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GREEN ROOFS WORLDWIDE UWC Dilijan College in Armenia: Educational Facility in Accordance with Mother Nature



UWC Dilijan in autumn. Copyright: Tim Flynn Architects

Tim Flynn Architects (TFA) is an international team of architects and designers with offices in London, Yerevan and Moscow. In 2007, TFA was commissioned to deliver the architectural design, interior design, fit-out and landscape design elements for UWC Dilijan College in Armenia. Project managing and carrying out work from the TFA London and Yerevan offices, and in collaboration with a large number of experts, engineers, suppliers and designers from Armenia and around the world, the aim was to design an inspiring educational facility built with state-of-the-art environmental principals that would be the first of its kind in Armenia.

Back in 2006, the founders of the school, successful business entrepreneurs Ruben Vardanyan and Veronika Zonabend (RVVZ) developed a project to give back to their homeland of Armenia. A landlocked country with Turkey to the west, Georgia to the north-west, Azerbaijan to the north-east and Iran to the south-east of its borders, Armenia is a diverse yet troubled country which has suffered economically since the breakup of the Soviet Union and through the after-effects of its war with neighbouring Azerbaijan. RVVZ's dream was to build a learning facility in the Armenian town of Dilijan that would bring young people together, offering holistic educational experiences that were based on sharing and collaboration, where each student would be encouraged to act as a "Champion for Peace".

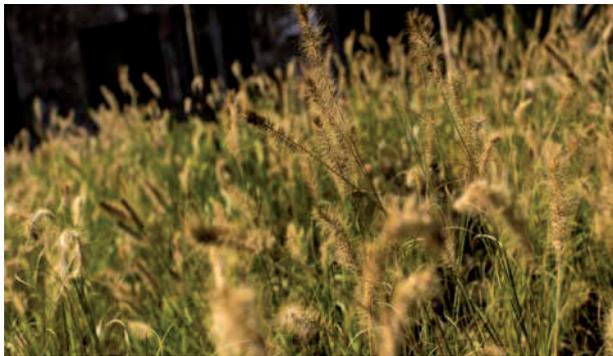
Situated on the verge of the beautiful Dilijan National park, initially the site comprised ten hectares of land, but as the ambition and size of the school grew, the masterplan was developed further to its site today of 88 hectares. Phase 1 was completed in October 2014 and includes a series of main school and residential buildings with its massing broken up to sit comfortably within its surrounds while also keeping the essence of the traditional Dilijan vernacular.

Playing fields, tennis courts and soft landscaping throughout invigorate the area. Completion of the whole campus is anticipated by 2020 and at full capacity this co-education secondary school will house 650 students and staff.



UWC Dilijan preparing the roof. Copyright: Tim Flynn Architects

For the hard and soft landscaping, TFA collaborated with Udo Dagenbach from award winning Glasser & Dagenbach landscape architects in Berlin. Together, their aim has been to design an ecologically sound building that nestles within and complements the spectacular landscape in which it sits. TFA and Glasser & Dagenbach wanted to keep the Dilijan population firmly at the centre of the project by using local labour and materials for construction – thus providing an additional environmental and economic benefit by keeping the supply chain to a minimum. The region is known for its unique biodiversity and it was a goal to make the most of the abundant natural resources that were available. There was little local expertise for landscaping works of this nature, so new standards had to be defined while finding ways to use the resources and plants which exist locally.



Native grasses of Armenia. Copyright: Tim Flynn Architects

The ethos of “putting back” has been at the heart of the design with an important concept for the school focused on restoring the natural vegetation which was disturbed during the construction phase. Therefore the former green orchard in the valley has been replaced by “putting back” the meadow on the roof and covering the vertical walls in plant modules. Volunteers and local workers helped collect native flora and fauna from neighbouring mountain meadows and along with hand cut grass sods, these have been used to frame the Green Roofs, providing the starting point for grass, flowers and herbs to flourish. Local workers



Hand cut grass sods will line the roof borders. Copyright: Tim Flynn Architects



Local volunteers collect grasses and flowers from the mountains. Copyright: Tim Flynn Architects

manufactured a blend of Dilijan soil which provides the basis for the roof and green wall substrate. There is a huge mining area for obsidian and ceolithe close to neighbouring Lake Sevan, so the mineral rich soil was mixed with local peat and lava – creating a unique and fertile soil blend for the walls and roof.

