

# EXPLORING INDUSTRY'S CONTRIBUTION TO THE LABOUR INTENSIVE CONSTRUCTION OF LOW ORDER RURAL COMMUNITY ACCESS ROADS

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## ABSTRACT

Due to the persistently high unemployment situation in South Africa, the Expanded Public Works Programme (EPWP) was launched by Government in 2004. Its objective is to provide essential services and infrastructure to disadvantaged communities, develop skills among the unemployed and create the much needed employment through the application of labour-intensive work methods.

Extensive research has been carried out on the effectiveness of this technology by reputable technical institutions including the major universities and the CSIR. In terms of policy formulation, research, organisational measures and also funding, South Africa has certainly done its homework in terms of preparing for a large-scale labour intensive public works programme. Yet, with all these good intentions, it is generally perceived that levels of labour intensity are low and further efforts should be made to increase the use of labour-intensive work methods' (Department of Public Works 2012:1).

It is estimated that only 12 per cent of the road sector expenditure is used for works classified as truly labour intensive projects (Department of Public Works 2012:1). There seems to have been no substantial changes in the extent to which labour-intensive work methods has been utilised in the road works programme.

This paper focuses on the extent to which consultants and contractors in the Civil Engineering Industry are involved in promoting the construction of rural community access roads using labour intensive methods, and to provide an insight into their depth of contribution to the design and construction management, according to the Expanded Public Works Programme guidelines. Recommendations are made on how consultants and contractors could improve the labour intensive component during the construction of rural community access roads.

**Key words:** Labour intensive, low order, road construction and design, construction management, work methods.

# 1. INTRODUCTION

## 1.1 Contextual Background

International and local experience has shown that, with well-trained supervisory staff and an appropriate employment framework, labour-intensive methods can be used successfully for infrastructure projects such as those involving roads, sidewalks, storm water drains, trenches, buildings, water and sanitation. On the basis of this experience, and in the context of high levels of unemployment, the national government has directed that these infrastructure projects must contribute to employment creation (Department of Public Works 2015: iii).

On the 31st of January 2005, in a speech to the Limpopo provincial and municipal government representatives by the Deputy Minister of Public Works, Ntopile Kganyago said: *“We need to remember the law of the country as stipulated in the Division of Revenue Act (DoRA) requires that provinces and municipalities must use the Guidelines for Labour Intensive Infrastructure when using the PIG and MIG budgets for certain types of projects. These guidelines require that provinces and municipalities amend their existing contracts to ensure that certain activities are designed to maximise the use of labour instead of machines.”*(McCutcheon & Parkins, 2009:200).

Labour-intensive construction has been advocated, explored and successfully implemented in Malaŵi, Lesotho, Ghana, Kenya and Botswana’ (Hlabela 2012:23). Based on the number of years of employment created, it is evident that labour-intensive methods of construction are a solution for countries with a high percentage of unemployed and unskilled people and can alleviate poverty. Labour-intensive construction methods have been extensively documented and, therefore, developing countries such as South Africa – with a high percentage of unemployment and poverty – have no reason not to replicate and learn from other countries how to implement such programmes successfully (Hlabela 2012: 23).

## 1.2 Problem Statement

Mashiri, Thevadasan and Zukulu (2005: 869) are of the view that, for community based labour intensive projects to be successful, government needs to not only show commitment to the objectives of the project but also to the aims of poverty alleviation and growing of local economies.

Thwala (2005:849) states that labour intensive programmes generate more direct and indirect local employment opportunities and income by using more locally available inputs (materials, simple tools and local labour) and thus creating a greater demand for local products and services than do the high technology programmes reliant on technology and equipment.

The Expanded Public Works Programme (EPWP) is one of the South African government’s medium-to-long term programmes. It is aimed at alleviating poverty and reducing unemployment. The programme will achieve this aim through the provision of work opportunities coupled with project based training. It is a national programme covering all spheres of government and state-owned enterprises. The programme covers four sectors

comprising (Department of Public Works 2015: iii):

- Infrastructure
- Social
- Non-State Environment, and
- Culture.

The EPWP guidelines aim to provide government and its partners implementing infrastructure sector programmes/projects with the necessary tools to successfully implement these projects using labour Intensive construction methods. These guidelines have been designed with the aim of minimising the additional work required from provincial and municipal officials. The National Department of Public Works is partnering with public and private institutions to develop the capacity of the construction industry to design and manage labour-intensive infrastructure projects successfully (Department of Public Works 2015: iii).

