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1.3 Labour-based construction and the development of emerging contractors in South Africa

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Executive summary

Traditionally, the construction industry has been viewed as an industry which produces a high rate of employment per unit of expenditure. The industry as a result has attracted much interest and investment in efforts to create job opportunities. The civil engineering construction industry is, however, very reliant on heavy construction plant such as graders, bulldozers, excavators and the like and there is considerable room for substituting men for machines to increase employment opportunities.

In recent years South African civil engineering projects have been critically examined to see if more job opportunities can be created to provide relief to the masses of unemployed. As a result, the terms labour- intensive, labour-based and community-based construction have entered the vocabulary of South African engineers.

At the same time, engineering services and structures have been constructed by established contractors who have all the necessary resources required to execute projects, viz. labour, materials, machines and the necessary finances or access thereto to secure contracts. Small scale enterprises located within local communities have been excluded from participation by the very structure of the industry. Barriers to entry which effectively prevent local entrepreneurs or emerging building contractors from engaging in construction contracts, include lack of financial resources, inability to obtain credit, lack of credibility, lack of commercial, managerial, administrative and technical skills. In civil engineering projects, sureties, plant-based construction practices and tendering and contractual requirements effectively exclude all such involvement.

Labour-based construction can be closely linked to the targeting of employment opportunities. The question "How many employment opportunities are created?" is just as important as, "Who is to be employed, or which person will benefit from the construction process?"

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Over the past few years, systems have been developed to support the emergence of entrepreneurs using labour-based construction methods within targeted communities. This form of construction may best be described as being community-based. Community-based construction may be defined as the use of labour-based technologies and labour-intensive methods on projects in which the community is, in addition, involved in the commercial, managerial and administrative aspects so as to maximise the amount of funds retained within the community and to transfer skills and competencies to the community.

The focus in community-based construction projects is on involving the community in the management and administration of labour-based construction projects, to promote the emergence of local contractors and to mobilise and utilise the resources of the community in an optimal manner.

In community-based projects, members of the community can also become involved in the operation of stores facilities, the support provided to local contractors, the transport of materials to local labour-only contractors, the manufacture of certain materials, the supply of minor materials, and security of the site.

Community-based construction has, however, enabled the necessary developmental support structures to be established. This, in turn, has led to the development of contractor development programmes for civil, electrical and building contractors, which enable emerging entrepreneurs to acquire and develop commercial, managerial and administrative skills while gaining credibility in commercial circles and assuming more contractual responsibility.

Certain restructuring of the industry will need to take place to enable small scale enterprises to have an adequate market share and to change the existing distribution of large, medium and small construction companies currently operating in South Africa. However, should the formal sector work together with the informal sector, contractors can develop together to the benefit of all.

Aspects of emerging practices and contractor development programmes are reviewed in the text.

Introduction

All civil engineering and building projects create a variety of job opportunities. Labour is required to manage and carry out the construction process, to handle materials and to operate and maintain the plant/machinery used. At the same time, opportunities are created for materials suppliers and manufacturers, financial institutions and professional firms. Indeed, construction projects offer meaningful employment opportunities to a wide spectrum of the labour force, ranging from unskilled workers to professionals.(Watermeyer, 1993 a).

In recent years, following the successful implementation of job creation programmes in Kenya and Botswana, South African civil

engineering projects have been critically examined to see if more job opportunities can be created to provide relief to the masses of unemployed. As a result, the terms labour-intensive, labour-based and, more recently, community-based construction have entered the vocabulary of South African engineers. At the same time, labour-based construction has been linked to the development of emerging contractors.

This paper reviews some of the current trends, thinking and practices in the construction industry.

South African construction practise

Trends

In recent years, the South African civil engineering industry has followed North American and European mechanisation trends and has favoured plant over manual labour. However, the ever rising cost of such plant and the ever increasing levels of poverty and underemployment have caused the industry to re-examine this policy. At the same time, funding bodies such as the IDT, the DBSA and the Department of Transport and forums such as the National Economic Forum have recognised the potential for job creation in the civil engineering industry should labour-intensive methods of construction be employed and have encouraged the industry to make more use of labour by making funds available for labour-intensive type projects.

Employer, professional and worker bodies representing the industry, namely, SAFCEC, SAACE, SAICE, IMIESA, SARF, COSATU and SANCO became signatories to a Framework Agreement for use on public works where labour-intensive and labour-based construction systems are employed. This frame work agreement provides guidelines for the preparation of contract documentation, training systems and task-based payment systems and conditions of employment as well as criteria for the selection of persons for employment.

Current practice

The civil engineering industry in South Africa differs in many respects from the building industry. The building industry, particularly in the area of house construction, has developed and promoted the emergence of small contractors who may operate at one of three levels, viz., they may provide all the labour and materials to construct the complete house, or they may provide labour only, or they may provide labour only for a specific trade. Small contractors able to operate at one or more of these levels in the building industry can be found within a large number of communities in South Africa. This is not, however, true of the civil engineering industry (Watermeyer 1993 b). The current Wage Order which is issued in terms of the Labour Relations Act of 1961 and regulates employment conditions in the civil engineering industry, does not permit the use of task-based payments on projects. Consequently the agreement in principal on the introduction of a task-based payment system by the participating

bodies in the Framework Agreement is of major significance to the industry.

Traditionally, engineering services and structures are constructed by established contractors, whose operations are highly mechanised. These contractors possess all the resources required to execute the projects, viz., labour, materials, machines and money. They have the finance required for salaries and wages and the purchase of materials, the credibility in commercial circles to obtain sureties, to open accounts with suppliers and to hire plant, the managerial, commercial, technical and administrative skills required to secure and execute contracts. The bulk of their labour force is, normally, recruited from a specific area and, as a result, the community for which the service is constructed is, in the end, left with the service, but with little else, since a negligible percentage of the money spent on the project stays within the community (Watermeyer 1993a).

