
بسم الله الرحمن الرحيم


PROJECT:
BASE
ISOLATION

GROUP MEMBERS:

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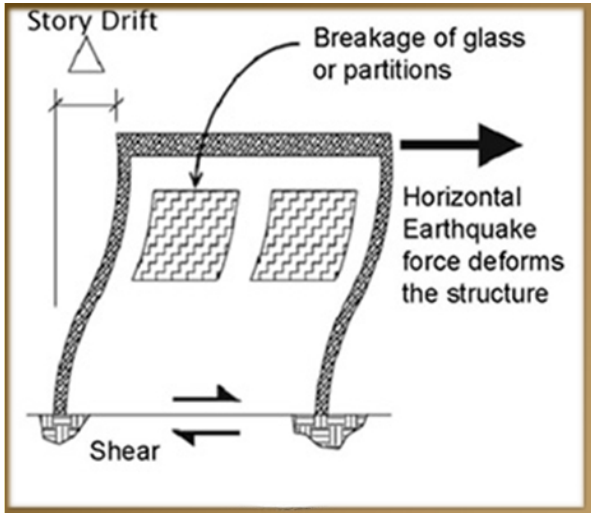
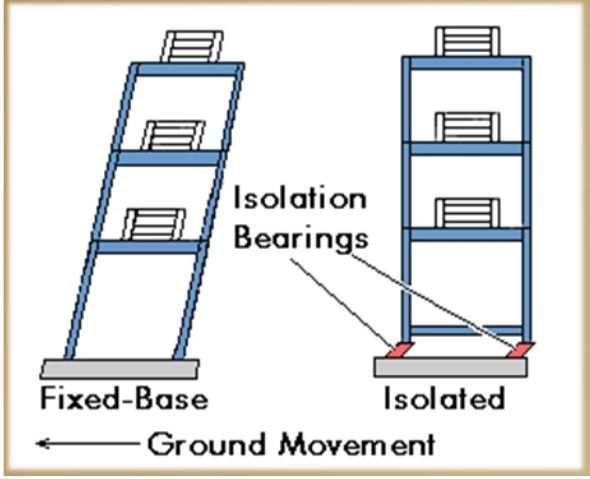
❑ INTRODUCTION & HISTORY

➢ **Base Isolation:**

- **Base isolation is a technique developed to prevent or minimise damage to buildings during an earthquake.**
- **The first base isolation was registered as a patent in 1800's.**
- **The one of the first few buildings that used the base isolation was in early 1900 ' s in Tokyo Imperial Hotel, in which after that structural bearing commercially used in bridge construction.**



HOW BASE ISOLATOR WORKS?

