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RIVER CLACK NEWS

Roofing Airports



The world's largest earthquake safe building Istanbul Sabiha Gökçen Airport

Soner Guner

Istanbul, the only city in the world which straddles the two continents of Asia and Europe, today stands at the cusp of a new era that looks at its touristic and economic growth. The brand new ISGIA- the gateway to this ancient city, where modernity and tradition go hand-in-hand, heralds a new chapter in Istanbul's coming of age.

Reverse of the medal: the city straddles one of the most active seismic fault lines on the globe. In 1999 a 7.4 earthquake on the Richter scale hit the area and there's a 65% probability that Istanbul will be hit by a 7.6 earthquake by 2030. Designers of the new terminal at Sabiha Gökçen Airport had to face this fact.

The technical features of the new terminal are truly world class-constructed to withstand earthquakes of highest intensity using pendulum isolators (Seismic Zone 5) and it has been rated as the world's largest earthquake safe building.

The terminal hosts a complete best-in-class airport equipment with latest generation IT systems, a fully automated baggage handling system with a 5 level security screening scheme and the latest security systems with over 1,000 cameras.

The biggest challenge was funding the new terminal in the middle of the global economic crisis. During the financial negotiation and closure period, the economic conditions in Turkey started to deteriorate seriously and the growth in Turkish aviation began to decline. Nevertheless, despite the unfavorable economic and financial situation the project was delivered in only 18 months, a significant achievement completed during one of the worst-ever financial crises.

The local joint venture company - Limak and GMR - and the ISGIA management, all demonstrated an important level of understanding of the business.



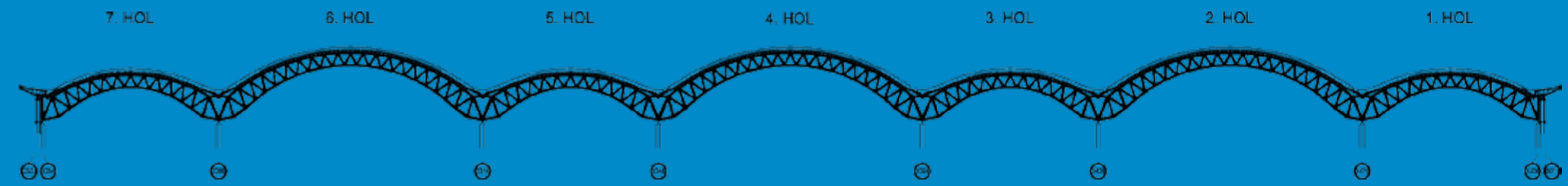
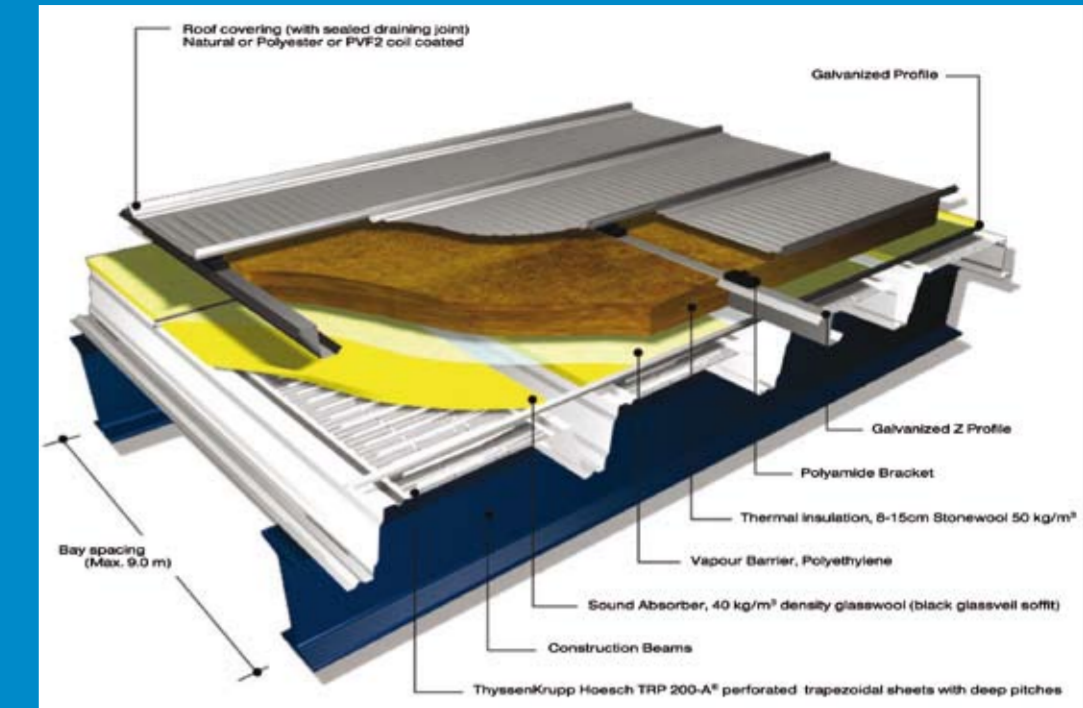
The world's largest earthquake safe building Istanbul Sabiha Gökçen Airport



