

## CONCRETE TECHNOLOGY II

### Introduction

This module unit involves the study of selection of appropriate plant, making precast concrete units, methods of fixing and the treatment of concrete joints. It is designed to equip the trainee with knowledge, skills and attitudes that will enable him/her to produce concrete products of good quality.

The trainee undertaking this module unit should have done Concrete Technology I.

### General Objectives

By the end of the module unit, the trainee should be able to:

- appropriate plant for making concrete units
- appreciate the use of concrete as a building material
- understand the need for treatment at concrete joints

### Module Unit Summary and Time Allocation - (33 Hours)

Code	Sub-Module Units	Content	Total Hours
20.2.01	Concreting Plant	<ul style="list-style-type: none"><li>Types of Concreting Plant</li><li>Uses of Concreting Plant</li><li>Selection of concrete plant</li><li>Estimation of Plant Output</li><li>Safety Precautions</li></ul>	4
20.2.02	Precast Concrete Units	<ul style="list-style-type: none"><li>Precast Concrete And In-Situ Concrete</li><li>Production of Precast Concrete Units</li><li>Principles of Pre-Stressing</li><li>Selection of Appropriate Methods</li><li>Reasons for using Precast Units</li><li>Procedure of using Precast Units</li><li>Tools and Equipment</li><li>Materials for Fixing Precast Units</li></ul>	6

Code	Sub-Module Units	Content	Total Hours
20.2.03	Joints In Concrete Works	<ul style="list-style-type: none"> <li>• Types of Joints in Concrete</li> <li>• Construction Process of Forming Joints in Concrete</li> <li>• Factors Considered in Selection of a Position for a Joint</li> <li>• Forming construction joints</li> </ul>	7
20.2.04	Concreting in Adverse Weather Conditions	<ul style="list-style-type: none"> <li>• Adverse Weather Conditions</li> <li>• Curing in Hot Weather</li> </ul>	7
20.2.05	Fixing precast concrete units	<ul style="list-style-type: none"> <li>• Reasons for using precast concrete units</li> <li>• Fixing units</li> <li>• Tools and equipments for fixing concrete units</li> <li>• Selection of materials precast units</li> <li>• Materials preparation</li> <li>• Fixing concrete units</li> </ul>	9
<b>Total</b>			<b>33</b>

# CONCRETING PLANT

## Theory

### *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- describe different types of concreting plant
- compare the uses of different types of concreting plant
- select appropriate concreting plant
- estimate the output of concreting plant
- observe safety and care during operations

### *Competence*

The trainee should have the ability to identify appropriate plant for a given job

### *Content*

Types of concreting plant

Uses of concreting plant

- vibrators
- concrete mixing plant
- dumpers
- conveyors
- trunk mixers

Choice of concrete plant

- output
- efficiency

- advantages/disadvantages

20.2.01T4 Estimation of plant output

20.2.01T5 Safety precautions

- personal safety
- plant safety

## 20.2.02

### PRECAST CONCRETE UNITS

#### Theory

### 20.2.02T0

#### *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- distinguish between precast and cast in-situ concrete
- produce precast concrete units
- explain the principles of prestressing concrete
- decide on the appropriate method of casting concrete
- discuss reasons for using precast units
- explain procedure of using precast units
- identify tools and equipments used in concreting
- describe material for fixing precast units



	The trainee should have the ability to:		<b>Practice</b>
	i) select appropriate method of casting concrete units	20.2.02P0	<i>Specific Objectives</i> By the end of the sub module unit, the trainee should be able to:
	ii) produce and use precast concrete units		a) select materials for making precast concrete units b) cast concrete units
20.2.02T1	<i>Content</i> Precast concrete and in-situ concrete		<i>Content</i>
20.2.02T2	Production of precast concrete units	20.2.02P1	Selection of materials
	- types of moulds		- quantity
	- assembly of moulds		- quality
	- casting	20.2.02P2	- properties
	- demoulding		Casting concrete
20.2.02T3	Principles of prestressing		- preparation of molds
	- prestress		- preparation of concrete
	- load		- placing concrete
	- combine stress		- compaction
	- methods of prestressing		- curing
20.2.02T4	Selection of appropriate methods:	20.2.03	<b>JOINTS IN CONCRETE WORKS</b>
	- in-situ		<b>Theory</b>
	- precast		
	- factors to consider	20.2.03T0	<i>Specific Objectives</i>
	- advantages		By the end of the sub module unit, the trainee should be able to:
	- disadvantages		a) describe joints used in concrete work
20.2.02T5	reasons for using precast units		b) explain the process of forming the various types of joints
20.2.02T6	procedure of using precast units		
20.2.02T7	tools and equipments used in concreting		
20.2.02T8	material for fixing precast units		

- c) identify appropriate positions for a construction joint
- d) explain how various construction joints in concrete are formed

20.2.04

## CONCRETING IN ADVERSE WEATHER CONDITIONS

### Theory

#### *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- a) describe concreting under adverse conditions
- b) cure concreting in hot weather adequately

20.2.04T0

20.2.03C

### *Competence*

The trainee should have the ability to apply appropriate joints in concrete work

### *Content*

20.2.03T1

Types of joints in concrete

- expansion
- contraction
- construction

20.2.03T2

Construction processes of forming joints in concrete

20.2.03T3

Factors considered in selecting a position for a joint

20.2.03T4

Joints formation

- considerations
- precautions
- removal of laitance
- joints in walls, water tanks
- slabs and pavement slabs

20.2.04C

### **Competence**

The trainee should have the ability to:

- a) describe concreting under adverse conditions
- b) cure concreting in hot weather adequately

20.2.04T1

### *Content*

Adverse conditions

- cold weather
- hot weather
- under water

20.2.04T2

Curing in hot weather



## CONCRETE UNITS

### Theory

20.2.05T0 *Specific Objectives*  
By the end of the sub-module unit, the trainee should be able to:

- a) outline the reasons of using precast concrete units
- b) procedure of fixing precast concrete units
- c) select tools and equipment used for fixing precast concrete units
- d) select the materials used for fixing precast concrete units
- e) prepare materials for fixing precast
- f) fix the precast concrete units

20.2.05C

### *Competence*

The trainee should have the ability to:

- i) fix precast concrete units in position safely
- ii) prepare materials for fixing
- iii) Cast and cure concrete in adverse weather

20.2.05T1	Reasons of using precast concrete units
20.2.05T2	Procedure of fixing precast concrete units
20.2.05T3	Tools and equipments used for fixing precast concrete units
20.2.05T4	Materials used for fixing precast concrete units
20.2.05T5	Preparation of materials and Fixing the precast concrete units
20.2.05T6	fixing the precast concrete units

### *Suggested Teaching/Learning Methods*

- Discussion
- Demonstration
- Curing

### *Suggested Teaching/Learning Resources*

- Textbooks
- Field trips

### *Suggested Assessment Methods*

- Oral tests
- Written tests
- Observation

### *Tools and Equipment*

- Spades
- Shovels
- Laying trowel
- Concrete mixer
- Mixing pans