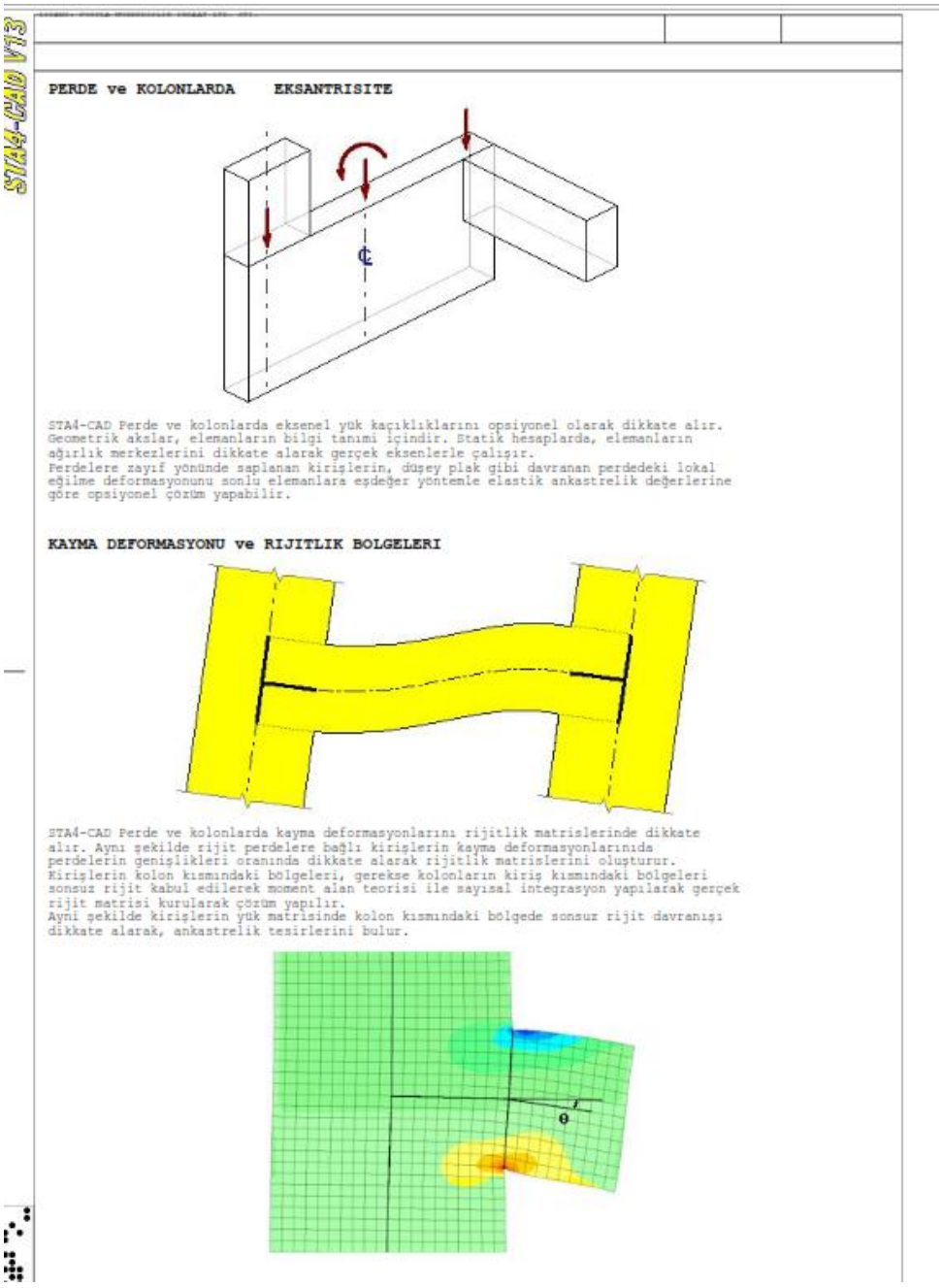


Picture60 Core taking from the building, corrosion control and reinforcement x-ray

Picture61 Stirrup spacing control



Picture62 According to the data received, the static model of the building was created....

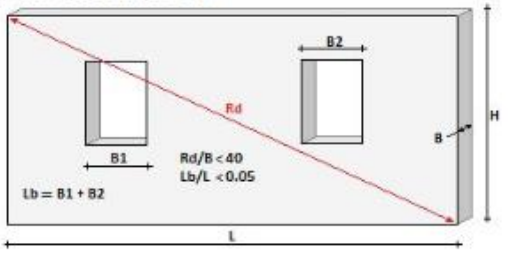


Picture63 Preparation of static calculation report

RİSKLİ BİNALARIN TESBİTİ YÖNETMELİĞİNE GÖRE YAPININ KONTROLU

BINA BILGI DUZEYI KATSAYISI : 0.9
HAREKETLI YUK AZALTMA ORANI : 0.6
KIRIS ve PERDELERIN ETKIN EGILME RIJITLIGI : (EI)e= 0.3 (EcmI)o
KOLONLARIN ETKIN EGILME RIJITLIGI : (EI)e= 0.5 (EcmI)o
MEVCUT BETON MALZEMESI : E2: C13,E=194940(kg/cm²)
RİSKLİ YAPI LİNEER HESABINDA KULLANILAN DEPREM ETKİSİ : MOD BİRLEŞTİRME YÖNTEMİYLE DEPREM ANALİZİ
YAPI LİNEER KAPASİTE HESABINDA R=1 ALINARAK ÇÖZÜM YAPILMIŞTIR.

