GODEC

Green Opportunities for Developing Economy Conference

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İMO

Local Building Materials to Sustainable Communities

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Partners:

Sponsor:

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How does sustainability affect us

- Economical
- Social
- Political
- Ecological
- Environmental
- Health
- Innovation

Sustainable architecture should

- explore how to minimize the negative environmental impact of buildings by increasing efficiency of planning
- improving building technology in the use of building materials,
- increase in resource efficiency,
- reduction of energy use,
- efficient spatial relationship and connection; in the context of both urban and suburban
- healthy indoor and outdoor environment

Some “green” building advantages if local materials and labor engaged

- Economic Sustainability
  - High and stable levels of local economic growth and em ployment
  - Improved project delivery
  - Increased project delivery & productivity

Local material = more jobs = healthier sustainable economies = better standard of living = low embodied ene rgy

Imported material = less jobs = unsustainable economies = worse standard of living = high embodied

3 Projects- 3 continents and Building material suggestion for Cyprus

- Madagascar- Rain Forest
  - Education
  - Job opportunities
- Cyprus- Urban
  - Interpretation / Innovation
- North America- Rural
  - Up-Cycling
  - Reclaiming

How to Measure Green Architecture

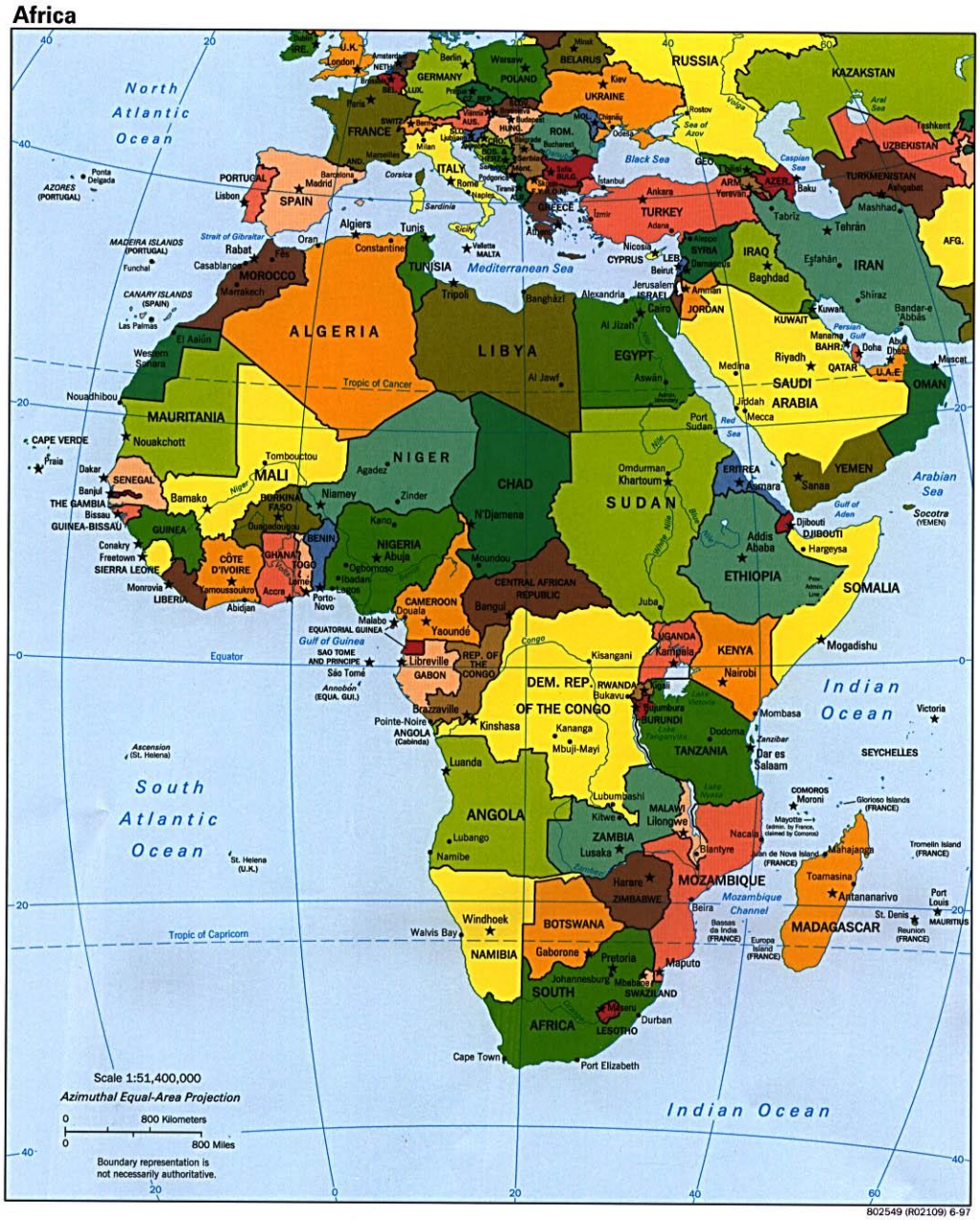
some of the entities

- LEED or BREEAM
- USGBC
- Passive House
- AIA 2030 challenge
- Conscious
- and more…

sus.tain - to keep in existence; maintain

monastery in kyrenia mountains, cyprus

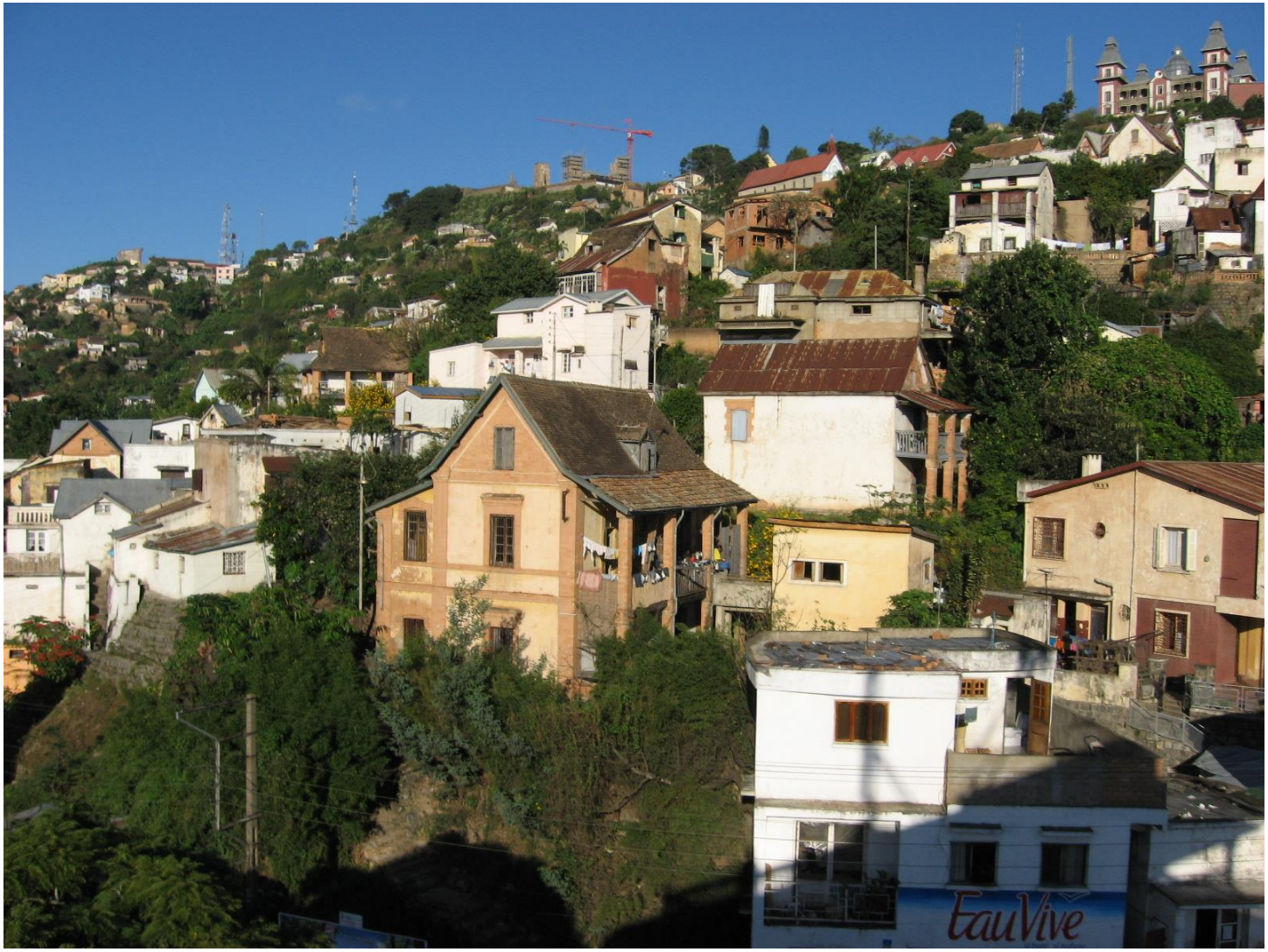
Centre Valbio,
Research and education center
Madagascar, South East Rainfor