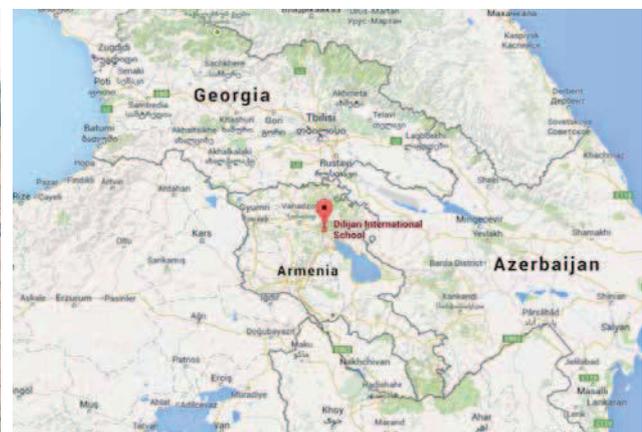
A complex system of planting schemes was created to ensure the right plant varieties for specific positions around the buildings with over 40 different species selected. A nursery of 4,000 m² has been set up within the school’s ground to mix soil and prepare the plant modules for the living walls –with the modules watered, fertilized and maintained on the ground for 6–8 months prior to installation. A key belief informing the landscape design has been that nature is indeed cyclical.



A system of plant varieties for different areas. Copyright: Tim Flynn Architects

Instead of engineering or forcing the maintenance of the grasses on the roof – there has been a focus to remain in-synch with the seasons of Dilijan. Due to the local conditions, 1,100 m above sea level and with 700 mm rain per year, no irrigation system was installed on the roof. As the air is often humid in the evenings, this provides ideal conditions for plants to work together with the seasonal elements of Dilijan. The roof thrives and grows along with the hot and cold seasons of Armenia.

Nature is perfect in its imperfection and so must the plantings in time be allowed to grow and then enter a phase of dormancy– as the Byrds song from the 1960s goes: “To every season, turn, turn, turn”. By letting certain grasses and plants dry out in the hot Armenian summer, a different and more natural type of diversity is permitted to breathe and develop, in accordance with Mother Nature.



The shapely roof itself echoes its context by mirroring the curve of the mountains in the background. In time the vision is to grow full sized apple and poplar trees upon it. The hope is that by allowing the landscaping to remain as natural as possible – the indigenous species will take over one day, with the building camouflaged into its context. With this also comes a significant educational element where the students of the school will be able to help maintain and understand how and why things grow. The Green Roof will be used as an experimental field for the students. Their task will be to enrich the biodiversity of the school for generations to come, by collecting plants, implementing them on the roofs and monitoring throughout the years.

It is a proud moment for Armenia with UWC Dilijan College now one of the first schools in Europe to cover such large areas of its façade – 4,750 m² of Green Roof and 1,300 m² of vertical living walls. It is a project which proves that sustainable green architecture can be realised anywhere in the world, and without a loss of aesthetic quality.

Project Data

Location: Dilijan, Armenia

Green Roof: 4,750 m²

Living Wall: 1,300 m²

Architects: Tim Flynn Architects

Landscape Architects: Glaser & Dagenbach

Living walls provider: ANS Group UK

For further information:

About UWC Dilijan College: <http://dilijanschool.com/>

About the UWC movement: <http://www.uwc.org>

Tim Flynn Architects: <http://www.timflynnarchitects.com>

Glaser und Dagenbach (landscape architects)

<http://www.glada-berlin.de/framesetE.html>



UWC Dilijan Green Roof. Copyright: Tim Flynn Architects



UWC Dilijan in context. Copyright: Tim Flynn Architects