TECHNICAL MARKETING STRATEGIES IN THE SOUTH AFRICAN CEMENT INDUSTRY

A Research Report
presented to

UNISA Graduate School of Business Leadership

In partial fulfilment of the requirements for the

MASTER OF BUSINESS LEADERSHIP DEGREE

by

SS SEPHTON

15 January 1996

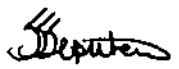
Confidentiality

The confidentiality of this report was requested and granted by Professor M.A. Ferreira of the UNISA Graduate School of Business Leadership.

As a result, this report will not be made available to anyone without the prior consent of PPC. The letter of confirmation has been attached in Appendix I, UNISA SBL correspondence.

Declaration

This report reflects the work and endeavours of the author, and every care has been taken to ensure that the applicable references are accurate.

Signed: 

Stanley Spencer Sephton
(BSc. Civil Engineering)

Dedication

To Beryl, Moira-Gene and Cristopher for their time and support.

Acknowledgements

I would like to acknowledge the assistance of Lindsay Hayes for her invaluable input into the typing and presentation of this report. Thanks also to Beryl, Lorraine, Michelle and Penny. Also to Annelie Kriel and her staff in the PPC library for their assistance.

Colin Jones, for his support and understanding.

Professor Anton Ferreira for his advice, support and contribution of material.

Maarten van Diggelen for his micro-economic information.

Mrs Eiselen of the UNISA Department of Statistics, as well as Mrs Hugo and Mrs Kemp of the User Support Group of the UNISA Department of Computer Services.

My sincere thanks, in particular, to all mentioned above and, in general, to my colleagues and the management of PPC, for making this study possible.

Many thanks to my Johannesburg syndicate group: Dave Bellis, Don Buchanan, Eddie Cassola, Darryl Crampton, Steve Kent and Glynn Matthews for four years of support

Finally, to John Gomersall for inspirational leadership.

Abstract

In partial fulfilment of the Master of Business Leadership degree at the UNISA Graduate School of Business, this project deals with technical marketing strategies in the post-cartel cement industry in South Africa. The hybrid exploratory and applied management research focuses on the South African construction industry.

Referred to as the project market segment, ten interviews were arranged with senior staff of each of the major construction companies listed on the JSE. The interviews were backed up by 72 mail survey questionnaires. The management problem consisted of the primary research problem, which dealt with the need for technical customer support as perceived by experts representing major construction companies, while the secondary problem dealt with the effectiveness of an array of proposed technical support strategies.

A desk study, dealing mainly with strategic management and industry analyses issues, was carried out and reported in Chapter 3. This was followed by an industry analysis in Chapter 4. The industry analysis of the cement industry was preceded by a macro- and micro-economic evaluation. The survey method adopted to acquire primary data was through the use of personal interviews and a mail survey. This allowed for qualitative evaluation of results obtained through the interviews and quantitative evaluation of the mail survey. The following five investigative questions were designed to deal with the research questions:

i Cement manufacturers involvement in technical customer support.
ii Scope of technical support strategies.
iii Cement industry related issues.
iv Forward integration by cement manufacturers in terms of the cement value chain.
v Customer support options.

The first question was the sole domain of the personal interviews, while the fifth question was dealt with in the mail survey only. For the remaining investigative questions, various measurement questions were designed for the personal interviews and mail survey. The responses were evaluated and presented in Chapter 6. The findings were then analysed in Chapter 7 and recommendations and conclusions were put forward.

Essentially, respondents indicated that a basic level of customer support was necessary and access was required by a broad spectrum of customers. Once established, practical site-related strategies were preferred, followed by data and product information. Courses for staff were also considered to be necessary. Training and skills transfer for production staff as well as cement application received a lower priority.

The continued involvement with industry-related issues was supported. Forward integration into readymix concrete and aggregate supply was not considered to be a threat, as long as there were not spatial monopolies. The opportunity to adopt random sampling was foregone in favour of the selection of knowledgeable respondents. The results can therefore not be inferred on the population as is the case with more scientific research. However, the trends established through the evaluation of the respondents were incorporated in the recommendation put forward in Chapter 7. This is appropriate for exploratory research and the dynamic and competitive post-cartel cement market. Due to the inelastic demand for cement, differentiation would need to be carefully considered and the cost of differentiation contained through prioritisation of strategies and concentration on major customers. Manufacturers should always bear in mind that low cost leadership has the potential to outperform a differentiation strategy.

Glossary of Terms

AAR	Alkali aggregate reaction.
ACPA	American Concrete Paving Association.
ASR	Alkali silica reaction.
BTI	Board of Trade & Industry.
C&CI	Cement & Concrete Institute (Currently PCI).
CDSA	Cement Distributers of South Africa.
CPI	Consumer Price Index.
CPM	Concrete product manufacturer.
CSF	Condensed silica fume.
CSSA	Concrete Society of South Africa.
GDFI	Gross Domestic Fixed Investment.
GGBS	Ground granulated blast furnace slag.
GIS	Geographic information system.
HAC	High alumina cement.
Hydration	Chemical reaction between cement and water (heat is given of).
Hydraulic	(Binders). React with water in the hydration process.
JSE	Johannesburg Stock Exchange.
MES	Minimum efficiency scale (of production).
NPC	Natal Portland Cement.
OPC	Ordinary Portland cement.
PBFC	Portland blast furnace cement.
PCA	Portland Concrete Association (USA).
PCI	Portland Cement Institute.
p:e ratio	Price to earnings ratio.
Pozzolan	Material which only reacts when activated by cement reactants (basic def.).
PPC	Pretoria Portland Cement.
PPI	Producer Price Index.
RCC	Roller compacted concrete.
RONA	Return On Net Assets.
SAACE	South African Association of Consulting Engineers.
SABS	South African Bureau of Standards.
SACPA	South African Cement Producers.
SAFCEC	South African Federation of Civil Engineering Contractors.
SBL	UNISA School of Business Leadership.
SBU	Strategic Business Unit.
SCT	PCI School of Concrete Technology.
Soffit	Under side of beam of slab.
Specificity	(Of assets). Assets with limited alternative application and flexibility.
SSC	Super sulphated cement.

Table of Contents

Chapter 1: Introduction

1 Terms of Reference

This research project is in partial fulfilment of the requirements for the Master of Business Leadership degree at UNISA's Graduate School of Business Leadership. The purpose of such a report is to undertake an empirical investigation and a structured theoretical analysis.

To this end this report is primarily based on qualitative research through the use of structured interviews of opinion formers in the construction sector of the cement market. However, to broaden the base of the research, quantitative research was carried out by way of a mail survey.

At the same time it is the purpose of this individual endeavour to add value to PPC's technical marketing strategic planning process through a broad evaluation of the cement industry as a whole.

2 Background

The following information was largely drawn from the PPC centenary publication, "Building on Our Strengths: 1892 to 1992", and provides a brief historic background which places much of the evolution of the cement industry into perspective.

2.1 A Historic Perspective

The discovery of diamonds and gold in South Africa in the latter half of the Nineteenth Century transformed the focus from broad geographic subsistence agriculture to industrial hubs, which mushroomed in support of the mining industry. Infrastructural requirements resulted in demand for cement, which was otherwise imported from Europe through Cape Town. The cement was transported by rail and ox-wagon to the Witwatersrand in 400 pound casks resulting in considerable delay between order and delivery. The manufacturing cost of approximately R1.00 per cask in Europe in the late 1880's escalated to approximately R25.00 by the time it reached the gold fields.

On 22 April 1892, the Eerste Cement Fabrieken Beperkt was registered and the Pretoria factory was established. This factory was formally opened by Paul Kruger, the then State President of the Transvaal Republic, and currently operates as the PPC Hercules factory. The Anglo Boer War, between 1899 and 1902, stimulated cement demand through fortified block houses, as did reconstruction following the

resumption of peace.

A second cement company, White's South African Portland Cement Company (now Blue Circle) established a factory at Henneman in the Orange Free State and went into production in 1914 (Blue Circle Ltd Brochure, 1989: 1). PPC established the Cape Portland Cement Company in 1921 following the acquisition of interests in the Herman Piketberg Lime Company Limited and after establishing the De Hoek factory, went into production in 1928. To meet the growing needs of the Eastern Province, PPC founded the Eastern Province Cement Company and started producing cement at Port Elizabeth in 1928. The National Portland Cement Company constructed a factory in 1928, at Phillippi, on a portion of land that was later to be expropriated for the D F Malan airport outside Cape Town.

In response to further demand on the Witwatersrand, Anglovaal Portland Cement Company Limited entered the industry and went into production at Roodepoort in 1935. The Henneman factory was brought into the fold when Anglovaal amalgamated with Atlas Cement Company to become Anglo Alpha in 1934. Anglo Alpha established their Dudfield quarry near Lichtenburg in 1944 to further provide Roodepoort and later the Dudfield factory with limestone. In the same year Anglo Alpha merged with National Portland Cement thus establishing links with the world-wide Holderbank Group. Anglo Alpha's Ulco plant was established in 1944 in the Northern Cape, not far from Kimberley and some 180 kilometres from Bloemfontein. Although remote from the major South African markets, this factory has a unique raw materials situation with shale overlying limestone in approximately the required proportions for cement production. Anglo Alpha also acquired the Kimberley Portland Cement Company in 1945 (Anglo Alpha Annual Report, 1984: 1-2) .

Although PPC established the Slurry factory, as early as 1916, in the Western Transvaal, capacity was steadily increased through the years. To meet the demand of the newly established gold mines in the vicinity of Klerksdorp and the far West Rand, PPC established a factory at Orkney and commissioned the kiln in 1949. In the same year Blue Circle went into production through their Lichtenburg factory in 1949, making the Western Transvaal South Africa's major cement manufacturing region (Blue Circle Ltd Brochure, 1989: 2).

PPC opened a further factory at Riebeeck West in 1960 to meet the growing needs of the Western Province, while a Durban milling plant went into production, using clinker from Anglo Alpha, Blue Circle and PPC in 1964. Now known as Natal Portland Cement (NPC), a company owned by the three established cement companies, the plant draws clinker from Simuma, near Port Shepstone. By now, the cement industry was in a position to supply cement to all of the major industrial

centres and cities in South Africa.

The Portland Cement Institute (PCI) was established by the three cement manufacturers in 1938 to provide technical service and training to cement consumers (PCI Services and Publications Brochure, 1995: 1). The PCI is a Section 21 organisation and is funded by the three cement manufacturers in proportion to their respective regional market share. Refer to Appendix A for further details relating to the objectives and services offered by the PCI. The structure and services offered by the PCI are currently being reviewed, and it will probably emerge as the Cement and Concrete Institute (C&CI) to signal and market their new strategic positioning.

To promote the use of concrete, the Concrete Society of South Africa (CSSA) was also founded in 1938. Other than cement manufacturers, this association includes members from other organisations with interests in concrete, such as Civil Engineering consultants.

2.2 Political Intervention

In return for permission to set up a cement factory, the Volksraad of the Transvaal resolved, in May of 1888, that:

> "From now on, in all contracts for the erection of government buildings and public works of whatever kind, over which the government has the right of control or superintendence, a condition shall be inserted that, in each case, cement of De Eerste Zuid-Afrikaanshe Cement Fabrieken shall be used, for a period of ten successive years."

A further condition was that 2,5% of the profit from the proposed cement manufacture would be paid to the government (PPC Building on Our Strengths, 1992: 6).

Politics dominated business decisions in the late 1890's. The Transvaal Republic refused to join the customs union formed by the Cape Colony and the Orange Free State. This resulted in punitive customs duties being imposed at Cape ports on Transvaal-bound goods. In response, the Transvaal Volksraad granted generous concessions to regional business and introduced protective tariffs, thus effectively creating early monopolies in the Transvaal. The confrontation between imperialism and republicanism led to the Jameson Raid which was supported by Cecil John Rhodes, the then Prime Minister of the Cape Colony. Interestingly, among the prominent businessmen imprisoned for their part in the abortive raid was Sir Percy Fitzpatrick, author of the well known novel Jock of the Bushveld and Chairman of the Eerste Cement Fabrieken.

