

University of Biskra
Architecture Department

Theory of Project 2
course

Functions in Architecture

1st year of Architecture diploma
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Functions in Architecture

part 01

Introduction to functions

1. Historical context.

- Vitruvius context
- Modernity and functionalism (Luis Sullivan, Le Corbusier)
- Modernity criticism and Formalism (P. Blacke, Venturi)

2. Historical types of Functions in Architecture

3. Functions requirements

4. Classification of functions

5. Introduction to functional analysis

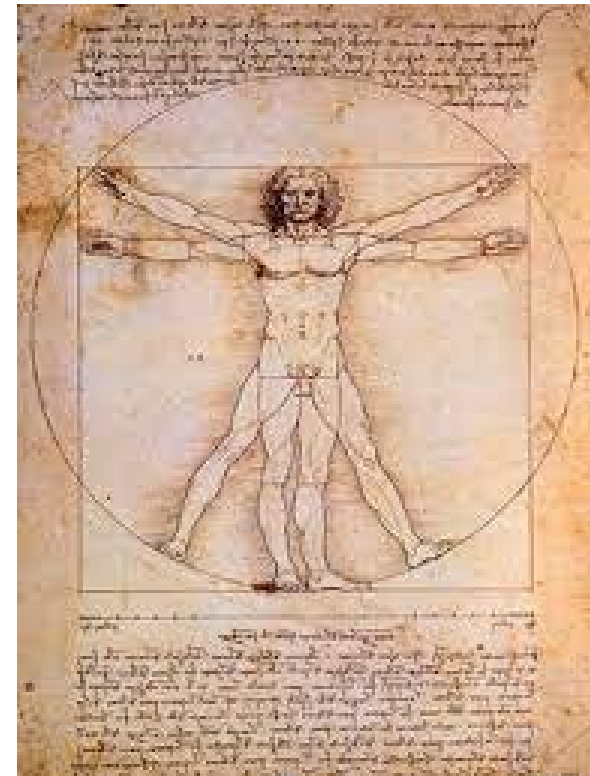
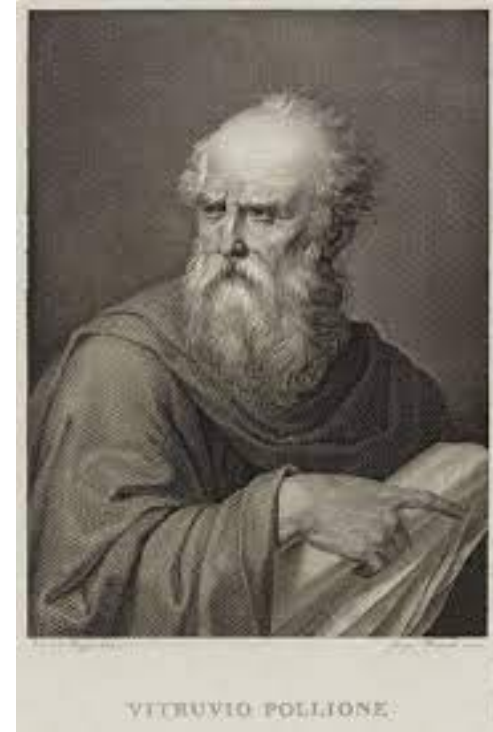
Introduction

- Function, or utility of an object/work of architecture, says that the object/work of architecture is fitted to a particular use.
- In Architecture, the question became early important in Antiquity. It served also in last 20th century of a great element of debate between functionalists and formalists.

Vitruvius vision

Principles of Architecture
according to Vitruvius:

- Firmitas (Strength)
- Utilitas (Utility or Function)
- Venustas (Beauty or Aesthetics).



Form follows function

Louis Sullivan famously stated that 'form follows function,' emphasizing that the design of a building should be primarily dictated by its intended function or purpose."