long span acoustic roof

The combination of Riverclack® standing seam metal roof and ThyssenKrupp Hoesch steel deck provides:

- High Technology combination
- Maximum durability
- Purlins elimination (span up to 10m) thus bringing economy and fastest construction
- Perfect acoustic performance
- Aesthetic Value
- Fully waterproof
- Quick and simple installation



There were several key factors involved in achieving the construction program. Careful planning was, of course, essential, as was the early procurement of long lead items. Selection of construction methods was important. A steel structure, rather than in situ concrete, was selected for the terminal because it could be prefabricated on and off-site. Good coordination was essential.

Beside the GMR/Limak Joint Venture as main contractor, more than 500 construction sub-contracts and major procurement agreements were also awarded. The design was coordinated by the Project Author, Dogan Tekeli of Tekeli Sisa; terminal structural design was undertaken by Arup Istanbul, electrical design was by Enmar, mechanical design was by Dinamik Proje and special systems by Arup London.

Roofing was awarded to EMI inşaat, strong of its proven experience in covering Turkish airports' started in 1997 with the Bodrum Terminal.

On the structure's steep arches the proven built up roof combining Hoesch Trapezoidal Acoustic Deck on the inner side and Riverclack55® Aluminium Roofing Sheets on the outside (as showed in the box), was laid down respecting the challenging work schedule. This was thanks to the long span Hoesch deep profile capable to span up to 10 m and the exceptional ease of installation of Riverclack roofing sheets not requiring any laborious setting up of the clips and any seaming machine.

Moreover, the unique self curving properties of the Riverclack55® panels, saw to it that even the arches' radius of 22.00 m didn't require a mechanic curving thus avoiding an extra on site working.

Although the planned roofing installation time was the fall season of 2008 it shifted into the winter. As a very high, dangerous, huge, cold and wet structure became the work place. The clever design/coordination and the use fast track products were the key factor for succeeding.



We have met Mr. Soner Guner, chairman of EMI Contracting Co. Ltd.

Esenboga Airport - Ankara - Turkey



Emi contracting Co. Ltd. has reached an acknowledged important position in the quality metal roofing field within ten years that followed its founding in 1998. It has been since the beginning a partner of ISCOM and its know how in the use of Riverclack make it become one the first Iscom's international collaborators. Emi takes the pride of successful accomplishment of almost all of the metal roof cladding off the modern terminal buildings of the important airports of Turkey as well as the successful completion of many other precious projects.

We have met Emi's Chairman, Mr Soner GUNER during one of his visits in Iscom. I'm Mechanical Engineer, graduated 30 years ago, 18 years as professional manager in two different companies, and last 12 years with Emi. As the reality of our business life applies us here in our country, you can hardly save time for leisure or hobbies during professional life. So I tried to pick up the hobbies from my job itself. Fortunately I managed to create hobbies like wine and photography. Mr. Fabio Menegoli, who is a wine lover as well, has caused me to become the lover of great Italian wines, as the natural result of delicious lunch and dinner offerings during my business visits to Iscom. Now I am importing some Italian wines to my country as a separate hobby business. On the other hand, I have been taking pictures from our works to create references in so many years and finally I have a big fun in focusing deep in photography.