The guidelines contain sections which should be adapted into the relevant parts of the contract documentation for consulting engineers and contractors, based on the specific need. These sections introduce a requirement that certain construction and maintenance activities must be carried out by hand' (Department of Public Works 2015: iii).

An EPWP Project refers to a project that incorporates the following elements to the extent possible: employment creation, labour-intensive methods, local resource optimisation (only use equipment for activities that cannot be effectively done by the use of labour), quality is not compromised, skills development and transfer, community ownership, optimisation of quality cost and time, decent working conditions (fair wages, appropriate provision for safety and health and freedom of association) and lays the foundation for sustainability (Department of Public Works 2015: vii).

The objectives of implementing labour-intensive infrastructure projects under EPWP include:

- Providing employment opportunities and distribution of income through injecting some project funds into the local economy in the form of wages to local poor and unemployed people
- Providing training or skills development to locals employed on the job
- Building quality assets cost-effectively, and
- Development of labour-intensive capacity in the construction industry.

Yet, with all these good intentions, it is generally perceived that levels of labour intensity are low and further efforts should be made to increase the use of labour-intensive work methods.

### **1.3 Study Aim**

This study explores the extent to which consultants and contractors in the Civil Engineering Industry are involved in promoting the construction of rural community access roads, using labour intensive methods, and to provide an insight into their depth of contribution to the design and construction management, according to the Expanded Public Works Programme guidelines.

### **1.4 Study Objectives**

Specific objectives of the study include the following:

- Contribute to the knowledge base of labour intensive construction of rural community access roads.

- Assessing the level and depth of contribution of the Civil Engineering industry to the construction of low order rural community access roads.
- Provide a sense of how contractors and consultants address the needs of the EPWP program concerning rural community access road design and construction.

Based on the results and findings of the research, recommendations are made on how consultants and contractors can improve the labour intensive component during the construction of rural community access roads.

## 2. STUDY RESEARCH METHODS

### 2.1. Study Approach

This case study was restricted to three rural community access roads of eThekweni's outer west region. The participants of the study were eThekweni's Outer West Roads Department, consultants and contractors who have all designed and managed the construction of rural community access roads in the rural communities. As discussed below, a survey was conducted in this research. However, the predominant methodology was qualitative.

A qualitative approach was used in this research to gain the necessary data that will allow for meaning and interpretation of the contribution both consultants and contractors have made in promoting labour intensive road construction methods. This approach allowed for an understanding of motivation and the experiences that both consultants and contractors have had as a result of the design and construction management choices they have made.

### 2.2. Research Questions

Data production was primarily by interviews and survey questionnaires with the companies, contractors and staff from the outer west roads division that have over the past, consistently worked on the construction of rural community access roads.

### 2.3. Study Sample

All low order labour intensive road projects undertaken by the Outer West Municipality of EThekweni from 2015 represented the sample size. For this pilot study, data collected and analyzed for this paper is restricted to three completed projects having the following contract values.

**Table1: Project monetary values**

<b>Project</b>	<b>Contract Value</b>
Project 1	12,2 Million Rand
Project 2	3,2 Million Rand
Project 3	2,8 Million Rand

### **3. DISCUSSION OF RESULTS AND FINDINGS**

#### **3.1. Design and Contract Documentation**

In all three projects, the design was not related and supportive of labour intensive construction methodology. There was no appropriate information to facilitate manual setting out of works or setting out information not reliant on sophisticated survey equipment. The setting out of the road and storm water design relied heavily on sophisticated survey equipment.

The low order rural roads in the three projects were existing gravel roads that required minor realignments, layers works and blacktopping. The contractors when commencing with these projects used the expertise of professional surveyors to set out the works on existing gravel roads. After spending a huge sum of the budgeted item on setting out the works, the contractors realized that they could have used cost-effective manual setting out methods.

All that was needed was a few control points from which setting out could be done. If the design consultant provided information to facilitate manual setting out of the works money would not have been wasted on expensive surveyors using expensive equipment to set out minor works on existing low order rural gravel roads. This saving could have been used in providing informal training to the local labour on how to manually set out the works.

According to the Expanded Public Works Programme guidelines, drawings must be produced and presented in a clear easily understandable way. Where setting out information is provided in the form of coordinates, it should be backed up with methods, not relying on sophisticated surveying instruments, such as offsets measurable with the use of a standard tape. Where possible, appropriated drawings should be produced using a background of ortho photos to provide for easy identification of surrounding features. (Department of Public Works 2015: iii).