«In architecture, functionalism (or 'form follows function') is the principle that rather than buildings being designed in accordance with past precedents or stylistic trends (aesthetics), the underlying purpose of the building should determine its form.» <https://www.designingbuildings.co.uk>



Louis Sullivan



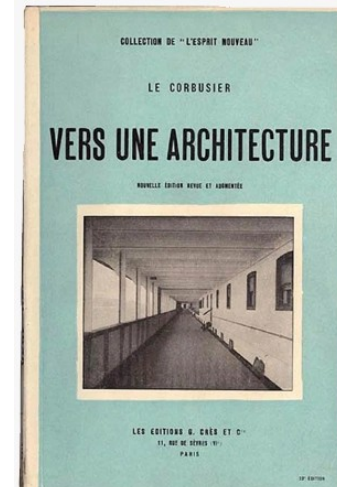
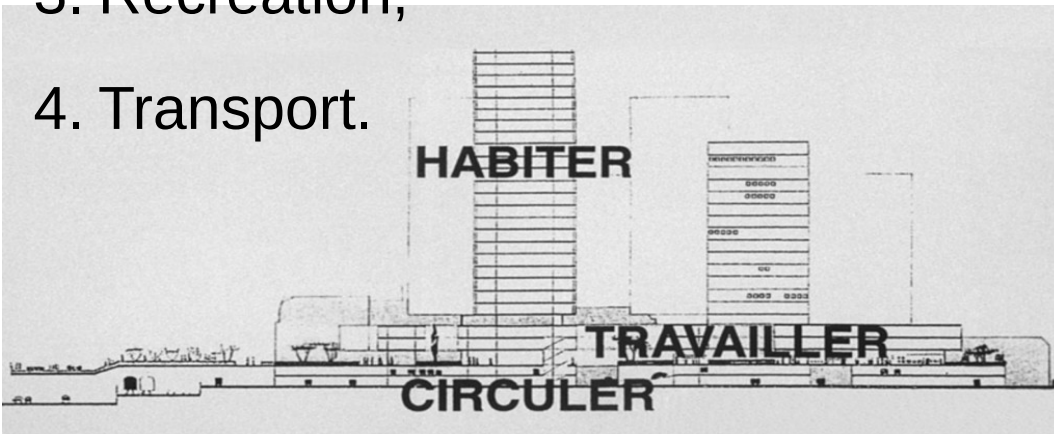
Wainwright Building (left) and Guaranty Building (right) by Louis Sullivan

Le Corbusier's "A House is a Machine for Living In"

- Le Corbusier's Approach to Functionalism:

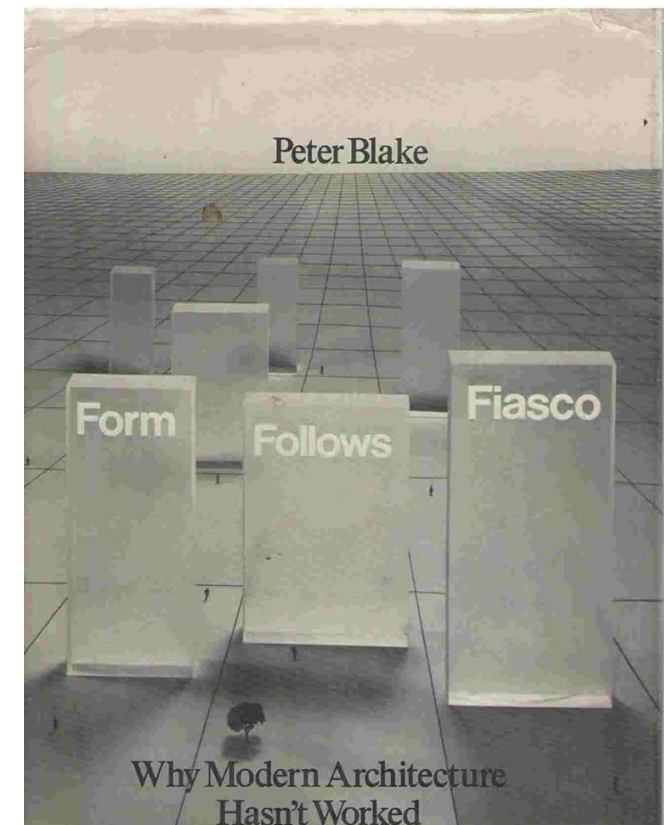
Le Corbusier's philosophy was based on the fact that architecture should serve the needs of its occupants efficiently and effectively. In the Athena Charter, he divided functions of a city to four main categories :

1. Work,
2. Housing,
3. Recreation,
4. Transport.



Form follows fiasco!