Mr. GUNER "why do you work so frequently in airport roofing?"

The initial budget of our metal roof system is quite high in comparison with many traditional systems. So our system is mainly preferred in projects where the performance is in the first place rather than the budget. Such projects are mainly the buildings with high importance factor, and airport buildings are in this group. On the other hand the air transportation has been increasing enormously in the last era and therefore a big demand for the new airports and buildings was created.

Of course I have to state here that our initial project, Ataturk Airport of Istanbul, was contracted to TAV, the company who became a leader in airport construction and operation. We became a solution partner of TAV, thanks to our upper class products and precise servicing.

"Which are the most important topics in the construction of an airport"

As said airport buildings are in the highest ranks of importance factor. Besides functionality and durability, these buildings are essentially the aesthetic face of the city or the country where it is built. So the architects are quite keen on their design from both functional and aesthetical points of view.

On the other hand, the construction time is very important. The contractors are also the operators in our projects mainly and therefore they are intending to shorten the construction at the maximum to gain more operation period and thus increase their income. Almost all of our basic projects were completed six to twelve months earlier than planned.

"What is your principal competitive strenght" or "why do you think your customer prefer your company"

Well, I can simply summarize that the combination of "correct product" and "accuracy of the service" is our motto and I state that our company is fitting perfectly to above requirements that we discussed in important topics, which are

functionality, durability and fastness. We are having a perfect set of products in our range to satisfy the needs in important building projects. Our products are at the highest class, functional, reliable, very long lasting and easy to construct. And our company serves at the utmost care to every party in the scope, in all phases. We are assisting the architects with our technical capacity and solutions, we are coordinating our works very very precisely to avoid any delay or complication and achieve required results in our contracts.

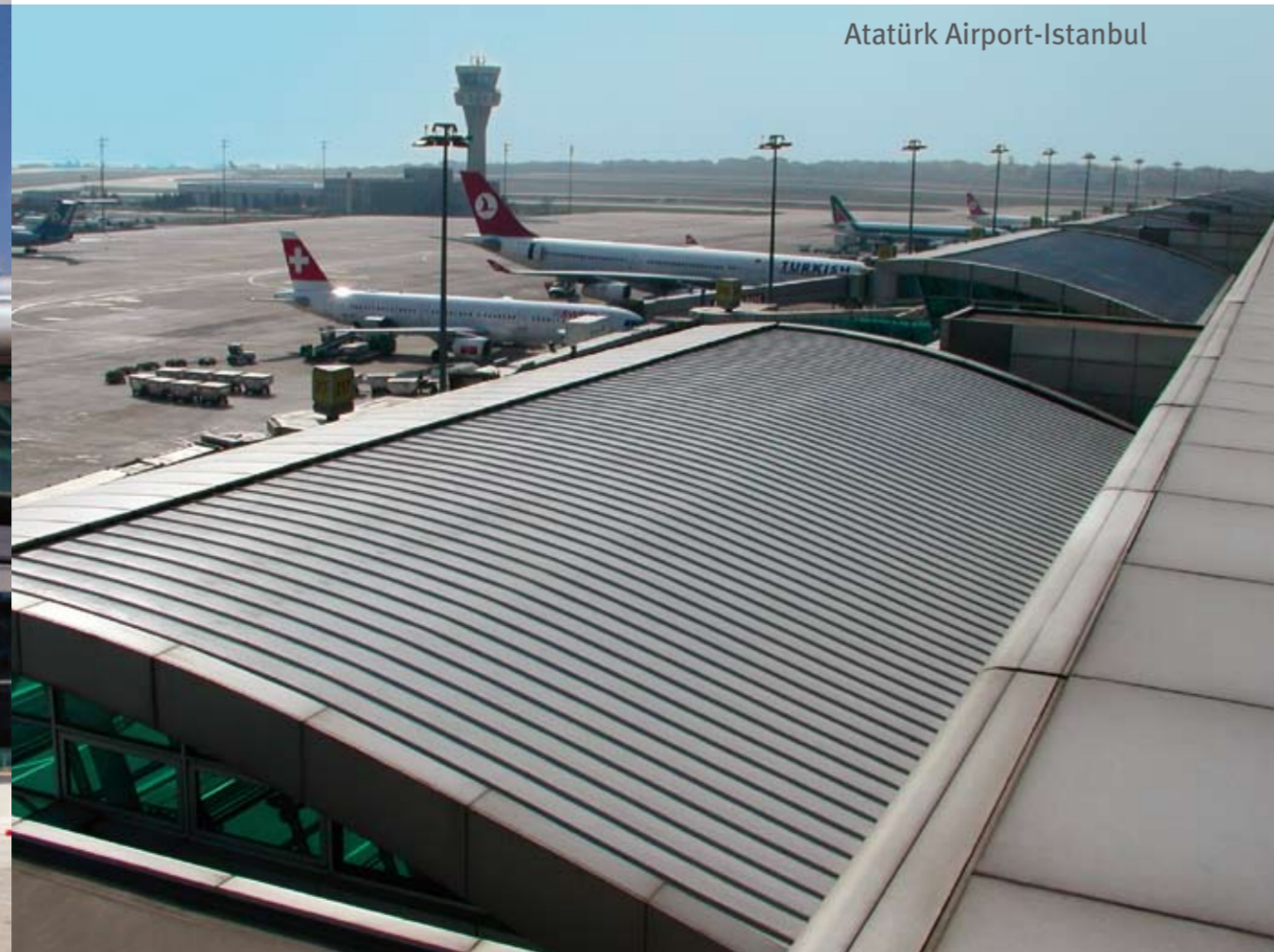
"Where do you think is your new market target, in which country or in which industry or kind of building"