The Expanded Public Works Programme guidelines state that items in the bill of quantities that can be constructed labour intensively must have an abbreviated "LI" written next to it and if machinery is used in place of labour the contractor would not be paid for that item. The purpose of which is to prevent the contractor from constructing that item using only machines. The bill of quantities in all three projects did not have any abbreviated "LI" items. When running out of time due to slow progress the contractor used this opportunity to use a paver to lay asphalt rather than use labour to haul and spread the asphalt. This defeated the purpose of it being a labour intensive project. Compaction however had to be done by compaction machinery.

#### **3.2. Qualifications of the Contractor and Consultant**

The Expanded Public Works Programme guidelines state that the staff member of the company who designed the project must be qualified with an NQF 7 (Develop and promote labour intensive construction strategies) qualification. The employers site supervisor qualified with an NQF 5 (Manage labour intensive construction projects) qualification and the contractors foreman qualified with an NQF 4 (National certificate: Supervision of civil engineering construction processes) qualification.

The design flaws of not identifying labour intensive items in the bill of quantities and lack of manual setting out data indicates that the designer did not have the necessary qualifications or experience. The contractors did not appoint a qualified NQF 5 person

from the start of the project. An appointment was made much later in the project. This resulted in a lack of guidance in setting out task rates. The contractors paid a daily wage instead of giving the labour an incentive to complete a task. Labour had no incentive to complete the work timeously. The contractor being confronted with progress delays resorted to the use of machinery to complete the work timeously, which defeated the purpose of it being a labour intensive project.

### 3.3. Compliance from the Contractor and Consultant

The Expanded Public Works Programme guidelines state that the following compliance declaration forms must be used on labour intensive projects.

**Table 2: Compliance forms**

<b>Compliance</b>	<b>Meaning</b>	<b>Responsible Party</b>
Form E1	Guideline for Agreements with consultants responsible for Designing	Consultant
Form E2	For Project Managers supervising implementation of Labour Intensive Projects	Project Manager/Contractor
Undertaking	Consultants appointed on the project confirming they have complied with the EPWP requirements at design and implementation stage	Consultant

None of the above compliance declaration forms were used on these projects.

### 3.4. Training and Employment of Local Labour.

According to the Expanded Public Works Programme guidelines public bodies should ensure that participants employed on their EPWP projects receive accredited training whenever possible. This may be done through submission of training applications to the relevant Regional Office of the Department of Higher Education and Training. Personnel from the National Department of Public Works of Provincial Coordinating Department EPWP units will assist the Public Body to prepare and submit the training applications to relevant Provincial office of the Department of Higher Education and Training or to any other funders like SETAs. The Public Body implementing the project must ensure that training applications for participants are made by its relevant project manager assisted by relevant training officials from the National Department of Public Works.

This, however, did not occur timeously which resulted in the local labour not receiving any accredited training.

The Expanded Public Works Programme guidelines state that an item containing a provisional sum for training of local labour be included in each contract. None of these contracts had an item in the bill that allowed for accredited training of local labour during or prior to commencement of the project. There was also no effort to maximize opportunity for training before the implementation of the project. This resulted in the local labour not knowing how to carry out their appointed tasks when they were initially employed resulting in the contractors being confronted with slow progress and not being able to complete the tasks using local labour. They instead hired machinery to speed up the work.

Another EPWP guideline requirement is that local labour after the completion of the project be given a certificate stating the following:

- The worker's name

- The name and address of the employer
- The EPWP on which the worker worked
- The work performed by the worker
- Any training received by the worker as part of the EPWP
- The period for which the worker worked on the EPWP, and
- Any other information agreed on by the employer and worker.

These projects did not abide by the above requirement. This also served as a double blow to the current contractors who tried employing labour who had no references from their previous contractors resulting in the current contractor not knowing which tasks labour are more proficient in.

The project steering committee was formed too late for these projects. EPWP guidelines recommend that the project steering committee be formed prior to the design and construction of the project. This resulted in the late appointment of a community liaison officer who plays a vital role in helping the contractor recruit the experienced unemployed labour in the ward. This in turn made it difficult to employ temporary workers in accordance with the current Code of Good Practice for Employment and Conditions of Work for Expanded Public Works Programme.

The employment of local labour according to the demographic breakdown recommended by the EPWP guidelines could not be efficiently met. Workers were therefore not employed through a fair and transparent process where they could be classified as poor, unemployed or underemployed and those who lived close to the project area.

