BOARD NOTICE
RAADSKENNISGEWING

NOTICE 93 OF 2004

CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD ACT, 2000 (ACT 38 OF 2000)

BEST PRACTICE LABOUR-BASED METHODS AND TECHNOLOGIES FOR EMPLOYMENT INTENSIVE CONSTRUCTION WORKS

The Construction Industry Development Board (CIDB) is a Schedule 3A public entity established in terms of the Construction Industry Development Board Act, 2000 to provide leadership to stakeholders to stimulate sustainable growth, reform and improvement of the construction sector for effective delivery and the industry's enhanced role in the country's economy.

Section 4 of the Act Tasks the Board to-

"(c) determine and establish best practice that promotes—
- **(i) improved industry stability;**
- **(ii) improved industry performance, efficiency and effectiveness;**
- **(iii) procurement and delivery management reform;**
- **(iv) improved public sector delivery management;**
- **(v) national social and economic objectives, including—**
  - **(aa) growth of the emerging sector;**
  - **(bb) labour absorption in the construction industry;**
  - **(cc) improved labour relations; and**
  - **(dd) positive safety, health and environmental outcomes;**
- **(vi) human resource development in the construction industry;**

(d) promote best practice through the development and implementation of appropriate programmes and measures aimed at best practice and improved performance of public and private sector clients, contractors and other participants in the construction delivery process;

(e) promote uniform application of policy with regard to the construction industry throughout all spheres of Government;"

Labour-based methods and technologies can provide temporary work opportunities to unemployed persons and as such contribute to government's national social and economic objectives.

The Board convened a focus group comprising some 40 knowledgeable practitioners, representing a broad spectrum of stakeholders including public and private sector clients, investors, voluntary associations of established and emerging business, contractors, the consulting professions, subcontractors, materials suppliers, and others,

to consider what constitutes desirable and appropriate standards, processes, procedures, methods or systems in the field of labour-based methods and technologies.

The outcome of this process is the development of comprehensive, peer reviewed best practice guidelines containing a wide range of labour-based methods and technologies for employment intensive construction works.

The CIDB has in terms of section 4(c) of the Act, published the Best Practice Labour-based Methods and Technologies for Employment-Intensive Construction Works contained in the schedule hereto.

SIGNED
BRIAN CAMERON BRUCE
CHAIRPERSON: CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

BEST PRACTICE LABOUR-BASED METHODS AND TECHNOLOGIES FOR EMPLOYMENT-INTENSIVE CONSTRUCTION WORKS

1 PREAMBLE

Engineers have traditionally used their skills and expertise to ensure that structures and their components are serviceable and durable in addition to possessing adequate strength and stability. A well designed structure is, normally, considered to be one which meets these requirements in the most economically efficient manner; least cost being the measure of value for money. Engineers similarly design services using the same approach. In recent years, however, the term "value for money" has in South Africa been broadened to take cognisance of socio-economic and political benefits. Government has realised that there is a cost to unemployment and poverty and that there is a price to be paid for the economic empowerment of marginalised communities. Accordingly, value for money is now assessed in a revised context.

The Green Paper on Public Sector Procurement Reform in South Africa (1997) proposed that Procurement should facilitate the generation of jobs in South Africa. The White Paper on Creating an Enabling Environment for Reconstruction, Growth and Development in the Construction Industry (2000) expressed the need for public-sector delivery to maximise employment opportunities through labour-intensive construction. It calls for an enabling regional policy that advocates the use of locally based technologies and encourages labour-based construction and materials production.

President Mbeki, in his State of the Nation Address in February 2003, formally announced the Expanded Public Works Programme (EPWP) as one of government's short-to-medium term programmes aimed at alleviating and reducing unemployment. The EPWP, which was launched by the president in May 2004, is a national programme covering all spheres of government and state-owned enterprises, is expected to achieve this aim through the provision of temporary work opportunities coupled with training.

