

## Use of Re-cycle Aggregate in Concrete Production

**Name of Supervisor: Omer A Alawad**

**Name of Students: Abdullmajeed Asweed, Ahmed Mhamma, Khalid Ali Almutairi, Mohammed Kaljamal, ZahidM Meshal**

### Abstract

Recently, large construction and infrastructure projects are built in the Kingdom of Saudi Arabia. Concrete is the main material used in construction projects. Accordingly huge amount of raw materials are consumed in construction.

Concrete consists of four main ingredients: cement, sand, aggregate and water. Most of the coarse aggregate used in concrete is sourced from the mountains located in limited areas within the Arabian Peninsula. This led to find alternative sources of aggregate to be used as aggregate in the construction projects. Re-cycle Materials from waste or construction demolition are investigated to be used as source in concrete production. The use of recycling aggregate in concrete, which constitutes the largest proportion of waste, offers both a solution to waste disposal problems and enables preservation of natural resources.

### Methodology

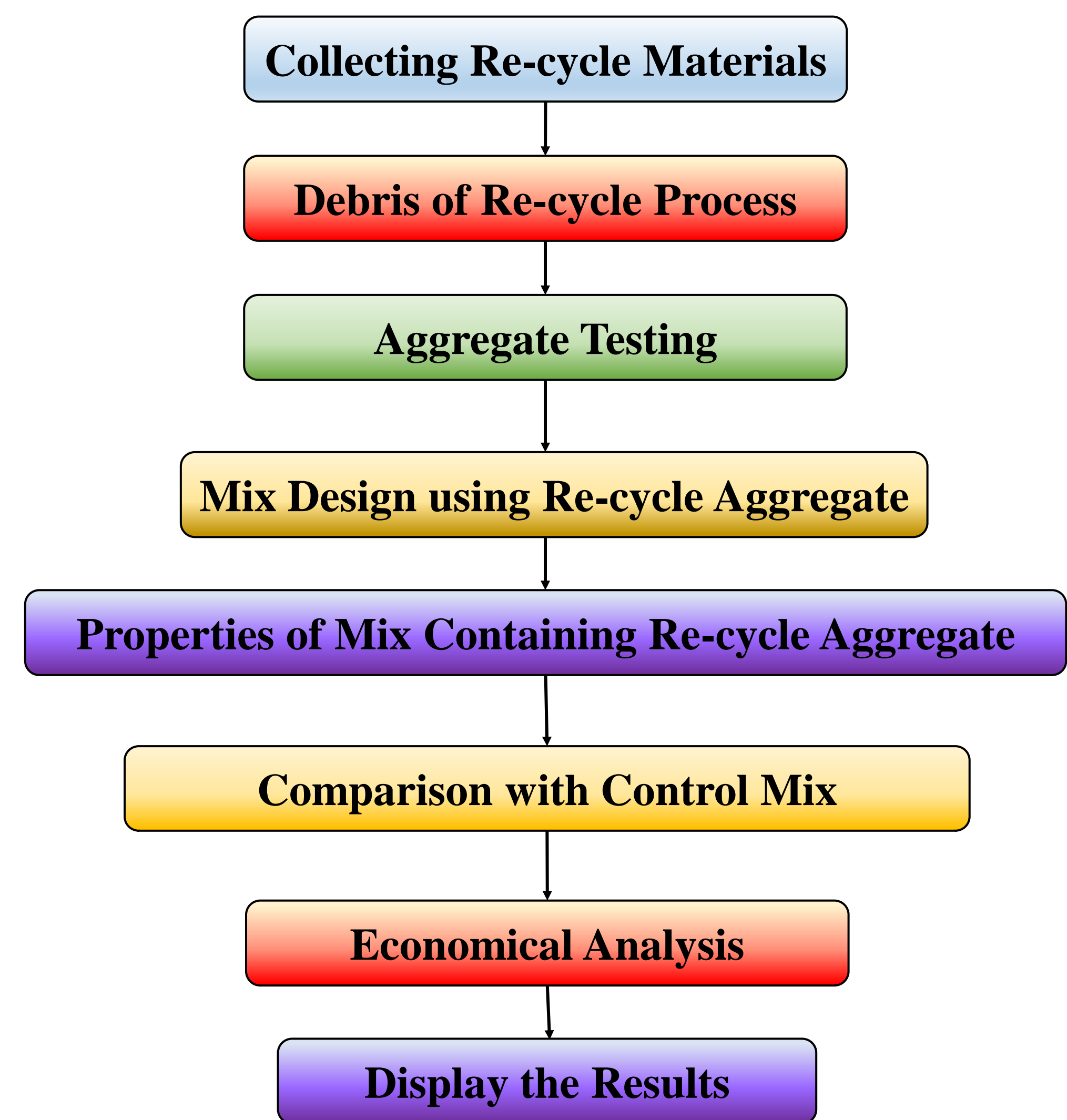


Figure 1: Modelling Process



### Objectives

**The overall objective of this project is to reduce the environmental impact of a constructed facility over its lifetime.**

**The specific objectives of this project are:**

- To provide sustainable construction materials
- Maximize the use of Re-cycle aggregate as a replacement for natural materials in a range of construction applications including concrete and asphalt production
- Conducted laboratory tests to examine the strength and durability of recycled aggregate concrete
- Compare the properties of re-cycle aggregate concrete with properties of natural aggregate concrete.

### Significance to the Kingdom

- Protecting sand and aggregate supply in areas where natural reserves are in decline
- Minimizing transport costs for aggregates – recycled materials are typically produced closer to urban centers
- Ensure the ability to meet growing demand for aggregates from a sustainable source

### References

1. Kabir, et al. "Recycled Construction Debris as Concrete Aggregate for Sustainable Construction Materials." *Procedia Engineering* (2016): 1518-1525.
2. Abdelfatah, et al. "Review of Research on and Implementation of Recycled Concrete Aggregate in the GCC." *Advances in Civil Engineering* 2011 (2011).