

# INFRASTRUCTURE





## *Sugar Processing Toolkit*



## **INFRASTRUCTURE**

### **1.- Physical layout**

#### **Infrastructure**

The areas adjacent to the plant should be maintained under cleaning conditions without the presence of trash or deposits of materials such as firewood or old sugarcane bagasse. The dirtiness in the neighborhoods of the factory make possible the growth of fungus (mildews) in the outside, whose spores (seeds) are transmitted by the air, therefore contaminating the products, as well as increasing the return of those products from the market.

#### **Area for the raw material reception and sugarcane milling**

The area for sugarcane reception should be ample enough to store the necessary amount of sugarcane. The ideal is to be covered. In this area, the products that could contaminate the raw material such as the cleaning ones and pesticides should not be stored in this area. A mill area must be covered and its height must be at least 3 m; it may be open or protected with walls. The floor must be cemented (reinforced concrete) or another material that makes possible a complete washing /cleaning and does not allow for the sugarcane to get in touch with the ground. When the sugarcane is in the mill, it is recommended that it be placed on a broad bench or pallet made of wood or another material at 8cm-height from the floor. This prevents from contamination with earth and facilitates the operator's work when feeding the mill, in the case of manual operation. These areas should be maintained very clean, whereas the mill and its area must be periodically washed, for instance, soon after each at each operational interval.

#### **Area of the large boilers / Preparation and Concentration of the sugarcane juice and Mass cooling / sugar sieving / Rapadura molding and Sugarcane syrup packaging.**

This is a covered area, from which the height should be 5m at least. The walls and floors should be washable. In addition, their floors should be declivitous as well as provided with appropriate drains to avoid the formation of puddles. The area should be closed with walls and provided with windows that make possible a satisfactory ventilation and airing. In the case of an open installation, the lateral walls must be screened (1mm screen) to prevent the entrance of insects and birds.

#### **Store**

The area must be preferably covered with flagging and low thermal conductivity tile covering, with height of 3m at least, and provided with windows that make possible a good ventilation. The products should be stored on wooden broad benches or pallets made of wood or another appropriate material.

## **2.- Basic Services**

### **The electric facilities**

The electric connections must be isolated, as minimizing risks and facilitating the cleaning. The cables with electric wire that are not contained in insulated tubes must be protected with plates that allow for ventilation and cleaning. The electricity points must be situated at high positions on the walls, as well as away from water supplies so that they do not become wet when hosing down the building. The load capacity and other details concerning to safety and distribution must be observed. The lighting should be natural, when possible. If artificial lights are used, they should not get into the way of processing. The bulbs must be protected to prevent the fall of glasses on the products if the lights are broken.

### **The hydraulic facilities**

The hydraulic facilities must be visible to facilitate their installation and maintenance. So, they are placed externally to the processing area. The used materials should be resistant and the pipelines well dimensioned in order to provide the necessary flow rate during the processing. The hydraulic lines must be separate according to the purpose of water use. The crossing of the pipelines, that is the industrial water lines and the potable water lines entering into contact with the food is not recommendable.

### **Drinking water**

Drinking water should be available in sufficient quantities to allow for the safe, hygienic processing of food. Water must be protected from all possible sources of contamination. The storage tank must be covered. Clean water is often a scarce commodity and therefore efforts should be made to conserve it. Clean water must be available at all times. It is recommended that an elevated storage tank is used that is not reliant on the use of electricity. The use of a storage tank allows the water to be treated with a disinfectant. It is recommended that chlorine is added to water as a disinfectant. The recommended dosage is 2 ppm of free chlorine, which is equivalent to 100ml sodium hypochlorite solution per 2000 litres of water. At this level, the chlorine disinfects, but does not affect the taste of the water.

### **Disposal of waste water and material**

Provision should be made for the disposal of waste water and waste material

### **The sanitary facilities**

These facilities should be clean, illuminated and ventilated. Dressing rooms and bathrooms should be provided with lavatories where there are detergents and sanitizing products. If possible, the toilets should be located outside the processing building. If they are located in the main building, there should be two doors between the processing room and the toilet. Workers must have access to handwashing facilities with soap and clean towels.

## **3.-Equipment suppliers**

The information contained here is adapted from the ITDG publication Small-scale Food Processing (see bibliography number 11). Please note that the list is far from exhaustive. There are many more suppliers of equipment that we could not locate. Contact numbers change, suppliers go out of business and new suppliers emerge. Please inform FAO if you know any suppliers that would like to be included in this database.

<b>Manufacturer</b>	<b>Country</b>
Indústria e Comércio Rani Pierotti Ltda	Brazil
VM Indústria e Comércio Ltda	Brazil
Alambique Santa Efigênia	Brazil
D&R Alambiques em Cobre	Brazil
SANDER	Brazil
Metainox	Brazil
Dancor	Brazil
Metalúrgica Barro Branco	Brazil