The aforementioned policy positions and programmes presuppose that appropriate labour-based methods and technologies are readily available to those engaged in construction works as designers and constructors. The availability, or lack thereof, of appropriate specifications and suitable technology choices can have a marked influence on the degree to which policy and programme goals can be attained through construction works contracts. Appropriate specifications and labour based technologies are required to optimise the engagement of smaller contractors and the increase in employment opportunities per unit of expenditure. The absence of design information on labour based technologies frequently leads to the situation in which only those technologies for which there are adequate design information are considered in the design of a project. Alternatively, labour based technologies are approached circumspectly and conservatively.

2 LABOUR-BASED CONSTRUCTION METHODS

Earthworks are at the core of most civil engineering construction, especially road construction. For centuries earthworks have been executed using employment intensive methods and there is no doubt that a wide range of earthworks can be executed in this

manner. In recent decades, however, most earthworks have been executed using equipment based methods.

It is generally accepted that employment-intensive methods are technically feasible for a wide range of construction activities and can generally produce the same quality of product as equipment-intensive methods. It must be stressed, however, that the term "employment-intensive" does not mean that only labour should be used in the construction process, but implies the use of a range of machine/labour combinations, based on considerations of quality, cost and time constraints.

- Best Practice Guideline 2, (CIDB document 1023), *Labour-based construction methods for earthworks,* establishes desirable and appropriate standards, processes, procedures and methods in respect of the following employment intensive earthworks activities:

  - clear and grub;
  - excavate, load, haul, unload and spread (ELHUS); and
  - trench excavation and backfill

3 LABOUR-BASED METHODS FOR MATERIALS MANUFACTURE

Precasting is an economical means of producing high-quality concrete items. It is an accepted, proven and traditional method for making items required in buildings and civil engineering such as bricks, blocks, sills, lintels, paving blocks and slabs, kerbs, pipes of small diameter, and retaining blocks. Precast concrete units for the garden – flower pots, trellis supports, security fences, fencing posts, decorative slabs, poles for clothing lines, washbasins, gravestones, flower bed edging, sculptures, bird baths, drainage elements are popular. The range of precast concrete products to be made is only limited by the imagination and market requirements.

The small-scale manufacture of precast concrete products, bricks and blocks is a labour-based form of producing units that can be used in construction and other uses. Production can be carried out in the open, the processes are simple, equipment does not require high capital investment and are employment -intensive. These products are well suited for small scale manufacture.

An alternative to cast insitu concrete masonry units are bitumen emulsion stabilised adobe blocks. Agrément South Africa has in this regard recently developed the BESA Building System (i.e. a bitumen emulsion stabilised adobe blocks and mortar walling system) for single storey houses, schools, clinics and offices which fully complies with all the requirements of National Building Regulations. The BESA Building System is the subject of an open certificate issued by Agrèment South Africa, the concept of which is that the technology is not the intellectual property of any company or individual and the information is available to anyone who wishes to use it and is capable of constructing buildings in accordance with the provisions of the certificate.

- Best Practice Guideline 3-1, (CIDB document 1024), *Precast concrete products, brick and block making,* establishes desirable and appropriate standards, processes, procedures and methods in respect of a wide range of precast concrete products using the hand methods and light equipment.

➢ Best Practice Guideline 3-2, (CIDB document 1025), the BESA Building System, establishes desirable and appropriate standards, processes, procedures and methods in respect of walling in buildings comprising bitumen emulsion stabilised adobe blocks and mortar.

4 LABOUR-BASED CONSTRUCTION TECHNOLOGIES

A number of employment-intensive technologies such as rubble masonry construction and waterbound macadam, for various reasons, have fallen into disuse. Researchers and practitioners alike have revisited these technologies in the search for cost effective labour-based technologies which can provide employment for unskilled and semiskilled workers in the fight against poverty. At the same time, new construction technologies have evolved to expand the range of labour-based options available to project implementers.