### **3.5. Local Emerging Sub-contractors**

Project 1, due to its long duration of two and a half years, helped empower some local talented experienced workers to register as emerging subcontractors. These subcontractors were employed to construct kerbs, manholes, catch pits, storm water channels and loffelstein retaining walls. Project 2 and 3, having a contract period of one year each, found it difficult to help locals become sub-contractors. This problem could have been avoided if the project steering committee and community liaison officer was formed prior to the commencement of the project. More time would have allowed the community to identify experienced unemployed local labour to register as sub-contractors.

The quality of the workmanship of kerb laying by the subcontractors in project one was poor when the work started. The contractor had to carry out informal onsite training with the sub-contractors to bring their kerb laying workmanship up to an acceptable level. Again, this can be attributed to no formalized budget in the bill for accredited training.

### **3.6. Green Jobs**

The Expanded Public Works Programme guidelines state labour intensive projects must promote Green jobs. Green Jobs can be created through a deliberate choice of materials, processes and work methods that rely mainly on renewable resources. The following are examples of infrastructure related elements that can create Green jobs:

- Drainage structure and protection works using natural and locally based resources.
- Appropriate choice of technology and construction materials
- Non-motorised transport infrastructure e.g. sidewalks and cycle lanes

- Storm water management infrastructure.
- Gully protection e.g. use local rock material.
- Construction of gabions, etc., and
- Any other element that promotes green jobs.

Local Labour was employed by the contractors on these three projects to carry out the following labour/ machine work:

- Relocation of services both water and sewer
- Box cut, rip and re-compact existing road bed
- Spread G5 material and compact
- Spread G2 material and compact.
- Kerb laying by labour based sub-contractor
- Laying of storm water pipes
- Construction of storm water manholes and catchpits
- Construction of sub soil drains.
- Laying by hand ( without pavers) 40mm Mix A type asphalt
- Laying by hand ( without pavers) 40mm Mix D type asphalt for trial section
- Finishing and clearing
- Traffic control
- Reinstatement. Road patching using Mix D Asphalt
- Road embankment protection using Terra force L13 Blocks
- Construction of steep portions of road using concrete
- Landscaping completed road verges
- Construction of concrete stairways
- Road patching and pothole repair
- Redirecting traffic. Stop Go and flagmen
- Installation of guard rails
- Erection of road signs, and
- Painting of road markings.

The Green Job contribution on these three projects was due to the following working methodologies:

- Using minor machinery where possible and increasing the labour content. Graders and TLBS were replaced with mini front-end loaders or bobcats.
- Hand laying of asphalt where possible instead of using pavers.
- Use of local rock for stone pitching.
- The use of concrete instead of asphalt on steep portions of the road, and
- Hand painting road markings instead of using machinery.

#### **4. CONCLUSION AND RECOMMENDATIONS**

There is no doubt that labour enhanced and labour intensive work was carried out in all three projects. The contractors, consultants and parastatal officials all tried their best to promote labour intensive work on all three projects. However, when one looks at the adherence to the EPWP guidelines one will find that there are many areas where the



possibility of improving the labour enhanced component could have been vastly improved. In all three projects, EPWP guidelines were not followed with the following deviations topping the list:

- No labour intensive items were identified in the bill of quantities.
- No accredited training budget was allocated in the bill of quantities.
- The formation of an active project steering committee and sourcing an active community liaison officer occurred too late in the project.
- The lack of an appointed experienced NQF 7 staff person during the design and monitoring phase of the project.
- The appointment of an experienced NQF 5 staff person on site occurred too late.
- Poor budget available for the NQF 5 staff to carry out the necessary duties.
- Contractor unwilling to adopt a task rate. Local labour was paid a daily wage instead.
- Consultant and contractor not willing to comply with the E1 and E2 compliance forms and undertaking forms.
- No manual setting out data on the design drawings.
- Consultant not providing working design drawings timeously.
- Inexperienced staff and lack of knowledge in labour intensive construction.
- Noncompliance to the Planning and implementation checklist in the EPWP guidelines during the design of labour intensive works.

Mashiri, Thevadasan and Zukulu (2005: 869) is of the view that, for community based labour intensive projects to be successful, government needs to not only show commitment to the objectives of the project but also to the aims of poverty alleviation and growing of local economies.

One of the things that is still a challenging issue is the lack of commitment from consultants, contractors and parastatal to make labour intensive projects work. There is also lack of intense monitoring and supervision from the inception of the project. There is still a need to design more in-depth compliance declaration, monitoring and reporting forms on labour intensive projects.

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