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AUSTROTHERM BULLETIN

Kayseri- Boğazköprü geoBLOCK® Project

SPECIAL ISSUE



AUSTROTHERM GEOBLOCK® MEGAPROJECT IN KAYSERI TURKEY

The Boğazköprü project is the largest geofoam bridge approach embankment in Europe in the last 10 years.

AUSTROTHERM GROUP MANAGEMENT VISITED THE SITE

The biggest Geofoam Project was constructed in Kayseri

GEOFOAM BLOCK APPLICATIONS IN CIVIL ENGINEERING

Fast and economical geotechnology compared to traditional methods

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AUSTROTHERM
Yalıtım Malzemeleri

**Tolga Celayer***Austrotherm Turkey
Deputy General Manager*

Dear Readers,

I'd like to start by wishing difficult pandemic conditions in the world will come to an end as soon as possible.

The word 'pandemic' derives from the words 'pan' (all) and 'demi' (human) in ancient Greek, and at such times, all humanity will go through this process by acting together with discipline.

Strictly implementing the measures taken by our state is very important in terms of combating pandemics in our country. As Austrotherm group, we too; have taken all the necessary precautions primarily for the health and well-being of all our employees, and to ensure the continuity of our supply for our customers that we feel responsible for. It is obvious that this global crisis will seriously affect all sectors. However, I believe that Austrotherm will come out of this process even stronger by taking the right steps.

We have prepared this special issue of our Austrotimes newsletter specifically for Kayseri Boğazköprü Bridge Approach Embankment, which is the biggest EPS geofoam project of Europe in the last 10 years, with our Austrotherm geoBLOCK® product. This project, completed in the last quarter of 2019, is the first geofoam project implemented by KGM – Republic of Turkey General Directorate of Highways. This construction which was approved and successfully completed within General Directorate of Highways jurisdiction is a pioneer for all subsequent projects for future KGM projects. As Austrotherm, we provided technical supervision services to the contractor Mön İnşaat, from the beginning to end of the project, in Kayseri Boğazköprü bridge approach embankment. This construction is also the fastest bridge approach embankment on weak subsurface conditions without the need for ground improvement, and thanks to our geoBLOCK® application, the project was completed and road was opened to traffic in a significantly short period of time of 75 days.

This bridge approach filling is a unique project built using approximately 300 meters long, 2 meters to 10 meters high, 28 meters wide and more than 55,000 m³ geoBLOCK® built on weak subsurface completed successfully using Austrotherm geoBLOCK® without the need for any soil improvement. This honor lies with all Austrotherm employees who contributed.

Austrotherm has developed a new product and market for the EPS industry with its geoBLOCK® applications that has been pioneering for 3 years, while creating a value added for the construction industry, it has created a new geotechnology that provides advantages in both the total cost of the project and also provides economy for significantly reducing the project completion time.

You can find all the details about Kayseri-Boğazköprü Bridge Approach Embankment Project in this issue of Austrotimes. We also kindly invite you to log in to our [Youtube/Austrothermtr](https://www.youtube.com/channel/UCv8mtr) account to watch our timelapse video and other exciting geofoam project videos, where the project construction steps is shown in a timelapse from the beginning to the end. In our Youtube channel, you can also watch the AustroTalk webinar series that were made for geofoam applications.

I wish you healthy and happy days.

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What is Geofoam Block?

Expanded polystyrene block (EPS geofabric block) is a lightweight and closed cellular geosynthetic product used in geotechnical engineering applications (ASTM D4439, 2018). Geofoam block is a material with high strength to density ratio (ASTM D6817, 2017), produced in densities ranging from 11.2 kg / m³ (EPS12) to 45.7 kg / m³ (EPS46).

Geofoam block technology, is a well proven and mature geotechnology, widely used in various countries throughout the world, since 1972 and supported by design / application specifications.