South Africa has to some extent led developing countries in the quest for labour-based methods and technologies. The information although being available in theses, dissertations, professional papers, donor funded booklets and the like, needs to be appropriately packaged and endorsed by an authoritative body so that it can be disseminated and accepted as viable alternatives to conventional technologies and methods.

➢ The following CIDB publications establish desirable and appropriate design and construction standards, processes, procedures and methods:
- Best Practice Guideline 4-1 (CIDB document 1026), *Labour-based Open Channel Flow Technology;*
- Best Practice Guideline 4-2 (CIDB document 1027), *Rubble masonry dam construction technology,*
- Best Practice Guideline 4-3 (CIDB document 1028), *Rubble masonry concrete arch bridge construction technology*;
- Best Practice Guideline 4-4 (CIDB document 1029), *Foam bitumen gravel*;
- Best Practice Guideline 4-5 (CIDB document 1030), *Cast in-situ block pavements (hysen cells)*;
- Best Practice Guideline 4-6 (CIDB document 1031), *Emulsion treated gravel*;
- Best Practice Guideline 4-7 (CIDB document 1032), *Waterbound macadam;*
- Best Practice Guideline 4-8 (CIDB document 1033), Slurry bound and composite macadams; and
- Best Practice Guideline 4-9 (CIDB document 1034), *Labour-based methods for unsealed roads.*

5 METHODS FOR IMPLEMENTING LABOUR BASED METHODS IN CONSTRUCTION WORKS PROJECTS

Two alternative procurement approaches to implementing employment-intensive works methods can be adopted:

- **Method 1:** Lay down the use of specific employment-intensive technologies and methods of construction/ manufacture in the tender document; or
- **Method 2:** Afford tenderers the opportunity to choose the technology /construction method/method of materials manufacture which they wish to use in

order to maximise the participation of labour in construction works and in so doing win bids.

Either method may be used to increase the quantity of employment generated per unit of expenditure. Method 1 achieves this objective by restricting the use of certain types of plant/manufacturing methods and by specifying particular technologies. Method 2, on the other hand, by means of targeted procurement procedures, enables tenderers to tender the amount of targeted labour, which they undertake to engage in the performance to the contract. Method 2, accordingly, permits tenderers to use their knowledge, skill and creativity in arriving at an optimum economic mix of equipment, technology and labour in order to meet objectives and win bids.

- Best Practice Guideline 1 (CIDB document 1022), *An overview of employment-intensive construction works*, establishes desirable and appropriate standards, processes, procedures and methods establishing employment intensive works.

Schedule

Best Practice Labour-based Methods and Technologies for Employment-intensive Construction Works

The standards, processes, procedures, methods and systems embodied in the following CIDB best practice guidelines are deemed desirable and appropriate by the Board:

Number	Title	CIDB document number
Best Practice Guideline 1	An overview of employment-intensive construction works	CIDB document 1022
Best Practice Guideline 2	Labour-based construction methods for earthworks	CIDB document 1023
Best Practice Guideline 3-1	Precast Concrete Products, Brick and Block Making	CIDB document 1024
Best Practice Guideline 3-2	The BESA Building System	CIDB document 1025
Best Practice Guideline 4-1	Labour-based Open Channel Flow Technology	CIDB document 1026
Best Practice Guideline 4-2	Rubble masonry dam construction technology	CIDB document 1027
Best Practice Guideline 4-3	Rubble masonry concrete arch bridge construction technology	CIDB document 1028
Best Practice Guideline 4-4	Foam bitumen gravel	CIDB document 1029
Best Practice Guideline 4-5	Cast in-situ block pavements	CIDB document 1030
Best Practice Guideline 4-6	Emulsion treated gravel	CIDB document 1031
Best Practice Guideline 4-7	Waterbound macadam	CIDB document 1032
Best Practice Guideline 4-8	Slurry bound and composite macadams	CIDB document 1033
Best Practice Guideline 4-9	Labour-based methods for unsealed roads	CIDB document 1034