- Peter Blacke.
- Blacke argued that the original mantra of Sullivan was denatured to a tendancy of visually attractive design rather than focusing on real human needs.



So, what is function ?

- *Every architectural object has its basic utility function expressed in its colloquial name, such as a cottage, a house, a residential building, a sky-scraper, a temple, a factory, a shipyard, a theatre, a stadium, a rail-way station, etc.*
- *At the same time, every object additionally performs a number of public functions whose meaning goes beyond its strictly utilitarian role. The ability to satisfy all of these needs, I call the functions of architecture. (A. Wallis, 1985).*
- In relation to the built environment, the term 'function' refers to the purpose of a building or structure. It can also relate to the proper operation, process or performance of something and how it works, such as plant, tools, lift, building services.

Historical evolution of Architectural functions

- Housing / Shelter
- Religious fact : Temples
- Political fact : Monuments
- Other historical types : Academic, Recreational, Healthcare, Etc.

Housing

Protection and security dimension :
This objective was the first one in building original shelters.



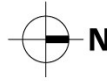
Housing

Comfort dimension :

– It is about realizing conditions of :

- physiological,
- psychological
- and social comfort.

Ventilate roof space to minimise temperature differential across bulk ceiling insulation



Downfacing reflective foil insulation under roofing limits daytime heat gain

$\Delta T > 45^\circ\text{C}$

1000W/m^2

$65^\circ\text{C}+$

Cross ventilation from cool breezes

$35-40^\circ\text{C}$

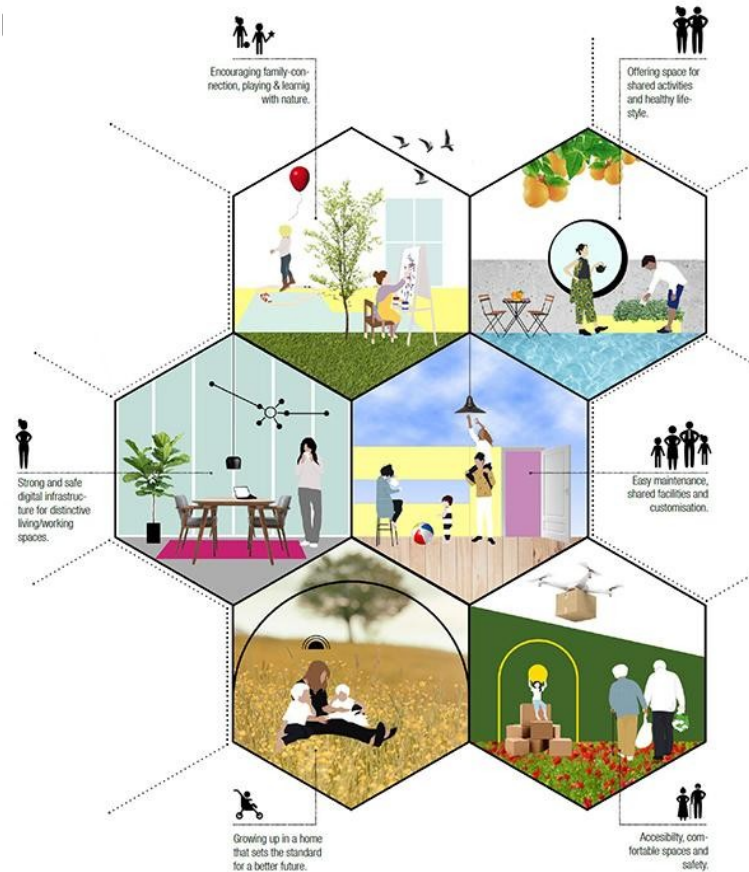
$\Delta T 8-20^\circ\text{C}$

$20-27^\circ\text{C}$



Deciduous trees can shade the roof and keep incoming air cooler

Well



Housing

Symbolic dimension.
A house is a Home Place. Defined by a Property with limits, with a door and a threshold as symbolic identification. This place is intended to be defended.