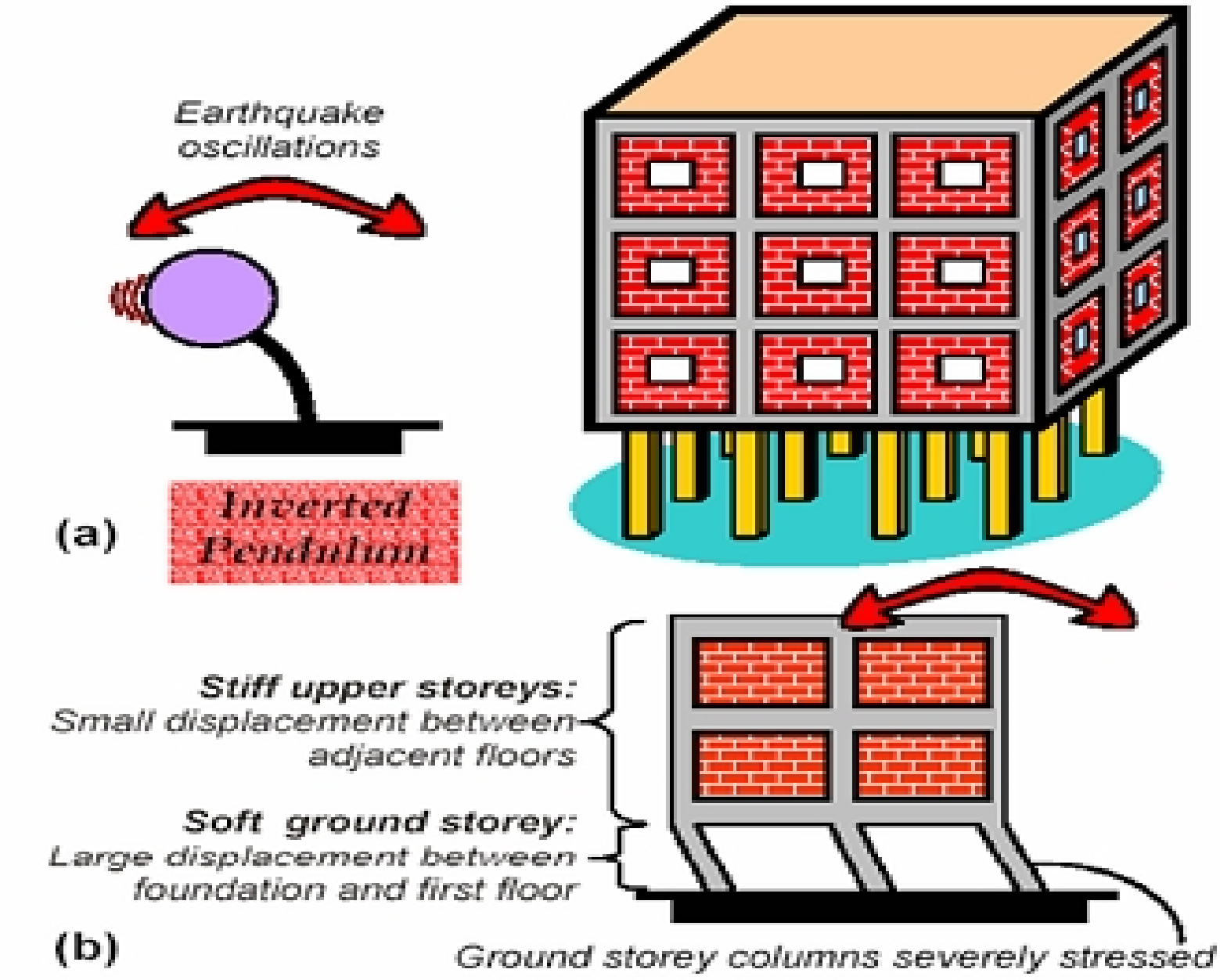


- The Base Isolation system decouples the building from the horizontal ground motion induced by earthquake.
- It offers a very stiff vertical components to the base level of the superstructure in connection to substructure (foundation).
- It shifts the fundamental lateral period, dissipates the energy in damping, and reduces the amount of the lateral forces that transferred to the inter-story drift, and the floor acceleration.
- The isolators work in a similar way to car suspension, which allows a car to travel over rough ground without the occupants of the car getting thrown around.

❑ BEHAVIOR

- The images shows the behavior of both isolated and a conventional building.

MECHANISM



Upper storeys of open ground storey move together as single block.

COMMON TYPES

- LEAD RUBBER BEARING (LRB)
- ROLLING BEARING
- ELASTOMERIC BEARING
- HIGH DUMPING RUBBER BEARING(HRDB)

❑ OVERVIEW OF BASE ISOLATED BUILDING

- Location: Los Angeles City Hall (U.S.A)
- Completed in 1928.
- It is 138 m high ,having 32 floors.
- It is the tallest base isolated structure in the world.
- The building is supported with 526 base isolators, which will allow the building to move independently of the ground and to sustain an 8.1 magnitude of earthquake.