Fast and economical solution compared to that of traditional methods

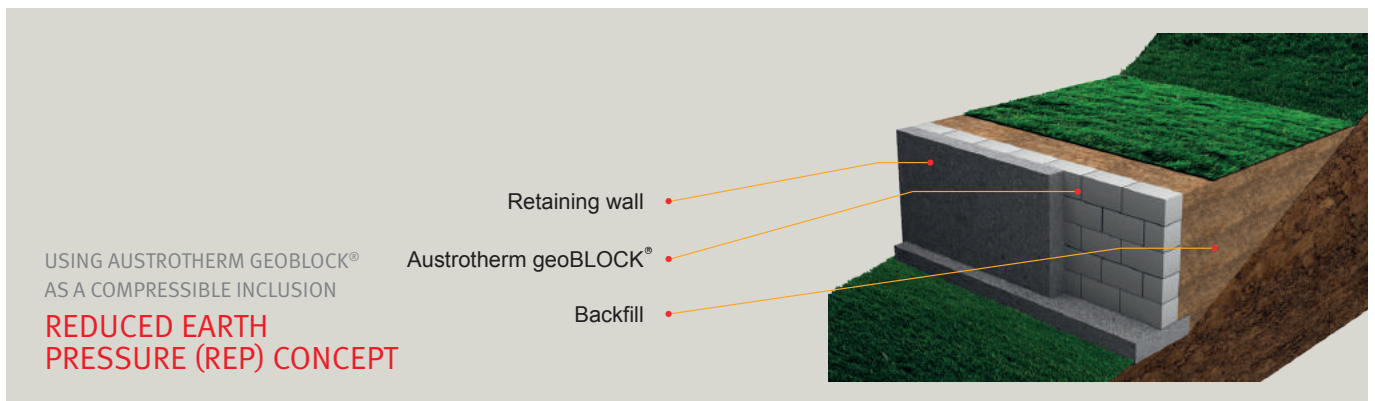
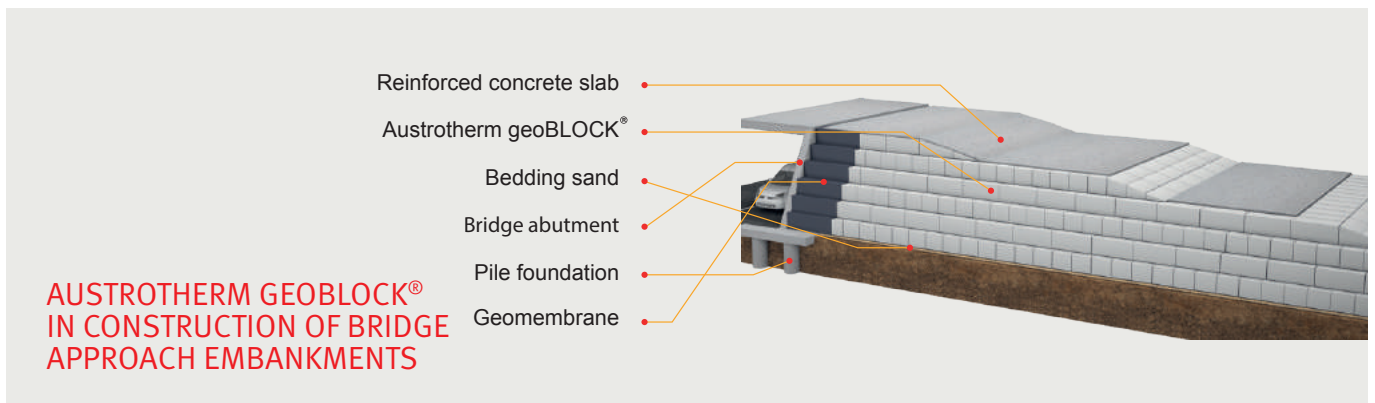
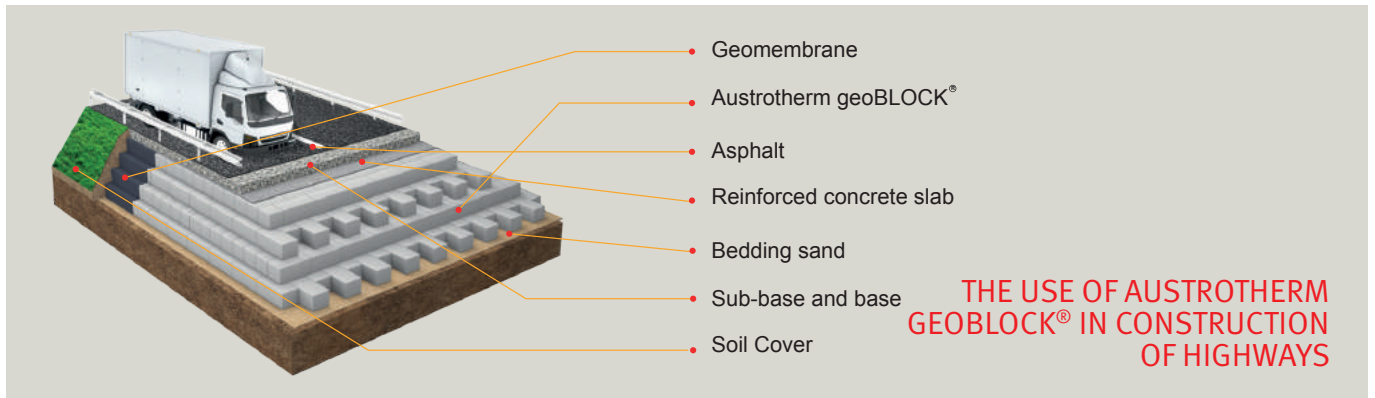
Geofoam Block Application Areas