- Historical monumental Architecture :
Religious fact

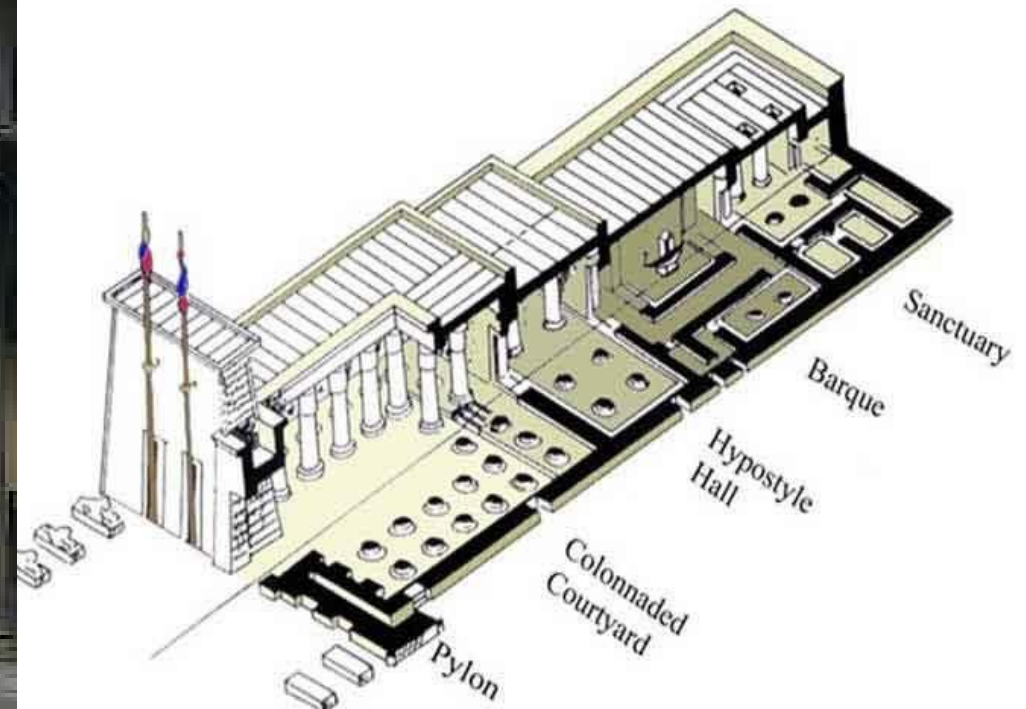
Massive shapes
with symbolic
functions

- Spiritual Authority.
- Rise, Expression of Ascension.



- Historical monumental Architecture :
Religious fact

Expression of faith
by procession



- Historical monumental Architecture :
Religious fact

Work on symbolic light.



- Historical monumental Architecture : **Religious fact**

Work on space poetics .



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• Historical monumental Architecture : Political fact

Palaces,

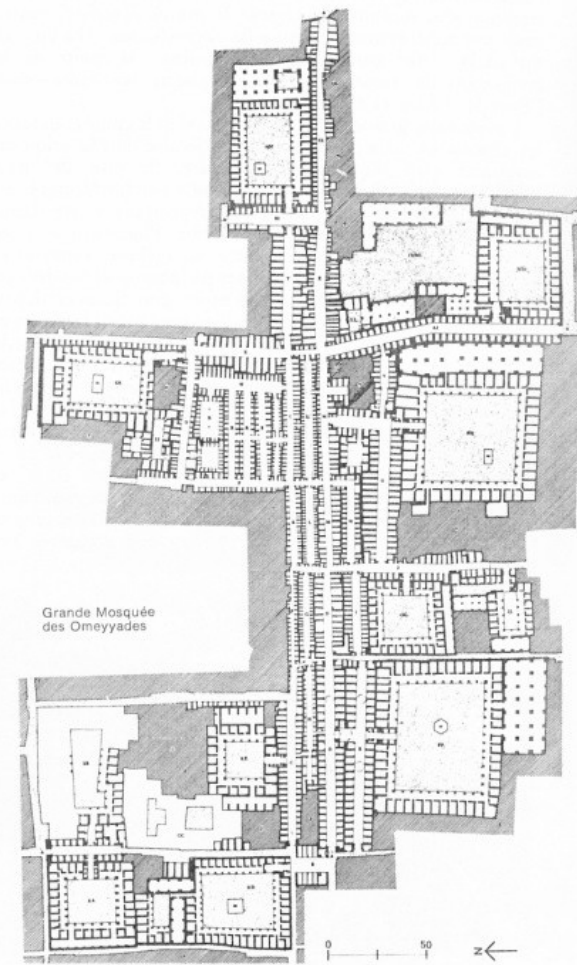
- Governing places (Agora, Parliaments).
- Military Architecture (Castels, Barracks, Prisons).