The barriers which prevent local entrepreneurs or small building contractors in a local community from engaging in civil engineering construction are (Watermeyer, 1993b; Watermeyer and Davis, 1993):

- Tendering and contractual requirements, such as the provision of sureties, the inclusion of penalty clauses and the tendering of rates.
- The prevalence of plant-based construction practices.
- The lack of financial resources to purchase materials, hire plant and tools and to pay wages.
- The lack of credibility in commercial circles.
- The lack of commercial, managerial and administrative skills.
- The discontinuity of work.
- The lack of technical competence.

A recent survey was conducted on behalf of the National Housing Forum into the barriers which prevent small scale enterprises from realising opportunities presented by the provision of housing (Watermeyer and Band, 1994). Different categories of opportunities were examined, viz. construction of houses, construction of infrastructure, manufacture of materials, construction of amenities, provision of transport, maintenance of services and buildings, selling and renting and the provision of professional services. The writers of the report, after analysing the responses to a questionnaire, concluded that:

- Lack of financial resources, with the exception of the selling and renting category, appears to be the main barriers to entry.
- Inability to obtain credit where purchase of materials is required is a major barrier to entry.
- Lack of credibility, with the exception of the categories for manufacture of materials appears to be a major barrier to entry.
- Lack of commercial, managerial and administrative skills, lack of technical knowledge and discontinuity of work, may be regarded as major *barriers in most categories*.

The writers of this report also remarked that *in none of the categories*

was numeracy or literacy seen to be a major barrier, and that with the notable exception of the category for construction of houses, lack of technical knowledge/expertise is considered to be a major barrier.

Emerging practices

In South Africa, machines are available to facilitate most aspects of construction. Consequently, established construction practices in South Africa have become plant- based and projects are planned and designed around the plant available. As a consequence, labour-intensive and labour-based construction practices are approached differently to elsewhere in Africa.

Before embarking upon a particular construction project it is important to have a clear and fundamental understanding as to what is meant by the various terms and how each form of construction differs from each other. Plant-based, labour-intensive, labour-based and community-based construction may be defined as follows (Watermeyer and Band, 1993):

Plant-based construction

The effective employment of technologies in the implementation of projects which are designed to maximise the use of plant and minimise the size of the workforce.

Labour-intensive construction

The substitution of labour for construction plant in plant-based projects to achieve as great a component of labour on a project as is technically feasible, whilst achieving the standard of construction specified.

Labour-based construction

The effective employment of appropriate technologies and labour-intensive methods on projects which are specifically designed to maximise the involvement of a workforce recruited in a specific locality and the transfer of skills and competencies to that workforce.

Community-based construction

The use of labour-based technologies and labour-intensive methods on projects in which the community is, in addition, involved in the commercial, managerial and administrative aspects so as to maximise the amount of funds retained within community and to transfer skills and competencies to the community.

There are fundamental differences between labour- intensive, labour-based and community-based construction. Labour-intensive construction is concerned with substituting labour for capital intensive plant and as such is concerned with increasing the number of employment opportunities per unit of expenditure. Labour- based

construction, however, incorporates a blend of labour and light equipment. It uses labour-intensive construction methods but with the aim of creating employment opportunities for work forces in targeted localities, with a specific view to transfer skills and competencies to that work force, i.e. it seeks to mobilise and utilise local labour resources. Labour-intensive construction seeks to maximise the use of labour; labour-based construction to optimise the use of labour. Labour-intensive construction serves, in the short term, to increase the number of unskilled jobs available and provides a measure of relief to depressed communities. Labour-based construction, on the other hand, benefits a community by not only creating employment opportunities but also by facilitating the acquisition of technical skills. In community-based construction projects, the focus is on involving the community in the management and administration of labour-based construction projects, to promote the emergence of local contractors and to mobilise and utilise the resources of the community in an optimal manner.

The goals and objectives of these forms of construction are very different. The benefits accruing to a community depend upon the construction method that is adopted.

With regard to targeting, labour-intensive construction is concerned with the increase in the number of employment opportunities that are created; labour-based construction with the earning capacity and increase in spending on the local labour force and community-based construction with the amount of project expenditure retained by the community.

Labour-intensive and labour-based construction

General

The ILO has been involved in a world employment programme since 1970 which has sought to substitute labour for capital in a cost effective way. Its focus, however, has been on the construction of rural roads. The ILO's experience of Public Works Programme in Africa, albeit multisectoral at the outset, is that these programmes camp around the construction and maintenance of rural roads and occasionally include irrigation works. Recently, the organisation has been mobilising communities to work on their own needs in urban areas where unlined open drains have been constructed to attend to stormwater problems (Morris 1994).

The roads which have been constructed in these rural road programmes are classified as low (less than 20 vehicles/day) and medium volume roads (up to 100 vehicles/day) (Morris 1994), e.g. in Kenya the typical design standards were 10-30 light and medium vehicles per day in all weather passage at a speed of 30 km/h (McCutcheon 1989). With regard to the irrigation projects, all pipelines were gravity (as opposed to pressure) pipelines (Morris 1994).

In South Africa, on the other hand, labour-based methods of

construction have been employed on projects which include rural roads (Markman 1991, Boothway 1993, Scott 1993), low level bridges (Otte et al 1993), dams (Manson 1993), residential roads using waterbound macadam bases (Watermeyer 1992, Harrison 1993), block paved roads (Kelly 1993), water and sewerage reticulations for townships (Saxby 1993, Watermeyer 1993 a, b, Powers et al 1994), bituminous surfacing of roads (Powers et al 1994) and low voltage electrical reticulations (Watermeyer 1993a, b).

