



**Nelson Mandela  
Metropolitan  
University**

*for tomorrow*

# Construction Management the BSc Programme

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## Myths of construction

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- **Putting bricks on top of bricks**
- **“Anyone can Build; I just put up a carport over the weekend!”**
- **“All you need is a bakkie (LVD)!”**
- **“Construction is for men!”**



## Realities of construction

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- **Sometimes the bricks have to be laid on the 30th floor**
- **Try managing the erection of a carport 230 working days a year to the requirements of clients and others**
- **Construction requires the use of tower cranes working at heights of up to 100 storeys and tunnel boring machines (TBMs) beneath the English channel**
- **Women:**
  - **Constitute approximately 50% of the population**
  - **Have traditionally built in rural areas throughout Africa**
  - **Work at management, supervisory, and production level in construction**



# What does construction entail?

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- **Apartments**
- **Bridges**
- **Casinos**
- **Dams**
- **Factories**
- **Harbours**
- **Highways**
- **Houses**
- **Office blocks**
- **Railways**
- **Schools**
- **Tunnels**



## Does construction have a future?

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- Major industry in South Africa
- Contributes up to 10% of GDP in developed countries
- South African contractors are working outside of South Africa
- Economic growth
- Population growth
- Reinstatement after wars and natural disasters e.g. floods
- Backlog in development (South Africa and Africa)



## Project team (1)

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- **Client (Owner, Investor):**
  - Individuals
  - Businesses
  - Government
  - Pension funds
  - Developer
- **Finance:**
  - Private funds
  - Banks
  - Government
  - Pension funds



## Project team (2)

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- **Design team:**
  - **Project Managers (Principal agent)**
  - **Architect (General design and often principal agent)**
  - **Engineers (Structural, Mechanical, Electrical and Civil design & often principal agent)**
  - **Interior designers**
  - **Landscape architects**
- **Contracting team:**
  - **General contractor**
  - **Subcontractors (Specialist work e.g. Electrical)**
  - **Materials suppliers and manufacturers**



## Why the professional construction manager?

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- **Science and technology involved**
- **Range of resources to be managed**
- **Parameters within which projects need to be managed**
- **Value, size, and scope of projects**
- **Internationalism and globalisation**
- **The implications of failure during the construction process and the use of facility**
- **A professional is needed to interact and liaise with other stakeholders**
- **The range of stakeholders requiring construction managers e.g. academic institutions, banks, developers, government**





## What is Construction Management? (1)

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**Within the context of contracting is “the management of the business of construction and projects”:**

- **Managing the organisation functions: general management; administration and information technology; financial; human resources; legal; marketing; procurement; production (projects), and public relations**
- **Using the resources: management; supervision; labour; competencies; finances; information; material; plant and equipment; subcontractors; technology, and innovation**



## What is Construction Management? (2)

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- **Within the defined parameters of: budget (cost); developmental objectives; environment; health and safety (project and public); productivity; quality; schedule (time), and client, designer and worker satisfaction**
- **Using the functions of management work: planning; organizing; leading; controlling, and coordinating**