Kritik Kat no: 1 λx=1.0, λy=1.0 (Kritik kat seçilmiştir.)



KRİTİK KAT DUVAR ETKİ KONTROLU

Duvar no	aks	sol aks	sağ aks	H cm	B cm	Duvar tipi	L m	Rd/B < 40	Lb/L < 0.05	Awx m²	Awy m²
W1	1 (1x)	A (1y)	D (3y)	260	13	Tugla	8.87	9.24/B=71.1 ✗	0.0/L=0.0 ✓	0.00	0.00
W2	A (1y)	1 (1x)	4 (5x)	260	13	Tugla	9.46	9.81/B=75.5 ✗	0.0/L=0.0 ✓	0.00	0.00
W3	4 (5x)	B (4y)	D (3y)	260	13	Tugla	9.03	9.4/B=72.3 ✗	0.0/L=0.0 ✓	0.00	0.00
W4	D (3y)	1 (1x)	5 (4x)	260	13	Tugla	9.90	10.24/B=78.7 ✗	6.5/L=0.66 ✗	0.00	0.00
									∑Aw=	0.00	0.00

KAT KESME KUVVETİ SINIR KONTROLU

KAT	∑ (N/Ac)	(δ/h) X	(δ/h) Y	λ×Vx	λ×Vy	∑Akn X	∑Akn Y	∑Ap
3	6.195 = 0.049×fcm >> V/Vk=0.350	0.00597	0.00560	26.194	30.421	2.347	6.540	101.480
2	15.100 = 0.119×fcm >> V/Vk=0.338	0.01032	0.00862	48.985	56.121	1.743	7.103	101.480
1	24.245 = 0.182×fcm >> V/Vk=0.298	0.00965	0.00667	62.955	70.786	0.000	0.000	101.480

Kritik Kat Duvar etki kontrolu:
X yönü: ∑Akn/Ap=0.0000<0.002×N=0.0060, (δ/h)= 0.00965<0.015 >> λx=1.0×1.0=1.0
∑Akn/Ap>0.002 N ve (δ/h)<0.015 koşulu sağlanmamıştır. λ=1.0×λ alınmıştır.
Y yönü: ∑Akn/Ap=0.0000<0.002×N=0.0060, (δ/h)= 0.00667<0.015 >> λy=1.0×1.0=1.0
∑Akn/Ap>0.002 N ve (δ/h)<0.015 koşulu sağlanmamıştır. λ=1.0×λ alınmıştır.

Yapı elemanlarında, deprem statik sonuç çarpanı CeX= 4.000, CeY= 4.000
Perde deprem katılım oranı αsX=0.000, αsY=0.000
Kolon ortalama donatı oranı =0.0068

Picture64 Interpretation of static calculation results

T.C.
ÇEVRE VE ŞEHİRCİLİK
BAKANLIĞI
ALTYAPI VE KENTSEL
DÖNÜŞÜM HİZMETLERİ
GENEL MÜDÜRLÜĞÜ

Riskli Yapı Tespiti Lisans Belgesi

KURULUŞUN

ÜNVANI :PUSULA MÜH. İNŞ. SAN. TİC. LTD. ŞTİ.
ADRESİ :Arnavutköy Merkez Mah. Şener Sok. No:1 Arnavutköy / İSTANBUL

TİCARET SİCİL NO :577261

İŞ BU BELGE 6306 SAYILI "AFET RİSKİ ALTINDAKİ ALANLARIN DÖNÜŞTÜRÜLMESİ HAKKINDA KANUN" KAPSAMINDA ÇEVRE VE ŞEHİRCİLİK BAKANLIĞI TARAFINDAN VERİLMİŞTİR. TAHRİF EDİLEMEZ. KISMEN VEYA OKUNMASINI ZORLAŞTIRACAK ŞEKİLDE ÇOĞALTILAMAZ.

BELGE NO :13T0764
VERİLİŞ TARİHİ :12.11.2013

VEDAD GÜRGEN
GENEL MÜDÜR

Picture65 Risky building analysis authorization certificate

Ainesi iştir kişinin lafa bakılmaz şahsın görünür rütbe-i aklı eserinde.
Ziya Paşa

PUSULA
MÜHENDİSLİK

Karlıbayır Mah. Tahsin Sk.
No: 2 D: 5 Arnavutköy / İSTANBUL
T. +90 212 597 97 00
T. +90 212 597 96 00
info@pusulamuhendislik.com
www.pusulamuhendislik.com