Traditionally, the construction industry has been viewed as an industry which produces a high rate of employment per unit of expenditure. Labour-intensive methods of construction and labour-based technologies have been effective in improving upon these figures; e.g. in Soweto's Contractor Development Programme, the multiplier in employment opportunities has been found to be (Watermeyer et al 1994):

- excavate and backfill for water reticulation - 1,9
- excavate, lay pipes and backfill water reticulation - 1,4
- construct concrete block paved roads - 2,3
- construct waterbound macadam roads - 4,7

The average cost in South Africa to generate a man-hour of employment in the civil engineering industry currently amounts to R37. The building industry, on the other hand, is less machine orientated and, to a large extent, is labour-based by nature. In house construction, depending upon the standard of housing required, the cost per man-hour of employment generated lies between R19 and R28 (Watermeyer and Band 1994).

The current cost per man-hour of employment on projects involving the construction of water pipelines and surfaced roads in Soweto, where labour-based construction practices are employed, ranges from R17 to R19 (Watermeyer et al 1994). Labour-based construction practices have enabled the construction of township services to yield more employment opportunities per unit of expenditure than is the case for house construction.

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Approaches to implementation

Labour-intensive construction methods and labour-based technologies are currently implemented in Southern Africa in one of 5 approaches or a combination thereof, (Watermeyer, 1992; McCutcheon et al 1992), viz:

- The Public Sector approach, whereby workers, predominantly labourers are trained and employed directly to perform specific tasks.
- The Conventional Contractor approach, whereby restrictions on the use of plant and training obligations are imposed on such contractors.
- The Managing Contractor approach whereby an experienced contractor contracts to administer, manage, finance, train and supply materials and equipment to nominated labour-based sub-contractors.
- The Development Team approach, whereby professionals and specialists provide support to a labour-based contractor in administering and managing his contract, financing the contract, giving technical training, engaging specialist contractors and supplying materials and equipment.
- The Project Manager or Managing Consultant approach whereby a project manager in addition to providing conventional engineering services undertakes to manage labour-based contracting teams and thereby provide the support, materials, training and equipment required by such teams.

The contractual relationship between the participants involved in the above mentioned five basic approaches are illustrated in Figure 1.

If labour-intensive construction methods were cheaper than conventional plant-based methods to implement conventional contractors would have utilised such methods to obtain a competitive advantage in tendering on the open market. It is for this reason that the aforementioned approaches have been developed.

All the approaches have demonstrated that it is possible to implement labour-based and labour-intensive construction using the methodologies associated with the particular approach in given circumstances and with specific objectives in mind. However, in the

Project Manager or Managing Consultant Approach, an approach which has been regarded by many to be an interim method, accountability cannot be adequately assigned as there are conflicts of interest and split responsibilities inherent in the contractual structures of such projects.

Each approach is structured to achieve distinctly different objectives and to deal with differing circumstances, both in rural and urban areas.

The Conventional Contractor approach can be used to employ targeted labour on projects. However, this approach does not develop or necessarily employ local small scale contractors in the construction process. On the other hand, the Managing Contractor and Development Team approaches make use of and develop local contractors and sub-contractors in the implementation of labour-intensive methods and labour-based technologies, and as such promote community-based construction. These two approaches can also be used to develop contractors in a contractor development programme. Both these approaches can be structured to adequately address the client's risk associated with engaging emerging contractors to construct infrastructure and the like.

Wages and productivity

Wages and productivity on projects in South Africa where labour-intensive methods and labour-based technologies have been employed, vary widely. Minimum wage levels range from R7-00 per day to about R43/day. Current legislation determines the minimum wage levels applicable to the formal sector of the industry (Watermeyer and Band 1994).

Productivity, on the other hand, is dependant on the method of payment to labourers and is highest where labourers are paid on a piecework basis, i.e. on the number of tasks completed in a day.

Productivity is also dependant, to a lesser extent, upon the following:

- skill of management.
- skill of labourers.
- wage levels.
- climatic conditions.
- supply of quality hand tools.
- physical conditions such as ground conditions, depth of excavations, etc.
- work ethic of labourers.

Excavation rates for pickable material on various projects in South Africa are reproduced in Table 1 (Watermeyer and Band, 1994). The very low productivities relate to "relief type projects" where wages were extremely low. On the other hand, on projects where emerging contractors have been encouraged to employ a task-based payment system and to base remuneration for tasks completed on the prevailing statutory minimum hourly rates, as is the case in Soweto's Contractor Development Programme, productivity is high. In Soweto, excavation

rates for a 6 hour task are between 3 and 4 times higher than that achieved on projects funded by the sale of the strategic Oil Reserves and compare favourably with standard production rates suggested by the World Bank and that achieved in the Kenyan Rural Roads Programme (Watermeyer, 1993c).

Table 1: Trends in excavation rates for pickable material in various projects.

Project/Programme	Production rates for Excavation in Pickable Material
Soweto's Contractor Development Programme	2,8 to 3,2 m ³ /6 hour task
Kenyan Rural Roads Programme	3,0 m ³ /man day
Kwa Zulu road construction	0,7 to 1,0 m ³ /man day
Kwa Zulu road construction	0,3 to 1,1 m ³ /man day
Gazankulu and Venda	1,0 m ³ /person day
Ciskei	0,6 to 0,8 m ³ /man day
Ilinge	2,3 m ³ /man day
Ibhayi	6,0 m ³ /man/day
Siviele Konstruksie	5-12 m ³ /man day
SAFCEC- up to 1,0 m deep	2,5-5,0 m ³ /man day
- up to 1,5 m deep	1,1-4,0 m ³ /man day
World Bank standard	3,0 to 4,0 m ³ /man day

Activities such as excavation and backfilling by hand on projects involving the construction of roads and the installation of services create the most job opportunities. The approaches on projects to these two activities vary greatly, e.g., on certain projects it is obligatory to excavate trenches to a depth of up to 1,5 m in soft material by hand and thereafter to use conventional plant, whereas in Soweto an earthworks classification for 5 types of materials is used in terms of which no construction plant other than compressors are used to excavate non-pickable material. (see Table 2). Typical production rates, based on the authors' experience, for a 6 hour task, in soft materials where the depth of the excavation does not exceed 2,5m are presented in Table 3.