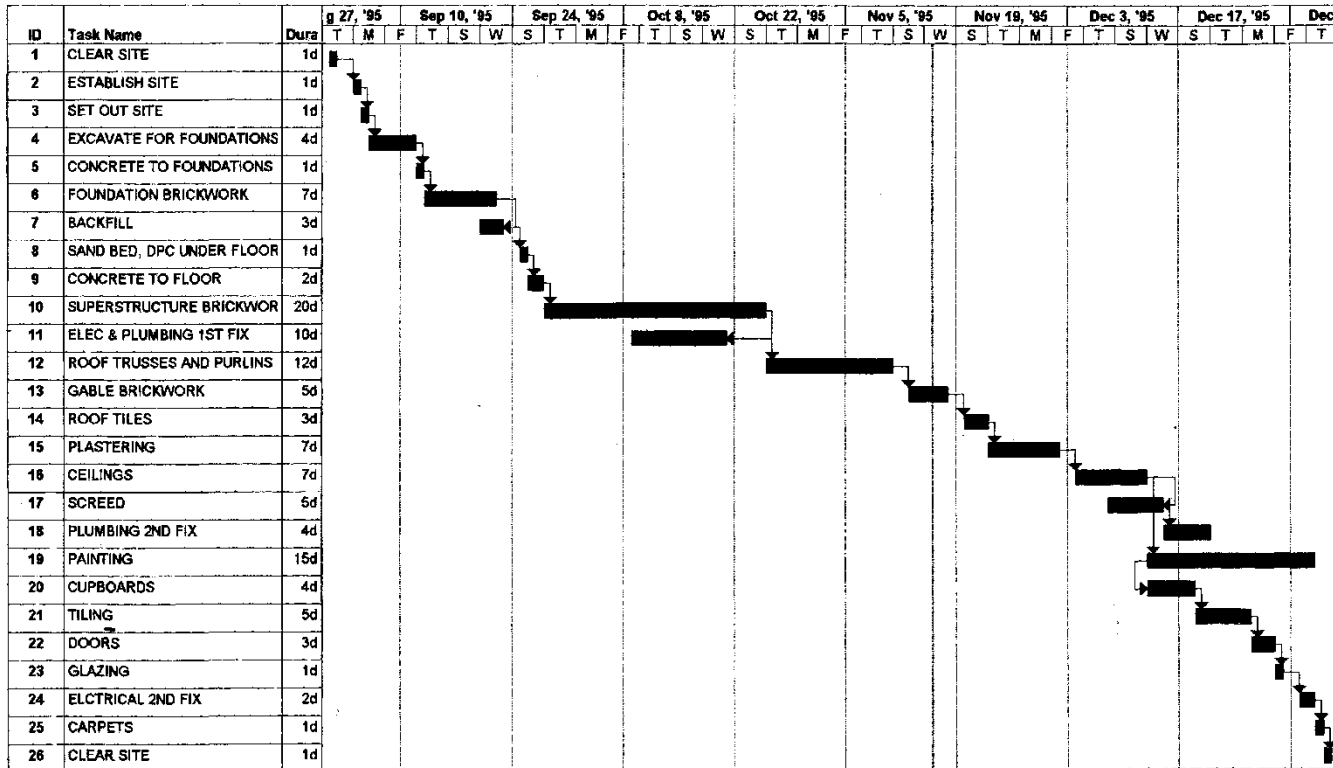


# Planning

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- **Planning includes the activities of:**
  - **Forecasting**
  - **Developing objectives**
  - **Programming**
  - **Scheduling**
  - **Developing procedures**
  - **Developing policies**