As early as 1914, protection in the form of tariffs were first implemented by the South African government to provide a disincentive to the dumping of European cement. The South African cement industry has used a multiple based point pricing system since 1922 and in 1940 a market sharing agreement, in the Cape province, was entered into by Cape Portland Cement and National Portland Cement, later a subsidiary of Anglo Alpha. This arrangement lasted for 40 years until Anglo Alpha stopped production in the Western Cape, in 1980 (Leach, 1995: 27).

During World War II, cement was considered to be a product of strategic importance and was subject to price control. Concerned about the close cooperation between cement producers, the Board of Trade & Industry (BTI) investigated the cement industry in 1946. Although the BTI found the industry to be highly monopolistic, it did not conclude that the consumers had been adversely affected. Price control was retained for a further 36 years and was only lifted in 1982. With the introduction of price control, the producers agreed to compete only on service, since no benefit could be obtained from any other form of competition, such as a price or quality war.

Severe restrictions on road transportation were legislated in favour of the State railway system, between 1950 and 1980. As a result, cement was transported primarily by rail. This prompted the cement producers to develop a computer-based distribution model to rationalise cement distribution logistics by rail and in this way achieve the lowest delivered price. The government agreed to the establishment of a central selling organisation to implement the model, thus tacitly sanctioning a cement cartel. As a result, price control was removed in 1982, leaving pricing initiatives to the cement producers through Cement Distributers (SA). The selling arrangements were reviewed by the Competition Board from time to time, and found to be "not against the public interest"(Hodgkiss, 1993: 154).

In 1971 a sharing agreement was added to the previous agreement between the three manufacturers. In terms of that agreement, Blue Circle received 24% of the CDSA sales which excluded PPC Cement Sales tonnages. After Blue Circle's share had been allowed for, Anglo Alpha received 45% and PPC 55% of the remaining CDSA and PPC Cement Sales tonnages. After allocating a third split of the NPC sales, the national percentage market share as at the end of December 1994 was Anglo Alpha 35%, Blue Circle 22% and PPC 43%. The South African Cement Producers Association (SACPA), with representation from all the three cement manufacturers, administer the market sharing process. The quota balance is calculated weekly on the basis discussed above. The forecasted under or over recovery is then balanced monthly, usually by scheduling rail delivery from the relevant manufacturers North Western Province factories, Slurry, Dudfield and Lichtenburg. PPC Cement Sales in the Cape are included in Anglo Alpha's market share as part of the agreement for

Anglo Alpha exiting the Western Cape market.
The PW Botha government embraced a laager mentality to resist a communist inspired "total onslaught". World rejection of the apartheid ideology and the ever tightening grip of sanctions resulted in a sanctions busting and survival psychosis, with fiscal priorities being directed towards defence.

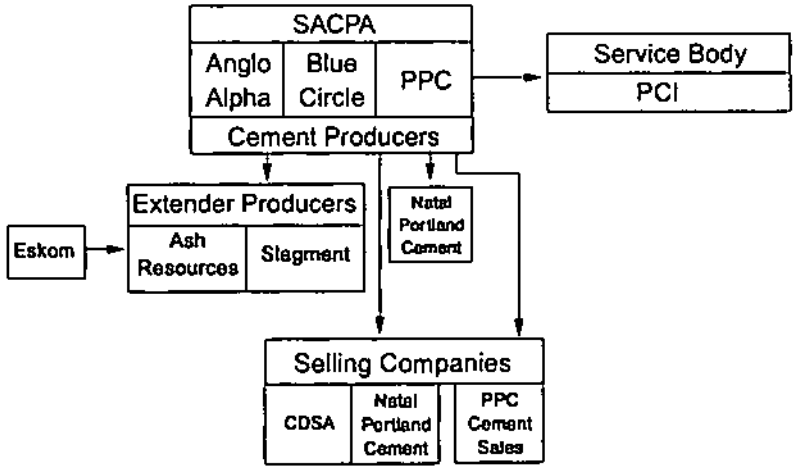
The South African cement cartel has been investigated on many occasions, and in 1988, the cartel was granted a permanent exemption under the Maintenance and Promotion of Competition Act from the 1986 law prohibiting price fixing and market sharing. The Board confirmed previous findings that the cartel was "not against the public interest". In 1991, the Competition Board launched another investigation into the cement cartel. In September 1994, following the historic multi-racial elections of April of the same year, the Competition board recommended that the cartel be abolished. This recommendation was subsequently accepted by the newly appointed Minister of Trade and Industry, Trevor Manual, in November 1994 (McCaffrey, 1995: 22-27).

2.3 Structure of the S A Cement Industry

Cement, in South Africa, is currently produced by Anglo Alpha, Blue Circle and PPC. These manufacturers have an equal share holding in Natal Portland Cement. The cement manufacturers also have an equal share holding in Slagment Limited, a manufacturer of ground, granulated blast furnace slag (GGBS) and sold under the "Slagment" brand name. Together with Rotech, a division of Eskom, the cement manufacturers also have an equal share holding of Ash Resources (Pty) Limited, which markets fly ash in its various forms.

The South African Cement Producers Association (SACPA) provides a forum for manufacturers to deal with matters of mutual interest (Refer to Appendix B for SACPA's mission and objectives). With the demise of the cartel, SACPA has undergone downsizing and restructuring. SACPA's administrative function will be combined with that of the PCI and will probability be renamed CEMPRO. On the other hand, the sale and distribution of cementitious material is coordinated and carried out by Cement Distributors of South Africa (CDSA). PPC Cement Sales, however, serves the Western Cape market while Natal Portland Cement administers the cement sales in Kwazulu-Natal. The structure of the cement industry is represented diagrammatical in Figure 1 below.

Figure 1: Organisation of South African Cement Industry



2.4 Location of Cement Production Facilities

A brief outline of the geographic position and key production facilities will be a useful reference for an industry analysis and understanding of logistical dynamics in the industry.

The distribution of the major deposits of limestone in South Africa is located in the North-West Province and Northern Cape, some 250 km and 500 km from Johannesburg, respectively. The Gauteng province is the major industrial and economic centre in South Africa and currently accounts for approximately 25% of the national cement demand and more importantly, 46% of the inland market (PPC Strategic Planning, 1993).

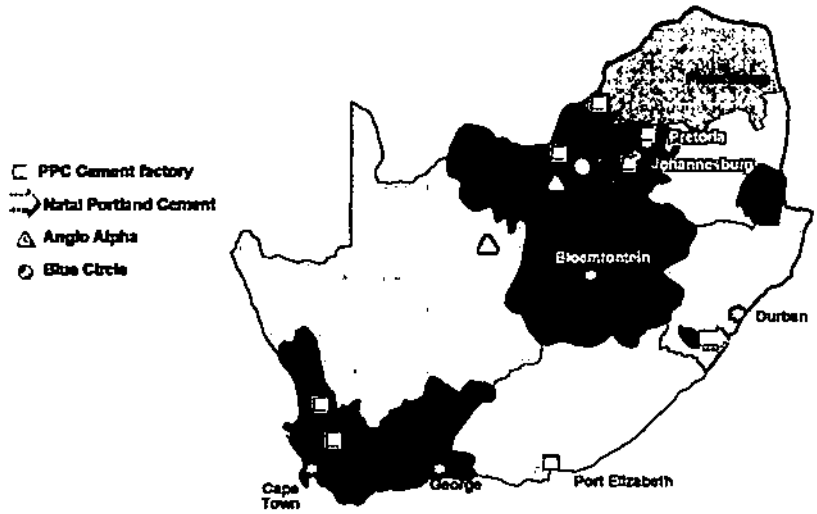
In earlier days, a preferential railage rate levied by the state railway system on limestone resulted in the establishment and expansion of "island" factories, such as PPC's Jupiter and Hercules factories. Raw material was railed long distances to these factories, despite some one third loss in mass in the burning process to produce clinker. When the preferential railage rate was withdrawn, development of plants on limestone reserves became a logical route to follow.

PPC, the largest cement manufacturer in Africa, has seven factories in South Africa. They have two "island" factories in Gauteng, namely Hercules in Pretoria and Jupiter in Johannesburg. The Slurry factory is in the North West Province and Dwaalboom is in the Northern Province. In the coastal regions, PPC has the Port Elizabeth factory to service the Eastern Province, while De Hoek, at Piketberg, and

Riebeeck factories service the Western Province.

Anglo Alpha's Dudfield plant is located near Lichtenburg, in the North West Province, with further milling facilities at Roodepoort. The largest Anglo Alpha factory, Ulco, is located near Barkly West, in the Northern Cape. Blue Circle has one factory at Lichtenburg, and a modern fly ash blending plant at Kaalfontein, between Johannesburg and Pretoria. Blue Circle also produce fly ash blends at White's in the Free State, primarily for the mining industry. The Petermix blending plants in Pietersburg and Nelspruit have now been bought out by Blue Circle. NPC has a cement kiln at Simuma, near Port Shepstone, and milling and packaging facilities in Durban. NPC also manufactures slag blends at Newcastle in Kwazulu-Natal. The locations of these factories are given in Figure 2 below.

Figure 2: Location of Cement Production Facilities



PPC have recently established a milling and blending plant in Gaborone to make use of fly ash from Morupule. PPC and the Botswana Development Corporation have joint ownership of Cempak Botswana (Pty) Ltd. and the fly ash blends will be sold under the Cempak brand name. PPC also have blending facilities at the old Orkney factory, to serve the mining industry with fly ash blends. Orkney is also well placed to secure return legs for transport supplying the mining industry with mine props, for example.

Anglo Alpha have ownership of Namibia Portland Cement, a distribution outlet, as well as a majority shareholding in the East London based Cementman, and Interafrica in Swaziland. Anglo Alpha have also recently opened a fly ash blending plant in Bloemfontein, under the name of MacDonald & Volck, their transport division.

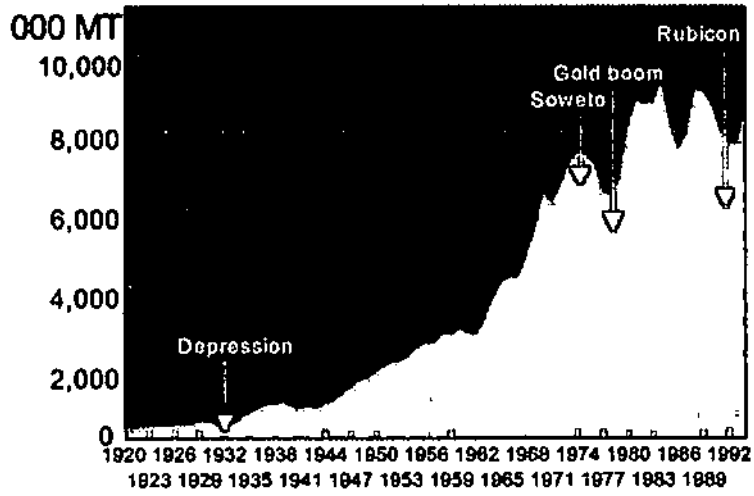
Other than the above mentioned blending facilities, there are a number of third party blenders. Eastern Cement Distributors (Pty) Ltd blend cement at Trichardt, near Sasol II in Mpumalanga, using Sasol ash. This is a good quality blend which carries the SABS mark. Other cement blenders in the Gauteng region, such as Viking and Trojan, have blends which have varied considerably in quality.

2.5 Cement Demand

The trend in cement demand was reasonably predictable up to 1974 and showed a significant and steady growth. This situation, together with price control, resulted in minimum over-capacity, assisted by an arrangement whereby producers increased capacity on a rotational basis. This was clearly an ideal situation, from the manufacturers perspective, to ensure stability in a capital intensive industry.