inspiration

Vernacular Architecture Research

Vernacular Architecture Research



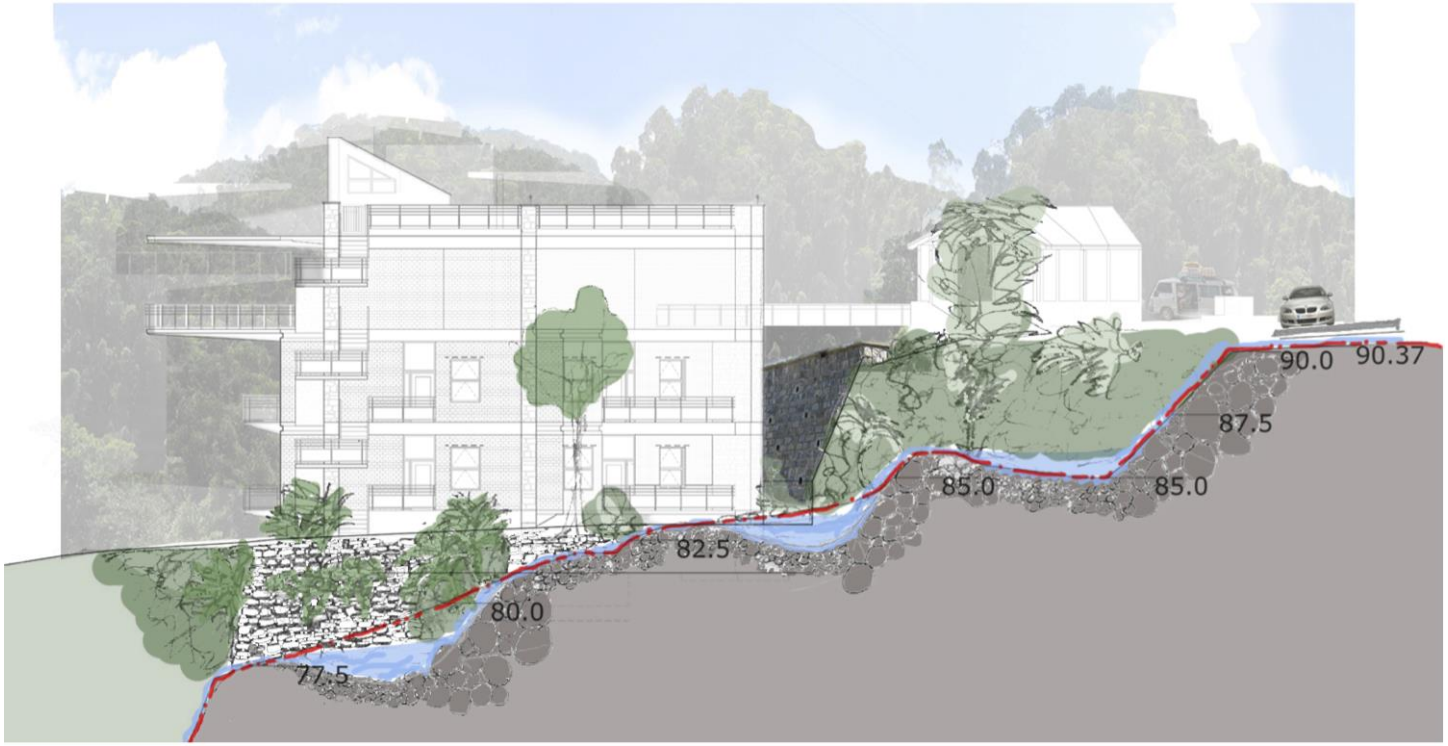
PUBLIC
SHARED PRIVATE
PRIVATE
WET ROOM

0 8' 16'