# Planning – Bar chart (General)



PROJECT

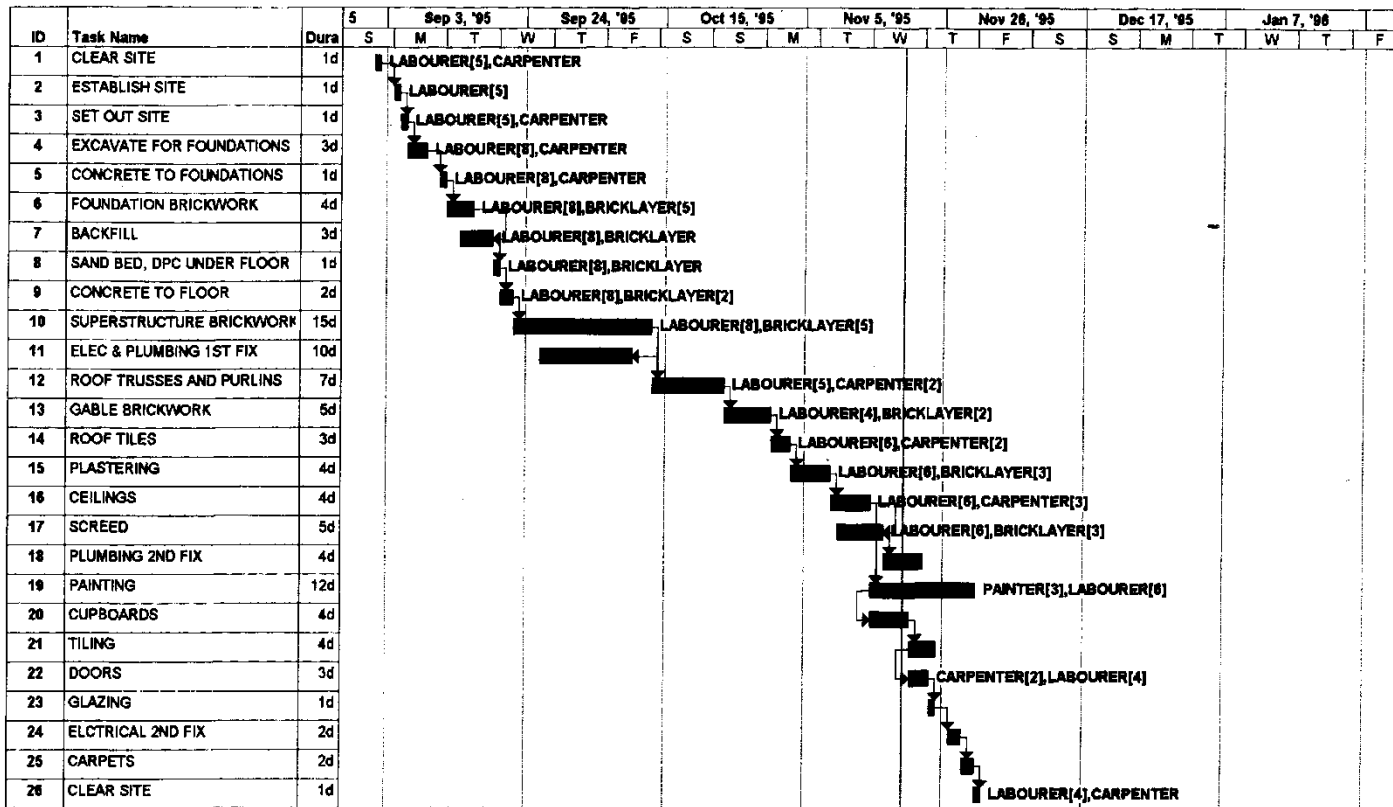
DATE: 24Aug 1995

BIFSA HOUSE TYPE A

DRAWN BY: CR

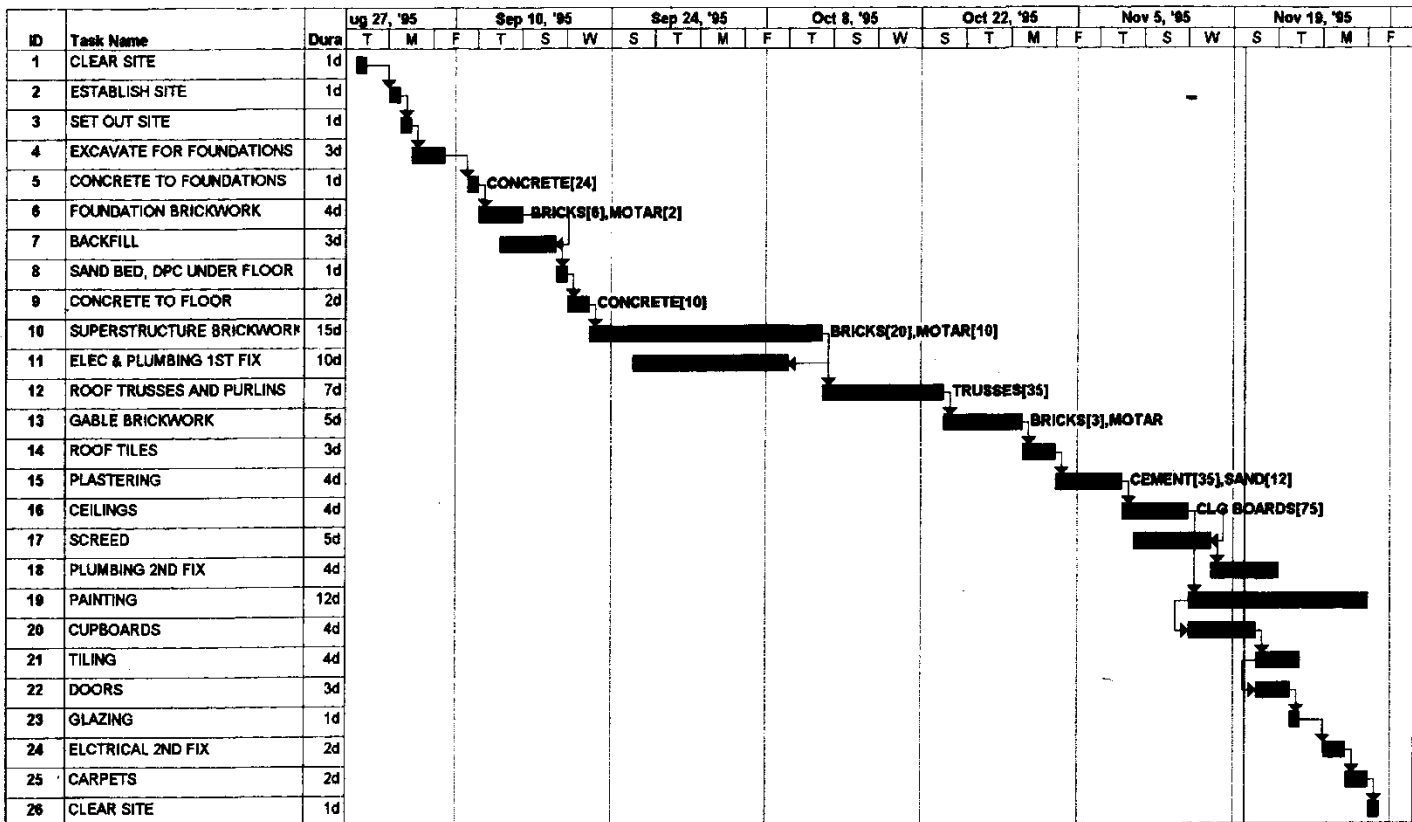
SHEET NO: BHA: 001

# Planning – Bar chart (Labour)



|                                    |           |            |
|------------------------------------|-----------|------------|
| PROJECT                            | DATE:     | 28Aug 1995 |
| BIFSA HOUSE TYPE A LABOUR SCHEDULE | DRAWN BY: | CR         |
|                                    | SHEET NO: | BHA: 001 L |