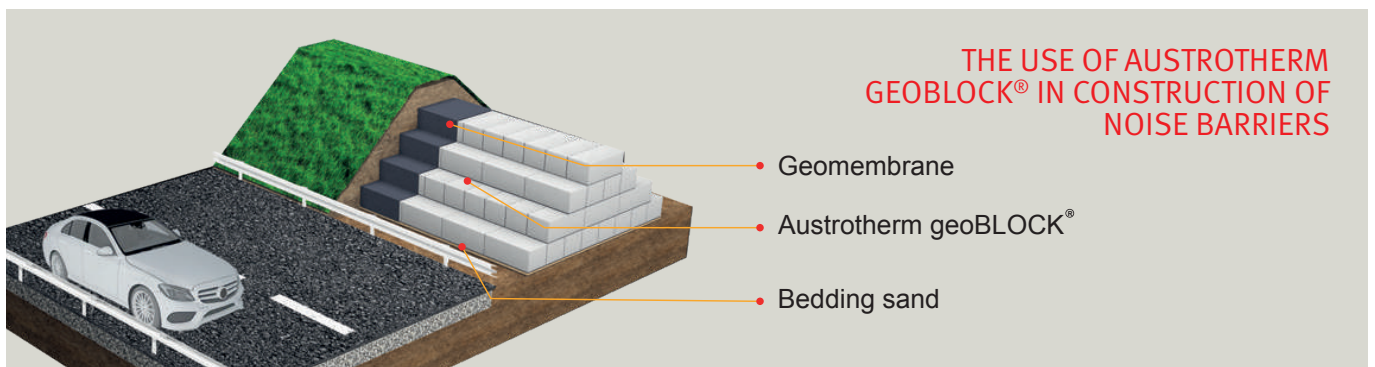
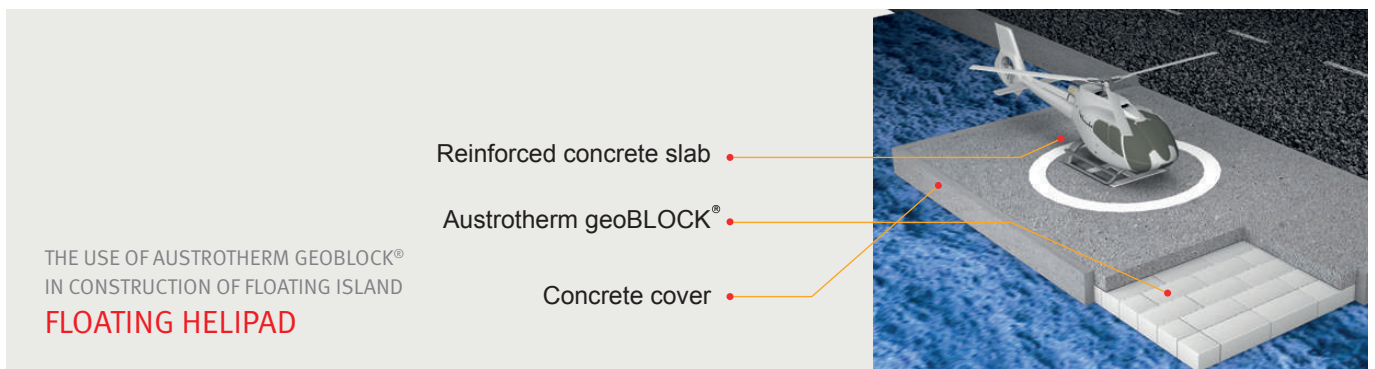
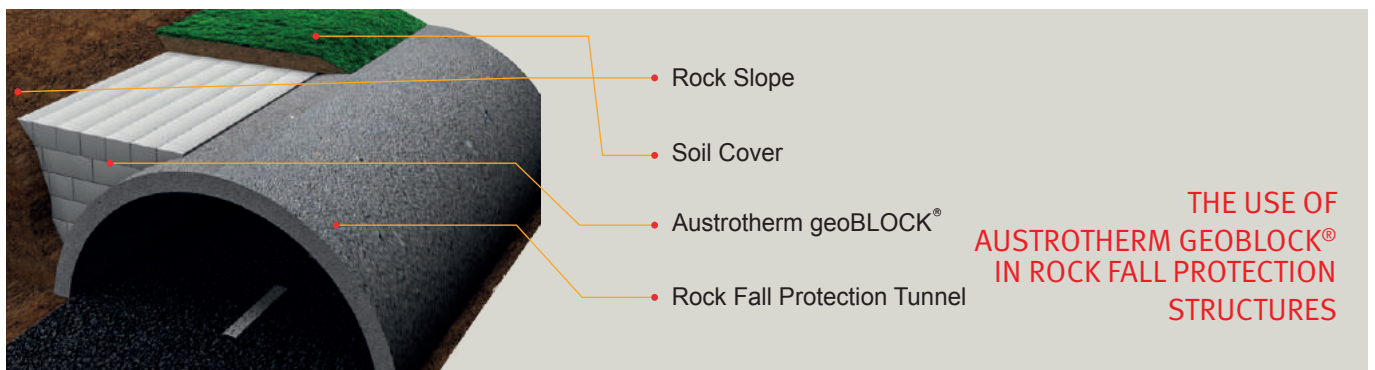
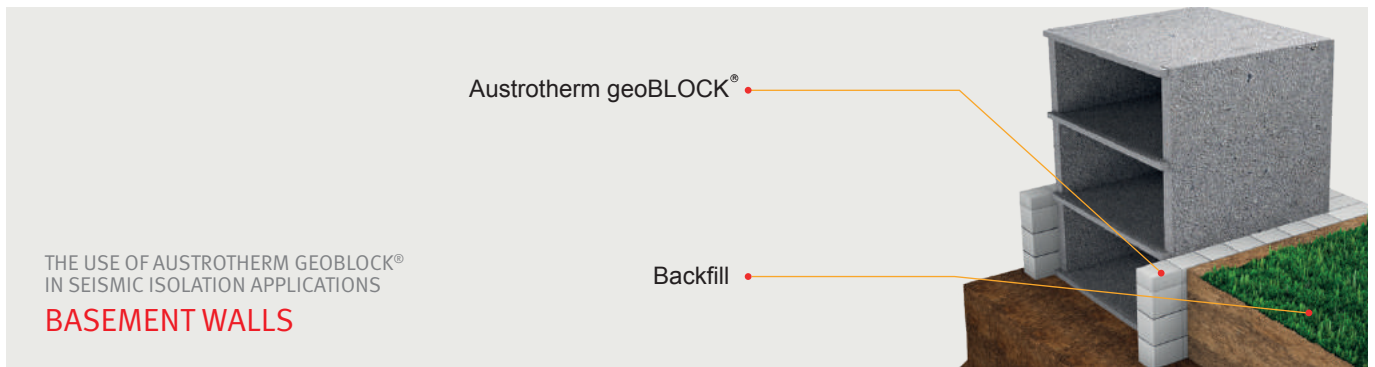
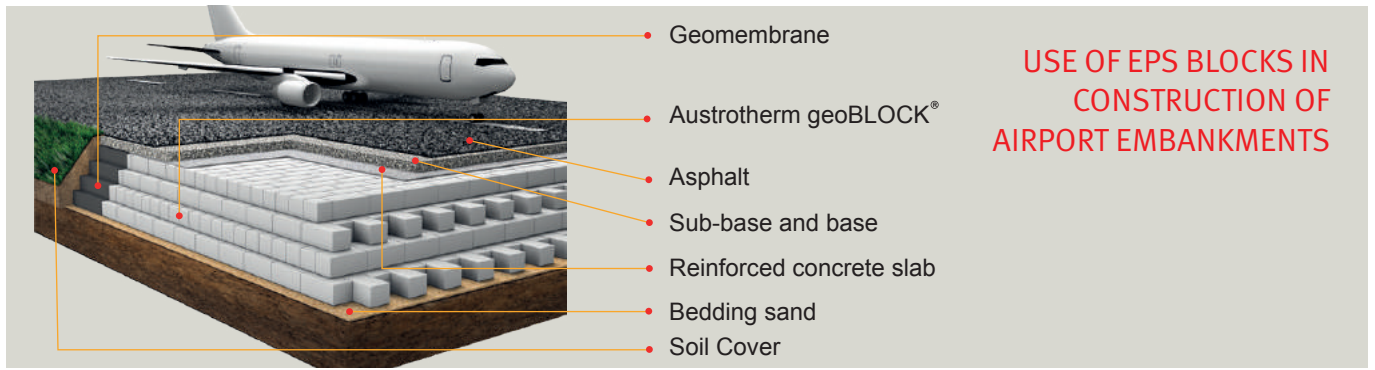
Geofoam technology was first used by the Norwegian Road Administration (NPRA) to prevent total settlements in embankment constructions on weak subsurface conditions in 1972. Geofoam technology has proven itself as an alternative geotechnology to traditional compacted earth fill construction to mitigate the settlement and bearing capacity problems since the first application in Norway.