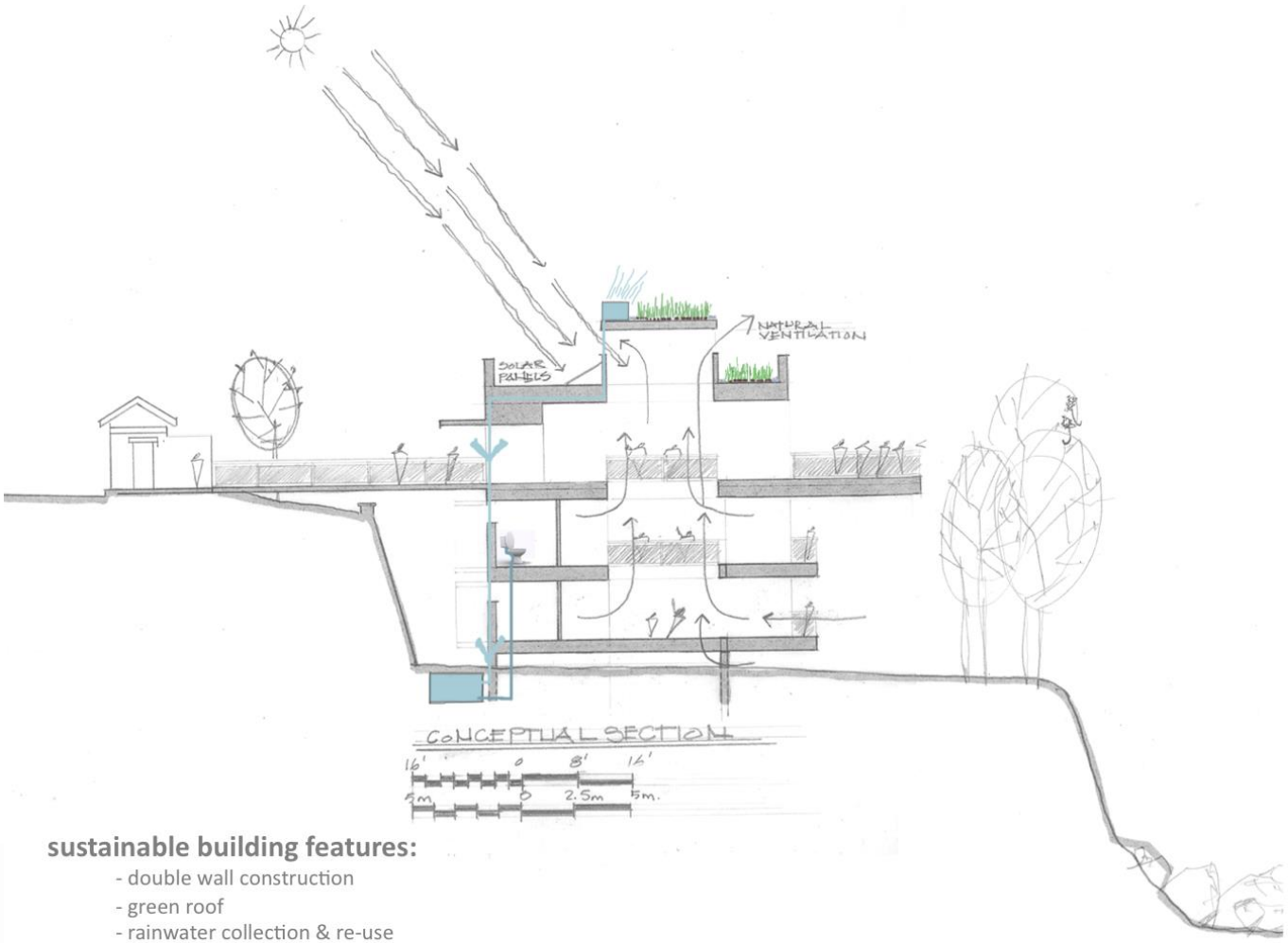
0 2.5m 5m

sleeping level 2 plan-
plan du premier étage

434.5 m² (4,677 sf)



site section at proposed eco-swale



sustainable building features:

- double wall construction
- green roof
- rainwater collection & re-use
- natural ventilation
- local materials

Rice paddies

Brick kilns

Gravel making from local granite boulders

Burning brick kiln

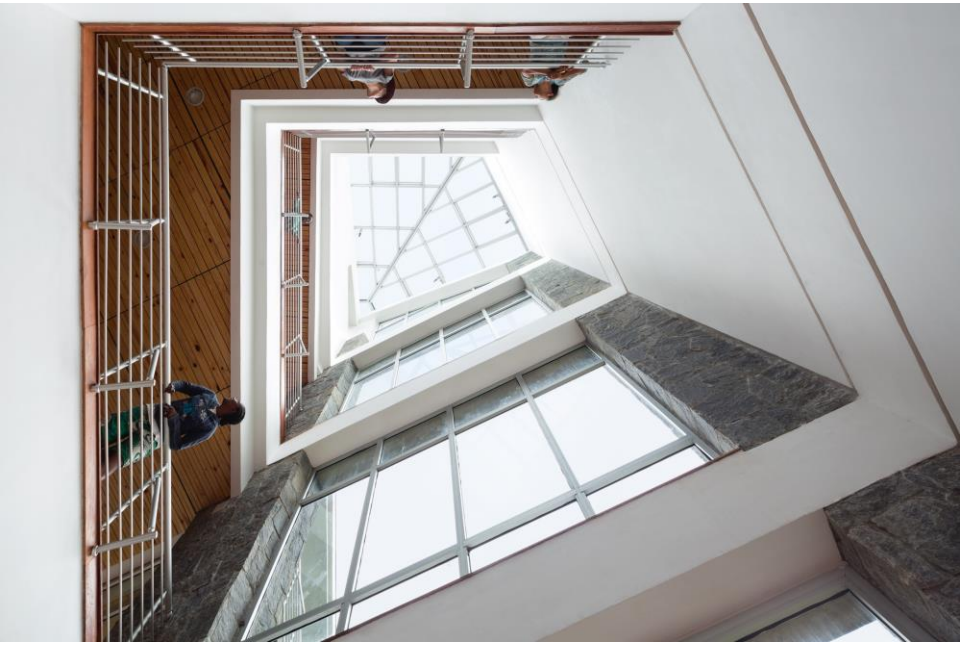
Mock-ups, interpretations/ innovation

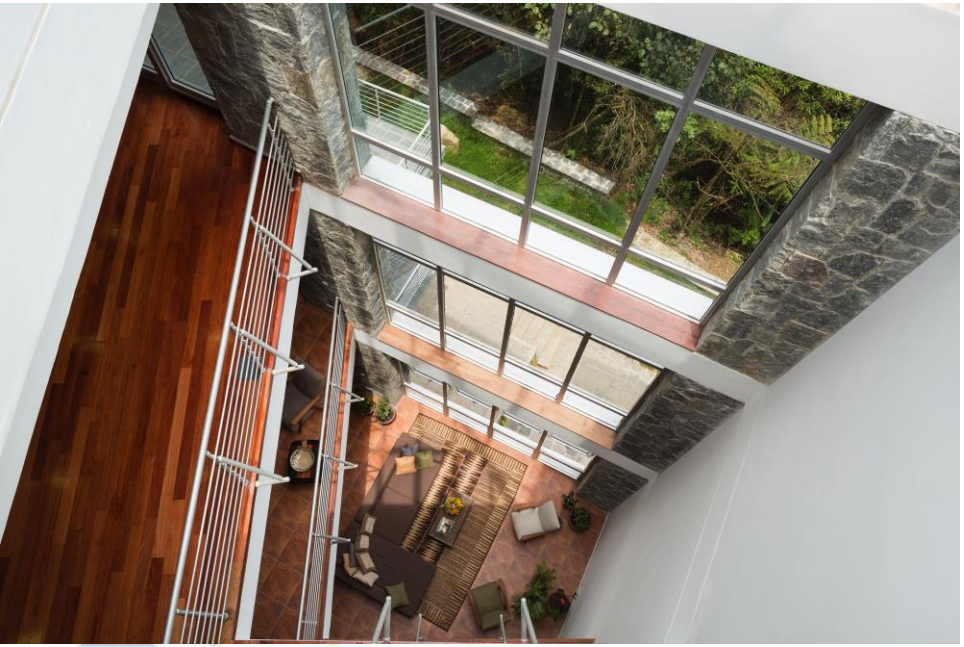
Interpretation/ Innovation using local available materials

Women's Co-op making table cloths and window treatments

View from
Namorona River


NamanaBe
Hall





Building Community Market using recycled materials from the research center construction as part of the Local Building permit fees

Barn Again
Lima, NY
Zero Net Energy
LEED Platinum

PROTECT

wind&noise the building mass & orientation protect from winds and road noise

land berming against the house at the north provides thermal insulation and acts as a sound barrier

solar careful **orientation** of the residence & overhangs protect glazing from summer sun, and admit lower winter sun deep into the living space