# Planning – Barchart (Materials)



PROJECT

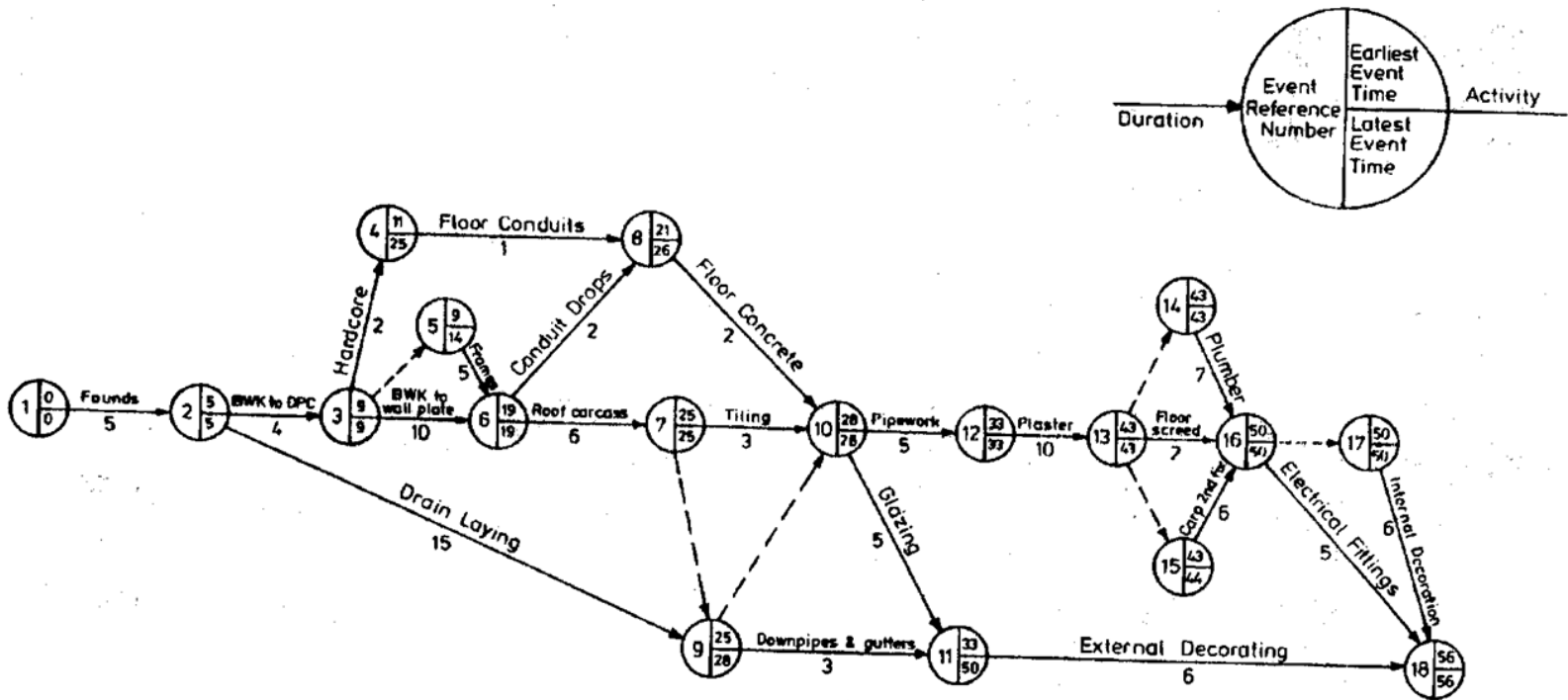
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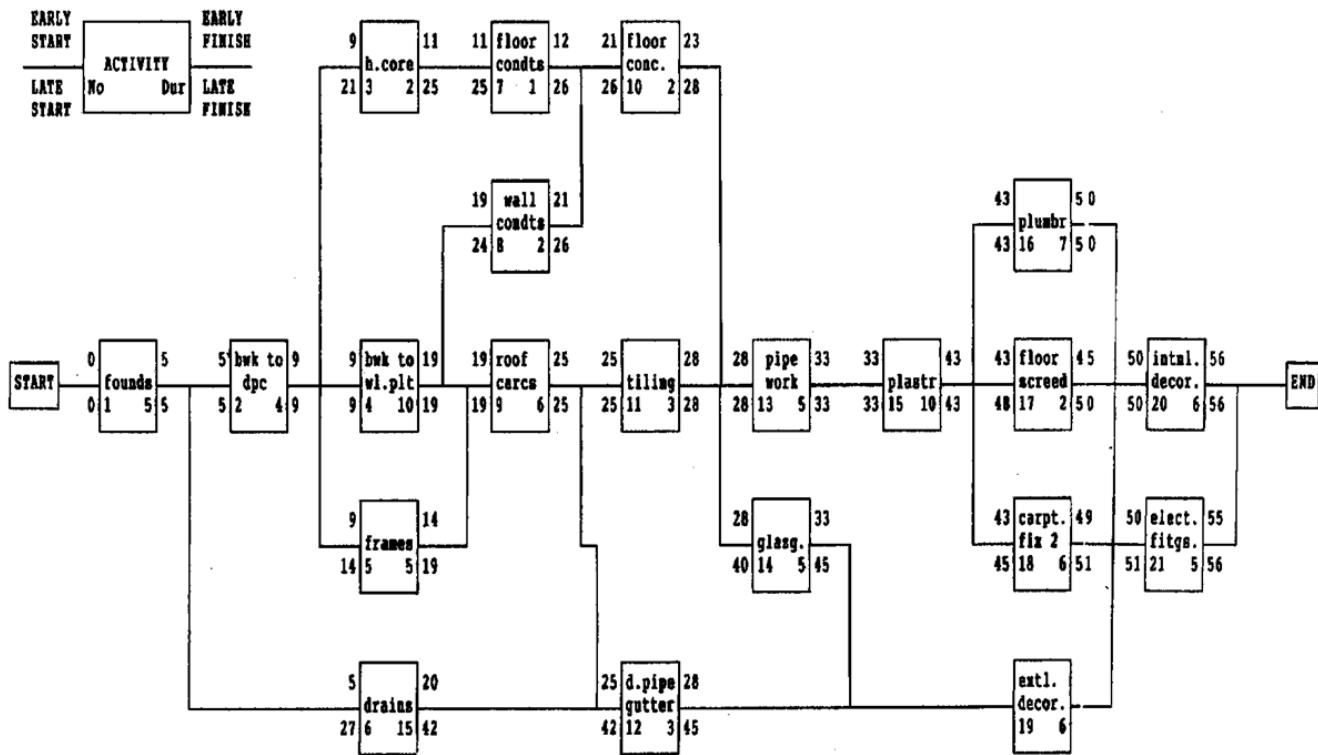
BIFSA HOUSE TYPE A MATERIALS SCHEDULE