Due to the significant reduction in project completion time and easy handling of geofoam blocks on site without the need for heavy machinery, geofoam technology produces fast and economical solutions compared to that of traditional methods and became a wide spread technology.

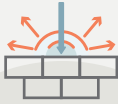
Geofoam blocks are used in;

- Construction of highway and bridge approach embankments,
- Construction of railway and light rail system embankments,
- Construction of retaining wall backfills,
- Construction of embankments atop culverts and backfills of buried pipelines,
- Slope stability applications,
- Green flat roof and landscape applications,
- Construction of airport taxiways and runways embankments,
- Seismic Isolation / Vibration damping applications,
- Protection structures against rock fall,
- Construction of floating islands,
- Construction of noise barriers.





Advantages of EPS Block



HIGH STRENGTH

It has the highest strength/density ratio among the lightweight fill materials used in geotechnical engineering. It can easily carry heavy traffic loads.



LOW MAINTENANCE COST

Maintenance cost is as low as zero when compared to that of traditional methods.

FAST AND EASY INSTALLATION



Construction period is short and easy when compared to that of traditional soil improvement methods.

ECONOMIC



It is a technology that offers a more economical solution under many circumstances relative to traditional soil improvement methods in terms of the initial investment cost and total project cost.



LIGHT

It weighs about 1% of traditional earth materials.



RESISTANT TO WEATHER CONDITIONS

It is not affected by weather conditions during construction process.



LONG LIFE

Thanks to its closed cellular structure, it is resistant against environmental impacts and freeze-thaw cycles. Low water absorption capacity. Resistant to pesticides and mould.



PROVEN PERFORMANCE

Long term project performance records in last 48 years are available



PRODUCTION ACCORDING TO STANDARDS

Physical, mechanical characteristics and material behavior is known.



ENVIRONMENT FRIENDLY

It is not biodegradable and possible to recycle.



Why using Austrotherm geoBLOCK[®] in the construction of bridge approach embankments?

Austrotherm specializes in the production of expanded polystyrene (EPS) with 67 years of experience and has become a leader in its field in central and Eastern Europe with 22 production facilities in 11 countries.

Austrotherm Turkey has established the Civil Engineering Applications Department in 2016. The Civil Engineering Applications Department has targeted to raise awareness about the advantages of Austrotherm geoBLOCK[®] applications by contacting the potential users from the public and private sectors for highway, bridge approach, retaining wall, slope stability, culvert and similar construction and infrastructure projects.

Austrotherm has adapted the 48-year-old technology used in various countries of the world in infrastructure projects. Austrotherm Turkey has launched many design and construction projects using the geofoam technology in Turkey since 2016. With our experience based on the design and instrumented field data we have collected projects, our technical

team and know-how are used to design fast and economical solutions for infrastructure projects. Our services start from design stage to preparation of block layout plans and continue with the placement of instrumentation arrays and site supervision.





What are the **Advantages** of Austrotherm geoBLOCK® Applications?

Compared to traditional applications, Austrotherm geoBLOCK® offers an advantage in terms of construction time and / or total project cost. Austrotherm Turkey manufactures according to international standards and presents all the quality control of the test history geoBLOCK® Austrotherm products to the clients. You are not alone in project design and implementation processes!! Our Civil Engineering Applications Department provides technical support during the design and on-site block placement support during the field implementation phase of your project.

Austrotherm has manufacturing facilities in Dilovasi-Kocaeli, Sincan- Ankara, Turgutlu-Manisa and İncesu-Kayseri and Arsin -Trabzon and Diyarbakır, with the necessary production qualifications for civil engineering projects and capacity for infrastructure projects to produce Austrotherm geoBLOCK® product and has ability to fully supply with its vast logistics network that will provide timely delivery to the site.

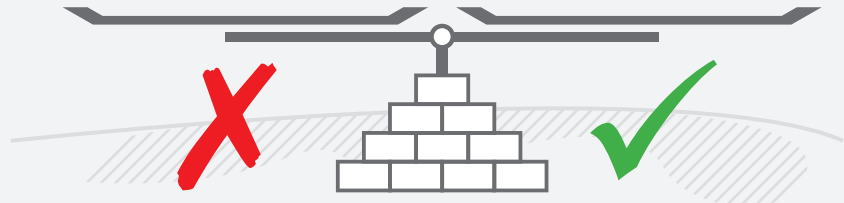
The Use of EPS Block in Bridge Approach Embankments Faster - Economical - Lighter

TRADITIONAL SOIL IMPROVEMENT

- Construction process is slow ▶
- High labor cost ▶
- High mobilization cost ▶
- Requires heavy machinery - High placement/compaction cost ▶
- Difficulties in the compaction process near the abutment ▶
- High lateral pressures acting on the abutments ▶

EPS BLOCK

- ◀ Construction process is fast
- ◀ Low labor cost
- ◀ Low mobilization cost
- ◀ No need to use heavy machinery-Low placement cost
- ◀ Smooth installation at the abutment interface
- ◀ Lateral pressures acting on the abutment reduce to negligible levels





Important Considerations in Geofaom Bridge Approach Embankment Applications

It is a complete engineering solution to design and construct geofaom bridge approach embankments, which will be built on a subsurface profile with low bearing capacity. Technical details to be considered in the realization of this technology can be summarized as below;

- Design of the project under service loads,
- Preparation of project specific specification package,
- Quality control mechanism in the production process of geofaom blocks,
- Transportation to the site and temporary storage of blocks in the field,
- Placing the blocks in the field according to the block layout plans,
- Quality control process in the field.