Other historical functions

- Civil Architecture :

- Markets,
- Courts,
- Baths,
- Administrations, etc.



Other historical functions

- Recreational Architecture :
 - Theaters
 - Amphitheaters,
 - Stadiums
 - Hyppodromes, etc
 - Parks, etc.



Other historical functions

- Academic Architecture

- Primary and high Schools,
- Universities.



Other historical functions

– Healthcare Architecture

- Hospitals
- Health centers.



Other historical functions

- Cultural Architecture
 - Museum
 - Theaters,
 - Cinema boxes
 - Libraries, etc.



Requirements for Architectural functions

Successful functions in Architecture relate to four main requirements. They tend to realize comfortable environments with respect to ergonomic factors, enhancing people's socialization and ensuring safety and security.

1. Comfort

2. Ergonomics

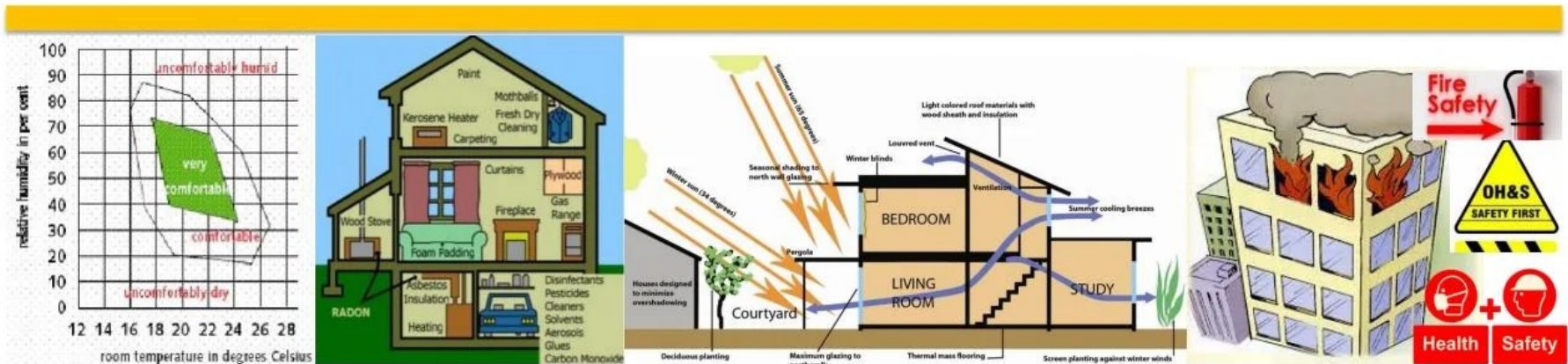
3. Socialization

4. Security

• Comfort :

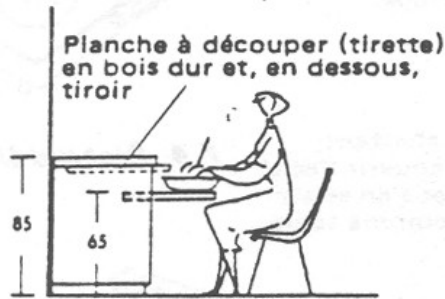
– All design activity requires realizing conditions of :

- Thermal comfort
- Lighting comfort,
- Acoustic comfort,
- Hygrothermic comfort,
- Air comfort.