One of the major obstacles perceived by the formal civil engineering construction industry in the implementation of labour-intensive methods of construction, are the provisions of the Wage Order issued

in terms of the Labour Relation Act. This wage order prescribes a minimum wage level and permits employees to be remunerated on a piecework basis provided that such remuneration is not less than that which would have been paid, had the employee been remunerated on the basis of time worked. The wage order, however, does not apply to an employer who does not employ more than twenty employees at all times and whose annual turnover does not in any 12 month period exceed R 1,000,000.00. Thus in effect, small scale enterprises in many instances, are not required to remunerate employees in accordance with the prevailing minimum wage.

Table 2: Classification of materials.

Classification	Description
Soft, class 1	Material which can be excavated by means of a suitable shovel without the use of a pick or other hand swung tool.
Soft, class 2	Material which can be readily excavated with the aid of a pick or other hand swung tool.
Soft, class 3	Material which can be excavated with difficulty with the aid of a pick or other hand swung tool.
Intermediate	Material which is difficult to excavate by hand even with the aid of a crow bar and requires the assistance of pneumatic tools for economical removal.
Rock	Material which cannot be economically fragmented and loosened for removal by hand implements and pneumatic tools, except by drilling and blasting or the use of rock breaking equipment.

Table 3: Trench excavation rates for a 6 hour task.

Excavation Type Typical Production per 6 Hour Task for Depth Range (m3)

	0 - 1,0	1,0 - 1,5	1,5 - 2,0	2,0 -2,5
soft class 1	3,5	3,0	2,4	1,6
soft class 2	2,8	2,4	1,9	1,3
soft class 3	1,7	1,5	1,2	0,8

Organised industry has argued that labour-intensive construction methods are only cost effective where labourers are paid at wage

levels below the minimum wage and are remunerated on the basis of tasks completed. In terms of the Framework Agreement, civil engineering contractors on projects which meet all the requirements relating to the selection of persons for employment, training and task-based payments, may remunerate labourers at wage levels below the prevailing minimum levels and on the basis of tasks completed. On the other hand, Watermeyer and Band (1994) in a report commissioned by the National Housing Forum, concluded that :

- Projects accredited in terms of the Framework Agreement will probably attract a premium of up to 15%.
- Projects implemented using the Conventional Contractor Approach, where labourers are paid sub minimum wages, attract highly variable tenders, the range being from small cost savings to significant cost premiums.
- Projects where local small scale emerging contractors have been employed have attracted little or no cost premiums and in some instance have realised significant savings.
- Wage rates have been highest where small scale emerging contractors have been engaged to implement labour-intensive methods and labour-based technologies on projects.

Community based construction

General

Community-based construction in a sensitive and non- imposing manner aims at the use of labour-based projects to promote the emergence of local entrepreneurs who, with adequate technical, commercial and financial support and instruction, can, in due course become fully fledged contractors/subcontractors, should they so desire. Community-based construction practices make use of technologies which optimise the use of labour and methods of construction which maximise the use of labour in a cost effective manner, and implement these employment intensive options in construction by means of small scale contractors.

In community-based projects, members of the community can also become involved in the:

- operation of stores facilities.
- support provided to local contractors e.g. administration, monitoring of progress.
- transport of materials to local labour-only contractors.
- manufacture of certain materials.
- supply of minor materials.
- security of the site.

and, in so doing, be meaningfully exposed to management and administrative activities and further benefit from the employment and entrepreneurial opportunities presented thereby.

If communities are to be engaged as contractors in construction, changes both in the construction method and construction process are

required.

Development support required

Local entrepreneurs from underdeveloped communities cannot engage in construction without developmental support and the acquisition of external resources. The question which then arises is how should the support be rendered?

Various methods to implement labour-based technologies and labour-intensive methods and to facilitate the involvement of entrepreneurs from targeted communities are presented in the report commissioned by the National Housing Forum (Watermeyer and Band 1994). In this report, two approaches are recommended for engaging local contractors in civil and electrical construction projects, viz., the Managing Contractor and Development Team approaches. The Development Team approach ensures that the ownership of the project remains with the community and readily allows the community to participate in construction and materials management and other construction related activities. The Managing Contractor approach, on the other hand, is somewhat restricted in scope and permits the community only to own subcontracts. The contractor support mechanism between the two approaches are, however, similar. To illustrate the support mechanisms and to demonstrate how communities can be meaningfully engaged in as wide a scope of construction activities as possible, the Development Team approach will be used to illustrate the necessary developmental support required.

The development team approach

In the Development Team Approach, experienced and suitably qualified persons assist local community-based contractors with the administration and management of their contracts, offer technical training, engage specialist contractors, and supply the necessary materials and equipment. In addition, the development team employs and trains members of the local community to run stores facilities, monitor progress, assist with administration, etc. Normally, the local contractor enters into a contract with the client/funding body and the development team is appointed on a fee basis directly by the client. The development team may be regarded as construction facilitators who arrange to provide resources that the contractor lacks. In a community-based project, the Development Team must ensure that certain specific functions are carried out, normally by the following individuals who assume distinct responsibilities:

- The Design Engineer.
- The Engineer.
- The Construction Manager.
- The Materials Manager.