❑ ADVANTAGES

- Isolates building from ground motion.
  - Lesser seismic loads, hence lesser damage to the structures.
  - Minimal repair of superstructure.
- Protects the building and other structures from damaging effects of earthquake.
- The main advantage of a base isolation system is that no structural elements should be added and that the building should not be closed for the retrofitting period, which is especially important for public buildings.

❑ DISADVANTAGES

- Expensive and uneconomical.
- Cannot be applied partially to structures unlike other retrofitting.
- Challenging to implement in an efficient manner.
- Allowance for building displacements.
- Inefficient for high rise buildings
- Not suitable for buildings rested on soft soil.

PROJECT MODEL

❑ OVERVIEW

- Objective
- Methodology
- Specification & Design
- Materials Required
- Time & Cost

❑ OBJECTIVE

- To present one of the base isolation technique used in structures preventing them against damage due to earth quakes.
- To model and investigate a behaviour of building with base isolation.

❑ METHODOLOGY

- First decide and specify the dimensions and design of the model.
- Decide about the materials to be used in a model.
- Decision about the Isolation technique to be used in the model.

❑ MATERIALS

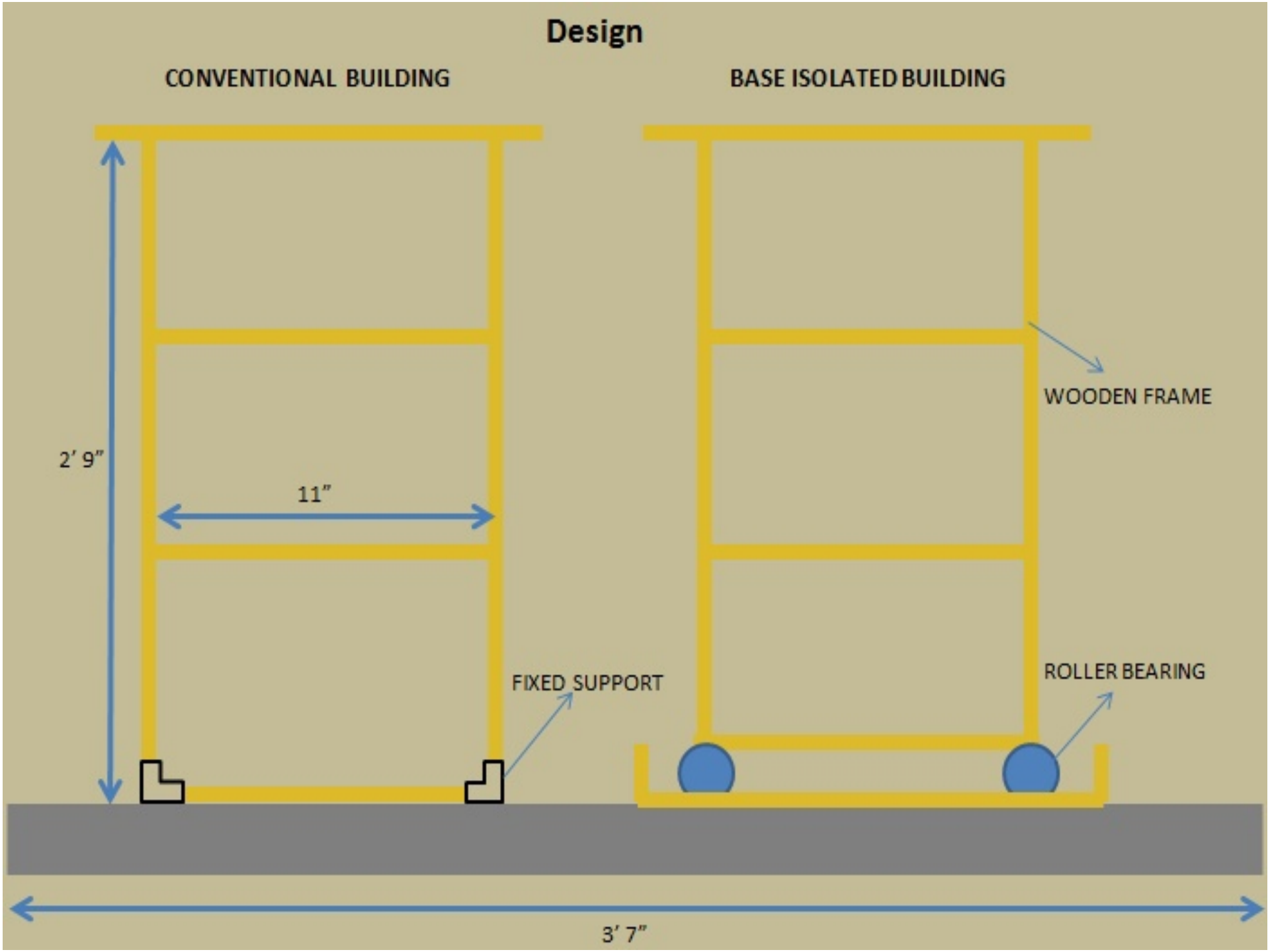
- The materials which were used in the preparation of this model are:
- Wood
- Samad Bond
- Cotton Dressing
- Thin Steel Plate
- Nails
- Small metal Rolling tires
- Paint Spray