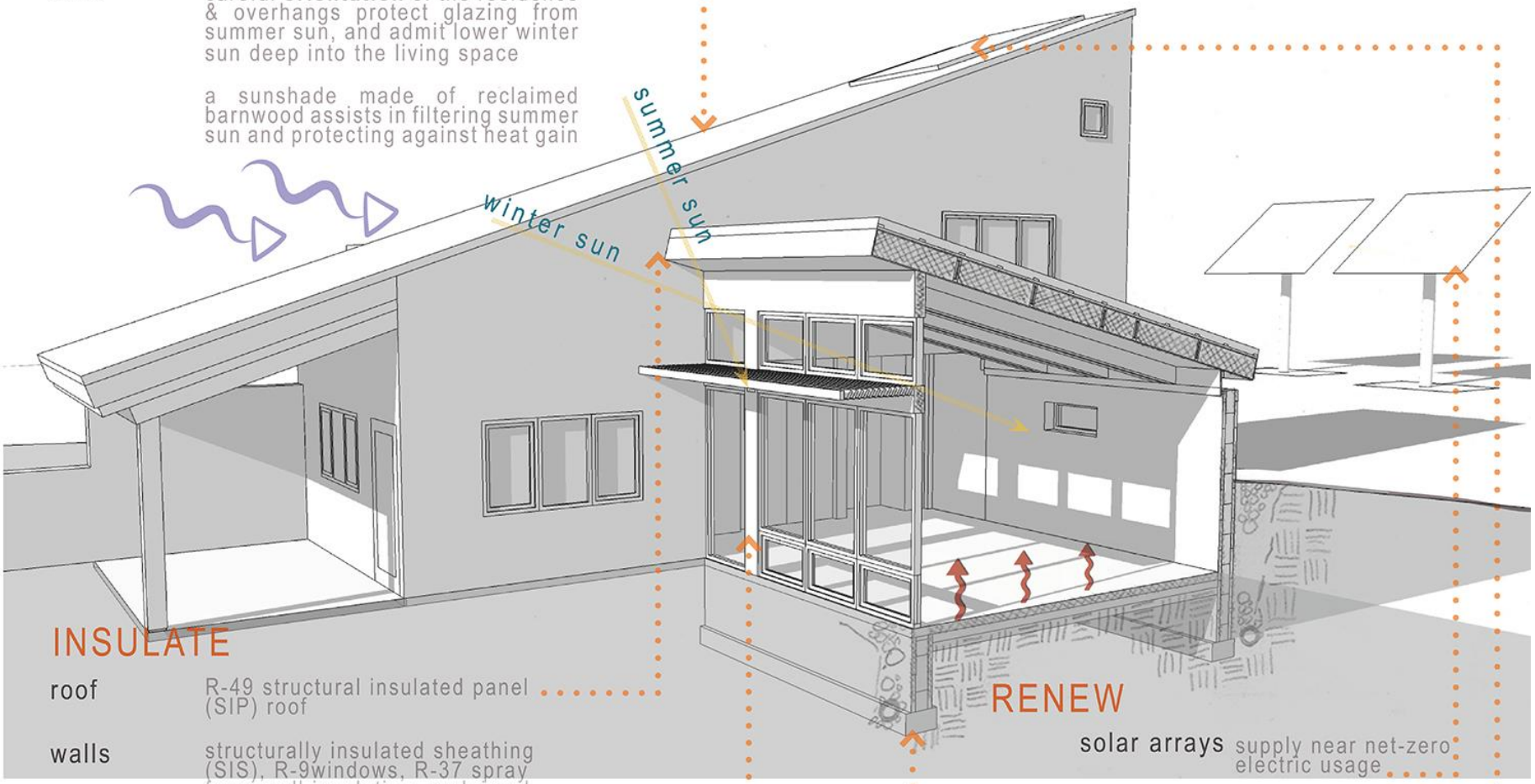
a sunshade made of reclaimed barnwood assists in filtering summer sun and protecting against heat gain

RADIATE

ground source heat pump horizontal trenches & circulating tubes provide consistent heating and cooling year-round

in-slab radiant heat tied to ground source heat pump

concrete slab provides thermal mass to absorb & radiate heat



INSULATE

roof R-49 structural insulated panel (SIP) roof

walls structurally insulated sheathing (SIS), R-9windows, R-37 spray foam wall insulation, reclaimed barn wood, rain screen siding

foundation/ floor insulated concrete form (ICF),R-20 rigid insulated floor slab

RENEW

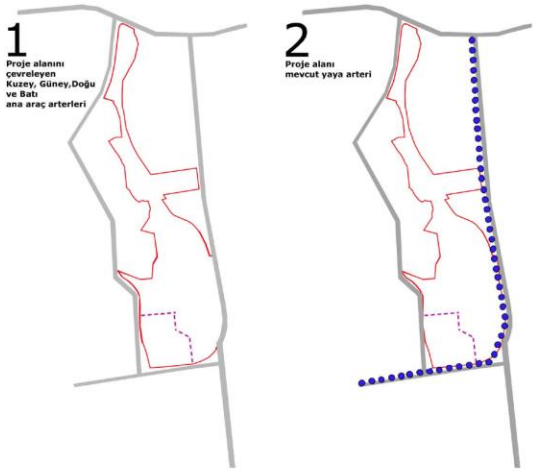
solar arrays supply near net-zero electric usage

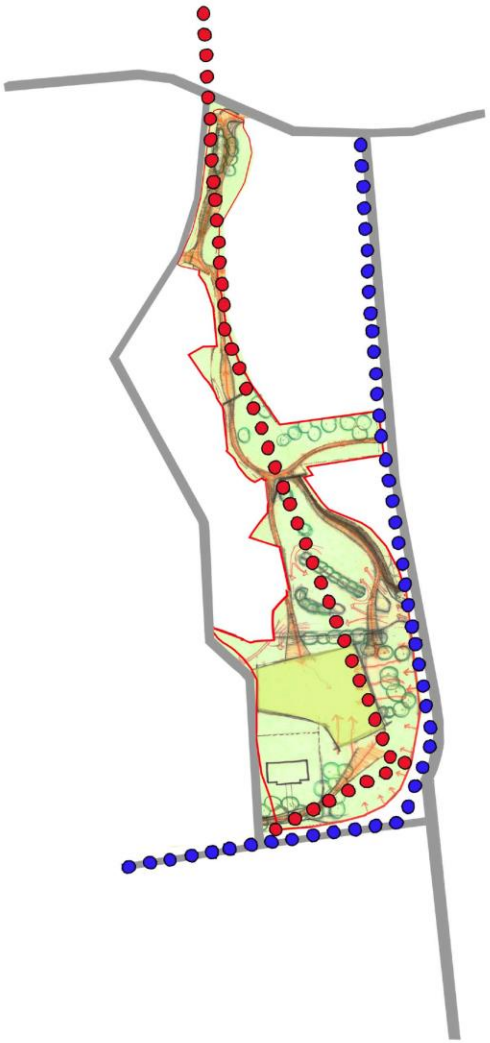
solar hot water panels on the roof reduce energy consumption

sustainable strategies

Girne Civic Center, “LEED Certifyable”. Girne, Cyprus

GİRNE BELEDİYESİ HİZMET BİNASI, KONGRE MERKEZİ VE REKREASYON PROJESİ





Araziye Yerleşim ve Kütle Oluşumu

PROGRAM ÖZETİ

Proje alanının konumu, Girne-Lefkoşa ana arteri ile Girne kenti Doğu-Batı istikametindeki (Çatalköy-Lapta güzergahı) ana arterinin kesişme noktasında yer almaktadır.

Belediye Hizmet Binası, uzun zamandır Girne'nin ihtiyaç olarak eksikliğini hissettiği bir Kongre Salonu ve bunları çevreleyen mevcut yeşil dokunun büyük kısmının da korunacağı rekreasyon alanlarından oluşacaktır. Tasarlanacak yeni Belediye Hizmet Binası ekolojik ve çevresel faktörler de düşünülerek, Girne'nin gelecekteki gelişimine cevap verebilecek kapasitede olacaktır.

AMAÇLAR

1. EKOLOJİK AMAÇLAR

• Bu arazinin proje alanı olarak seçilmesinin nedeni, Haci Halil Deresi'nin arazi içerisinden şehir merkezine alternatif bir yaya aksı yaratması ve mevcut su kanalının proje içerisinde değerlendirilip, rekreasyon ve yeşil alanlar yaratmaya elverişli olmasıdır. Bu alan şu anda inşaat atıkları, döküntülerle kirletilmiş ve mevcut bitki örtüsü yıllardır dikkate alınmamıştır. Şehrin ortasındaki bu yeşil alan ne yazık ki kaybolmuştur.