Issues to be considered by end users, administrations or project owners:

- The most important point that final users, administrations or project owners must consider is that, EPS Blocks to be used in the project must have CE marking according to TS EN 14933. The first step of a successful EPS block highway application project starts with the block production. Compressive strengths and apparent mass densities of the blocks manufactured must be reported according to the standard



- before transported to the site.
- Blocks, which are transported to the site, must be kept away from any actions that may have a physical or chemical damage on them during the block placement on site.
- If a temporary storage area is necessary before the placement of the blocks according to the block layout, such storage area must be located in a place away from any heating source and construction activities where heat and fire are used.
- The blocks must be protected from thinner and similar organic solvents and petroleum based solvents such as gasoline and diesel.
- Traditional EPS Block highway embankment construction is composed of preparation of the site for installation, placement of blocks, construction of reinforced concrete distribution slab and construction of road super structure respectively.
- The soil on which EPS Block will be constructed, must be cleaned and free of any construction debris, leveled with using granular sand with goods drainage conditions.
- EPS Blocks layout plans are implemented on site in a manner that is stated in the engineering drawings.
- Reinforced concrete load distribution slab which is located between the EPS blocks and road base layer, provides protection against possible oil leakage, forms a foundation for the road super structure by reducing the thickness of road sub base and base layers, is constructed using the concrete class and reinforcement detail stated in the Project drawings.
- Materials forming the road super structure must be placed on the load distribution slab by means of front-loading excavators.
- During the construction, no vehicle or heavy machines should pass over the load distribution slab directly.



FROM AUSTROTHERM TURKEY

Europe's Biggest geoBLOCK[®] Project in Kayseri



Republic of Turkey General Directorate of
Highways' "Kayseri- Boğazköprü Railway
Overpass Approach Embankment Project
was Built Using Austrotherm geoBLOCK®
Product in Just 75 Days. The Project Designed
by our Civil Engineering Applications
Department. The Project is the Biggest Bridge
Approach Embankment Constructed in Europe,
Using Geofabric Blocks in the Last 10 Years.



Kayseri Boğazköprü Railway Overpass Bridge Approach Embankment Project

Problem: The bridge approach embankment to be built under local subsurface conditions with low bearing capacity, high total and different settlement potential requires special geotechnical solution. In the case of using conventional compacted soil in the construction of this approach embankment, the estimated total consolidation settlement behind the bridge abutment was estimated at the order of 1.9 m. The measures should be taken against the stability problems that will occur along this ramp alignment, which is well above the allowable limits.

Traditional Solution: To keep the consolidation settlements within the allowable limits, the ground improvement should be applied in accordance with the local subsurface conditions in the projection of the ramps (trapezoidal cross-section fill area approximately 5 acres).

Problems of Traditional Solution: Considering the embankment footprint and depth to the bedrock, traditional ground improvement technologies both increase the total cost of the project and extend the project completion time and significantly delays the traffic opening.

Innovative Solution, Alternative Geotechnology: The geoBLOCK® technology which is approximately 100 times lighter than traditional compacted earth, was preferred and the project was completed without the need for any ground improvement to remediate total settlement



and bearing capacity. geoBLOCK® bridge approach embankments, each of which is 14 m wide, 320 m long and 2.0 m high at the beginning station of the approach embankment and reach to 10 m high behind the bridge abutment, have been constructed.

Result: In total, 55.000 m³ geoBLOCK® fill was completed in a short period of time of 75 days. With the preference of geoBLOCK® lightweight technology, economical design was achieved not only in total project cost, but also by completing the project in a short

period of time and opening traffic, preventing stability problems against total and different settlements.





Austrotherm Management Visited the Project Site in Kayseri

Austrotherm Management also paid a visit to the site and evaluated the project during the “Overpass Approach Embankment” project construction.

Peter Schmid, one of the owners of Schmid Industrie Holding, visited the Turkey’s largest geofoam project in Kayseri and expressed that this is the biggest geofoam project in Europe. Martin Zelenka, International Manager of Austrotherm GmbH, expressed his pleasure to be involved in such a great project.

Austrotherm Turkey General Manager Selçuk Vanlı also frequently visited the field during the construction of the project and followed the construction stages closely. He also mentioned that this project is going to be a real breakthrough for both our country and geofoam application as well as a major contribution to our EPS industry.

Austrotherm Turkey Deputy General Manager Tolga Celayir, who is also leading and managing geofoam department in Austrotherm Group, closely followed construction stages from start to finish. He stated that the project is completely designed by our own engineers of “Austrotherm Turkey Civil Engineering Applications Department” and drew attention to the fact that during the construction our team gave the technical supervision. Upon the completion of the project our engineers are collecting the data under service loads from the instrumentation arrays which are also installed by our engineers.





Services Provided by Austrotherm in Kayseri Boğazköprü Approach Embankment Project



Austrotherm Turkey Civil Engineering Applications Department finalized Kayseri-Boğazköprü approach embankment project with dimensions of 330 meters long, 14 meters wide and a height of up to 10 meters, and the vertical side slopes, using geofoam blocks technology on weak soil profile.

Geofoam block technology has been used in different areas of civil engineering (highway embankments, bridge approach embankments, railroad embankments, etc.) for nearly 50 years. With geofoam blocks that are 100 times lighter than compacted earth, fast and economical solutions can be obtained without applying any soil improvement method on weak subsurface conditions. While designing a road and / or bridge approach embankments with geofoam blocks, external and internal stability designs are carried out just like in the construction of a traditional highway embankments.



Civil Engineering Applications Department of Austrotherm Turkey supply technical field supervision during the construction process for our projects. With our experienced engineers, we offer on-site application training to the field team workers and engineers of contractor that will construct the application and point out important issues be considered and

prevent possible problems that may rise. This bridge approach embankment project, built using geoBLOCK®s, consists of various construction steps. These steps can be listed as placement of the base leveling sand, placement of the blocks, the construction of the concrete load distribution slab, the construction of the road superstructure and the assembly of the precast side panels.