Experienced contractors, project managers or consulting engineers may perform the duties and assume the responsibilities of the Construction and Materials Managers. However, the design and

supervision of the works, i.e., the duties and responsibilities of the Design Engineer and the Engineer must be undertaken by Professional Engineers or Technologists.

It should be noted that the Construction and Material Managers are appointed by the client on a fee basis in terms of a scale of fees. Thus the contractor is motivated by profit to successfully complete his contract whereas the Development Team is motivated by seeking to secure another appointment. Model forms of agreement have been written for the appointment of Construction and Materials Managers (Soderlund and Schutte, 1994).

The developmental support provided by the Construction and Materials Managers may be summarised as follows:

Construction Manager

- offer advice, practical assistance and training
- provides plant other than small tools
- arranges for specialist work
- arranges for payment of fortnightly/weekly wages
- transport of materials to site

Materials Manager

- provides all material

In terms of the model form of agreement, the Construction Manager is required to advise, assist and train on-the-job the contractor in the execution of his contracts and to this end shall make visits to the Site at such intervals as he deems appropriate during the various stages of construction in order to ensure that the Contractor makes satisfactory progress, shows technical competence in the execution of all aspects of the works and generally fulfils his contractual obligations. The Construction Manager shall procure the services of site staff, as necessary, to assist him and provide continuous support to the Contractor in order to ensure that the Client's objectives are achieved.

The Construction Manager cannot, however, ensure the performance of the Contractor, nor guarantee against any failure by the contractor to perform his work in accordance with the Contract (Soderlund and Schutte Inc, 1994).

The Construction Manager's function is therefore to minimise the client's contractual risk and to meet the client's objectives of having the works constructed to specification within a specified period and a given budget using community-based contractors and labour-based construction practices (Soderlund and Schutte Inc, 1994). Thus the client has the assurance that the local small contractor, by relying on the support provided by the Construction Manager, will have the necessary skills available to adequately complete the contract (Watermeyer and Band, 1994).

It should be noted that the Construction and Materials Manager carry

professional indemnity insurance which can be called upon in the event of negligence on their part.

The support provided is flexible and can be varied depending upon the needs of the community, e.g., if the community is capable of procuring the materials, then there would be no need for a Material's Manager.

Community-based developments

The Managing Contractor and Development Team Approach are not the only way in which communities can become involved in construction projects. The range of options include (Watermeyer and Band, 1994):

- Labour Pool Worker Programme (NCLIC Framework Agreement type approach).
- Managing Contractor.
- Development Team Approach.
- Main Contractor.
- Contractor Team Approach.

Depending upon the community's requirements and the resources and expertise available, any combination of the above mentioned approaches can be utilised to facilitate community involvement as illustrated in Figure 2.

There are different emphases on community involvement and training opportunities in the aforementioned approaches to implementation, the differences are briefly listed hereunder (Watermeyer and Band, 1994).

Labour pool worker programme approach

- job creation.
- training of labour in the appropriate skills required to do a particular project.
- ownership of contract rests with main contractor.

Managing contractor approach

- training as for Labour Pool Worker Programme plus management training.
- ownership of contract as a whole rests with the main contractor but nominated emerging sub-contractors owns subcontracts.

Development team approach

- job creation and entrepreneurial development.
- involvement of community in contractor support systems, management of emerging contractors and materials supply, transport of materials and security of site.
- training as for Managing Contractor Approach and Labour Pool Worker Programme plus training in commercial and

- administrative aspects.
- emerging contractor has ownership of contract.

Main contractor approach

- assets creation.
- training of contractor's staff in the traditional manner.
- ownership of contract rests with the main contractor.

Contractor team approach.

- job creation and small scale enterprise development.

Mentorship approach

- coaching and mentoring and emerging contractors.
- rendering assistance in the setting up of proven systems.
- enhancing business and management skills.

Joint venture

- business development.

Cost retained by the community

The amount of construction cost retained by the community gives an indication of the degree to which entrepreneurship and small scale enterprises are promoted in the community and is a direct measure of the benefit accrued by the community from the project as well as that of economic empowerment. (Watermeyer et al, 1994).

In community-based construction projects in Soweto, where materials are not manufactured by the community, the amount retained by the community varies from 37 to 50%, depending upon the cost inputs relating to materials. This is achieved through the community's involvement in the construction contracts (25-33%), transport of materials (2 - 9%), construction management (6-7%) and materials management (2-3%) (Watermeyer, et al, 1994). In house construction, the cost retained by the community by means of community-based construction practices can be in excess of 40% (Watermeyer and Band, 1994). Where communities engage in the manufacture of materials, these percentages will increase.

Contractor Development Programme

General

The employment of local entrepreneurs in community-based developments has led to the establishment of contractor development programmes. Details of such programmes have been published by Watermeyer (1992) in a manual on Soweto's Contractor Development Programme, Watermeyer and Band (1994) in a report commissioned by the National Housing Forum and Milne (1994) in a DBSA

publication.

Watermeyer and Band (1994) suggest that a contractor development programme (CDP) should be based on the following convictions:

- An excellent bricklayer does not necessarily make a good contractor.
- A successful contractor must possess certain practical, theoretical and managerial knowledge in addition to individual flair (entrepreneurship).
- Professional management, supervision and training should be used to improve/transfer skills and to ensure satisfactory progress on projects.
- Commercial skills, which are an important factor in a contractor's success, should be taught
- A skill is normally developed by repeating the same work on a repetitive basis.
- Participants with suitable experience should be allowed to enter the programme at their level of proficiency and not be forced to enter at a beginner level.
- Not all small scale enterprises will necessarily grow into medium and large scale enterprises.
- Participants should not be allowed to "camp" in the programme (i.e. operate solely on a continuous basis within the programme) and should be encouraged to leave and return to the programme from time to time.
- Certain small scale contractors may elect to operate as labour-only contractors/subcontractors and not express any desire to progress beyond this level of operation.
- The contract documentation employed should enable emerging contractors to become familiar with industry standards to enable them to ultimately compete in the formal sector of the economy.
- The selection of emerging contractors for participation in a CDP should be on the basis of open tenders.
- Development support provided should be aimed at enabling emerging contractors to operate in the formal sector of the economy.
- Credibility and financial security are earned through training and through successful, profitable, completion of projects.