Aviation sector continues to develop and seems to go like this in any circumstances. There are a lot of projects under construction or being projected in many countries around us, for the near future. We will be following the leading Turkish companies in this field closely. We are also focusing in shopping malls which are increasing in the number in many cities in our country. We have completed a few projects in recent years and consider that there will be new ones coming based on these successfully established references.

Sabiha Gökçen-Istanbul



Atatürk Airport-Istanbul



Esenboga Airport - Ankara - Turkey



Zine El Abidine Ben Ali Airport Enfidha, Tunisia

The record construction time of one and a half year has challenged all the players from main to sub contractors from project management to skilled labour.

The 80 ha infrastructure is placed 80 km south of Tunis, but in the middle of a major tourist region. With excellent hotels, fine golf courses and above all beautiful beaches and a year round sunshine Tunisia has seen in the recent years an big increase in holiday visitors. Before the completion of Enfidha Airport, the increase of inbound tourists was handled by 6 small international airports around the country none of them really suited to the purpose of receiving the more and more demanding international travelers. That's why the Tunisian government decided that a new Airport should be built in the area and set up a BOT (build, operate, transfer) tender, a 40 years concession which also included the operation of the already existing and operating Monastir Airport (60km away), eliminating the risk of competition between the 2 facilities.

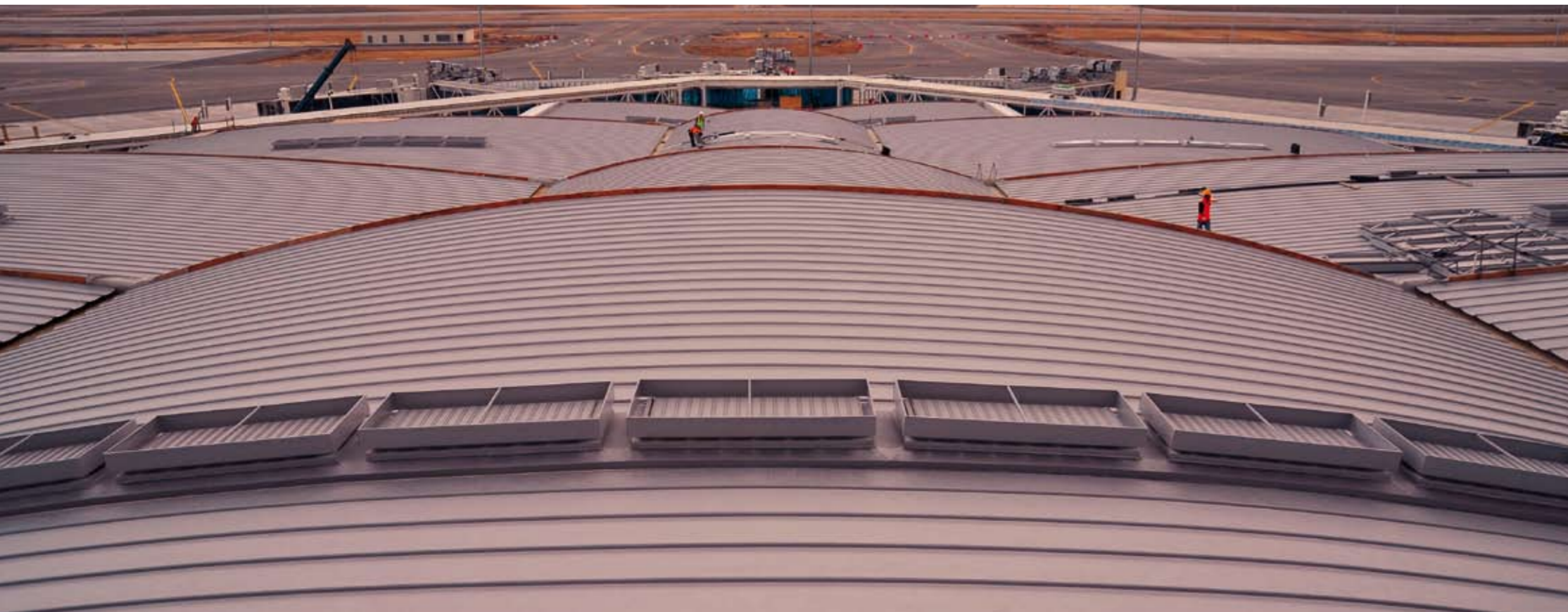
TAV (Tepe Akfen Ventures) was awarded with the tender and completed the construction as scheduled in October 2009. The roof plays a key role in the architecture of the building. Its bird-wing shape is emphasized by the use of glazing all around the wall which allows light to permeate the whole of the interior space. Being no visual screen between the interior and the air operation field, gardens have been designed between the runways and the departure lounges to offer passengers a relaxing view.