After the block placements completed, a reinforced concrete load distribution slab is casted between geoBLOCK®s and the road sub-base layer to protect the blocks against possible oil and derivatives from leakage, reduce the thickness of the road sub-base and foundation layers by incre-



Laying Road base



Spraying of water on road base before the compaction



Road base compaction



Completed road base

sign the stiffness, form a foundation for the road superstructure. The reinforced concrete slab protects the blocks against possible solvent-based leaks while distributing the superstructure loads (dead and live loads) uniformly on the blocks.

After casting the reinforced concrete slab, the layers forming the road superstructure (sub-base and base) were prepared with the front end loader buckets and compacted with cylinders and made ready for the production of binder and asphalt layers.

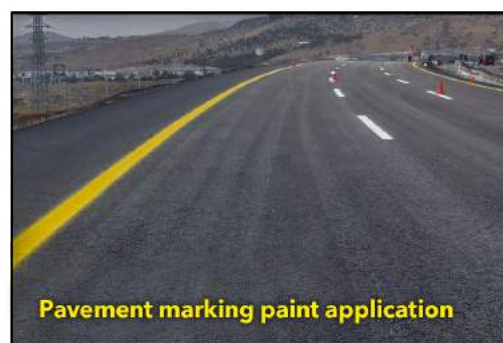
Geofoam blocks should be protected against UV. As soon as the block placement is completed, construction of pavement should be started and the exposed vertical sides should be protected. In this project, vertical sides of the embankment were protected using precast concrete panels. In addition panels were preferred to

create an aesthetic appearance.

After the placement of granular layers of the pavement, bituminous foundation, binder and wearing course were placed and the road was opened to traffic in a short period of 75 days.

Austrotherm Turkey Civil Engineering Applications Department also provides instrumentation services along with te-

chnical site supervision services. Our experienced engineers collect data from the instrumentation stations that they've set up to monitor the performance under the service loads.



Pavement marking paint application



ASSOCIATE PROFESSOR A. TOLGA ÖZER:

Bridge approach embankment composed of 55000 m³ of Geofom block was completed in 75 days

In this special issue of AustroTime, which is dedicated to Kocasinan - Kayseri, İncesu - Himmetdede Boğazköprü Railway



overpass bridge approach embankment project, we had an interview with Associate Professor A. Tolga Özer of the Gebze Technical University Department of Civil Engineering, regarding the Civil Engineering Applications of geofom blocks.

What is the current state of the Geofom technology in Civil Engineering applications in Turkey?

Expanded polystyrene (EPS) block (geofom block) is a geosynthetic product with a high strength to density ratio. Geofom block technology was first used in highway embankment construction by the Norwegian Public Roads Administration in 1972 to prevent consolidation settlements. Despite the proven long-term performance of geofom technology in constructing highway embankments, the first geofom technology awareness activities in Turkey was started in 2009. EPS industry representatives started to follow international meetings and seminars on Civil Engineering applications of geofom blocks since 2010. Systematic education and awareness activities

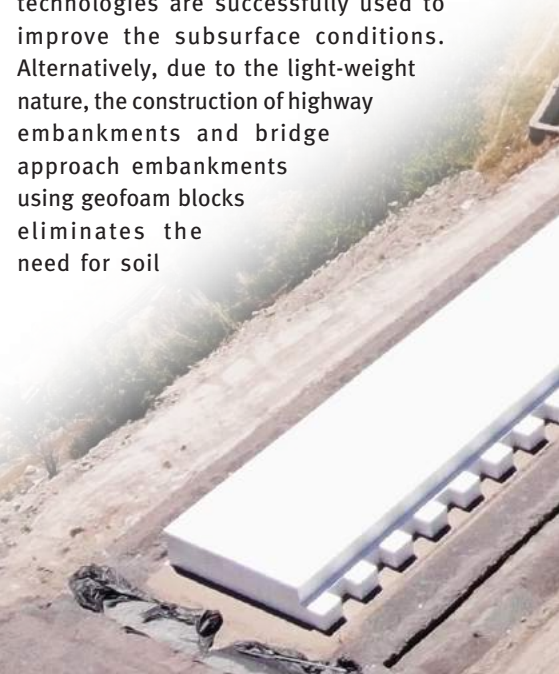
about Civil Engineering applications of geofom blocks carried out by the EPS industry gave its first results in 2017. The first geofom block road embankment was opened to traffic in April 2017. With this first application, a new geotechnology was introduced to the toolbox of Geotechnical Engineers practicing in Turkey. The second light-weight fill roadway embankment project built in Turkey was designed as a dual-function fill (retaining wall backfill and roadway embankment) and opened to traffic in November 2017. The first geofom highway embankment in Turkey was built in May 2019 as part of the Northern Marmara Highway Project. The first geofom block application constructed by the General Directorate of Turkish Highways was a bridge approach embankment and opened to traffic in October 2019. As can be seen from all of these road and highway embankment projects, a new geotechnology has been introduced to the Civil and Geotechnical Engineers in our country and the well-proven geofom technology has been adapted. Thanks to the

field instrumentation arrays placed in all of these first geofom block embankment projects, the behavior of embankments both during construction and under service loads are recorded periodically. In addition to these roadway and highway applications, the technology is also known to be used in retaining walls as a backfill, in flat roofs as structural and non-structural fill to create terrains and terraces, in side-hill-fill projects constructed adjacent to stable slopes, in basement walls as a backfill and various similar projects in Turkey.

In addition to these examples built to date in Turkey, geofom technology can also be considered as an alternative geotechnology in the construction of road/highway lane expansion, airport runway and taxi zone, rail and light rail embankments. I think that the knowhow based on the construction and physical field performance of the geofom embankments built in Turkey since 2017 will shed light on the construction of other innovative geofom applications.

Why Using Geofom Blocks are Preferred in Construction of Highway and Bridge Approach Embankments?