They also suggest that a CDP should offer emerging contractors the opportunity to mature into a contractor/subcontractor who has all the resources to execute a project or portion thereof. Such a programme should therefore allow emerging contractors to develop:

- Commercial skills.
- Managerial and administrative skills.
- Credibility in commercial circles.
- Experience in pricing complete contracts while accepting increasingly greater risk and contractual responsibility.

The structure of a CDP should be such that the supporting structures and the associated construction processes, effectively eliminate the barriers to entry, for those entering the programme and reimposes

these barriers as emerging contractors are developed within the programme. This should be done in such a manner so as to enable contractors leaving the programme to compete in the formal sector of the economy at their level of proficiency. At the same time, the CDP should encourage entrepreneurial flair, provide training to enhance business skills and enable participants to learn and mature through experience.

Watermeyer's Contractor Development Programme in respect of civil and electrical contractors

A CDP needs to be structured in levels of contract to enable emerging contractors who have different proficiencies, aspirations, business acumen and size of businesses, the opportunity to enter and exit the programme at various stages. At the same time, the levels of contract need to be structured in such a manner that those leaving at any level or stage, can function without developmental support in the formal industry, and those within the programme have reduced and appropriate developmental support at each successive level of contract, with increased contractual responsibility and risk

Five levels of contract are proposed, viz.:

- Level 1 : labour only.
- Level 2 : labour plus transport of materials to site.
- Level 3 : labour plus transport plus materials (assisted).
- Level 4 : labour plus transport plus materials (unassisted).
- Level 5 : labour plus transport plus materials plus full surety.

The contractual responsibilities and developmental support required for each level of contract is summarised in Table 4 and the proposed value and duration of contracts at each level is tabulated in Table 5.

The levels of contract can also be viewed as the re- introduction of the barriers to entry with each successive level of contract to ensure that emerging contractors can be integrated into the mainstream of the economy. This is demonstrated in Table 6.

The 5 levels provided for in the programme are structured in such a manner that a contractor, who has no resources when he enters the programme, can build up his resources while he learns tendering and contracting skills. This is generally achieved by putting profits back into his business. Credibility in commercial circles at the higher levels of contract can be established by successfully completing a number of lower level contracts.

Not all contractors will, necessarily, advance to Level 5 and some may only aspire to Level 2 or 3. The programme caters for all levels of contract and allows contractors to operate in a manner similar to that of the building industry. Competent contractors who operate at Level 2 could, for example, leave the programme and successfully operate as labour only subcontractors to established contractors, on other projects outside of the programme. The programme, by virtue of providing contract opportunities for all levels of work, will also provide

emerging contractors with opportunities for continuity of work. The opportunities for contractors who leave the programme and the qualifications of those who enter the programme are depicted diagrammatically in Figure 3.

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Table 4: Contractual responsibilities and developmental support required for each level of contract.

Level of contract	Type of support	Contractor's contractual responsibilities	Degree of Development Support Provided
1	Construction & Materials Manager	Provide labour Provide small tools	Offer advice, practical assistance and training. Provide and transport materials to site. Provide plant other than small tools. Arrange for specialist work. Arrange for fortnightly wages.
2	Construction & Material Manager	Provide Labour Provide small tools Transport material from yard to site Provide certain materials.	Offer advice, practical assistance and training. Provide most materials. Provide plant other than small tools. Arrange for specialist work. Arrange for fortnightly wages.
		Provide Labour	Offer advice, practical assistance and training.

3	Construction & Material Manager	Provide small tools Provide site office and certain storage facilities Provide all materials.	Provide plant other than small tools. Offer materials for purchase. Arrange for monthly wages. Arrange for specialist work.
4	Mentor	Provide labour, materials and plant. Provide 5% surety. Engage specialist contractors. Finance all contractual obligations.	Conduct a tender workshop. Advise, coach, counsel, guide, teach, instruct and tutor the contractor. Render assistance in the setting up of proven systems to enhance management and business skills.
5	Mentor	As for level 4. Provide 10% surety	As for level 4.

Table 5: The duration and value of contracts.

Level of Contract	Typical Contract Duration	Typical Contract Value
1	3 to 4 months	< R100 0001
2	3 to 7 months	< R250 0001
3	6 to 9 months	< R1 200 000
4	up to 12 months	< R1 000 000
5	up to 18 months	< R2 000 000

1 Labour only

Table 6: Resources required by contractors at each successive level of contract.

Level of Contract	Additional Resources Required
	Transport or access to transport.

2	Finances for transport and the supply of minor materials.
3	Finances for fortnightly wages. Credit with materials suppliers.
4	Finances for wages. Credit for plant hire and purchase of materials. Access to a surety equal to about 5% of the value of the Works.
5	All the resources of a conventional contractor. Access to a surety equal to 10% of the Works.