The 90000 m² of roof surface are clad with Riverclack55[®] aluminum roofing sheets 0.7mm thick RAL 9006 PvdF coated. The use of a PvdF (Polyvinylidene fluoride) coating is highly recommended in a desert environment given its superior weatherability in combination with high durability, high



chemical stability (reduced color changes in time), but a somewhat inferior scratch resistance which, however, doesn't affect the duration of the metal being this aluminum: the coating has in fact, in this case, mostly an aesthetic reason. The Riverclack sheets were on site roll formed up to a length of 98 meters, and rolled directly off the roll forming machine up a ramp to roof level.

EMI instaat the turkish airport roofing specialist based in Ankara has been providing consultancy and installation.



The Riverclack® welcoming to Jamaica

Sangster and Norman Manley International Airports

Paolo Massi

With its stunning landscapes and the crystalline water Jamaica is the destination of over 1 million vacationers each year. Either they arrive to Sangster Montego Bay airport or to Manley Kingston airport, a Riverclack® roof welcomes them to Jamaica. The two major infrastructures of the island are in fact covered with the innovative standing seam roof profile. The story of the two airports develops along different plots with different designers, different consultants and contractors but a sole far-sighted Airport Authority of Jamaica that chose for both roofs the solution based on Riverclack® system proposed by PALGAG Caribbean, a part of PALGAG group, the Israel's largest roofing company. Their proposal was in fact found to be most suitable, complying with all project requirements as well as meeting strict demands such as durability under severe weather conditions including strong winds, year-round rain and hurricanes. In particular the choice was driven by the exclusive draining channel feature of Riverclack55®, capable to withstand a full submersion of the roof under water and the wind uplift performance provided by the Riverclack® secret fixing system. Although Riverclack® is installed by a simple foot pressure on a

polyamide bracket, it achieved the highest FM I-225 wind storm classification.

Montego Bay Sangster International Airport was completed in 2004. Its 7000 square meters aluminum Riverclack roof has been operating for 6 years facing storms and hurricanes including the devastating Ivan and Dennis.