❑ TOOLS

- The tools which were included during model production:
- Hammer
- Scissor
- Wood Cutter (Automatic and Manual)
- Wood Surface Softener Machine
- Measuring tape

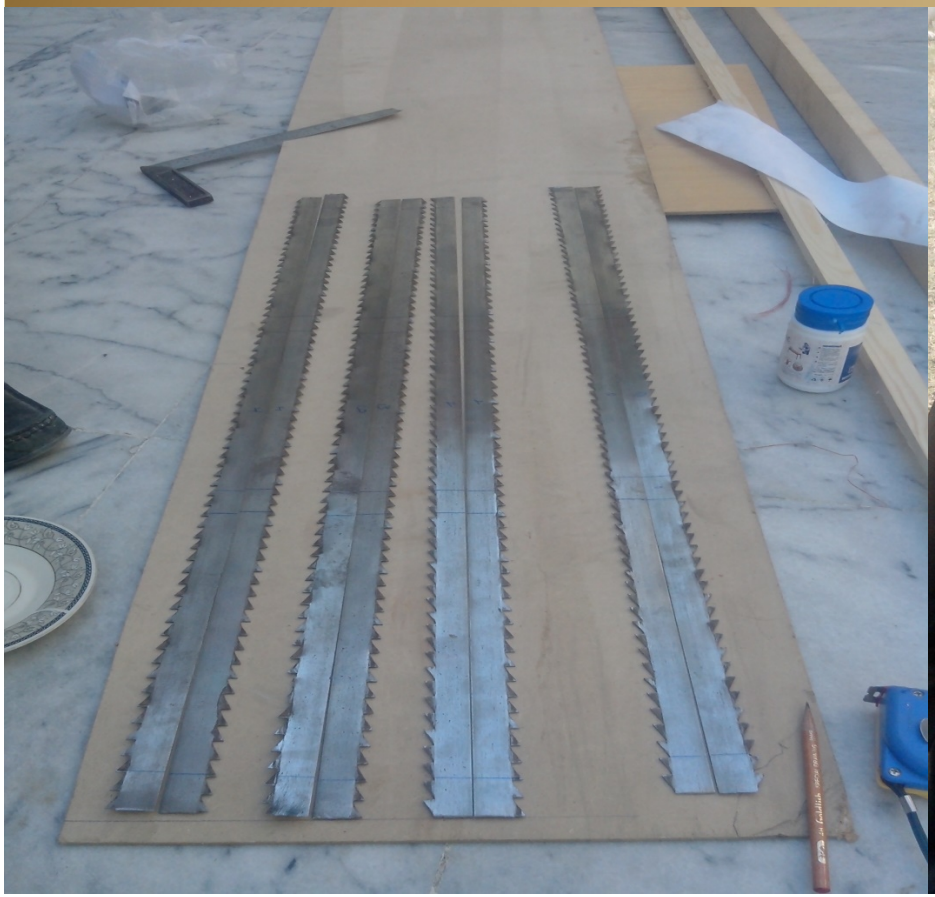
❑ SPECIFICATION

- Model Height: 2’ 9”
- Length: 1’ 2”
- Width: 11”
- Domain: 1’ 7” x 1’ 1”
- Wooden Base Plate: 3’ 7” x 1’ 7”


Design
CONVENTIONAL BUILDING
