

Dams – Hydraulic Project

Recharge Dams and flood protection works

Northern Emirates

United Arab Emirates

Project

Update of studies and designs for new recharge dams and barriers, execution of safety audit of existing dams, design of new recharge structures and other flood protection works

Construction Cost

Total cost: approx. € 100 m.

Project Schedule

Design: 2011 - 2017

Construction: 2012 - 2017

Project Description

- Design and review of approx. 148 recharge and energy dissipation structures, flood protection and water diversion works, in various locations
- Safety audit of existing Ham Dam upstream of Fujairah City and Bih Dam upstream Ras Al Khaimah City
 - Dams' catchment areas: 0.2km² – 416km²
 - Dams' reservoir volumes: 500m³ – 8.000.000m³
 - Dams' crest lengths: 10m – 2,800m
 - Dams' heights (wadi bed – dam crest): 2.5m – 16m
 - Types of Dams: Concrete gravity dams
Embankment dams
Gabion drop structures
- Approximately 57km of flood protection channels
- Erosion and slope protection works in wadies
- Energy dissipation and sediment retention structures
- Other retaining works for the protection of farms and houses in the reservoir area of the recharge dams

Geology

Gravelly alluvium, sandy-gravelly old wadi and terrestrial terrace deposits, igneous rocks of ophiolitic complex (harzburgites, peridotites, gabbros), metamorphic schists, cherts, limestones, claystones, siltstones

Our Services

- Study, review and evaluation of existing studies and designs
- Assessment and evaluation of historic storms in the wider Arabic Peninsula region
- Extensive reconnaissance of each dam site to establish suitability
- Hydrologic and hydraulic assessment and evaluation of each site
- Geological, hydrogeological and geotechnical assessment of each dam site
- Design of the required technical solutions, including the relevant hydrologic, hydraulic, structural and geotechnical calculations
- Elaboration of tender documents (BoQs, technical specifications, construction cost overview)
- Execution of preliminary designs, final designs and construction drawings

Client

Consultant HSS – United Arab Emirates-



Existing Ham Dam in Fujairah City view



Embankment dams view



Gabion drop structure view

Construction Details

- Concrete gravity dams with upstream and downstream slope of 1:1 (V:H) in order to sustain the greater than hydrostatic force applied in the dams' body
- Ogee and stair shaped spilling section for concrete dams
- Embankment dams with upstream slope of 1:2 (V:H) and downstream slope of 1:4 (V:H)
- Rock armor protection in the downstream slope of embankment dams
- Geomembrane in the upstream slope of embankment dams and gabion drop structures to prevent piping
- Bottom outlets provided in all recharge structures