However, between 1975 and 1978, the market experienced a decline in demand, followed by a sharp and dramatic increase between 1979 and 1981. This cyclical trend was in sympathy with the fluctuating fortunes of apartheid politics and world-wide reaction to events such as the Soweto Riots and P W Botha's infamous Rubicon speech. All three producers installed extra capacity, including PPC who responded by establishing their new Dwaalboom factory in the Northern Province. This factory was never commissioned and has since been on a care and maintenance programme, as a result of the demand falling off in 1981. A temporarily peak demand of 8 370 000 tons per annum was experienced in 1984, a level of demand which has not been exceeded to date. (SACPA Annual Review, 1993: 5). The trends in cement demand are illustrated in Figure 3 below.

Figure 3: South African Cement Demand



(Source: PPC 5-Year Plan, 1995)

In the cement and concrete industry, the demand for cement has been dominated by government infrastructural spending, typified by the impressive Garden Route arch bridges, Koeberg Nuclear Power Station, Huguenot Tunnel, as well as the construction of numerous national roads, dams and power stations.

As a result of over capacity, manufacturers focused their attention on technical improvements directed at efficiency, quality and consistency. A range of solutions included pre-blending of raw materials, retrofitting of precalciners to kilns, high efficiency separators in cement mills for the grinding of clinker, and X-Ray Spectrometer analytical quality control. Labour intensive stem loading was partially replaced by automatic unitising systems and mechanical loading. Some of the later systems include shrinkwrap, which allow for all-weather storage and handling by forklift trucks.

2.6 Background on Cementitious Materials

This project is not intended to be a technical study of cementitious materials. However, some basic background on cement and cement extenders which are in common use today would assist in a better understanding of discussions later in the report.

In 1791, John Smeaton published his report on the construction of the Eddystone Lighthouse, off the South coast of England. Smeaton claimed that his mortar would be as strong as Portland stone. The significance of this development was the recognition of hydraulic lime. In 1824, Joseph Aspdin took out a patent for "Portland" cement which recognised the temperature at which the mixture was burnt in a kiln and the significance of lime and clay as the primary ingredients (Lea, 1974).

From early days, Portland cement, together with sand, stone and water, formed the basis of concrete widely used in the industrialisation of countries. In masonry work, the stone, or coarse aggregate, was omitted and the mortar was used with natural stone or clay bricks. Lime was often added to the mortar to impart plasticity and water retention properties, necessary in good quality masonry construction.

Following the industrial revolution of the early Eighteenth Century, steel was the major material associated with heavy industry and was necessary for all forms of machinery and equipment. Coal was the other major material used to provide the energy necessary to meet the power consumption of the industrialised nations. With these materials, however, came a significant generation of waste material. In recent years, these waste materials have played a useful role in cement and concrete technology. These products can either be successfully used as components of a

concrete mix, or be blended with Portland cement. Cement and cement extenders can be classified as indicated below (Mantel, 1992: 2).

2.6.1 Hydraulic Binders

Hydraulic binders react with water in a process called hydration and harden with time to form a solid mass. Portland cement is the most common form of hydraulic binder and consists primarily of limestone. Cement in South Africa is manufactured from a suitable mixture of quarried and crushed limestone and shale or clay. Alumina and ferric oxide are also added to the mix to act as a flux and reduce the clinkering temperature. The mixture is burnt at approximately 1400^{0}C in a rotary kiln to a state of partial fusion. The resulting clinker is finely ground together with some 5% gypsum to control the set and allow for the practical application of cement.

2.6.2 Latent Hydraulic Binders

These binders contain a limited amount of limestone, and react very slowly with water. These materials can be activated by Portland cement, to harden sufficiently to be of practical use. Ground Granulated Blast Furnace Slag (GGBS) is a well-known product in this category. South Africa's major steel manufacturer, Iscor, produces blast furnace slag in the process of manufacturing steel, at both Pretoria, Vanderbijlpark and New Castle. This material is quenched with water while it is in a red-hot liquid form and the resulting granules are ground to a fineness similar to cement.

The GGBS is supplied by Slagment (Pty) Ltd under the trade name "Slagment." GGBS is also blended with rapid hardening Portland cement in approximately equal proportions and marketed as Portland Blast Furnace Cement (PBFC).

2.6.3 Pozzolanic Materials

Fly ash (FA) and Silica Fume are examples of pozzolanic materials. Pozzolans do not harden by themselves when mixed with water, but once activated by the reactants of Portland cement, behave in a similar manner to latent hydraulic binders. The Romans used volcanic ash, from the town of Pozzoli, and mixed it with lime to create strong mortars and concretes, hence the name "Pozzolan". These materials were used in structures including the Pantheon in Rome, which is testimony to their durable nature (Ash Resources brochure, 1994).

The fly ash resulting from the burning of pulverised coal, in modern power stations is captured by electrostatic precipitators or bag filters to limit atmospheric pollution. South Africa currently produces a total of some 29 million tons of fly ash per annum on top of an estimated 450 million tons of stockpiled ash (Kruger, 1990: 1). Of this, approximately 700 000 tons of fly ash is used in cement blends and related products. The major supplier of fly ash is Ash Resources (Pty) Ltd, using material from Eskom's Lethabo and Matla power stations. Ash Developments entered the market in 1995, using fly ash from the Sasol II power station in Mpumalanga.

Silica Fume, another Pozzolan, is a by-product of the silicon or ferrosilicon manufacturing process, using electric arc furnace technology. The resulting particles are extremely fine and with a specific surface area of 20 000 m^2/kg is similar in size to cigarette smoke. With a bulk density of only 200 kg/m^3, silica fume is extremely difficult to handle and expensive to transport. Silica fume can be slurried or densified to a bulk density of 650 kg/m^3 and when included with cement, results in extremely high strength concrete. The densified product is referred to as Condensed Silica Fume (CSF) (Addis, 1987: 19-25).

This chapter has provided a general background to the cement industry, which will be useful in setting the scene for later discussions. The following chapter will develop the problem and provide the scope and structure for the remainder of the project.

Chapter 2: Definition of the Problem

1 Aim of the Study

The aim of this business research project is to investigate competitive strategies that have the potential of achieving a sustainable competitive advantage in the post-cartel cement industry in South Africa, in the field of Technical Marketing. These differentiation strategies, when successfully implemented, should add value to cementitious products as perceived by customers in the formal construction sector.

Challenges that come with a rapidly changing environment revolve around open and intensified competition. The current situation needs to be evaluated to establish a benchmark which will provide a spring-board for predicting the extent and direction of future strategies in technical marketing. This includes the need for differentiation strategies in support of generic low cost leadership strategies, typical of a competitive market in an oligopoly.

Based on the investigation, a secondary aim of this project is to predict how best to serve the future needs of customer groups, and thereby strive to secure a sustainable competitive advantage. This evaluation of the competitive positioning of the various players in the industry should make decision makers aware of the effectiveness of the options available to them. At the same time, it should provide senior managers a sense of anticipation of the strategies open to competitors, in order to embrace time-based competition that is more responsive through cross-functional matrix management.

The investigation will cover the entire cement industry through an industry analysis, personal interviews of opinion formers, and a mail survey. The analysis will investigate the dynamics of the environment within which the cement industry operates. This would include the opportunities that present themselves and the threats that will need to be dealt with in a responsive manner.

The project will achieve a degree of success, if management in the appropriate functions are moved to embrace the degree of change required to effect a paradigm shift in providing value-added solutions to customer needs. This can be achieved by buying into the findings presented and championing those competitive strategies, which customers consider to be of value.

2 Discussion of the Problem

The primary problem is to establish if the need exists for a spectrum of competitive

customer support strategies in the construction segment of a post cartel cement industry in South Africa. The customer support strategies are focused on technology and hence referred to as technical marketing for the purpose of this report. Constant reference to technical marketing is furthermore intended to reinforce an industrial marketing approach and promote a customer orientation throughout. However the study is primarily focused on the development of strategies which are synergistic with marketing principles. As such it is intended to draw from both fields of study in a synergistic manner.

Secondary problems relate to the effectiveness of an array of proposed technical service strategies as perceived by a number of experts representing the formal construction industry. This aspect of the study will be discussed in greater detail later in this chapter.

3 Purpose of the Report

The purpose of the report is to establish the degree of technical support, if any, and involvement expected of cement manufactures by the various customers in the construction industry, with specific focus on cement and concrete. Once this point of departure has been established, it is intended to further explore a range of technical support strategies available to cement manufacturers. The research also explores product related issues as well as forward integration in terms of the cement value chain.

There will be considerable pressure on all three cement manufacturers to carefully consider their strategic options. Any attempt to add value in terms of technical customer support will have a significant cost attached which will compromise a low cost leadership strategy. The manufacturers will also want to fiercely maintain market share without resorting to a price war in retaliation to conceding market share. The findings of this study should provide an indication of the needs of customers in the construction sector and indicate the options available. The manufacturers could then apply their technical support resources in an appropriate manner in a way that has the potential of contributing substantially towards adding value in a sustainable manner.

4 Scope

Cement in its application is an extremely broad field due to the versatility of the product. Every year more than a billion tons of cement are produced world-wide and used to make roughly a tonne of concrete per human being, making concrete the most widely used material, on a weight basis, after water.(Aïtcin, 1995: 259). In an unsophisticated market, cement has been found to be "abuser" friendly and tolerant in use. Globally, cement has been used in the most elementary applications such as pathways and driveways, through to the most sophisticated bridges, high rise buildings and off shore oil rigs. The North Sea oil rigs, such as those manufactured in Norway, have achieved new levels of concrete

excellence through the application of high strength concrete.

The South African situation has similar parallels, but also has a third world element. For example, concrete in general housing construction is often poorly proportioned and mixed. The fundamentally important cement to water ratio is often not appreciated in the former scenario and the concrete tends to be mixed to a sloppy consistency that aids placing, to the detriment of strength development. Despite this poor construction practice, relatively few problems are experienced with the serviceability of these houses under normal founding conditions. The manufacture of bricks and blocks on a small scale in outlying tribal and rural areas is an example of the versatility of cement in an unsophisticated market. Besides cement and a hand operated mould, all that is required is a source of sand and water to make these blocks. The result is effective use of intermediate technology as well as the use of labour based, labour intensive and community based practices suitable to address third world needs.

At the other end of the scale, products that serve the same purpose can be manufactured, using automated batching plants and sophisticated brick making machines, requiring considerable capital expenditure and economies of scale. South Africa is also known to have a first world infrastructure where concrete has made its contribution in the form of concrete dams, highways and arch bridges.

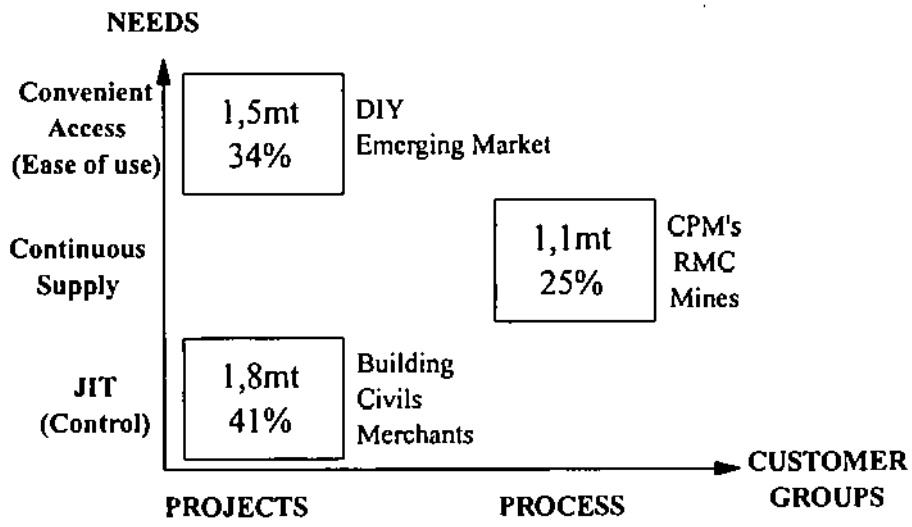
It would not be appropriate to attempt to address such a broad spectrum of cement applications. The formal construction sector has been singled out as being appropriate for the purpose of this report. Due to the exploratory nature of the project and the need to discuss technical marketing issues with opinion formers, the big nine construction companies listed on the JSE were selected by applying the Pareto Principle. This concept suggests that 20% of the contractors would be expected to consume some 80% of the cement in the construction sector.