Milne's Contractor Development Framework

Milne in the DBSA publication *Guidelines for emerging contractor development* defines five levels of contractor (see Table 7) being artisan assistant (Level 1), artisan (Level 2), emerging small contractor (Level 3), established small contractor (Level 4) and established large contractor (Level 5). Watermeyer and Band (1994), however, point out that this *classification can be readily modified to include the sub-contracts arena i.e. artisan assistant (Level 1) and artisan (Level 2), as before, followed by "emerging small sub-contractor", (Level 3) "established small sub-contractor" (Level 4) and "established large sub-contractor". There is, however, an inference in this classification that a contractor or sub-contractor must have been an artisan first. This is not usually the case with all the medium to large established contractors who currently exist. Accordingly, this classification is a misnomer.*

Milne's contractor classification and framework is based on a presentation to the Small Contractor Action Forum during February 1990. The framework for contractor development, as shown in Table 7, is based on guiding principles which differ significantly from that proposed by Watermeyer and Band. Contract types, documentation and tender procedures at the lower levels of contract are very different from industry norms. The framework is also written around technical and managerial counselling and training at the lower levels of contract as opposed to proactive on site, continuous management support and "on the job training" provided for in Watermeyer's classification. Watermeyer's contractor classifications, on the other hand, was developed by the Soweto Project Team during 1991 and was first published in the final draft of the DBSA's guideline document and thereafter in the project team's manual entitled *Contractor Development in Labour-Based Construction*. The team identified 5 areas or components of civil construction viz. labour, transport, materials, plant and finance. These components were ranked in order of complexity and each level of contract was intended to introduce contractors to each of them in a progressive manner. During 1993, when the form of contractor support at the higher levels of contract

were fully developed and documented, the levels of contractor at levels 3, 4 and 5 were modified to their present descriptions. It is important to note that the fact that both Watermeyer and Milne have chosen five levels of contractor categorisation is coincidental as the levels have considerably different meanings. These differences are highlighted in Table 8.

Table 8: Differences in levels of civil engineering contracts between that proposed by Milne and Watermeyer.

DBSA (Milne)	CDP (Watermeyer)	
Field of Operation	Construction	Civil Works
Level 1	Artisan Assistant	Labour only contractor
Level 2	Artisan	Labour plus transport contractor
Level 3	Emerging small contractor	Labour plus transport plus materials
Level 4	Established small contractor	As level 3 plus limited sureties
Level 5	Established large contractor	As level 3 plus full sureties

Watermeyer and Band's Contractor Development Programme in respect of building construction

Building construction differs appreciably from civil engineering construction in respect of contractor development. The principal reason for this is that building construction is to a large extent reliant on the availability of competent sub-contractors. Many of the large formal contractors dig the excavations, pour the foundations and use sub-contractors to continue and complete the construction. Some contractors even employ sub-contractors to excavate and cast the foundations. The main contractor, therefore, frequently operates as a provider of materials for labour only sub-contracts and as a project manager who controls the programme and the budget, and provides foremen to check the quality of the work provided by sub-contractors. Contractors can be classified as falling into one of the following five categories :

- labour and materials contractors.
- labour only contractors.
- labour and materials sub-contractors.
- labour only sub-contractors.
- materials only managing contractors (nominal labour force).

Most reasonably sized projects comprise a combination of contractors, labour and materials sub-contractors and labour only sub-contractors.

In the Contractor Team Approach, individuals who assume responsibility for a trade (e.g.. bricklayer, carpenter, plumber, painter,

electrician, etc.) or aspect of the works (e.g.. excavation) are brought together to form a construction team. Each team member operates as a sub- contractor in his own right and is remunerated on the basis of the accepted "market rate". Prices which are too low or too high are not accepted. Certain rules are laid down to ensure that contractor teams complete projects on time, to the correct quality, and within budget.

The necessary support required on a project where the Contractor Team approach is adopted, is the overall site management and the management of the materials. These functions can be performed by one or two organisations, as appropriate. Such organisations may be either a main contractor or a company which has the appropriate skills. The functions of these two support groups are as follows:

- Site management (Site Agent). Responsibility for the overall management of the site, and to ensure parties adhere to the systems prescribed on a particular project.
- Materials management. Responsibility for procuring, storing and issuing materials to the respective contractor teams.

The development support which is provided in the Contractor Team Approach, is similar to that in respect of the Managing Contractor and Development Team Approach proposed for civil and electrical construction projects. The basis of the appointment of organisations to undertake responsibility for the site and materials management functions is dependent on the developing agents' requirements and organisational structures. Organisations can either contract to perform these functions or be appointed on a fee basis. Wherever possible, members of the local community should be trained to enable them to become involved with these functions to further increase the benefits accruing to a community.

Small scale entrepreneurs can develop along two distinct paths in this approach, viz.:

- Sub-contractor Each of the contractor team members have the opportunity to develop as sub-contractors in their own right. The building industry is dependent on the depth and strength of its sub-contractors and within each project where the Contractor Team Approach is used, there must be training in the management skills necessary for the sub-contractor to run his own business.
- Contractor Contractors develop along two routes in the Contractor Team Approach. One of the team leaders from a particular team can take over the role of contractor, if he demonstrates his leadership and organisational attributes to the rest of the team. With the necessary training and the experience gained on site, such contractors have the potential to develop into fully fledged contractors, (See Figure 2.) The remainder of his team can either continue to operate as sub-contractors or join the entrepreneur as a part of his management team.

The manner in which the both contractors and sub- contractors develop, is shown in Figure 2. This figure shows the various

development routes which are possible for emerging sub-contractor and contractors. Not all entrepreneurs will aspire to become main contractors. Many large, medium and small formal sub-contractors, (labour only and labour and materials), have developed their organisations on the basis of one trade only and operate particularly successful businesses. It is therefore unrealistic to assume that the sole objective of such a programme is to produce main contractors. Nevertheless, the opportunity to do so must be built into the programme.

The approach indicated in Figure 2 shows the several courses of action open to those entering the house building arena as well as for those already operating within the industry.