BASE ISOLATED BUILDING
2' 9"
11"
WOODEN FRAME
FIXED SUPPORT
ROLLER BEARING
3' 7"

❑ SNAP SHOTS

•These are some snapshots which were taken during the whole process of model production..



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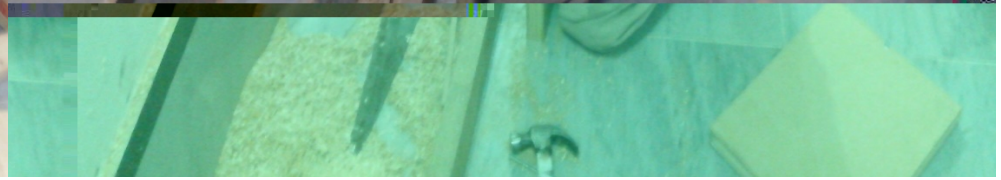

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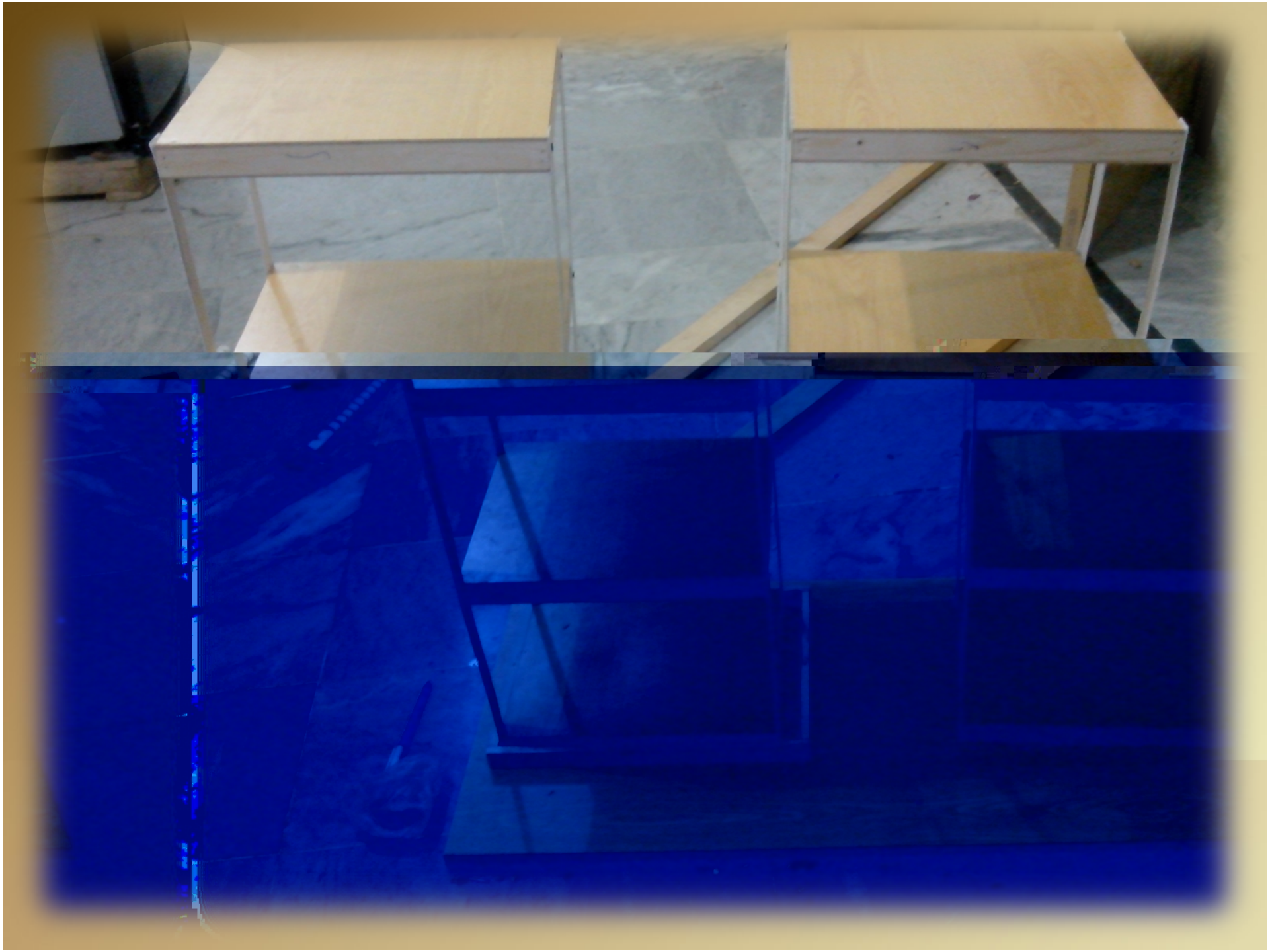




