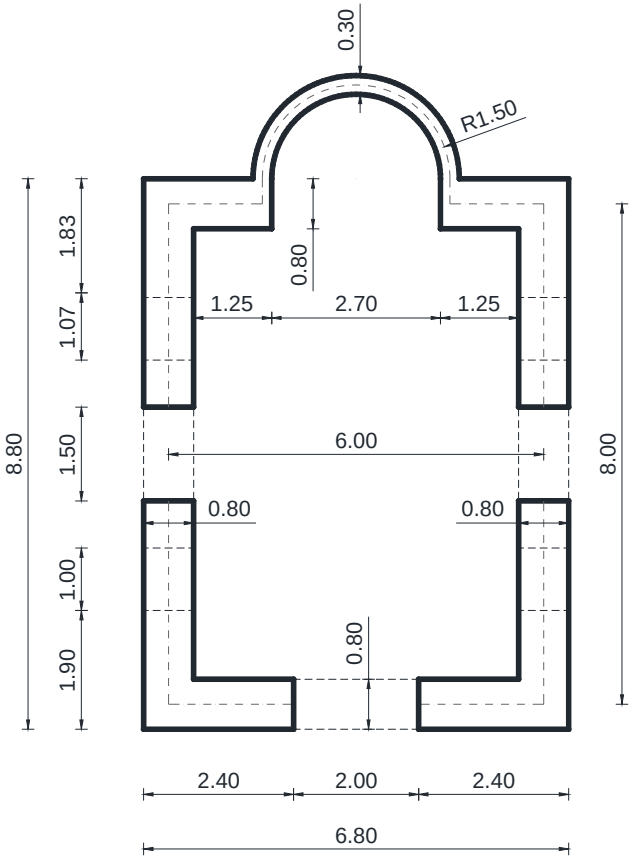
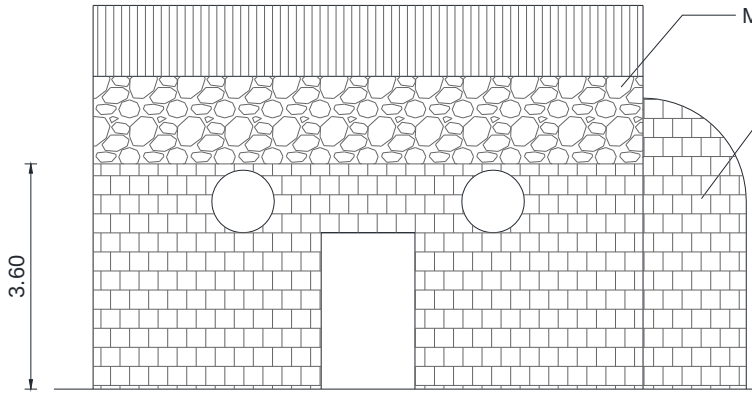
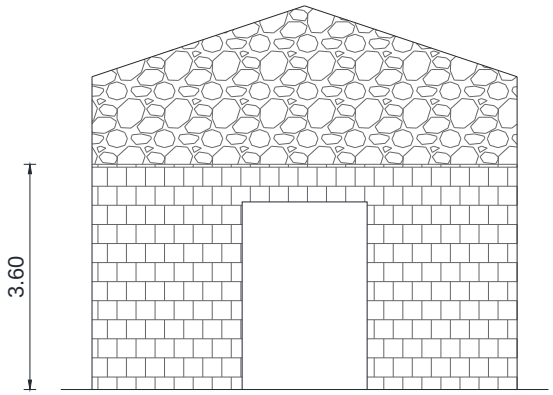
TUTORIAL 4

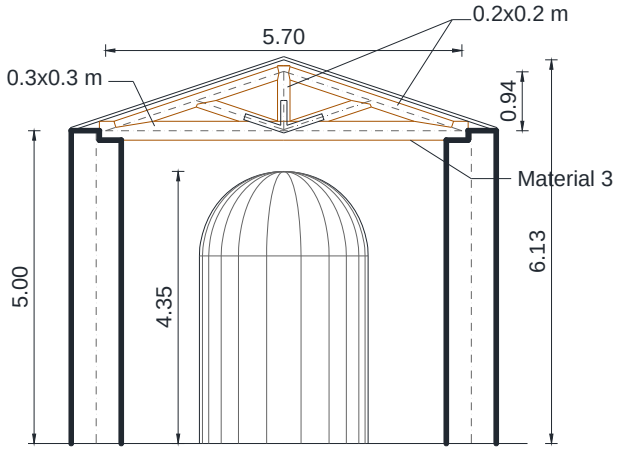
Nonlinear static analysis of a masonry church

Let's consider the structure sketched in the figure









- We suppose the structure subjected to its self weight (**only for speed of execution but we can also consider other load conditions)**

- We suppose the structure made of three materials:
  - ✓ **Material 1:** *masonry-like* material with zero tensile strength and bounded compressive strength; Young's modulus 0.69 GPa, Poisson's modulus 0.2, tensile strength 0 MPa, compressive strength 1.5 MPa, specific weight 19000 N/m^3
  - ✓ **Material 2:** *masonry-like* material with zero tensile strength and bounded compressive strength; Young's modulus 1.5 GPa, Poisson's modulus 0.2, tensile strength 0 MPa, compressive strength 2.0 MPa, specific weight 21000 N/m^3
  - ✓ **Material 3:** linear elastic material, Young's modulus 8 GPa, Poisson's modulus 0.3, specific weight 10000 N/m^3

- We suppose the truss of wooden beams, pinned to the wall (without bending moment transmission)

- We suppose the structure clamped at the base

Some remarks:

- Due to the strong nonlinearity of the material, we will apply the self weight by ten increments (dealing with a *masonry-like* material with zero tensile strength and bounded compressive strength, **this action is strongly recommended)**

- We will plot some output in the global reference system (using the subroutine plotv.f)

- We will manage the connection between truss of wooden beams and the structure using utie.f subroutine