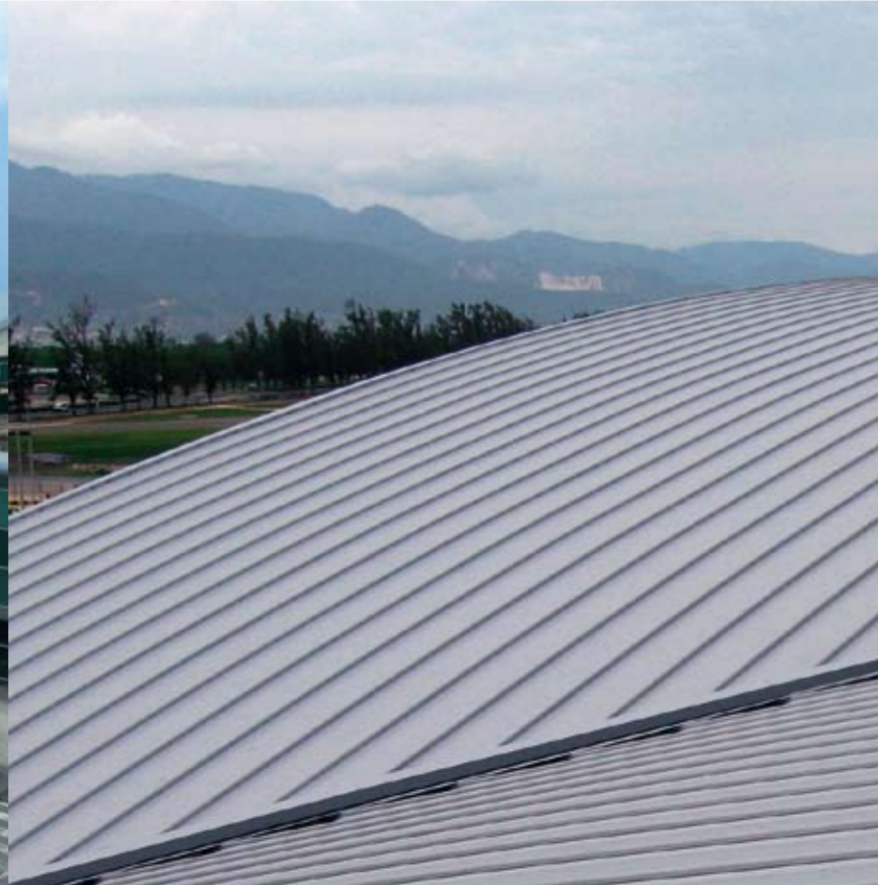
Kingston Norman Manley International Airport (completed in 2007) required 18000 square meters of thermo acoustic roofing including: a metal decking consisting of up to 9 meter free span of perforated cassettes, Insulation layers, Sub-construction for covering system and Riverclack® covering system made of pre painted aluminum.

In both cases the roofing sheets were roll formed on site with the fully engineered, factory specification mobile rollforming mill and lifted up with a lifting beam which is available in different configurations (for sheets length up to 100 m).

PALGAG Technologies specializes in planning, manufacture and construction of steel and wood structures, and roofing and cladding systems. In these two international airports, which were successfully carried out, PALGAG scope of work included steel structure, metal roofing and cladding systems.



Sangster International
Airport



Covering Airports with Riverclack. Why it is the right choice.

Interview to Mauro Menegoli, Iscom's chairman

What are the main reasons for airports to choose Riverclack?

Riverclack is an extremely reliable product, considering both its unique waterproofing performances and its high resistance to mechanical stresses, such as those ones generated by wind or snow. It is mainly a product which does not require maintenance.

Infrastructures like airports cannot allow to interrupt their work, if we think to these days air traffic stop caused by the Icelandic volcano cloud. Every maintenance intervention, especially on the roof, implies a series of issues related also to safety and security, that can affect the ordinary terminal's working with relevant economic consequences. Even more serious will be the consequences of a possible roof replacement. Therefore, a reliable and long-lasting roof is the right solution.