SHEET NO: BHA: 001 M

# Planning – Critical path method

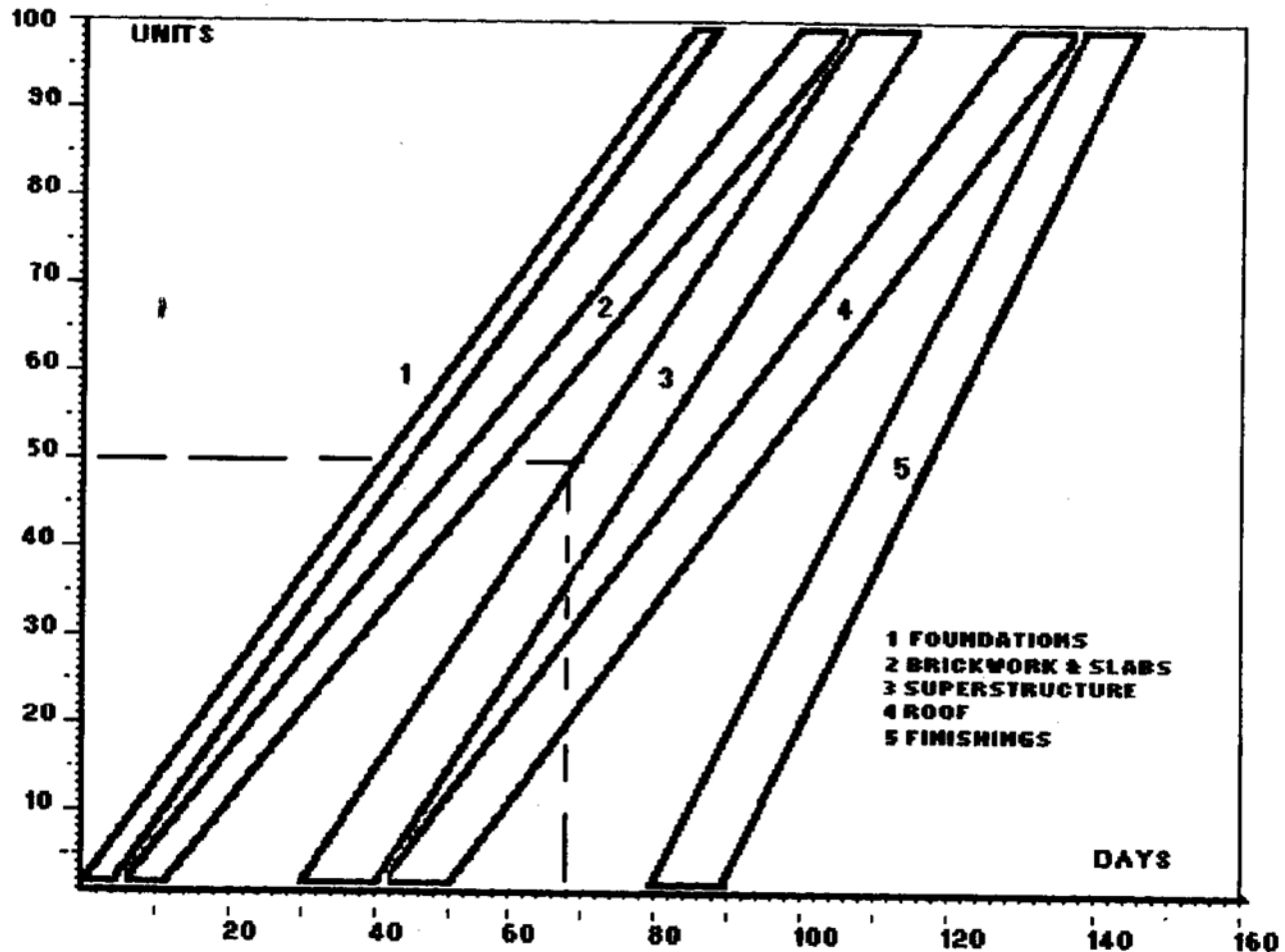


# Planning – Precedence network





# Planning – Line balance schedule





# Organising

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- **Organising includes the activities:**
  - **Developing organisation structure**
  - **Delegating**
  - **Developing relationships**



# Leading

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- **Leading includes activities of:**
  - **Making decisions**
  - **Communicating**
  - **Motivating**
  - **Selecting people**
  - **Developing people**



# Controlling

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- **Controlling includes the activities of:**
  - **Developing performance standards**
  - **Measuring performance**
  - **Evaluating performance**
  - **Correcting performance**



## Coordinating

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- **Coordinating entails integrating resources within parameters as a result of planning, organising, leading and controlling**



## Preferred personal characteristics

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- **Initiating**
- **Team orientated**
- **Enjoy challenges**
- **Enjoy working with people**
- **Leader**
- **Enjoy variety of work**
- **Exacting philosophy - do not turn a 'blind eye'**