Amacımız tüm alanı değerlendirip, arazi içerisinde bulunan Akdeniz endemik bitkileri, çalılıkları ve ağaçları koruyarak, binamızdan derenin sonuna kadar rekreatif yeşil alanlar yaratmaktır. Bunun yanında ekolojik olarak diğer amaçlarımız;

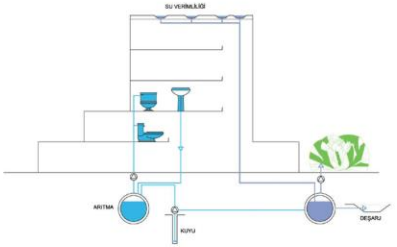
• Güneş Enerjisinden yararlanılarak Binanın enerji ihtiyacının belli bir miktarının karşılanması ve binayı ısıtma; havalandırma olanaklarını kullanarak binayı soğutma,

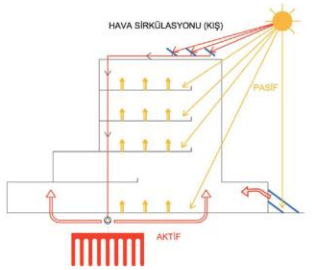
• Yağmur sularının uygun noktalarda toplanarak bina çevresinde oluşturulacak yeşil dokuda kullanılması,

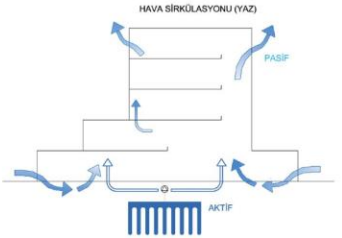
• Binadan çıkacak atık suların geri dönüşümle tekrar kullanıma hazır hale getirilmesi

2. ÇEVRESEL AMAÇLAR

• Bina ihtiyaç programı hazırlanırken, programın gerektirdiği fonksiyonel mekanlar ve ilişkileri göz önünde bulundurularak mevcut yeşil dokunun (Ağaçlar ve endemikler) en üst düzeyde korunmasına özen gösterilecektir.







Sürdürülebilir Alanlar
- Bölgeye uygun peyzaj ve yağmursularının değerlendirilmesi
- Akılcı ulaşım çözümleri
- Erozyon, ışık kirliliği, sıcak ada etkisini ve inşata bağlı kirliliği azaltma.

Malzeme & Kaynaklar
- Bölgeye uygun, geleneksel malzemeleri kullanmak
- Atık malzemelerin değerlendirilmesi ve geri dönüşüm stratejileri

Su verimliliği
- Akılcı su kullanımı
- Su kaybını önlemek; daha etkin tertibat, armatür ve aksamlarla içeride ve bilinçli peyzaj düzenlemeleriyle dışarıda

İç mekanların çevresel kalitesi
- Daha temiz ve sağlıklı, iç mekanlar geliştirmek
- Gün ışığı alan, manzaralı ve akustik alanlar yaratmak

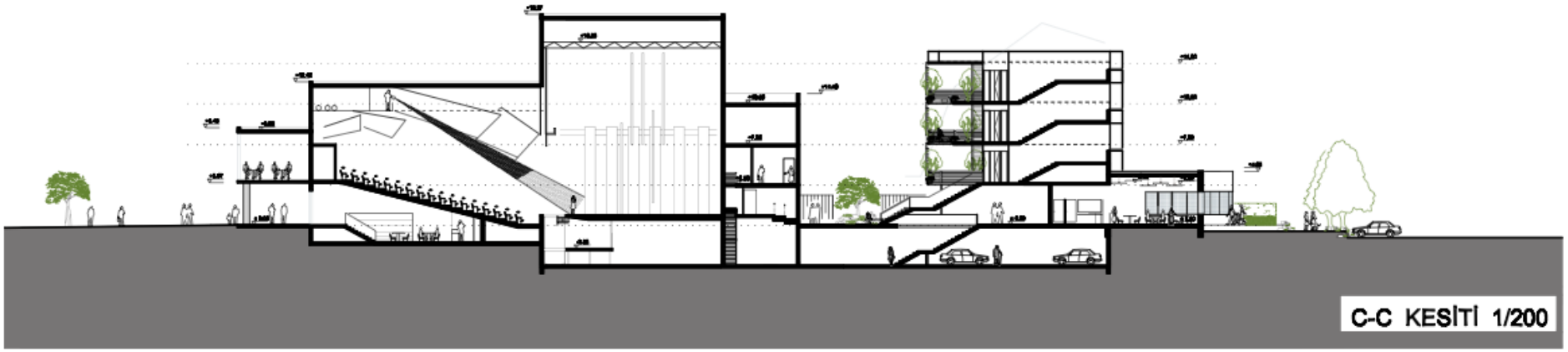
Enerji ve Atmosfer
- Enerji odaklı akılcı stratejiler üretmek ve enerji kullanımını denetlemek
- Etkin tasarım ve inşaat, etkin tertibat, sistemler ve aydınlatma, yenilenebilir ve saf enerji kaynaklarının kullanımı
- Arazideki veya arazi dışındaki üretim ve diğer yenilikçi önlemler almak

Tasarımda yenilik
- Tasarımda yenilikçi teknolojiler ve stratejiler oluşturmak.
- Bütüncül, birbirine entegreli yaklaşımlarla yapılacak tasarım ve inşaat süreci