Special design considerations should be made to satisfy both the bearing capacity and total-differential settlement criteria when constructing the highway and bridge approach embankments on soft soil sites. Various traditional soil improvement technologies are successfully used to improve the subsurface conditions. Alternatively, due to the light-weight nature, the construction of highway embankments and bridge approach embankments using geofom blocks eliminates the need for soil



improvement and has been successfully used since 1972 in the world and since 2017 in Turkey. In addition to eliminating the need for soil improvement, geofabric technology significantly reduces the project completion time when compared to that of conventional methods.

You have mentioned the importance of subsurface conditions. As you know, the first Geofabric block bridge approach embankment of Turkey was constructed at the Boğazköprü Railway overpass site located in the 6th Region (Kayseri) of the Republic of Turkey General Directorate of Highways. What is the importance of site-specific soil conditions in the preference of Geofabric blocks for the construction of Kayseri Boğazköprü bridge approach embankment project?

Based on the comprehensive in-situ boring program, subsurface profile of the site composed of approximately 30 m thick elastic silt (MH), high plasticity organic silt (OH) and fat clay (CH) over the bedrock. At some depths, the Standard Penetration Test (SPT) spoon advanced approximately 45 cm to 1 m under the dead weight of the SPT hammer or the drilling rods which indicated very soft consistency for MH, OH and CH. A maximum SPT blow counts of 22 blows per 45 cm, indicates very stiff consistency, has observed. Based on the

Geofabric technology was preferred for the construction of bridge approach embankments using approximately 55.000 m³ of geofabric blocks was opened to traffic in a short period of 75 days without the need for any ground improvement. Compared to that of traditional soil improvement methods, geofabric technology significantly reduced the project completion time.

comprehensive laboratory studies, undrained shear strength varies between 20 kPa – 70 kPa which indicates soft – stiff consistency. At some depths, moisture content of the local soils (38% - 259%) are above the liquid limit values (54% - 267%) and dry unit weights range from 4.0 kN/m³ to 14.8 kN/m³. Incremental loading consolidation tests indicated that the local soils can be classified as highly compressible to very highly compressible based on soil compressibility classification. In-situ void ratios vary

between 1.6 and 7.8. Silty sand (SM) lenses are also interbedded in these highly plastic silts and clays. Highway bridge approach embankments to be built on this type of





site-specific conditions require special design solutions against bearing capacity, total-differential settlements and overall stability concerns.

Can you summarize the benefits of Geofoam blocks to the project?

The Project site is located in west of the Industrial Park and Free Trade Zones of Kayseri. Site is an important junction of the main transportation corridor connecting the city to the other neighboring cities located in the north-west and south-west of Kayseri. When it is considered together with the industrial zones around it, the junction has a significant amount of commercial vehicle traffic. Geofoam technology was preferred for the construction of the bridge approach embankments using approximately 55.000 m³ of geofoam blocks was opened to traffic in a short period of 75 days without the need for any ground improvement in such a busy junction. One of the most important advantages of the geofoam technology in this project was the completion time. It has been significantly shortened when compared to that of traditional soil improvement techniques. In addition, preferring the geofoam block technology, which is approximately 100 times lighter than the conventional compacted earth, allowed the project to be completed without the need for any ground improvement to overcome the both total-differential settlements and bearing capacity concerns.

A comprehensive instrumentation program has been implemented in the Kayseri Boğazköprü Project geofoam approach



embankments. What is the importance of instrumentation stations in these engineering structures?

Thanks to the data from instrumentations, the performances of engineering structures both during and after construction can be recorded. Data collected from instrumentation arrays quantify the performance of embankments under service loads and also show that whether the expected design behaviors are met in the field. Therefore, instrumentation stations consisting of settlement plates and total pressure plates are installed in each approach embankments. In addition to the settlements occur at the foundation of approach embankments, settlements within the geofoam block rows are also captured using settlement plates. Total pressure plates were placed to measure the stress increase due to

geofoam block approach embankments at the foundation level and horizontal stresses transferred to the bridge abutments. The behavior of the bridge approach embankments during construction was recorded and also periodical readings are collecting under service loads from instrumentation arrays installed in each embankment. In addition to revealing the behavior of approach embankments under the design loads, the data collected from instrumentations will shed light on the design of similar engineering structures to geotechnical engineers and highway professionals. Also, the collected data will be used in comparative performance analysis with other instrumented geofoam embankments in Turkey and will create a database for the long-term track record of the performance of the geofoam technology in Turkey.



Blocks delivered from Our Facilities in Kayseri and Ankara

The required block capacity of over 50.000 m³ for Kayseri- Boğazköprü Overpass Approach Embankment Project was supplied by daily shipments from our Kayseri - İncesu and Ankara - Sincan factories. In order to prevent temporary storage area in the construction site, all shipments were made just-in-time, and the incoming trucks were directly unloaded on the side of embankments and immediately after placed based on the block placement plans. In this way, the entire approach embankment was completed and opened to traffic in 75 days smoothly.

Austrotherm, has a total of 22 manufacturing facility in 11 countries in Europe, is able to deliver all over Turkey the fastest possible timing, thanks to our 6 plants in Dilovasi-Kocaeli in Turkey, Sincan- Ankara, Turgutlu-Manisa, İncesu-Kayseri, Trabzon-Arsin and Diyarbakır. Our strategically selected 6 locations in Turkey allows us to produce with necessary production quality of EPS Thermal insulation board products as well as geoBLOCK® products and supply just in time for all projects.

Austrotherm EPS production started in



2008 in Turkey - began with the Kocaeli factory, providing thermal insulation industry with success and expanding with new factories and production facilities and supply networks in Turkey. Thanks to the Civil Engineering Applications Department that was established in 2016, we brought a different breath to the field of Civil Engineering Applications in addition to the thermal insulation

sector and carried out pioneering projects. Austrotherm Turkey has opened its Ankara plant which has a total of 9,000 square meter manufacturing area in 2018 with an investment of 2 million euros, and keep supplying its customers from the heart of Turkey. Thus, Austrotherm, which further developed its supply network, continued its operations and carried out outstanding projects.

This project is very important not only for Austrotherm, but also for civil engineering applications.



SELÇUK VANLI
AUSTROTHERM TURKEY
GENERAL MANAGER



What is the importance of Kayseri - Boğazköprü Bridge Approach Embankment project for Austrotherm?