The above consideration can be conceived as an exaggeration, but it is not. Just two years ago, we had to solve an issue at Tbilisi airport in Georgia. The roof covering, installed two years before with a competing product, had already presented water infiltrations only a week after the opening and had already blew off due to strong wind twice, the last time on 15 March 2008. The airport operating company, exhausted by this situation and satisfied by the results obtained in other airport terminals covered by Riverclack, has not hesitated to ask for a complete replacement of the whole roof covering with Riverclack system. As it happened, the roll forming operation occurred during bombing raid caused by the crisis between Georgia and Russia. However, this is part of the possible risks while working abroad.

Anyhow, in October 2008, Tbilisi had already its airport with a new roof and, especially, a not "convertible" roof, as the local press had said ironically referring to the previous roof.

From the first to the last airport done 16 years passed by, what has been changing in the clients' demand?

No doubts, that compared to 16 but even just 8-10 years ago, nowadays there is a higher consciousness in the choices done by the clients. This is the result of an intense information activity that we have been able to operate throughout the years with competence and professionalism. If years ago, notions as the importance of a single length panel, the absence of through perforations in relation with thermal movements, the ease of installation intended as a more reliable result, the minimization of maintenance were to be explained, today the client find by himself, in Riverclack, the answers to his issues.

Are there technical solutions concerning specifically this type of buildings?

Apart from what already said, that is the demand of maximum reliability, there is the need to guarantee an ever-increasing acoustic and thermal comfort. In particular, in airports' Halls, where the intrados of the roof works as soffit for the below spaces, it is very important to provide proper acoustic absorption systems by using perforated corrugated panels on the intrados in combination with possible layers of sound absorbent insulation. Layers of acoustic insulation for the lowering of external noises, that at airports are extremely strong, are also important. Moreover, big projects are, for architects, a good opportunity to express their creativity with a constant tendency to daring architectural solutions, with complex geometries and curves. Riverclack, thanks to a constant technical development, can provide concave and convex curving, tapering, or even variable width profiles to meet the expression of any architectural idea.

Airport terminals and infrastructures

KEMEROVO AIRPORT - Siberia - Russian Federation [1994]
m_ 5.000

AIRPORT - Bodrum - Turkey [1997]
m_ 16.000

ROMA FIUMICINO AIRPORTS - Italy [1999]
Satellite West - m_ 15.000 E Station - m_ 2.000
National flights - 1st functional module - about m_ 14.000

SABIHA GÖKÇEN AIRPORT - Istanbul - Turkey [1999]
m_ 27.000

ATATURK AIRPORT - Istanbul - Turkey [1999]
m_ 37.000

DIYARBAKIR (Turkey) [1999]
m_ 4.180

CAGLIARI "ELMAS 2010" AIRPORT - Sardinia - Italy [2000]
Poly-functional building

LAMEZIA TERME AIRPORT - Catanzaro - Italy [2001]
m_ 781

HANGAR ATITECH 2000 AIRPORT - Naples - Capodichino - Italy [2002]
m_ 11.000

G. GALILEI AIRPORT - Pisa - Italy [2002]
m_ 760

GUIDONIA AIRPORT - Roma - Italy [2004]
m_ 728

SANGSTER INTERNATIONAL AIRPORT - Montego Bay - Jamaica [2004]
m_ 7.000

TORINO AIRPORT - Torino - Italy [2005]
m_ 1.783

AIRPORT HANGAR - Pratica di Mare (Rm) - Italy [2006]
m_ 2.300

NORMAN MANLEY INTERNATIONAL AIRPORT - Kingston - Jamaica [2007]
m_ 18.000

TBILISI INTERNATIONAL AIRPORT - Georgia [2008]
m_ 11.500

SABIHA GÖKÇEN AIRPORT NEW TERMINAL - Istanbul - Turkey [2009]
m_ 42.500

ENFIDHA INTERNATIONAL AIRPORT- Tunisi [2009]
m_ 26.500

ENTZHEIM AIRPORT - SHELTER, Strasbourg - France [2009]
m_ 900

CHARLES DE GAULLE AIRPORT - TECHNICAL BUILDING - Paris - France [2010]
m_ 3.100

BORG AL-ARAB INTERNATIONAL AIRPORT - Egypt [2010]
m_ 3.600

Zine El Abidine Ben Ali Airport - Enfidha - Tunisia



Bodrum airport - Turkey



Tbilisi roof renewal - Georgia - International Airport



Sabiha Gökçen domestic terminal - Istanbul - Turkey

