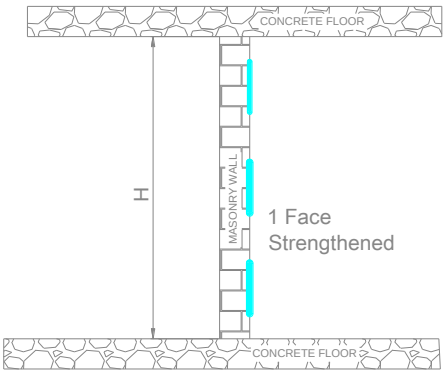
Externally Bonded Fibre Reinforced Polymer Systems for Strengthening of Masonry Shear Walls Structures (FRP)

On a recent project Mott MacDonald was contracted to assess and strengthen a set of overseas building for seismic zones. Mainly, the structural systems of the buildings were composed by Unreinforced Masonry Wall (URM). The result was a high number of walls failing under shear loading.

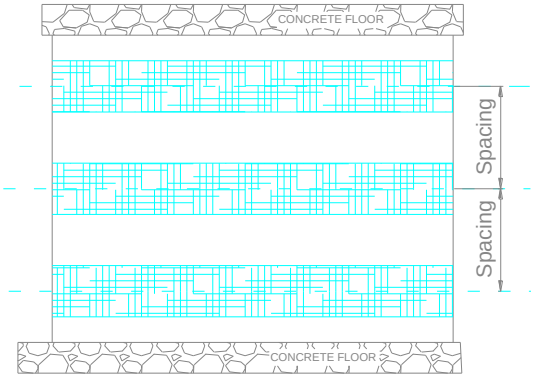
Traditionally, strength in masonry walls has been increased by:

- Adding reinforced core to URM walls
- Adding concrete overlay to masonry wall
- Infilling opening in the URM walls

Traditional methods were rejected due to the increase on the structure self-weight, this increment produced an unacceptable change to the dynamic response of the structure. As a solution, Mott MacDonald created a design analysis program using the technique of externally bonded structure with fibre reinforced polymer (FRP), based on Italian code (EUROCODE) to calculate the number, space and thickness of layers of FRP necessary to support the additional seismic load in an easy and fast way.



Section on Wall



Elevation on Wall

FRPs offer several important advantages over traditional materials for construction projects:

- Time saving – low weight for fast construction in time tight projects
- Durability – able to survive, especially in harsh environments
- Repair – to allow repair of structures in-situ
- Strengthening – strengthening of structures in-situ
- Tailor-made properties – where especially high performance is needed in one direction
- Blast/fire – where blast or fire resistance is required
- Low maintenance – in conditions where difficult access makes maintenance hard

Further information contact Daniel Pozo or Mariana Asinari - Mott MacDonald Tel. 0161 926 4538