The informal or so called emerging market consists of a multitude of relatively low volume cement consumers who purchase bagged cement. While this segment is arguably the most important growth segment in South Africa, an exploratory investigation would require different techniques, such as the focus group technique, to evaluate the needs of this market segment. The level of expertise in the emerging market would indicate a need for extensive training as a priority rather than higher level technical support. Done properly, training requires a different approach and the appropriate skills.

The third important market segment consists of concrete product manufactures (CPM's) and readymix concrete organisations who resemble a manufacturing organisation rather than the project orientated activities typical of the construction sector. These cement users tend to be the most sophisticated segment and would require a higher level of technical support. In many instances this process sector would represent a level of expertise in their

respective cement applications that would surpass the technical assistance available from the respective cement manufacturers.

Figure 4: Inland Strategic Segmentation



1993 TOTAL: 4.4 Million Tons pa (63% of national cement sales)

(Source: PPC Strategic Planning, 1994)

In determining the scope of this project, one option would be to investigate all of the market segments in limited depth and detail, at the risk of compromising the validity of the findings. The alternative would be a more focused approach by dealing with a substantial market segment perceived to have a significant need for technical customer support. To this end the construction or project segment was considered to be appropriate. Within this segment, the issues dealt with in the interviews and mail survey are intended to be relatively broad based.

5 Constraints

In the proposed survey it is assumed that the respondents are knowledgeable in the field of cement application. Cement and concrete is an exceptionally wide field due to the effectiveness of cement in diverse applications. The respondents will, in reality, tend to be generalists as their main field of expertise will be construction which includes the use of many materials and a wide range of disciplines such as contracting, tendering, industrial relations, contract law and management accounting. Care will thus have to be exercised to ensure that respondents have a common frame of reference in the survey process.

Although every effort will be made to assess the attitudes of respondents towards technical

customer support and technical requirements in the construction industry, no claim can be made as to the accuracy of measurement of these attitudes in the structured interviews. The results will represent a reasonable interpretation of trends obtained by qualitatively evaluating responses to the survey.

Due to the exploratory nature of the survey and the limited number of experts operating in the chosen market segment, it was necessary to carry out non-probability sampling. This means that the results from the sample cannot be accurately projected to represent the attitudes of the target population in a statistical sense. While this may be less acceptable to the purist, the chosen topic is of a practical nature, in line with applied business research and the trends obtained should represent the thinking of those surveyed and the industry which they represent.

It is arguable whether getting too bogged down in theory via probability sampling and limited hypotheses would provide more meaningful results. This is due to the cross-sectional nature of the time dimension, or "snapshot", to effectively freeze highly dynamic environments which may render probabilities, with a high level of significance, less relevant with passing time. This could be overcome by using a longitudinal time dimension and lower levels of statistical significance. However, this would require a higher level of resourcing and would thus fall outside the scope of this project.

Due the extremely wide application of cement, it would not be possible to evaluate all customer groups. Because of the unprecedented dynamic environment, not all respondents will have bullish sentiments as growth in their sectors may not yet have filtered through. A further bias may be that customers may resent the good economic performance of cement manufacturers as a result of the upturn in demand, while the effects of recent economic growth would not yet have fully impacted on the order books of the construction industry.

A further aggravation would be the production orientation, lack of involvement and openness, and a degree of arrogance on the part of cement manufacturers. As a result, the perceptions of the respondents could have a considerable impact on the outcome of the research.

Due to continuous downsizing as a result of poor trading conditions, specialist technologists and in-house concrete laboratories have been shut down by most of the construction companies. Those companies that retained some of these skills would tend to feel more self-sufficient with regard to technical support requirements. On the other hand, the questionnaires administered through the mail survey will have a higher level of scientific validity, a larger sample size and statistical significance than the structured interviews.

6 Planning and Development of the Report

This report deals primarily with research and as such it is necessary to proceed in a manner that preserves the validity of the findings and avoids supposition and perceptions of what the outcome should be. However, research can be conducted in a number of different ways. The research method followed needs to be compatible with the subject matter and reflect the realities of the day.

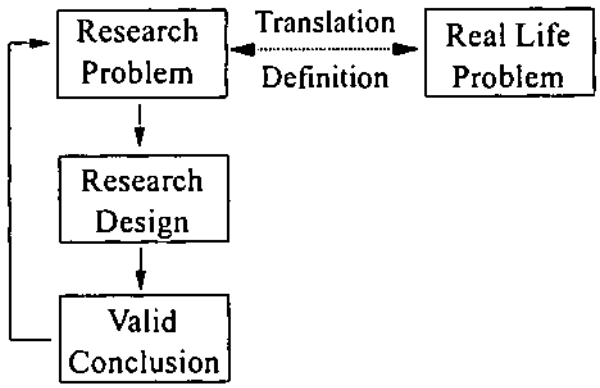
Due to the practical nature of the chosen field of study and having evaluated the alternative methods of research, it was decided that an exploratory research would be the most appropriate. The opposite end of the scale would be scientific research dealing with hypothetical constructs at the highest level of abstraction. The less abstract concepts dealt with in this project are by contrast more appropriate to the chosen topic. The research method adopted is also a category of applied research, as the findings have the potential of contributing to the decision maker's task.

However, the above discussion does not imply that business research should be a matter of muddling along until a conclusion is assumed. Business research is becoming more and more scientific. The common thread that runs through research is the interaction between a process and a body of knowledge by drawing on resources. In its most logical form this involves the following three phases (Mouton, 1995):

- The research problem.
- The evidence.
- The conclusion..

An expansion of the above framework forms the basis of the planning and development of this report. This is represented diagrammatically in Figure 5 below.

Figure 5: Research Model



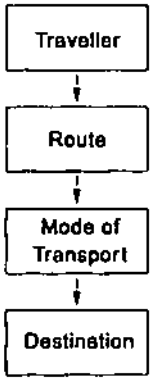
(Source: Mouton, 1995)

The research problem will be discussed in detail later in this chapter. Clearly this problem needs to be researchable and appropriate. Having established, by way of literature surveys, that technical marketing strategies and strategies in general are a processes and could not simply be prescribed to solve the specific problem at hand, the problem was deemed to be researchable. This evaluation is more relevant when the dynamic nature of the external environment is taken into consideration. To address the problem as defined in this project, it is necessary to interact with the social or real world, distinct from the theoretical specialisation of the science world.

The research design deals with the survey as the chosen means of locating the evidence. This involves choosing the population and sample representing that population. Having opted for exploratory research, some subjectivity was exercised to identify the appropriate opinion formers in the chosen market segment. The plan was then to administer a survey through personal interviews. This would allow the interviewer the opportunity to probe for clarity, where necessary, in order to obtain a common frame of reference. A set of investigative questionnaires, administered through a mail survey, were planned to supplement the personal interviews and, in this way, allow for quantitative analysis while at the same time broadening the base of the research.

Finally the conclusions would be arrived at through analysing and interpreting the data and would then be fed back to the original research problem to ensure that the objectives were met. The conclusions would guide decisions on the various options addressed as is appropriate with applied research. Note that an industry analysis component was included in order to develop the relevance of the research problem, questionnaire and appropriateness of the resulting strategic technical marketing options available to cement manufacturers.

In planning the report, the analogy of a journey is useful and is made up of the following components (Mouton, 1995):



The traveller represents the researcher, and includes skill, knowledge, experience and training.

The route establishes the domain or area of study, namely exploratory research for this project.

The mode of transport relates to methods and techniques employed, such as structured interviews and questionnaires.

Finally, the destination represents the purpose, or research objective, as discussed in item 1.4.

7 Defining the Primary Problem

7.1 The Significance of the Problem

Strategies and tactics employed by cement manufacturers have been restricted in scope by the cartel agreement. Any deviation in an attempt to gain market share outside this agreement became the subject of prolonged debate requiring consensus on issues of all magnitudes. The net result was a bureaucratic body which consumed substantial top management time and achieved limited output in an artificial environment protected from external shocks. As a result, the manufacturers were not responsive to the needs of the marketplace and remained inward looking and production oriented. The cement market in South Africa is typical of "push" economies, where supply exceeds demand, and customers are typically supplied with generic products in the Henry Ford Black Model-T approach, where the producer is king (Robert, 1994: 48). This was exacerbated by South Africa's prolonged international isolation through the apartheid era.

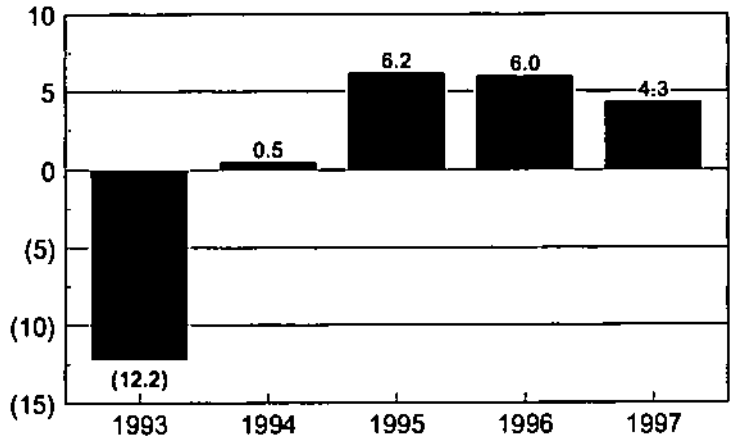
The significance of this artificial environment was that management was preoccupied with operating under cartel rules and the result was a cartel culture which permeated all levels of management. A major management task is to now unfreeze this culture which was developed and nurtured over some thirteen years and move employees to buy into a paradigm shift from a production orientation to a service orientation. Management must then re-freeze and reinforce this new service culture. The problem is that employees are unlikely to be motivated to embrace change without a full appreciation of the need for change and the impact that this will have on their area of responsibility.

The need for comprehensive strategic planning, however, is currently more obvious with the abolition of the cartel than it otherwise might have been. The challenge would thus revolve around the quality and effectiveness of strategic planning and the all important implementation phase. It is also vital for this process to cascade through all the functions in an organisation. The focus of this project would be to look into the technical marketing function and the possibilities of developing forward looking strategies that would have the potential of sustaining a competitive advantage. A further challenge would be to predict post cartel competitive positioning with regard to the effectiveness of technical customer support and service.

The structured interviews and questionnaires will be of a specific and practical nature, drawing from the experience gained in the construction industry, a highly

competitive market placed under extreme pressure from declining infrastructural spending as well as fixed investment in building and construction in real terms. This trend was reversed in 1994 in anticipation of growth following a post-apartheid environment, as can be seen in Figure 6 below.

Figure 6: Forecast of Fixed Investment: Building and Construction
(Real Annual Percentage Change)



(Source: SACPA Annual Review, 1994)

An indication of the past lack of customer orientation, in a cartel environment, can be appreciated by the following example. Due to the threat of imported Spanish cement in 1983, the cement industry subsidised cement in the coastal regions. Having effectively defended this threat, the subsidy was phased out without properly informing customers of this phasing out programme. This price increase was not fully compensated for by contract escalation, resulting in considerable losses being incurred by contractors. The cartel was perceived to be arrogant and was generally disliked due to their lack of market orientation. By contrast, what is needed in situations where supply exceeds demand, such as is the case with cement manufacturers in South Africa, is a demand pull situation where the customer is king. The cartel has effectively screened manufacturers from this demand pull economy that has taken place in the Western world over the last 15 years (Robert, 1994: 48).

7.2 The Problem Statement.

Due to the exploratory nature of the project and as a result of the need to survey experts in the construction industry, a problem statement and secondary problems will be the relevant proxy for a descriptive hypothesis. In terms of research theory, the findings from an exploratory research would normally be used to develop a hypothesis.

The primary problem is to establish whether a need exists for technical customer support in the post cartel environment in the construction market segment of the South African cement industry. The secondary problem relates to the degree of preference and ranking of an array of proposed customer support strategies as perceived by experts in the construction industry. Certain contentious technical support and value chain activities are also probed to establish their strategic potential. Evaluation of the above research in tandem with an industry analysis should allow some prediction of the effectiveness of competitive strategies in the field of technical marketing.

