

Course Number and Name																																																																																			
BCE071 - SHORING, SCAFFOLDING AND FORMWORK																																																																																			
Credits and Contact Hours																																																																																			
3 & 45																																																																																			
Course Coordinator's Name																																																																																			
Mr T.P.Meikandaan																																																																																			
Text Books and References																																																																																			
REFERENCES:																																																																																			
<ul style="list-style-type: none"> • Robert L • Hurd, M.K., Formwork for Concrete, Special Publication No.4, American Concrete Institute, Detroit, 1996 • Michael P. Hurst, Construction Press, London & New York, 2003 • Austin, C.K., Formwork for Concrete, Cleaver – Hume Press Ltd., London, 1996. • . Peurifoy and Garold D. Oberlender, Formwork For Concrete Structures, McGraw – Hill , 1996. 																																																																																			
Course Description																																																																																			
<ul style="list-style-type: none"> • practice by studying the materials, planning and design aspects and erection procedures. To bring about a thorough exposure to shoring, scaffolding and formwork procedures in construction.. 																																																																																			
Prerequisites						Co-requisites																																																																													
Building Construction Technology						NIL																																																																													
required, elective, or selected elective (as per Table 5-1)																																																																																			
Course Outcomes (COs)																																																																																			
CO1		Study the materials associated with formwork.																																																																																	
CO2		Study the design aspects of formwork under various requirements.																																																																																	
CO3		Know the design of forms and shores																																																																																	
CO4		Study the planning and erection aspects of form work for buildings.																																																																																	
CO5		Understand few other special types of forms.																																																																																	
Student Outcomes (SOs) from Criterion 3 covered by this Course																																																																																			
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List of Topics Covered																																																																																			
UNIT I PLANNING AND SITE EQUIPMENT & PLANT FOR FORM WORK 9																																																																																			
At Tender stage – Development of basic system – Planning for maximum reuse – Economical form																																																																																			

construction – Planning examples – Crane size, effective scheduling estimate – Recheck plan details – Detailing the forms. Overall Planning – detail planning – Standard units – Corner units – Schedule for column formwork – Formwork elements – Planning Crane arrangements – Site layout plan – Transporting plant – Formwork beams – Formwork ties – Wales and ties – scaffold frames from accessories – Vertical transport table form work.

UNIT II FORM MATERIALS 9

Lumber – Types – Finish – Sheathing boards working stresses – Repetitive member stress – Plywood – Types and grades – Textured surfaces and strength – Reconstituted wood – Steel – Aluminium Form lining materials – Hardware and fasteners – Nails in Plywood Concrete density – Height of discharge – Temperature – Rates of Placing – Consistency of concrete – Live loads and wind pressure – Vibration Hydrostatic pressure and pressure distribution – Examples – Vertical loads - Uplift on shores – Adjustment for non standard conditions.

UNIT III DESIGN OF FORMS AND SHORES 9

Basic simplification – Beam formulas – Allowable stresses – Deflection bending lateral stability – Shear, Bearing – Examples in wall forms – Slab forms – Beam forms – Ties, Anchors and Hangers – Column forms – Examples in each. Simple wood stresses – Slenderness ratio – Allowable load – Tubular steel shores patented shores – Site Preparation, Size and spacing – Steel Tower Frames – Safety practices – Horizontal shores shoring for multistories – More concentrated shore loads T- heads – Tow Tier wood shores – Ellis shores – Dayton sure grip and Baker Roofs shores – Safeway Symons shores – Beaver – advance shores Dead shore – Raking and Flying shores.

UNIT IV FORMWORK FOR BUILDINGS 9

Location of job mill – Storage – Equipment – Footings – Wall footings – Column footings Sloped footing forms – Curb and gutter forms – Wall forms –Prefabricated panel systems – Giant forms curved wall forms – Column heads – Beam or girder forms – Beam pockets – Suspended forms – Concrete joint construction – Flying system forms. Causes of failures – Inadequate shoring inadequate bracing of members – improper vibration – Premature stripping – Errors in design – Failure to follow codes – How formwork affects concretes quality – ACI – Case studies – Finish of exposed concrete design deficiencies – Safety factors – Prevention of rotation – Stripping sequence – Advantages of reshoring.

UNIT V FORMS FOR DOMES AND TUNNELS, SLIP FORMS AND SAFETY PRACTICES FOR SCAFFOLDS 9

Hemispherical, Parabolic, Translational typical barrel vaults, Hyperbolic Folded plates– Shell form design considerations loads – Inserts , Anchors bolts – Building the forms-Placing concrete – Form removed – Strength requirements – Tunnel forming components – Curb forms invert forms – Arch forms – Concrete placement methods – Cut and cover construction – Tolerances – Form construction – Shafts. Slip Forms - Principles – Types – advantages – Functions of various components – Planning – Desirable characteristics of concrete – Common problems faced – Safety in slip forms special structures built with slip form Technique – Codal provisions Types of scaffolds – Putlog and independent scaffold – Single pole scaffolds – Fixing ties – Spacing of ties plan – bracing – knots – safety net – General safety requirements – precautions against particular hazards – Truss suspended – Gantry and system scaffolds