I find the Kayseri-Boğazköprü project extremely important not only for Austrotherm but also in the field of Civil Engineering Applications and I call this project a milestone.

Thanks to our Austrotherm geoBLOCK® product, this project, which can be completed with more time and effort by traditional methods, was completed in a record time of just 75 days and the road was re-opened to traffic.

The geoBLOCK® product we produce makes an important contribution to the field of Civil Engineering and Austrotherm, we are happy to be in such a project, to support the project with our product and the supervision service provided by our experienced engineers.

What are the Austrotherm Turkey's strengths in this project?

Austrotherm Turkey's with its 6 production facilities located in Turkey can manufacture high quality products and deliver each corner of Turkey with high speed. In this sense, speed, quality and reliable shipping are our strong points. We have experienced and talented engineers working within our Civil Engineering Applications Department. Austrotherm geoBLOCK® Turkey does not

only supply product, but also our engineers provide technical supervision during the implementation of projects. After the construction is completed, we also collect project specific performance data, thanks to the measurement tools installed. We can analyze data and present with a final performance report. We involve in the every step of the project from design to implementation can be considered our strongest aspects.

What are Austrotherm's goals for the future?

Austrotherm Turkey will contribute to the EPS industry, our main goal is to continue to drive new projects. We want to take a pioneering role and undertake innovative projects in both thermal insulation and Civil Engineering Applications.

In the last 3 years Austrotherm Turkey signed the Geofoam block projects with the expertise of our team, we provide comprehensive services including project design and supervision services, as well as our success in the field of thermal insulation.

Also Austrotherm realized many geofoam projects in abroad. Our goal is to increase this potential and to continue our success in abroad. This is extremely important for both Austrotherm and our country and our industry.





Technical Supervision Service from Austrotherm Turkey

Kayseri Boğazköprü bridge approach embankments built in cooperation with the main contractor Mön İnşaat using EPS geofoam blocks which is a milestone in the construction of roads and bridges in Turkey.

For the first time in the history of KGM – Republic of Turkey General Directorate of Highways, geofoam blocks have been used in an important and large-scale project, and the product and method have proven in the field of road and bridge construction. In the future projects of the KGM, geoBLOCK® product has taken its place as an alternative geotechnology.

Austrotherm has completed more than 30 different geofoam infrastructure projects in the last 3 years in Turkey. It is an important and positive step for Austrotherm to take part in a large project for an important institution such as the General Directorate of Highways in road construction and to offer an innovative solution with the geoBLOCK® product.

Austrotherm not only provided the geoBLOCK® product to the project, but also the project designing of the Bridge Approach Ramp Embankment was made by the Austrotherm Civil Engineering Applications Department (CEA).

Our Civil Engineering Applications Department provides services in all steps



required for geofoam solution. First of all, the potential use of geoBLOCK® product in this project is evaluated by our experienced engineers. When the project is suitable for the Geofoam solution, all stability analysis are performed and the physical and mechanical properties of the geofoam blocks to be used for the project are specified.

Austrotherm , with its 6 manufacturing plants located in Turkey , can smoothly deliver to each point in Turkey. Our Ankara Sincan and Kayseri İncesu factories served at 24/7 for Kayseri Boğazköprü bridge approach embankment where more than 55.000 cubic meters of geoBLOCK® was

used. Due to the physical conditions of the Kayseri-Boğazköprü junction and its surroundings, it was not possible to stock geofoam blocks, so all shipments were organized by Austrotherm from these 2 factories in just-in-time basis. In the Kayseri - Boğazköprü bridge approach embankment project, geofoam blocks weighing 1/100 of the traditional earth fill were used without a need for any ground improvement, so that the bridge approach embankment of 330 meters long was completed in a record time of 75 days and road was opened to traffic.

geoBLOCK® become a brand-new solution for road and bridge approach embankments in Turkey, by eliminating the need for soil improvement and rapid completion time thanks to its easy handling on-site.

Our experienced engineer team provides technical support and supervision service during the implementation of the projects. After the construction is completed, the data received are analyzed and reported to the authorities. Austrotherm is the only EPS manufacturer in Europe that incorporates all these services in 'one stop shop'.





Kayseri-Boğazköprü D.D.Y Overpass Bridge **approach embankment project completed in 75 Days!**

“Kayseri- Boğazköprü D.D.Y.” Approach Embankment Project was built in a record time of 75 days with Austrotherm geoBLOCK® solution and the road was re-opened to traffic.

General Manager and representatives of KGM, Management team of the contractor, MÖN, and Austrotherm Turkey General Manager Selcuk Vanlı were witnessed this historic moment for KGM history together during the inauguration ceremony of the roadway. After the delegation’s visit of the construction area , the road was opened to traffic. The largest geofoam bridge approach embankment of the last 10 years were constructed without the need for any soil improvement.



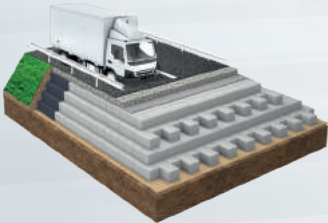
Lighten your load on your next Project with **Austrotherm geoBLOCK®**

AUSTROTHERM
Yalıtım Malzemeleri

Selçuk Bilge
(36, Geotechnical Engineer)



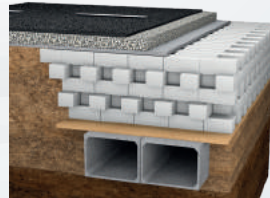
- ✓ Highway and Bridge Approach Embankments
- ✓ Retaining Wall Backfills
- ✓ Highway Embankments a top Culverts
- ✓ Slope Stability Applications



*The Use of
Austrotherm geoBLOCK®
in Highway and Bridge Applications*



*The Use of
Austrotherm geoBLOCK®
in Side-Hill-Fill Constructions*



*The Use of
Austrotherm geoBLOCK®
in Highway Embankments atop Culverts*



*The Use of
Austrotherm geoBLOCK®
in Slope Stability Applications*

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