7.3 Definitions, Assumptions and Limitations of the Investigation

7.3.1 Defining Key Concepts

In this project technical marketing refers to a spectrum of technical customer support strategies and a range of technical services applied to the different cement market segments. Technical marketing goes beyond selling the product to the marketing of solutions in the application of cement.

The construction market segment in this report is based on the strategic market segmentation of the PPC strategic planning team. It refers to cement consumers who operate on a project basis, where each project is not permanently located geographically and has a finite duration. Each project has unique features, but carries out similar activities which differ in magnitude. The projects are most commonly let on the basis of the closed tender system, although other methods such as turnkey projects and developments are also carried out. This strategic segment meets the following criteria (McCarthy & Perrault, 1990: 73-74):

- Homogeneous within; customers in a market segment should be as similar as possible.
- Heterogeneous between customers in different segments.
- Substantial enough to be profitable.
- Operational or feasible.

A glossary of terms has been included to qualify jargon, terms and abbreviations used in the report.

7.3.2 Strategic Segmentation Assumptions

It is assumed that the chosen market segment will tend to have similar needs although it is appreciated that the size and scope of projects will vary with

the requirements and means of the client body. Contractors will also tend to apply their resources and assets in a similar way while being subject to variable constraints. For example, they will tend to be exposed to the elements which will limit their ability to accurately predict their production and hence their material deliveries from time to time. This market tends to buy cement predominantly in bulk, but also in bags depending on logistics and the extent of the project. Having made the above assumptions, contractors will nevertheless endeavour to strive for stability and repeatability that approaches a process or factory type operation.

Process operations such as concrete product manufacturers (CPM's) on the other hand, tend to have relatively stable and permanent operations which will have regular and predictable material demand requirements. Their technical support needs will tend to be of a higher order and would revolve around optimising their respective operations and maintaining quality. Readymix concrete operators and manufacturers of value added products such as tile adhesives and grouts also fall into this market segment. This market tends to buy cement in bulk only.

The so called emerging or informal contractors and "bakkie builders", DIY and owner builders make up a third market segment. These customers tend to buy from retail outlets and require application orientated support, hands-on training and skills transfer. It has been assumed that alternative techniques such as focus groups and workshops would be more appropriate instruments of survey in this market segment. Interviews and questionnaires would therefore not be appropriate and this segment has therefore been assumed to be outside the scope of this project.

7.4 Possible Conclusions, Recommendations and the Implications Thereof

It is entirely possible that the customers may not perceive the proposed service strategies to be adding value, arguing that it would be preferable to reduce the selling price of cement to a minimum and then pay for technical services as required. This would be applicable to the specific market segment in question. The respondents may opt for a limited range of services considering other services not to be applicable to their activities.

The perception of the customer is all important and must be taken into consideration. However, there are three manufacturers who all offer some form of customer support and by not participating would leave that player at a competitive

disadvantage. The implication would be to gauge to what extent services are valued by the customers, select those that meet the needs of specific market segments and convert these services into a sustainable competitive advantage. The application of cement does carry considerable risk and high long-term maintenance costs if used in an irresponsible manner. Furthermore, the cement user is often not the owner of the end product and is often not fully aware of the long-term implications. There is therefore an obligation on the part of the cement industry to provide a basic level of customer support, training and general education of consumers as responsible citizens in what is a long-term industry.

Having provided some background and parameters for the research project, the following chapter will deal with those parameters in greater depth.

Chapter 3: Literature Review and Discussion of Relevant Theory

1 Introduction

A comprehensive survey did not yield any specific literature in the form of books dealing with technical marketing, other than a number of references dealing with generic strategic management and marketing. This is not surprising as the topic deals with technical support strategies, and while these are dealt with in general terms in the text books, one needs to apply the principles and make them relevant to the cement and concrete industry in South Africa.

The literature search through the UNISA library included the use of the following databases:

- ABI Information Database (an American database).
- The world-wide WBA Database (Wilson Business Abstracts).
- General Reading list of Books and Articles.

In addition, the literature search included the PPC library, which in turn makes use of an online search via SABINET for South African affiliated libraries and Worldnet Gateway which can, for example, make use of Dialog for a world wide literature search.

Although it would have been useful if more specific material had been uncovered, the lack of such information adds to the value of the findings of this project, and gives credibility to the necessity for carrying out an exploratory research on the chosen topic.

2 Generic Literature and Theory

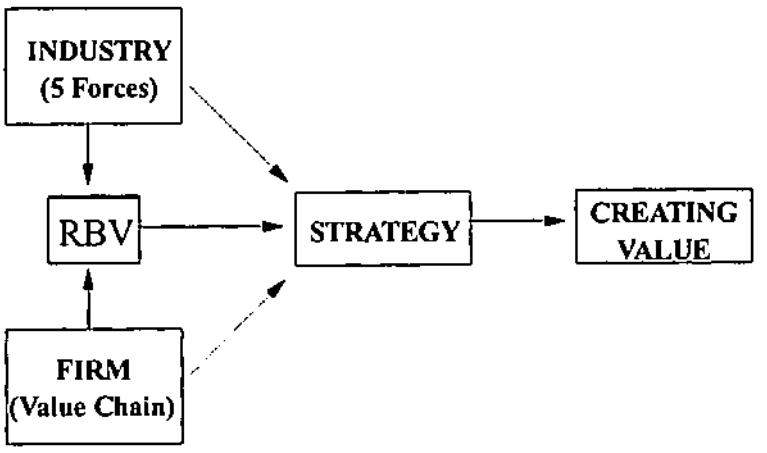
2.1 Strategic Management

In its broadest terms, Thompson and Strickland (1993: 2) state that "An organisation's strategy consists of the moves and approaches devised by management to produce successful organisation performance". They further suggest that without crafting and implementing company strategies, there is no established course to follow, no road map to manage by and no cohesive action plan to produce the intended results.

According to Grant (1994: 114), "Strategy is concerned with matching a firm's resources and capabilities to the opportunities that arise in the external

environment." Ferreira (Handout, 1995) incorporates Grant's concept in his resource based view (RBV) model:

Figure 7: RBV in Context



(Source: Ferreira, 1995)

This project deals primarily with the cement industry, rather than the internal environment of the industry players. However, organisations need to evaluate competencies and capabilities and match these to opportunities in the external environment when formulating strategies that create value for an organisation, thus creating a competitive advantage.

The literature review will, as a result, deal with generic strategy issues as a focus and will be followed up by an externally oriented industry analysis and, to a lesser degree, the internally focused analysis of the firms.

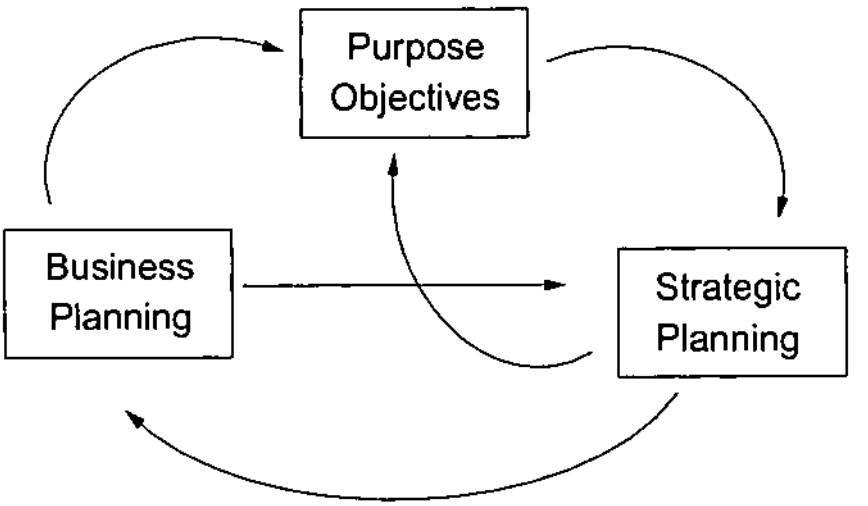
The relevance to the cement industry, at this point, is that the blanket cover of the cartel will no longer be available in a post-cartel competitive environment. The cartel environment allowed manufacturers to carry out capital intensive capacity expansion in a relatively controlled manner, knowing that one could always fall back on the agreed quota where necessary. In the dynamic post-cartel environment, it is obvious therefore that the three cement manufacturers would carry out significant strategic planning. The supply and demand situation for cement is extremely inelastic. As a result, if one is to compete on anything other than price, these strategies need to be extremely effective in order that the cost of achieving differentiation does not exceed the benefit sought. In the context of technical customer support, it would therefore not be possible to attempt to satisfy all of the customer support needs in a sustainable manner. In the words of Oster

(1994: 4), "A strategy is a commitment to undertake one set of actions rather than another". While seemingly obvious in the extreme, it requires little entrepreneurial flair to produce a shopping list of customer support activities. The skill is in establishing which alternatives to apply in order that the customer may perceive the application of these options to have added value. The alternative option of coasting along with the status quo is often more risky than making strategic changes (Thompson & Strickland, 1993: 7).

2.2 The Role of Strategic Planning

The dynamics of the total organisation process can be illustrated diagrammatically as follows: (Schutte, 1993: 53)

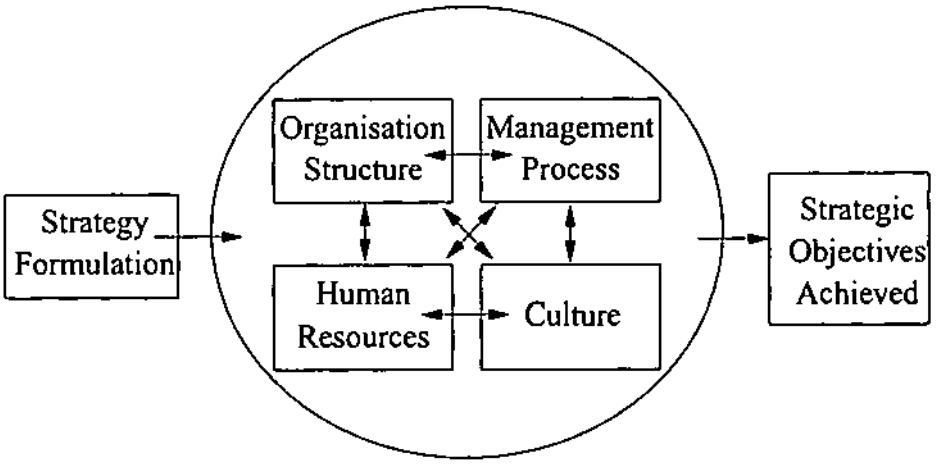
Figure 8: The dynamics of the total organisational planning process.



The purpose objectives contain outputs such as a company's vision, mission and values which guide strategic planning. The outputs of the purpose objectives are used as inputs for the strategic planning process which includes aspects such as critical assumptions, strategic guidelines and targets. The output of strategic planning in turn provides the input for business planning, which is carried out by many managers throughout an organisation (Schutte, 1993: 54). The technical marketing issues, which form the focus of this project, fit into the above business planning at the management planning level.

The management planning process is not carried out in isolation and Stonich (1982 : xviii) has put forward the following model to illustrate the process.

Figure 9 : Implementing strategy



Stonich has the following to say about the strategic planning process (1982: xviii-xix):

> The methods available and choices to be made by managers are numerous, but steps in common to many of these methods include objective setting, business definition, economic analysis, competitor analysis, market and company growth analysis, and resource allocation. But as the model implies, this external focus of strategy formulation must be balanced by assessments of internal capabilities - the organisations structure, human resources, management processes and culture - in order to implement strategy effectively.

According to Stonich (1982: 86), strategy formulation is done periodically when the need arises in reaction in anticipation of changes in the environment. It is thus appropriate that, with the impending dissolution of the cartel effective on 1 September 1996, strategic formulation issues receive the attention necessary to deal with the unprecedented change in the way cement companies will conduct their business in the near future.