Members of the community can enter projects as members of "contractor teams", labour-only sub-contractors or labour-only contractors. Individual members of "contractor teams" have the opportunity to become labour-only sub-contractors, labour only contractors, labour and materials sub-contractors, joint venture contractors or main contractors in their own right. Labour-only sub-contractors, on the other hand, (generally sub-contracted to the main contractor) have the opportunity to become contractor teams, labour and materials sub-contractors or labour-only contractors. Labour-only contractors have the opportunity to become contractor teams or become main contractors. Labour and material sub-contractors have the opportunity to become contractor teams, become joint venture contractors, or become main contractors. Joint venture contractors, in turn, have the opportunity to become main contractors.

Backward integration into the system is also possible. For example, a member of the contractor's staff may wish to start a labour-only sub-contract or join the contractor development programme, and so on. The programme affords housing projects the opportunity to maximise the development of human resources.

Looking at the future

Labour-intensive and labour-based methods of construction have a valid place in the South African construction industry and with the spiralling levels of unemployment will be used to create job opportunities. These methods will not replace plant-based methods but will co-exist with such practices.

Labour-based construction practices will probably become more cost competitive since current cost comparisons with conventional construction practices have been undertaken in a recessionary period where plant on most projects has been priced at unrealistically low levels. This trend may continue when current plant requires replacement. Any boom in the industry may result in a shortage of available plant and cause prices to rise sharply. Labour-intensive and labour-based construction practices, if implemented on a large scale and linked to the development of small scale enterprises, could be effectively employed to maintain competition, to stabilise construction costs and to circumvent the purchase of plant by increasing production

capacity.

Communities are expressing a strong desire to participate in the construction and maintenance of their own housing and infrastructure. Accordingly, the demand for community-based construction is going to increase, particularly as communities realise that they can construct their own infrastructure with the support of a developmental team. The cost of community-based construction practices will probably reduce as the level of competence in community-based contractors increases and the developmental support required is reduced. Community-based construction projects will also empower communities to take charge of their maintenance needs.

Certain restructuring of the industry will need to take place to enable small scale enterprises to have adequate market share and to change the distribution of the size of companies which are currently operating. Should the formal sector work together with the informal sector, contractors can develop together to benefit all.

References

- 1 Boothway DP, 1993. Labour-intensive Construction of Rural roads - a Case study: Madedeni Magisterial District SAICE/SARF symposium on Labour-intensive Construction, Midrand, March.
- 2 Harrison DM, 1993. Case study on waterbound macadam road construction in Soweto. SAICE/SARF symposium on Labour-intensive Construction, Midrand, March.
- 3 Kelly PJ, 1993. Concrete block paving for labour enhanced construction. SAICE/SARF symposium on Labour-intensive Construction, Midrand, March.
- 4 Manson EJ, 1993. Case study - rural dam. SAICE/SARF symposium on Labour-intensive Construction, Midrand, March.
- 5 Markman TS, 1991. Labour-based Construction of a Rural road in Kwazulu. Annual Transportation Convention. (Developing Areas), Pretoria.
- 6 McCutcheon RT, 1989. Kenya: The rural access roads programme 1974 to 1986. Labour-intensive Construction - Practical details for success. University of the Witwatersrand.
- 7 McCutcheon RT, van Zyl CWL, Croswell J, Meyer D and Watermeyer RB, 1992. Interim guidelines for labour-based Construction Projects. Development Bank of Southern Africa.
- 8 Milne JC, 1994. Guidelines for emerging contractor development. Development Bank of South Africa.
- 9 Morris D, (International Labour Organisation), 1994. Personal Communications, Johannesburg, February.

10 Powers G, (Power Construction), Potgieter J, (Hill Kaplan Scott Inc.), Judd M, (Ninham Shand Inc.), Burgher G, (Western Cape Training Centre), Stofberg M, (Power Construction), Vorster J, (Wouter Engelbrecht Inc.), Lambrechts A, (BKS Inc.), and Vorster S, (BKS Inc.), 1994. Informal discussions and site visits, Cape Town, January.

11 Saxby R, 1993. The need for commitment of the 4 C's: Client, Community, Consultant and Contractor. SAICE/SARF symposium on Labour-intensive Construction, Midrand, March.

12 Scott H, 1993. Community Contractors and the Construction of Township services. Symposium on Labour- intensive construction, Midrand, March.

13 Soderlund and Schutte Inc, 1994. Community-based construction: Documents for the implementation of the Development Team Approach. Johannesburg.

14 Watermeyer RB, (Ed). 1992. Contractor Development in Labour-based Construction. The Contractor Development Team. Johannesburg.

15 Watermeyer RB, 1993a. Community-based Construction. SAICE/SARF symposium on Labour-intensive Construction, Midrand, March.

16 Watermeyer RB, 1993b. Community-based Construction: Mobilising Communities to Construct their own infrastructure. XXIst World Housing Congress, May, CapeTown.

17 Watermeyer RB, 1993c. Labour-intensive, labour-based and community-based construction: what are their roles in the unfolding new South Africa. Railways and Harbour Division of the SAICE Symposium, Midrand, Oct.

18 Watermeyer RB, and Davies AH, 1993. Professional Support Structures employed in Community-based Construction Projects in Soweto. IMIESA Journal, May.

19 Watermeyer RB and Band NG, 1993. Implementing Community-based Civil and Electrical Engineering Construction Projects. Continuing Education course on Employment Creation in Construction, September, University of Witwatersrand, Johannesburg.

20 Watermeyer RB and Band NG, 1994. The Development of small scale enterprises, skills, entrepreneurship and employment opportunities through the provision of housing. National Housing Forum Working Group 3, Draft, 10 November.

21 Watermeyer RB, Nevin G, Amod S, Hallett RA, 1994. An evaluation of projects within Soweto's Contractor Development Programme. Paper submitted to Civil Engineer for publication. November.