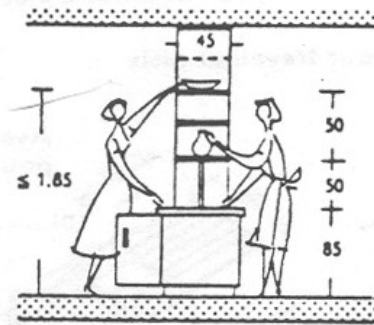


• Ergonomics :

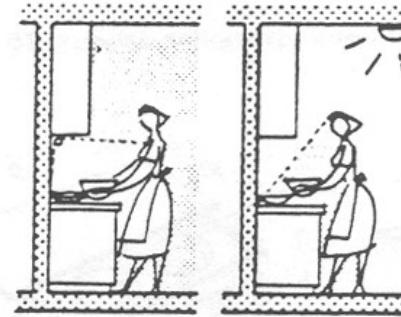
- Ergonomics studies the relationships between the person, the work object and the work environment. Influencing risk factors is part of protecting the health and life of workers. In addition to physical, chemical and biological risk factors, we also consider ergonomic factors



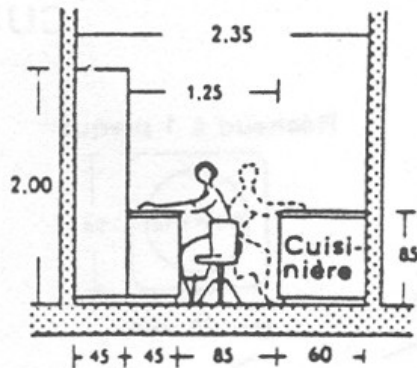
F.5 Prévoir dans la cuisine une place où la ménagère puisse travailler assise. De préférence avec tablette de travail tirable, tiroirs et planche à découper.



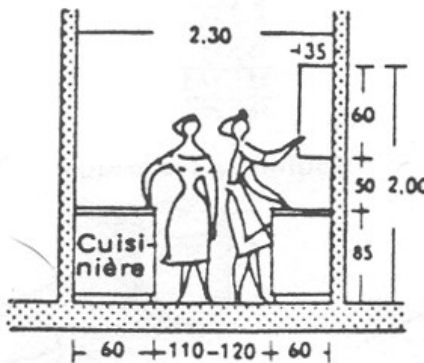
F.6 Dressoir entre cuisine, laverie ou office et coin salle à manger, supportant la vaisselle et accessible des deux côtés.



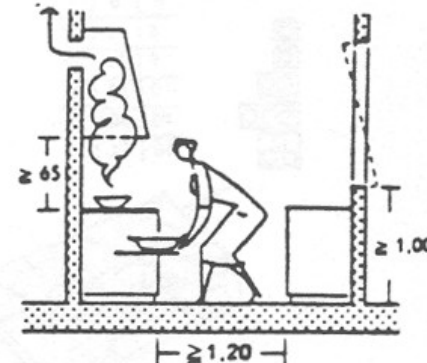
F.7 Bon et mauvais éclairage de cuisine.



F.1 Coupe de la cuisine d'une grande maison, dans laquelle deux femmes peuvent travailler en même temps.



F.2 Coupe de la cuisine d'une petite maison où la ménagère et la femme de ménage trouvent leur place.