Drucker (1959) emphasises the need to distinguish between forecasting or planning as follows:

> Forecasting attempts to find the most probable course of events, or at best, a range of probabilities. The central entrepreneurial contribution, and the one which above is rewarded with profit, is to bring about the unique event, the innovation that changes the probabilities.

The organisation's mission and long-term objectives, once chosen, may remain constant for several years, while strategies evolve constantly as a result of the ever-

changing external environment and managers efforts to exploit new opportunities (Thompson & Strickland, 1993: 8). The above discussion places technical support in perspective as cement manufacturers are exposed to the current dynamic external environment, to an unprecedented degree. Furthermore, top management have anticipated these dynamics to a greater or lesser extent and have all carried out some form of strategic planning at top management level. The effectiveness of these endeavours, however, will undoubtedly depend on the process cascading through the various functions in the organisations.

2.3 Manager's Role in Strategic Planning

Every manager is a strategy maker and implementor for their area of authority and span of control. The management of the strategy-supportive performance involves every individual in its execution, rather than developing and instituting radical strategic changes. Thus, managers who have a delegated leadership role and authority, have a role of supporting the overall strategy of the business with strategic action in their own areas (Thompson & Strickland, 1993: 13-14). Typical functions are Marketing, Production, R&D, Finance, Human Resources, and so on.

It is clear from the above that technical marketing initiatives can benefit from a strategic approach and strategic planning theory in general. Conscious strategy management, as opposed to freewheeling improvisation and gut feel, have many advantages to an organisation. Thompson and Strickland (1993: 17) cite the following advantage of a strategic approach which further illustrates the appropriateness of technical support strategies on which this project is based:

> The fifth advantage of being proactive, rather than reactive, is that trail-blazing strategies can be the key to better long-term performance. Business history shows that high-performing enterprises often initiate and lead, not just react and defend. They launch strategic offensives to secure sustainable competitive advantage and then use their market edge to achieve superior financial performance. Aggressive pursuit of a creative, opportunistic strategy can propel a firm into a leadership position, paving the way for it's products or services to become the industry standard.

Clearly, any efforts and endeavours to strive for the above objectives are worthwhile pursuing. This project subscribes to the above objectives by probing for opportunities within the scope of the parameters discussed in the introduction to this report. The validity of these objectives is founded in functional strategies, whose primary purpose it is to support the organisation's overall business strategy and competitive approach (Thompson & Strickland, 1993: 38).

Strategies need to be implemented to achieve an organisation's objectives. Thus, operating strategic planning is a vital part of the process. It is at this level of the

strategy making hierarchy that specific proposals need to be evaluated for potential to implement these action plans in a sustainable manner. Thompson and Strickland (1993: 49) suggest that a strategy is not a true winner unless it exhibits a good fit with the enterprise's situation vis-a-vis the external environment, builds a sustainable competitive advantage and boosts the company performance. The recommendations and findings of this project, when implemented, should be evaluated against these criteria.

At all levels of management, it is necessary to maintain an awareness that strategic options are only available in the context of scarce resources, a basic economic principle. Oster (1994: 12) reinforces this with a further principle of economics, namely that if everyone can do it, you can't make money at it. Strategies must thus be formulated in a competitive context, with an appreciation for how the market will react to those strategic moves. Evaluation of the strategic options developed should be mindful of the above principles, while being supportive of the overall strategy of the organisation.

2.4 Generic Strategy

This brings into play the generic strategies.

2.4.1 Low Cost Leadership

Thompson and Strickland (1993: 106) place low cost leadership strategy in the following perspective:

> The competitive power of low-cost leadership is greatest when rival's products are essentially identical, price competition dominates, most buyers use the products similarly and want similar features, buyer switching costs are low, and large customers shop aggressively for the best price.

The above statement would appear to be applicable to the cement industry in South Africa.

Low cost leadership, furthermore, provides the following attractive defences against Porter's five competitive forces (Thompson & Strickland, 1993: 106):

- As concerns rival competitors, a low cost company is in the best position to compete offensively in a price war by gaining market share through low prices and, in this way, earn above average profits.

- Buyers can only bargain price down to the survival level of the next most cost efficient seller.
- They are more insulated from suppliers if greater internal efficiency is the source of cost advantage.
- Low cost leadership raises the barriers to entry.
- A low cost producer is in the best position to defend against substitute products.

2.4.2 Differentiation Strategies

Many of the technical support issues dealt with in this project are based on an attempt to achieve differentiation. As a result, this powerful competitive strategy needs to be well understood, as much is done in the name of differentiation without focusing on strategic objectives.

Thompson and Strickland's views on differentiation are as follows (1993: 108):

> A differentiation strategy is effective whenever a buyer's needs and preferences are too diverse to be satisfied by a standardised product. As a result , the basis of a competitive advantage in a differentiation strategy is through a product whose attributes differ significantly from the products of rivals.

To be attractive, differentiation needs to provide a buffer against rivals' strategies through brand loyalty and have the potential to achieve the following:

- Erect entry barriers through loyalty or uniqueness that newcomers find hard to overcome.
- Mitigates the bargaining powers of large buyers since rivals' products and services become less attractive to them.
- Helps fend off substitutes.

Thompson and Strickland go on to recommend that (1993: 109):

> The most appealing types of differentiation strategies are those least subject to quick or inexpensive imitation. Here is where having core competences becomes a major competitive asset. Differentiation is most likely to produce an attractive, longer lasting competitive edge if it is based on:
>
> - Technical superiority.
> - Quality.
> - More customer support services.
> - More value for the money.

Buyers seldom pay for value they don't perceive, no matter how real the unique features may be. As a result, the price premium a differentiation strategy commands reflects the **value actually delivered** to the buyer and the **value the buyer perceives** even if it is not actually delivered.

Thus a firm whose differentiation strategy delivers only modest extra value but signals that value effectively may command a higher price than a firm that actually delivers a higher value but signals it poorly. Examples of such signals are word-of-mouth reputation, brochures and sales presentations, the sellers facilities, as well as the professionalism, appearance and personalities of employees and so on (Porter, 1980:138-142).

It is also vital to keep the cost of achieving differentiation below the price premium differentiating attributes can command in the marketplace, or offset thinner profit margins with enough added value to increase profits. Thompson and Strickland warn that low cost can beat differentiation when buyers are satisfied with a standard product and do not perceive the additional differentiating attributes to be worth the higher price. Differentiation can also be defeated from the outset if competitors can quickly copy the attempt at differentiating. Further pitfalls are as follows (Thompson & Strickland, 1993: 109-110):

- Trying to differentiate on the basis of something that does not lower the buyer's cost or enhance a buyer's well-being as perceived by the buyer.
- Over differentiating so that the price is high relative to competitors product quality, or service levels exceed buyer's needs.
- Trying to charge too high a price premium allowing buyers to be lured away by lower priced competitors.
- Ignoring the need to signal value and depending only on tangible product attributes to achieve differentiation.
- Not understanding or identifying what buyers consider to be value.

2.4.3 Focus and Specialisation Strategies

This relates to an organisation focusing on a niche market, where buyers have distinctive preferences and requirements. The basis of competitive advantage is either lower cost than competitors in serving the market niche, or the ability to offer niche members something different from other competitors (Thompson & Strickland, 1993: 111). Furthermore, niche opportunities may relate to geographic uniqueness or special product

attributes.

2.4.4 Hybrid Strategy

An alternative generic strategy for manufacturers in the industry would be that of best cost producer. This entails a differentiation strategy aimed at giving customers more value for money, usually by combining an emphasis on low-cost with a simultaneous emphasis on more than minimally acceptable quality, service, features and performance. This hybrid strategy allows a company to combine a potential competitive advantage of low-cost and differentiation (Thompson & Strickland, 1993: 110). As a result of the need to accelerate change in the transition from a cartel to a free market environment, it would not be surprising if the three cement manufacturers adopted the hybrid strategy mentioned above. This would certainly appear to be the case in the area of technical customer support. Again, the challenge is to strive for differentiation without compromising low-cost positioning.

2.5 Business Strategy

The objectives set for this project fall within the realm of an organisations business strategy. The central interest of these strategies is to build and strengthen a company's long-term competitive position in the market place and is concerned with the following (Thompson and Strickland, 1993: 36):

- Forming responses to changes within the industry's economy, politico-regulatory and others.
- Crafting competitive moves and market approaches leading to a sustainable competitive advantage.
- Uniting strategic initiatives of functional departments.
- Addressing specific strategic issues firms face.

A business strategy is powerful if it provides a sizeable and sustainable competitive advantage. Amongst other facets, Thompson and Strickland suggest that organisations should concentrate on segments where they have the best chance to win a competitive edge. Product and service attributes that have strong buyer appeal could have the potential to set an organisation apart from its rivals and neutralise competitive moves from rival companies. These strategies involve taking actions to develop the skills and capabilities needed to achieve competitive advantage. It is thus crucial to strategic success to build a company's core competence in one or more core activities crucial to strategic success. This core competence is the basis for competitive advantage because it represents specialised

expertise that rivals do not have and cannot readily match (Thompson & Strickland, 1993: 37).

There are several factors which shape an organisation's strategies at various levels, of which the following are the most relevant for technical service to customers (Thompson & Strickland 1993: 41-44):

- Social, political, regulatory, and citizenship considerations which include government policies, acceptability to interest groups and so on.
- The strategies need to closely match the competitive conditions in the industry.
- A well conceived strategy aims at capturing a company's best growth opportunities and defend it against external threats to its future performance.
- An organisations strategies are grounded on what it is good at doing, its strengths and competitive capabilities while avoiding its organisational and competitive weaknesses.

Furthermore, a link exists between strategy and ethics such as the expectations that customers have regarding the purchase of a product and associated services. Ethics also apply to the market relationship with suppliers who are both partners, regarding such issues as quality, and adversaries, as the seller strives to maximise his profits and the buyer reduce his costs.

2.6 Test of a Winning Strategy

Thompson and Strickland (1993: 49) further suggest the following tests of a winning strategy:

- Goodness of fit with regard to the companies capabilities, aspirations and the match of their strategy to the external environment.
- Competitive advantage test, whereby a good strategy leads to a sustainable competitive advantage.
- A good strategy also boosts a company's performance by way of profitability or gains in long-term business strength.

Much of the above theory relates closely to the objectives of this project and the will be further referred to in Chapter 6, discussion and analysis of the findings.

2.7 Competitive Analysis

The purpose of a situation analysis is to determine the features of the industry's competitive conditions in its macro environment and an organisations internal micro environment which is vital for the implementation of strategies amongst other issues. However, this project deals mainly with the macro environment of the cement industry.

The following is a summary of the techniques suggested by Thompson and Strickland (1993: 61-84):

- Primary forces such as change in technology.
- Porters five forces model of competition.
- Strategic groups or strategic group mapping.
- Competitor analysis.
- Industry attractiveness.

Furthermore, there can be several appealing scenarios about how the industry will evolve and the nature of future competitive conditions. Industry and competitive analysis in practice tends to be an incremental and ongoing process due to gradually accumulated knowledge and continuous rethinking of options available.

Although a detailed company situation analysis is beyond the scope of this project, it is important that any proposed technical support initiatives recognise and align themselves with the following strategy (Thompson & Strickland, 1993: 87):

- The company's competitive approach as to whether it is striving for low-cost leadership, trying to differentiate itself from rivals or focusing on specific customer groups and market niches.
- The company's competitive scope within the industry such as its degree of vertical integration and geographic presence.
- The company's functional support strategies such as product and technical support.
- Recent strategic moves in attempting to secure a particular competitive advantage.