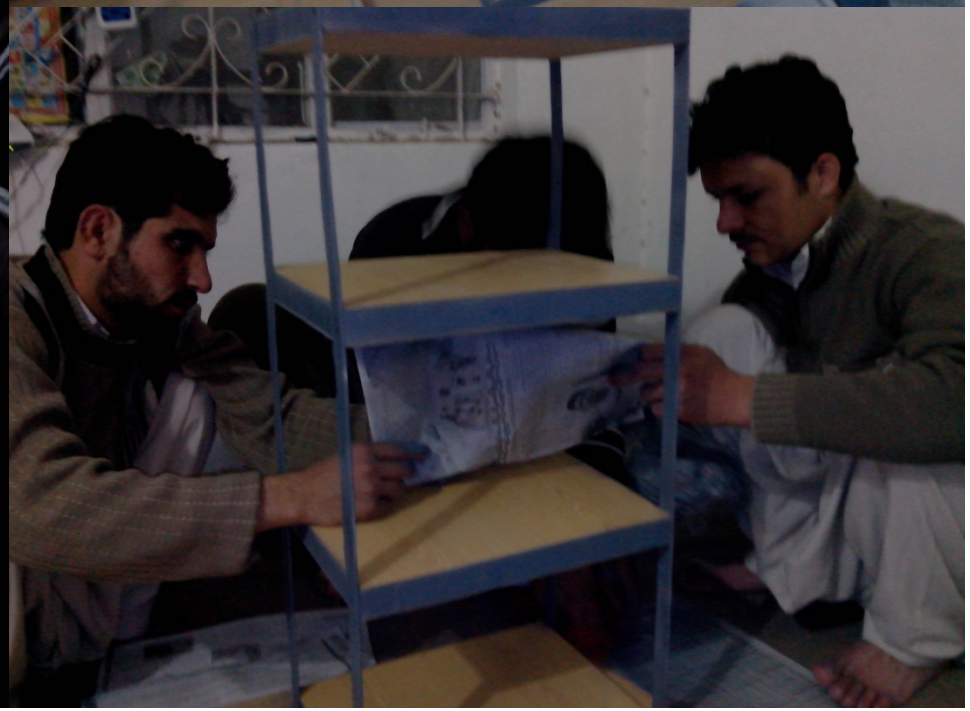

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Thank You


Any Questions?