






**TOTAL VOLUME CONCRETE FOR STRUCTURE**  
278.015 mc

**PARAMETRICAL INCIDENCE OF REBARS IN CONCRETE IN KG**  
49885.065 kg

	PILASTERS (29.66 mc) (A)
	SHEAR WALLS (57.21 mc) (A)
	PRIMARY BEAM (58.88 mc) (A)
	SECONDARY BEAM (27.15 mc) (B)
	FOUNDATION (134.775 mc) (B)

## Architecture Structural Design Lab BUILDING SYSTEMS DESIGN

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### *Understanding how superstructure works*

ASSIGNMENT #03

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### Understanding how superstructure works

This assignment is focused on how superstructure works, which its components are and how to recognize and assign materials/products in relationship to structural functions.

## HOW TO DO

To realize this goal it is required that students, using BIM software, follow this sequence:

•01\_ Following the instructions contained in the Guide “Building Virtual Architectures for Real”, create different types of *Material/Product* for each Structural Elements and Not Structural Elements (if are present) that are in your “Building without Functions” and use the following codes\*:

- B02... formworks
- B03... steel
- B04... concrete
- C01... not bearing walls product
- B08... slab product (if it is not made of reinforced concrete)

\*) for a detailed description of coding refer to *Prezzario Regione Toscana* available on internet

•02\_ Identify and model the *Building Component* of your “Building without Functions” using the following classification and codes and highlighting which one is a structural element and which one is a not structural element (in Bim software there is an option to flag to inform an element has a structural function):

- Pl\_ pilasters
- Wb\_ bearing walls
- Ws\_ shear walls
- Wn\_ not bearing walls (not structural)
- Bm\_ main beams
- Bc\_ connecting (secondary) beams
- Sl\_ slabs (not structural)
- St\_ stairs

- 03\_ Assign the appropriate *Material/Product* to each *Building Component*
- 04\_ Extract and estimate the total *Material/Product* quantity and cost
- 05\_ Reorganize the quantity and cost for each *Material/Product* under different *Building components*. For example, having the total volume of reinforced concrete and using the percentage and prices described in the Guide “Building Virtual Architectures for Real” is possible to describe the quantities for steel rebars, concrete and formworks. Vice versa, for some technical solution where the component material is a *Product* (such as some specific solution for slabs), is not required to produce any differentiation between their elements or parts. For this type of solutions it is sufficient to illustrate, through drawings and photos, its conformation and provide a comprehensive economic estimate of the completed work.

## WHAT TO PRODUCE

To present this assignment students must assemble drawings and information in three UNI A1 (vertical) with the following objects:

- Structure
- Slabs
- Not Bearing Walls

and cover in each sheet the following topics:

- Ontology and descriptions where to describe each used material and product (reinforced concrete for structure, slab types for slabs, wall types for not bearing walls)
- Identification and Localization where to indicate which kind of material each element is made
- Quantity Estimation where to schedule the analytical report and total of quantities and costs.

## References

- For a deeper explanation read “Building virtual architectures for real” located into the *Assignment Guide* of the Course Web site.

> [http://www.mailab.biz/form\\_manufacturing-2017\\_18/](http://www.mailab.biz/form_manufacturing-2017_18/)

-Part One: *Structural & Technological Model*

Read intro and chapters: 6. Structure, 07. Slabs, 08. Interior not Bearing Wall)

-Part Two: *How to manage Scheduling on BIM: reinforced concrete example*

Read all the chapters and take as a reference the final table “Types of reinforced concrete and their applications on building components” at page 25 to select your different type of reinforced concrete and to assign it to your Building Components (pilasters, main beam, secondary beam, structural walls,...)

- Check out students’ examples (Building Virtual Architectures for Real) from previous years linked into *Resources and Examples* of the Course Web site

> <http://www.mailab.biz/building-virtual/>