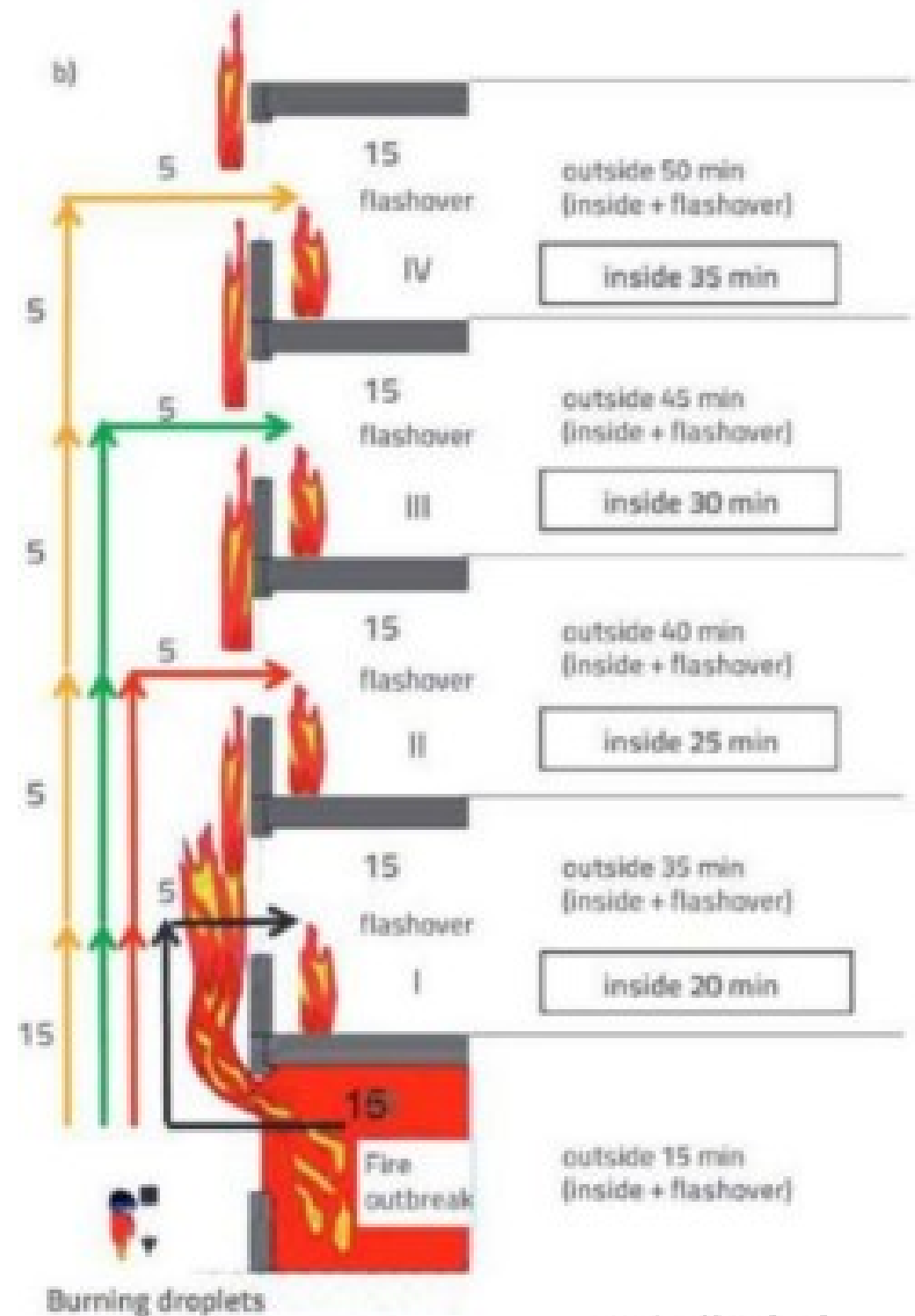


F.3 Les cuisinières basses exigent beaucoup de place pour les mouvements. Disposer une hotte au-dessus de la cuisinière.

- **Socialization :**
- Architectural spaces need to be designed in accordance to nature of social interactions occurring in.
 - Related to E. T. Hall, four social distances modulate relationships between people :
 - Public,
 - Social,
 - Personal,
 - Private.



- **Security :**
- Space might be designed to insure safety of its users in their behavior and activities.



Classification of functions

• Related to Wallis :

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-
1. Protective
 2. Distributive-organizational
 3. Worldview associated :
 - a. identification
 - b. prestige
 - c. political
 - d. ideological
 - e. philosophical
 - f. cumulative-structuralizing
 4. Catalytic
 5. Artistic
 6. Economic
-

Functional Analysis

Functional Analysis

- The process of evaluating user needs, spatial requirements, and circulation patterns to inform design solutions.

It is built on several methods such as :

- user surveys,
- observation,
- and space programming.