An understanding of the activity-cost chain is also relevant, as the impact on forward channel activities, such as to what extent the industry utilises the PCI in a post-cartel scenario, impacts on the issues discussed in this project. These possibilities in turn need to be fed back into the planning of customer services and outbound logistics. Supplier related activities also have an important role to play here as the industry is exceptionally energy intensive and there is often the

temptation to compromise quality for attractive cost reduction options, be they capital equipment or energy related. The inbound logistics of fly ash, for example, can serve to contribute towards quality and cost reduction while extending cementations capacity. This indicates an ideal situation and clearly justifies development efforts in this field. Importantly, however, these all need to be supportive of the overall strategy. Some of the issues that need to be considered in the activity-cost chain are:

- Prices and location of raw materials and energy (inbound logistics).
- Basic technology relating to plant and equipment.
- Internal operating costs of respective industry players such as economies of scale, productivity and overheads.
- Costs of customer service and outbound logistics.
- Transportation costs, as cement has a high mass and low cost component, which impacts on products and technical support options.
- Forward channel distribution costs.

The above discussion has been based on the work of Thompson and Strickland dealing with the company situation analysis (1993: 87-100).

2.8 Vertical Integration Strategies

The issues relating to vertical integration have been designed into the personal interviews and measurement questions of the mail survey. Vertical integration involves extending the competitive scope of an organisation in the same industry through forward integration or backward integration. Vertical integration must significantly strengthen the firm's competitive position through cost savings or competitive advantage.

Backward integration is appealing where the volumes needed are big enough to capture the same scale of economies of the suppliers or exceed the suppliers production efficiency. Alternatively an advantage is achieved when differentiation can be achieved through better quality products. A good example of the latter is being able to control the quality of coal supply and control costs in face of escalating prices due to export demand. Normally one would have to match export prices and there may not therefore be a cost saving to the cement manufacturer.

Although, cement manufacturers can operate on relatively low grade coal, variability which suppliers associate with lower grades, results in unstable kiln burning conditions and as a result, variable quality clinker and cement. An example of cost saving possibilities is backward integration into fly ash, which could be considered to be a raw material and a waste product with limitless supply, resulting

in considerable reduction in cost and energy consumption. Thompson and Strickland cite the following advantages of forward integration (1993: 121):

> Integration forward into manufacturing may help a raw materials producer achieve greater differentiation and escape price-orientated competition of a commodity business. Often in the early phases of vertical product flow, intermediate goods are "commodities" in the sense that they have essentially identical technical specifications irrespective of producer, as is the case with cement. Competition in commodity or commodity-like markets is usually fiercely price-competitive, with shifting supply and demand conditions causing volatile profits. However, the closer the production stage to the ultimate consumer, the greater the opportunities for a firm to break out of a commodity-like competitive environment and differentiate its end product via design, service, quality features, packaging, promotion and so on.

The above is a compelling argument for forward integration into readymix concrete by cement manufacturers and needs to be balanced against factors such as increased demand on capital investment and balancing capacity over the activity chain.

2.9 Matching Strategy to the Situation

When an industry is competing during the transition to maturity, the slower market growth causes competitive pressures to intensify, resulting in slimmer profit margins industry wide and fundamental changes in industry environment. Thompson and Strickland (1993: 128-129) suggest the following changes to the environment and possible strategies to deal with these changes:

- Slowing growth in demand which generates more head-on competition.
- Buyers become more sophisticated, often driving harder bargains on repeat purchases.
- Product innovation and new end-use applications are harder to come by.
- Firms have a "topping out" problem in adding production capacity.
- International competition increases as industry leadership passes to companies with the biggest global market shares and strong competitive positions.
- Industry profitability falls temporarily or permanently.

However as the growth slows and competitive pressure builds, firms can make several strategic moves to strengthen their competitive positions:

- Pruning the product line as variety becomes costly and prevents economies of scale.
- More emphasis on process innovation to achieve lower costs and better quality control.

- Stronger focus on cost reduction.
- Increasing sales to present customers by taking market share.

Thompson and Strickland also cite the following strategic pitfalls (1993: 130):

> Perhaps the biggest mistake a firm can make during the transition to industry maturity is steering a middle course between low cost, differentiation, and focusing. Such a compromise guarantees that the firm will end up with a fuzzy strategy, no clearly staked out market position, an "average" image with buyers, and no competitive advantage. Other pitfalls include sacrificing long term competitiveness for short term profit, waiting too long to respond to price-cutting, getting caught with too much capacity as growth slows, overspending on market efforts to boost sales growth, and failing to pursue cost-reduction soon enough and aggressively enough.

However, the South African market does have an emerging component to the cement industry due to the pressing need for the delivery of homes, schools and clinics with their associated services in the post-apartheid South Africa. Some of the strategies appropriate for such a market are to capture first mover advantages, employ bold new entrepreneurial strategies, search out customer groups, areas and applications and shift promotion from awareness towards creating brand loyalty.

At the same time, the formal market represented by the construction sector could be considered to be a mature market. Here issues such as differentiation based on quality improvements, product innovation and driving the costs down become important. At the same time, risks include being trapped in a war of attrition and over-optimistic views of the potential of the industry.

2.10 Strategies for Competing in International Markets

Although South Africa does export cement to neighbouring countries as far afield as the Middle East, the potential treat will come from growth-minded global market leaders who's domestic markets are in decline following maturity. For example, Anglo Alpha have linkages with the major international cement manufacturer Holderbank, who may look at the South African market as having growth potential relative to their mature markets elsewhere. In such circumstances, strategic alliances are an option for companies to remain independent while strengthening their competitive positions.

2.11 Strategies for Industry Leadership

Thompson and Strickland (1993: 146-147) suggest the following strategy for industry leadership:

i *Stay on the defensive strategy.*
The best defence is offense through continuous improvement and innovation.

ii *Fortify and defend strategy.*
Make it harder for challengers to gain ground with the objective of holding present market share, strengthening market position while protecting competitive advantage through the application of defensive actions of which the following are examples:

- More own brands to match competitor attributes.
- Reasonable prices and attractive quality.
- Build new capacity ahead of demand.
- Remain cost and technology competitive.
- Arrange exclusive contracts with suppliers and dealers.

Smaller or runner-up firms on the other hand would tend to identify vacant niche markets, focus on differentiation, aggressively pursue new products for target segments and innovate with "dare-to-be-different", "beat-the-odds" entrepreneurial approach to out-manage stodgy, slow-to-change market leaders.

Thompson and Strickland (1993: 155-157) put forward the following "thirteen commandments" for crafting successful business strategies:

- Craft and execute strategic moves that enhance competitive position for the long-term and that serve to establish it as the market leader.
- A clear, consistent competitive strategy, well-crafted and well executed, builds a reputation and recognisable industry position.
- Avoid creating strategies capable of succeeding only in the best of circumstances.
- Be cautious in pursuing rigidly prescribed or inflexible strategies as changing market conditions may render them quickly obsolete.
- Don't underestimate the reactions and the commitment of rivals.
- Be wary of attacking strong and resourceful rivals without a solid competitive advantage and ample financial strength.
- Consider that attacking competitive weakness is usually more profitable than attacking competitive strength.
- Take care not to cut price without an established cost advantage.
- Be aware that aggressive moves to wrest market share away from rivals often provokes aggressive retaliation in the form of a marketing "arms race" and price wars to the detriment of everyone's

profits.

- Empty bold strategic moves in pursuing differentiation strategies to open meaningful gaps in quality, service or performance features.
- Don't get "stuck back in the pack" with no coherent long-term strategy or distinctive competitive position.
- Invest in creating a sustainable competitive advantage.
- Play aggressive offense to build competitive advantage and aggressive defence to protect it.

2.12 General Strategic Planning Issues

Although it may appear as though a disproportionate amount of the desk study has revolved around strategic planning, the above represents an outline of the strategic planning process that has relevance to the objectives and scope of this project. The importance of what has been discussed above lies in the need for all functional activities to be integrated into the corporate strategic plan and be supportive of an organisation's objectives. By basing the strategic planning desk study on Thompson and Strickland, and the industry analysis on Oster, it was possible to achieve a degree of structure to this discussion.

3 Industry Analysis

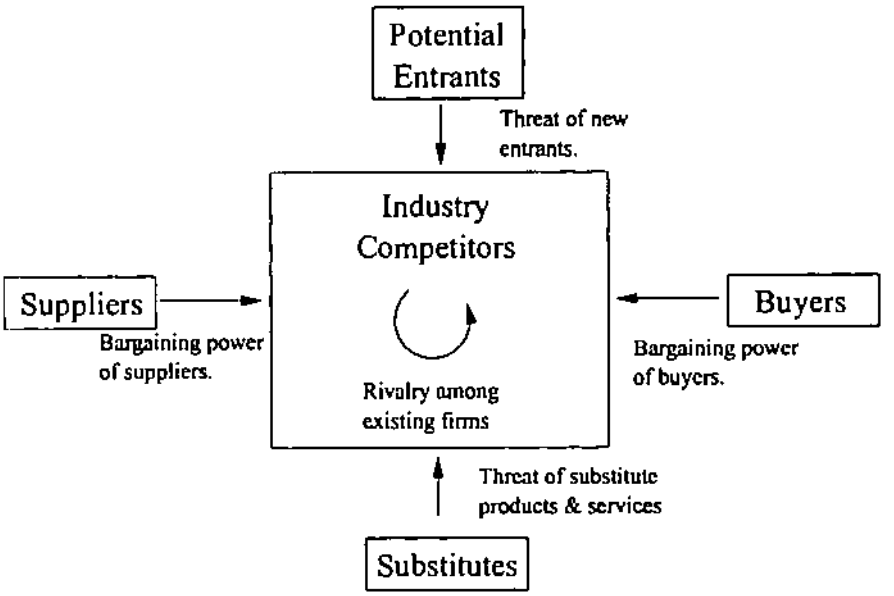
3.1 Need for Industry Analysis

Managers need to anticipate and prepare for, rather than react to sudden competitor moves, shifts in the industry environment, as well as to take forceful positive action to improve a company's position through tested competitive strategies. While the development of competitive strategies is not the focus of this project, an awareness of forces at play in the cement industry is necessary to make relevant and valid conclusions on the findings of the research. A certain amount of noise will inevitably be associated with the responses to the measurement questions. In working back through the question hierarchy, from the measurement question to the management question, one needs to provide recommendations that are synergistic with strategies appropriate for the industry and the industry players. In order to do this, a basic understanding of the industry is necessary. This is achieved through an industry analysis, which in turn can benefit from structure and techniques in an attempt to avoid the bias that one could expect from being accustomed to a cartel environment that has resulted in a controlled cement industry in South Africa.

3.2 Industry Analysis Techniques

Michael E. Porter has become synonymous with industry analysis and his "Competitive Strategy" is in many respects considered to be definitive work on this topic. His "Five Forces Model" has been broadly referred to by many other authoritative authors such as Thompson and Strickland, as well as work by Oster. Porter's work was developed with the view to developing competitive strategy based on industry organisation economics and competitive strategy. Oster in her work "Modern Competitive Analysis" incorporates Porter's "Five Forces Model" and introduces micro-economic synergies. Porter's model (1980: 4) is represented diagrammatically below:

Figure 10 : Porter's Forces Driving Industry Competition



One of the aspects introduced to the discussion by Oster is the historical dimension of the important players in an industry, as well as various associated institutions. According to Oster (1994: 46), history has an overwhelming effect on industry profitability, in much the same way that government does. It is thus appropriate that a historical perspective and government intervention in the South African cement industry was included in the introduction tho this report.