## Potential employers

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- **Self (within many of the following stakeholder capacities)**
- **Contractors**
- **Project managers**
- **Management consulting**
- **Property developers**
- **Financial institutions**
- **Government departments**
- **Materials manufacturers**
- **Academic institutions**
- **Research organisations**



# Contracting

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- **Construction (Process):**
  - Site management
  - Contracts management
  - Contracts director
- **Top Management:**
  - Managing director (branch / region)
  - Managing director (nationally or internationally)
  - Managing director (internationally overall or continentally)
- **Functions:**
  - Planning
  - Human resources
  - Marketing
  - Purchasing





## The BSc Construction Management degree program offered at the NMMU (1)

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- **BSc (Construction Studies) – 3 years**
- **BSc (Honours) (Construction Management) – 1 year**
- **Total of 4 years – completing Honours is important to:**
  - **Prepare construction managers to manage the business of construction and to pursue other careers**
  - **Register with the South African Council for the Project and Construction Management Professions (SACPCMP)**



## **The BSc Construction Management degree program offered at the NMMU (2)**

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- **Treatise of 12 000 – 15 000 words**
- **Internationally recognised and accredited (Chartered Institute of Building)**
- **Accredited by the SACPCMP**
- **Graduates currently working in Africa, Australia, Dubai, South Africa, UK, USA**



## **Content of the programme**

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### **3 Main fields - Construction Science and Technology; Construction Economics, and Construction Management:**

- **Construction Science and Technology:**
  - **Materials and Methods; Environment and Services; Structures; Surveying; Physics; Mathematics, and Computer Science**
- **Construction Economics:**
  - **Production Analysis; Statistics; Economics; Building Economics, and Property Economics**
- **Construction Management:**
  - **Organisational Behaviour; Accounting; Business Management; Construction Management; Project Management; Commercial Law Company Law; Industrial Law, and Professional Practice**



## Subjects per year (1)

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- **First year of study:**
  - **Building Science (Material & Methods) 1**
  - **Building Science (Environment & Services) 1**
  - **Building Science (Structures) 1**
  - **Mathematics (Special) 1**
  - **Physics (Special) 1**
  - **Geometric Drawing 1**
  - **Basic Surveying 1**
  - **Computer Science (End User Computing)**
  - **Production Analysis 1**
  - **Information Technology for Building Disciplines 1**



## Subjects per year (2)

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- **Second year of study:**
  - **Building Science (Material & Methods) 2**
  - **Building Science (Environment & Services) 2**
  - **Building Science (Structures) 2**
  - **History of the Construction Industry 1**
  - **Organisational Behaviour 2**
  - **Statistics 2**
  - **Business Management 1**
  - **Production Analysis 2**
  - **Introduction to Micro Economics (Special) 1**
  - **Information Technology for Building Disciplines 2**



## Subjects per year (3)

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- **Third year of study:**
  - **Building Science (Material & Methods) 3**
  - **Building Science (Environment & Services) 3**
  - **Building Science (Structures) 3**
  - **Production Analysis 3**
  - **Building Economics 3**
  - **Construction Management 3**
  - **Accounting 1**



## Subjects per year (4)

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- **Fourth year of study – BSc (Honours):**
  - **Construction Management 4**
  - **Building Economics (Special) 3**
  - **Information Technology for Building Disciplines 3**
  - **Property Development Economics 4**
  - **Project Management 4**
  - **Building Science (Material & Methods) 4**
  - **Professional Practice for Construction Management 4**
  - **Construction Management Treatise 4**
  - **Commercial Law 1**
  - **Commercial Law (Building Disciplines) 1**
  - **Commercial Law 1**
  - **Industrial Law 1**



# Admission requirements

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- **NSC**
- **Admission point score of 36**
- **English, Afrikaans or isiXhosa on at least level 3**
- **Mathematics NSC 4 rating**
- **Recommended subjects:**
  - **Engineering Graphics and Design**
  - **Physical Science**





## Postgraduate study

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- **MSc and PhD (Construction Management) by research:**
  - Generally 2 and 3 to 4 years in duration respectively
  - Enables specialisation
- **Coursework MSc (Built Environment):**
  - 5 Specialisations: Construction Management; Construction Health and Safety Management; Facilities Management; Project Management, and Property Economics and Valuation
  - 18-Month program