Site Plan

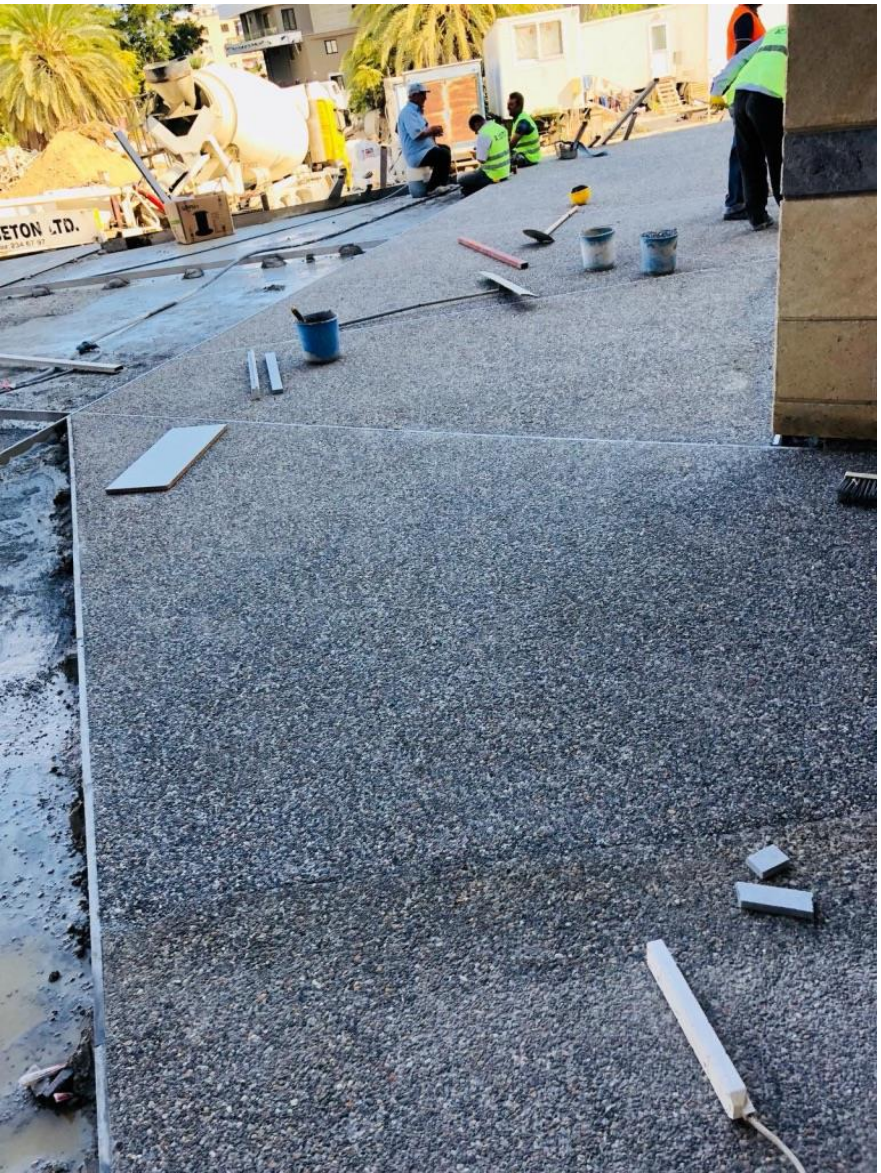
ZEMİN KAT PLANI

Ground floor plan



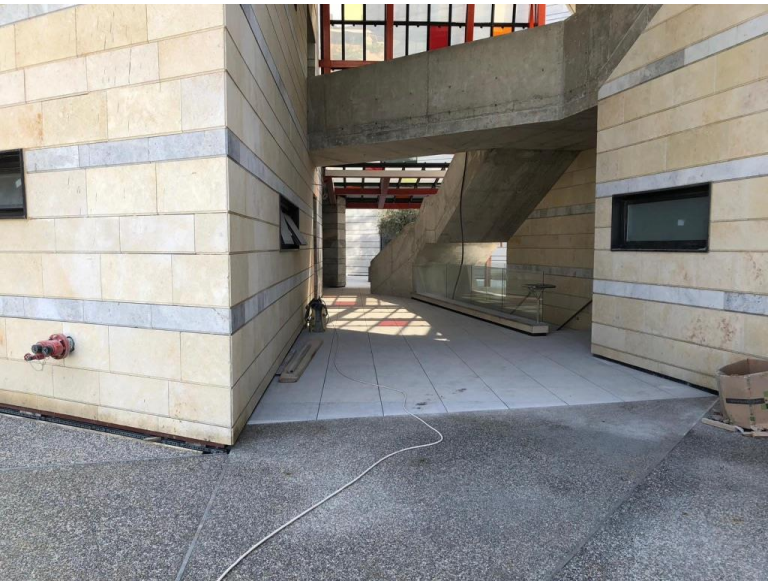
Section

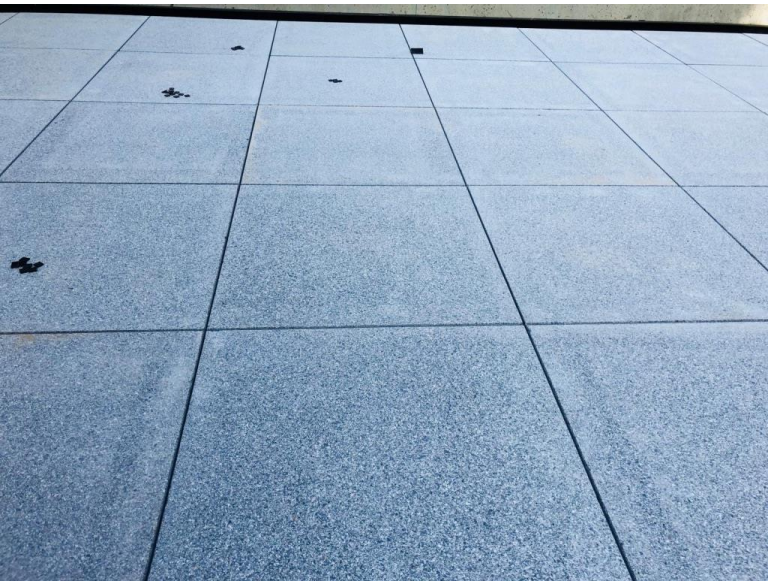
Exposed aggregate plaza using Local gravel

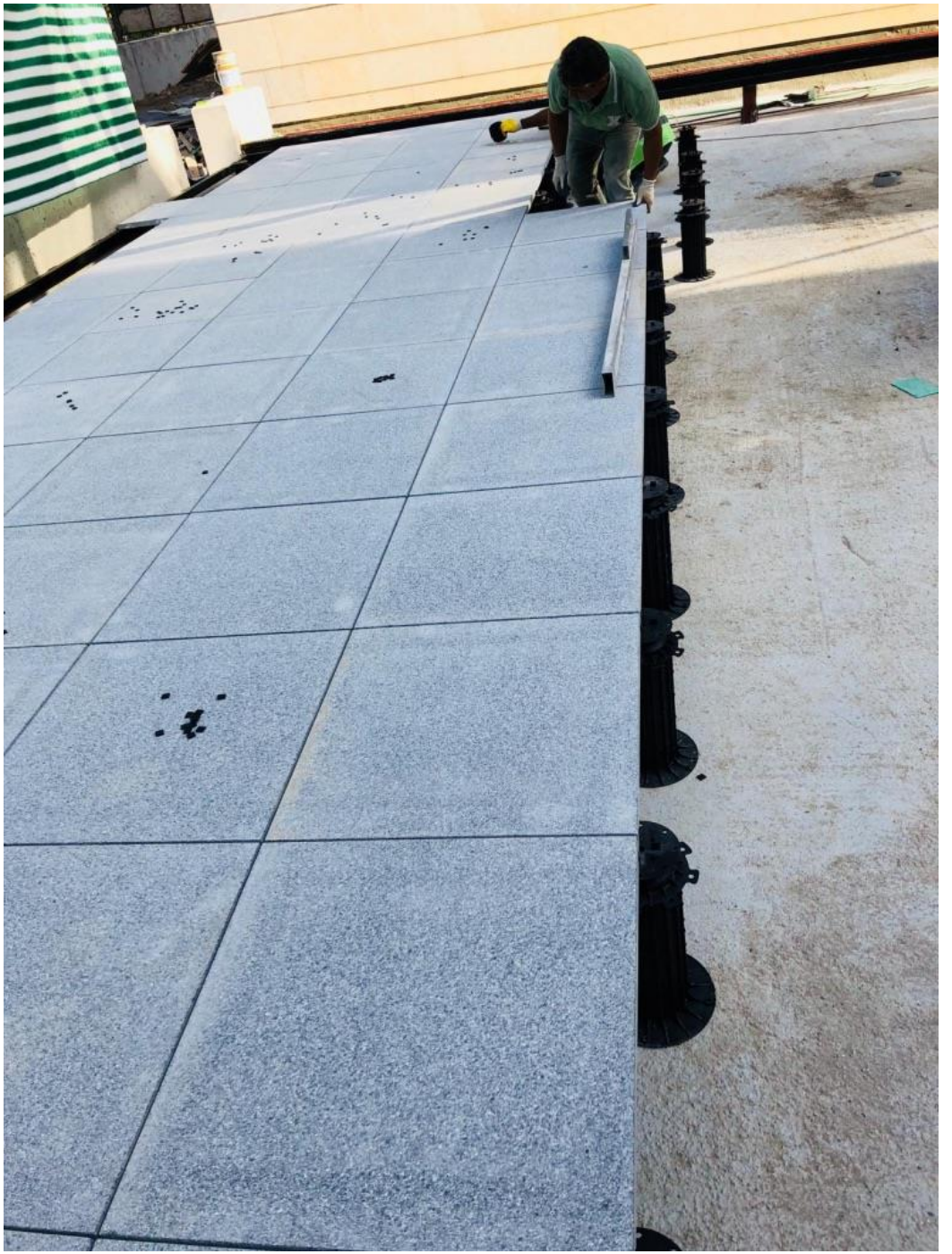


Polished concrete floors
Using local materials

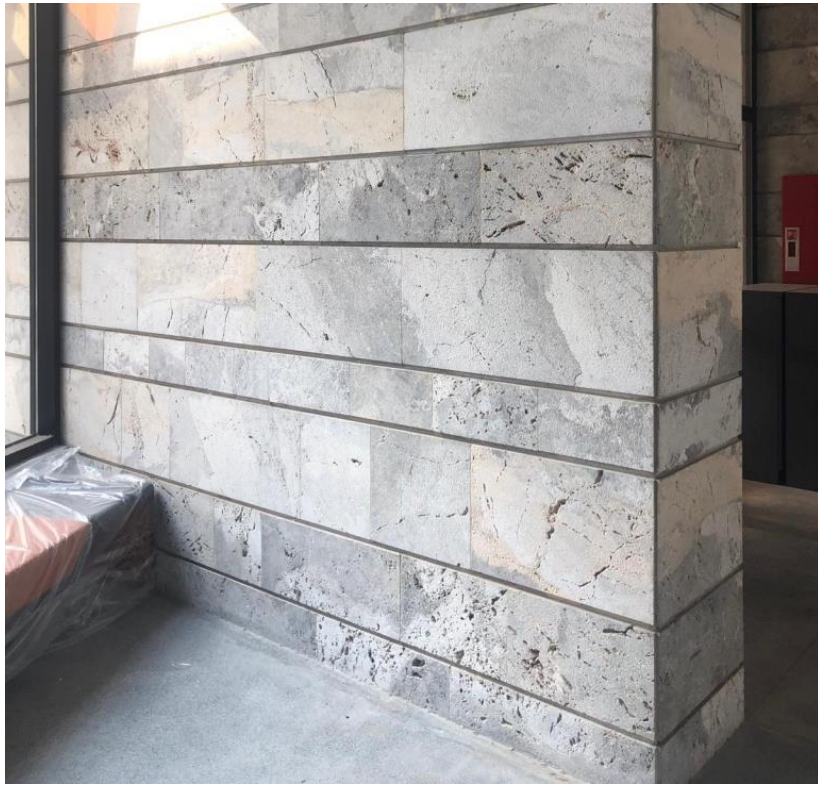
Raised floor system using local panels



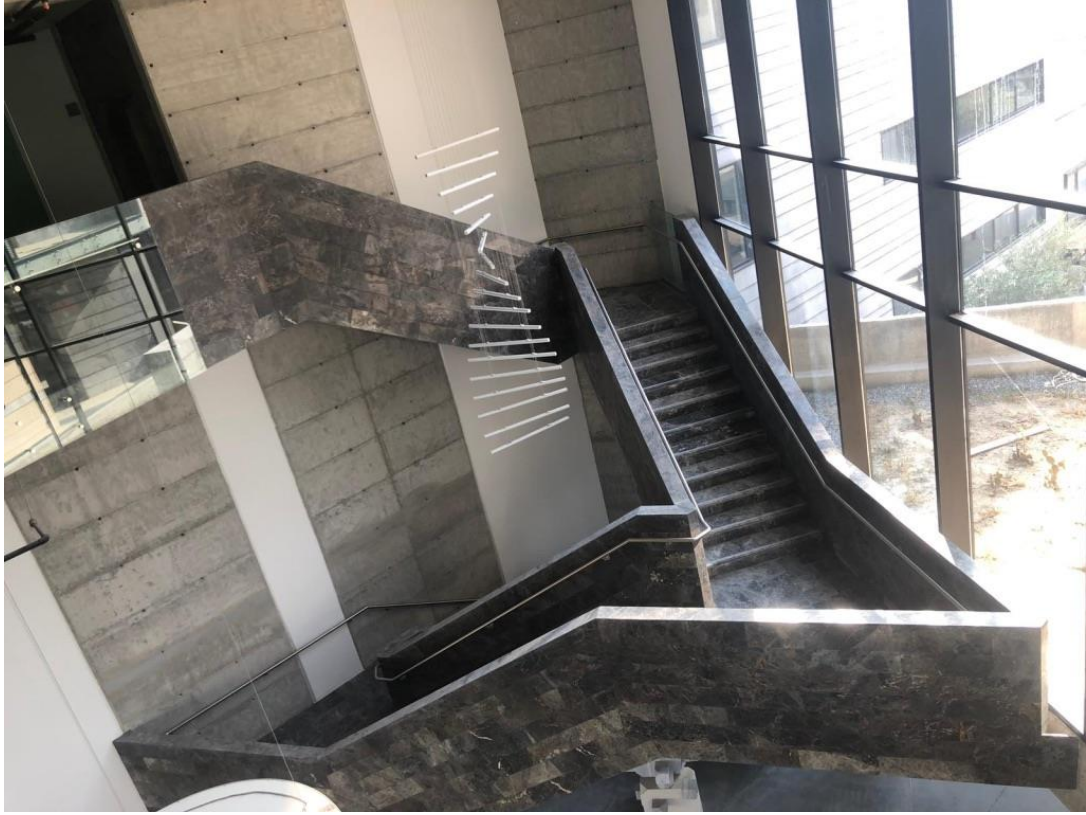





OUTWEAR+



Use of same stone
in 3 different finishes

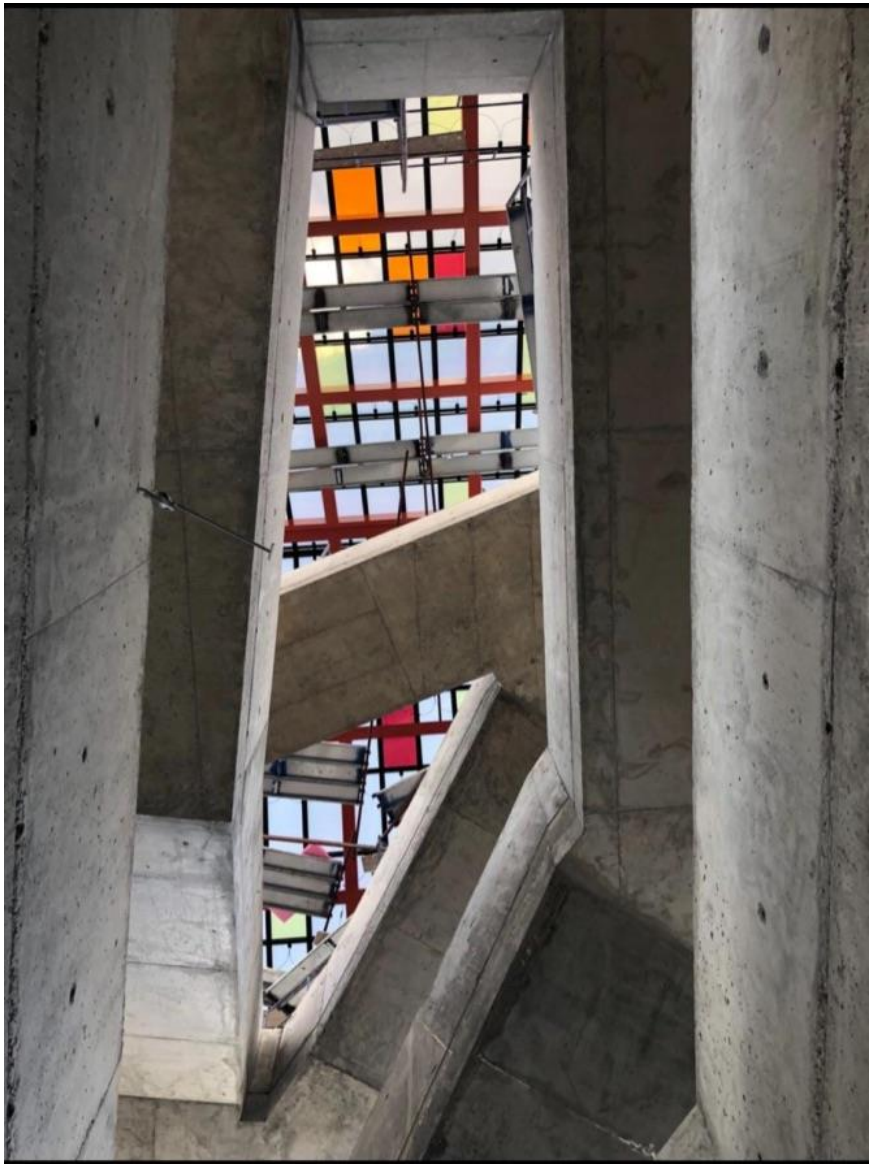


Integrated photo voltaic


GİRNE BELEDİYESİ

Integrated photo voltaic
as sun shade and
rain shelter shell

Integrated photo voltaic shadow play



Green Roofs with Mediterranean sedums

Courtyard

Local Stone as building cladding

Sun Shades

Rammed Earth construction for Cyprus

Soil types

Rammed Earth mix limits (by mass)

Non-stabilized

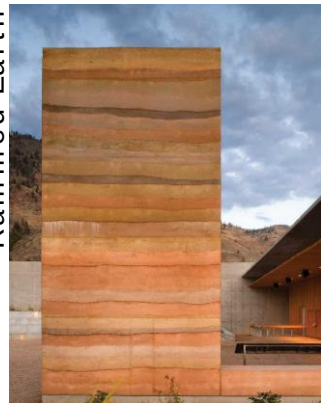
	Minimum	Maximum
Clay & Silt	20%-25%	30%-35%
Sand & Gravel	50%-55%	70%-75%

Stabilized

Clay & Silt	Less than 25% (0-20%)
Sand & Gravel	40% - 80% (gravel not larger than 25mm)
Cement	6%-10%

Rammed Earth
Exterior wall applications

Rammed Earth



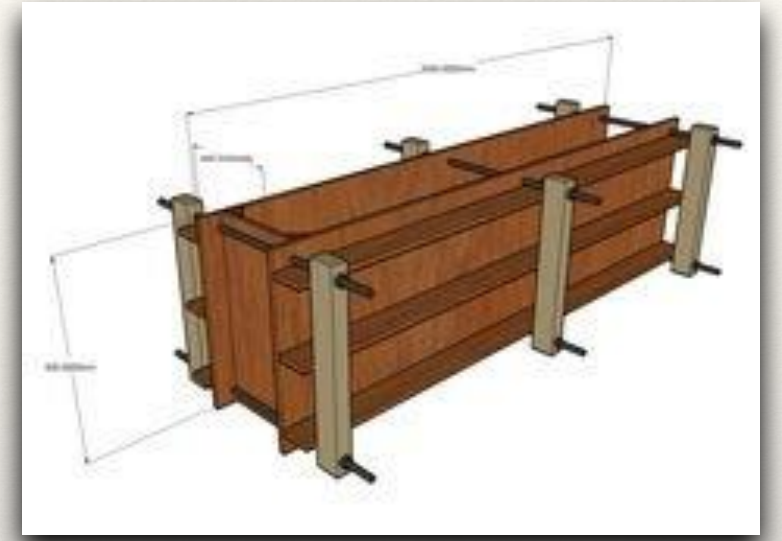
Girne, Cyprus
Municipality Recreation Area
Rammed earth walls
Using stabilized mix

mix

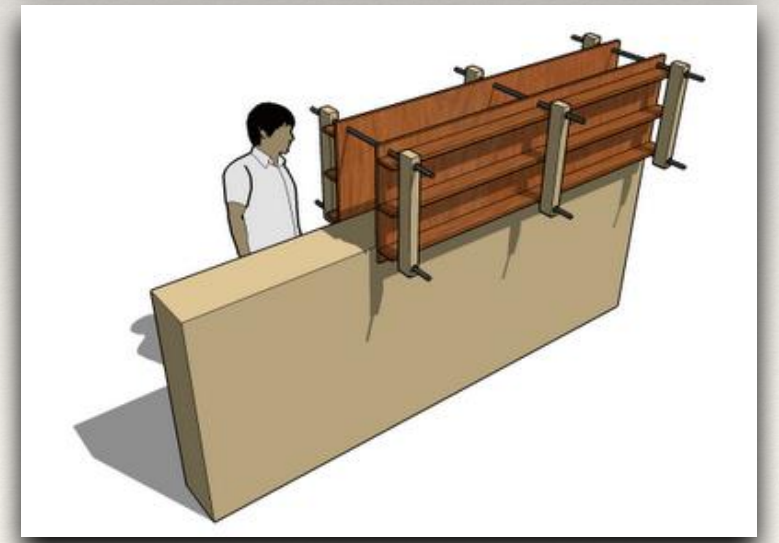
bucket measure

mixing

formwork



Wood planks, plywood, or steel systems could be used in modular units for formwork. Formwork clamps / cleats has to be very strong in order to withstand tamping/ pressure/ vibration by the tampers. Modular formwork size should be small enough for easy handling. For load bearing walls ideal formwork should be min. 300mm in width
and 2m - 2.5m in length.



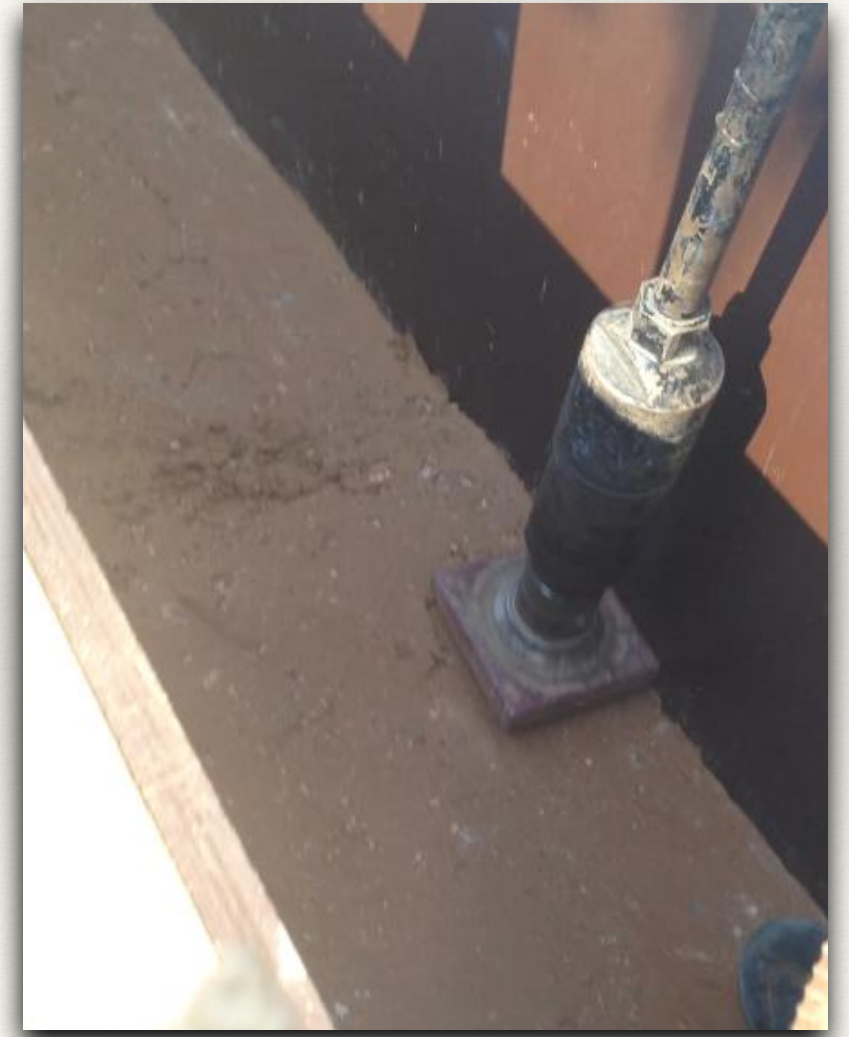
plywood formwork system

modular plywood system

modular plywood system

tamping

soil /formwork ready for tamping



pneumatic tamper

detailing

detailing

detail

detailing

Girne Belediyesi Tennis Courts - wall details


NK'MIP
Desert Cultural Centre