3.3 Fundamental Industry Analysis Issues

Modern competitive analysis needs to focus on the following areas (Oster,1994: xii):

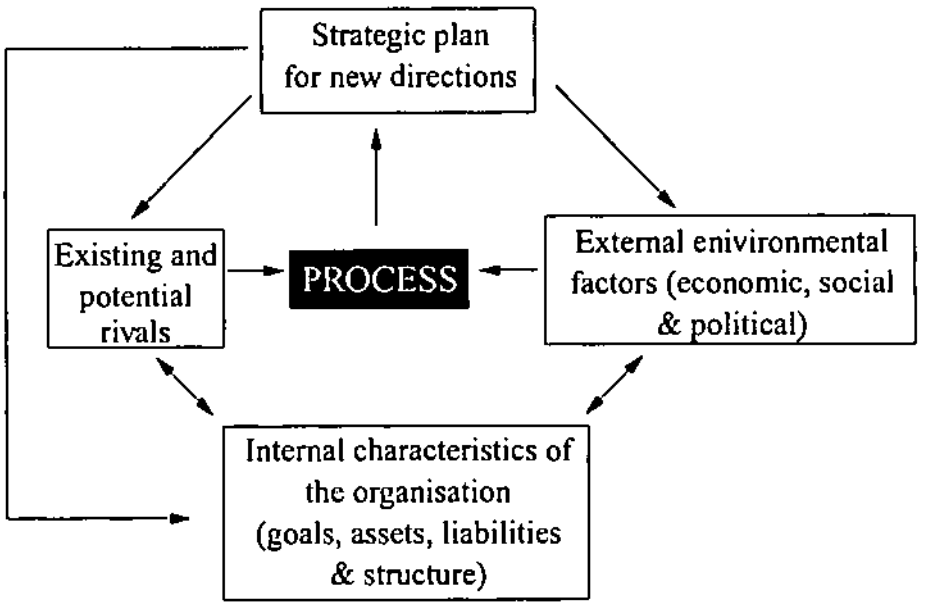
- Competitive nature of competitive strategies.
- Importance of change, where strategic planning is a way of creating and managing change.
- Choices involved in developing strategies are inevitably made in the context of limited information and market friction.

Oster (1994: 4) also provides the following insight that can be applied to all functional levels of an organisation:

> Fundamentally, a strategy is a commitment to undertake one set of actions rather than another and this commitment necessarily describes an allocation of resources.

Oster provides the following outline to put the strategic planning process into perspective.

Figure 11 : Forces contributing to the Strategic Plan



The dynamic nature of the above planning process is intended to bring possibilities of change to the front of the organisations consciousness. Oster also warns that strategic planning at many large organisations rapidly degenerated into formulaic mode where firms en masse articulated and follow strategies like "go for share". One of the fundamental principles of economics easily predicts and explains the failure of a slogan-following brand of strategy, namely "If everyone can do it, you can't make money at it". The observation whereby strategies are specific to circumstances are referred to as the contingency theory of planning (Oster, 1994: 13-14).

3.4 The Role of Economics in Industry Analysis

Unless otherwise indicated these discussions are based on work by Oster who suggests that in terms of the big picture one should not lose sight if micro-economic issues. To a greater or lesser extent, industries operate in an efficient market where prices reflect information instantaneously and one in which extraordinary profit opportunities are thus rapidly dissipated by the action of profit-seeking players in the market. In significant industries such as the cement industry, these forces can be reflected by investors on the stock market who effectively purchase the rights to a portion of the stream of earnings that the firm produces over its lifetime. The value of the stock thus tends to reflect the earning ability of the firm. In the stock market parlance, the efficient market translates to the "random-walk theory".

Not all industries are at a similar point in their evolution which explains the difference in profitability of those industries. During the early days of an industry, there is little industry capital which allows for high profits, the spoils of entrepreneurs. One of the functions of creative strategies is to take advantage of opportunities rapidly when they arise. According to Eisenhardt, the best strategies are irrelevant if they take too long to formulate (1990: 1-16). A second function of strategies is to alert an organisation to new entry and to prepare it to compete in what Jack Welch, CEO of General Electric, describes as "brutally Darwinian" markets.

The above forces result in an equilibrium price through supply and demand at which point, players in the industry will have a profit potential which largely relates to that organisation average costs and the level by which these prices exceed an organisations marginal cost. Included in the average cost from an economic perspective is the cost of capital.

To tie this back to the objectives of this project, the options available to the application of technical support will ultimately relate to the opportunity cost of capital which is an important ingredient of an organisations decision to invest in an array of ventures. Organisations typically measure the cost of capital through an internal hurdle rate represented by its internal rate of return (IRR) or through a projects pay-back period.

Despite the equalising effects of market efficiency and the risk adverse nature of the average investor, organisations and industries do regularly outperform the market for the following reasons:

- Companies earn excess returns when they operate in protected environments where entry is difficult.

- Companies earn excess returns when they anticipate market changes and rapidly exploit new opportunities.
- Companies earn excess returns when they possess a sustainable competitive advantage over potential and actual rivals.

In the struggle for profitability and growth, managers must constantly ask themselves the following fundamental market questions in testing alternative strategies (Oster, 1994: 30):

> What protects my strategy against encroaching entry and imitation by existing rivals? And if I am not protected and imitation does occur, what can I do to maintain good performance in the new era?

The above questions can effectively be applied at all levels of management across a broad range of functions and operations in an organisation.

3.5 Porter's Five Forces Model

The following discussion on "Porters Five Forces" is again drawn from the work of Oster (1994: 31-48).

Porter Force 1 : Intensity of competition

Variance in profits among industry players can in part be explained by differences in the levels of rivalry in an industry. Intensive rivalry among firms in an industry reduces average profitability. Thus in any given industry, coordination is to the collective good of industry participants, through avoidance of protracted price wars, avoiding duplication of research and duplication of branding among other factors. Nevertheless, while the collective interest is served by coordination, the self-interest of the firms in the industry may not be perfectly consonant. This paradox is a result of the incentives for individual firms to shade prices in the interest of increasing its market share and hence increase its own profits.

The following characteristics of an industry help determine the level of rivalry in the industry:

i The Number of Competitors

Large numbers of firms in a market reduce coordinating opportunities as organisations, considering themselves to be minor players, tend to act more individualistically, resulting in uncertainty with regard to relative costs and operating factors. Rivalry can be intense and impersonal with coordination

on various aspects, or intense and personal with little cooperation

ii Size and Distribution of Market Participants

In general, major firms which are all similarly sized leads to intense rivalry in the industry. A convenient measure of the balance in an industry is the Herfindahl Index (HI) used by the US government in the application of antitrust laws to help decide when mergers among industry participants should be allowed.

$HI = 10\,000 \sum S_i^2$ where S_i is the market share of the *i*th firm.

An index of greater than 1 800 indicates reduced rivalry and implies easier achievement of collusion.

iii Homogeneity of firms

The more similar firms are in a market, all else equal, the easier it will be to coordinate these firms. Where firms are very similar, the symmetrical solution where everyone behaves in the same way and reaps the same rewards, becomes a natural solution.

Ouchi's work on "clans" suggests that homogeneity within organisations allows managers to act more or less autonomously because the organisations goals are congruent with their own. This can apply across firms without explicit coordination.

iv Asset Specificity

In heavy manufacturing fixed costs form a substantial part of the total cots of the operation and tend to be quite long lived. The distinction among assets can be illustrated by an aircraft which at face value appears to be specific as it has limited alternative uses. However when one considers its geographic component, an aircraft is an extremely mobile asset which considerably diminishes the specificity of the asset as it enhances its resale value. A cement kiln in a geographically remote area can on the contrary be considered to be a highly specific asset.

As a result, industries with substantial specific assets, exhibit high barriers to exit and intensified rivalry during down turns. These assets have low opportunity costs and organisations will rationalise that they have little alternative than to stay in the industry and deploy these assets even when the markets exhibit low accounting returns. Alternatives may be to limit

backward intergration, lease specific assets or compromise a highly specialised item with a more general purpose machine that would be less efficient but also less specific.

v *Changing conditions of demand and supply*

Variability in demand creates more rivalry within an industry. A useful illustration is the correlation between diesel engines and GNP as a result of their use in raw-materials industries, resulting in a variable demand that is beyond the control of specific organisations in that industry. As a result industries which have "cut-throat" competition tend to suffer from cyclical demand. High demand leads to increased capacity to serve that demand, in subsequent slumps, excess capacity encourages fierce battles for market share which erodes the identity of the market leader and makes the industry more fragile.

Variability of supply and demand often creates additional uncertainty in an industry which will in turn influence the ease with which coordination can be maintained across disparate firms. The temptation to deviate from equilibrium prices is tempered by the oppositions resolve to observe such a move and retaliate. The above variability creates a lot of noise which makes it difficult to determine departure from common ground.

An important secondary impact that fluctuation has on an industry structure is the need for flexibility within organisations. Smaller may be better placed to leverage their advantages over larger firms and opportunities exist where firms are technically diverse. Diversity in turn reduces coordination amongst firms.

Porter Force 2 : Presence of Substitute Products

Substitutes restrict an organisation or industry's ability to raise prices. Substitutes tend to be more important in narrow markets where it is difficult to increase supply quickly, which would indicate excess profit and make alternative solutions more attractive. Situations of fierce competition or excess capacity are less vulnerable to substitution risk. To identify substitutes, one needs to investigate which set of products constrains the ability of a firm or industry to substantially raise their prices. The products should serve a similar function and similar people.

Substitutes can be available inside or outside an industry and can be activated through the cross elasticity of demand. This is the ratio of the percentage change in the demand for one good in response to one percent increase in the price of a

second good.

Porter Force 3 : Buyer Power

There are considerable differences across markets in how powerful buyers are and in how long they are able to force down prices or influence product quality levels. Buyer power can be influenced by the following factors:

- Number of buyers and the distribution of their purchases. The larger the number of buyers and the smaller their individual purchase, the less power each one will have.
- The characteristics of the products where standardisation of products increases buyer power since it typically reduces switching costs and allows buyers to more easily play one supplier against another.
- Backward integration also allows buyers to increase bargaining power as they can produce the goods for themselves.
- Institutional factors such as open transactions allow more power to the buyer as it reduces the cost of comparative pricing.

Porter Force 4 : Power of Supplier

In the same way that powerful buyers can squeeze profits by putting downward pressure on suppliers, suppliers can squeeze profits by increasing input costs. Thus the same factors that determine the power of buyers also determine the power of suppliers.

Porter Force 5 : The Ease of Entry Into an Industry

Entry into an industry is a prime vehicle for reducing the rate of return in that industry and thus factors that discourage entry will be viewed favourable from the perspective of the industry incumbents. Most potential entrants would tend to be reasonably structured in their deliberations and would thus tend to go through a decision process and use tools such as a decision tree, as the higher the pay-off, all else equal, the more attractive the entry to that market. Barriers to entry tend to reduce the rate of entry to below what is required to return acceptable profits through a sustained entry. Here the expectation of the incumbents reactions can strongly influence entry into a market. Also important to the decision process is the exit costs which will have a direct bearing on the cost of failure.

The following factors impede entry to a market and prolong the period over which excess returns can be earned by firms in an industry:

i Expectations of Falling Prices

Both the technology of the industry and its history act as barriers to entry, primarily by driving a wedge between the current market price and an entrants expectations concerning the likely post-entry price. These issues can be influenced by the following factors:

- An organisation's commitment to a market increase along with the specificity of assets.
- Economies of scale where the minimum efficient scale (MES) of production is the smallest volume for which the unit costs reaches a minimum. All else equal, the larger the MES related to the market, the greater is the expected wedge between pre-entry and post-entry price, and thus the less likely for entry to occur.
- Excess capacity deters entry by increasing the credibility of price cutting by incumbents as a response to entry.
- Reputation effect, such as occasional actions by firms that seem to violate their immediate objectives regarding their earnings, can increase their credibility to respond to potential entry by cutting prices and in that way deter entry.

ii Sources of Incumbent Advantages

New entrants may find themselves at a disadvantage due to the existence of:

- Pre-commitment contracts, where incumbents can create first-mover advantages and thus deter entry into markets through the use of contracts.
- Licenses and patents create asymmetries.
- Learning-curve effects, where a diffusion of new technologies can have a profound effect on eroding entry barriers.
- Pioneering - brand advantages deal with the demand side as opposed to the cost side of the equation. Pioneer brands tend to have a first-mover advantage when product uncertainty is high and mistakes are costly in the purchase of experience goods as distinct from search goods that can more easily be physically evaluated.

iii Substantial Exit Costs

The primary determinants of high exit costs revolve around the specificity of capital installation and equipment required as discussed previously.

3.6. The Role of Government in Determining Industry Profitability

Oster has considered the role of government to be an important factor in industry analysis, over and above the five forces put forward by Porter. The following areas need to be evaluated in an industry analysis (Oster, 1994: 43-48):

i Regulation

The sanctioning of the cartel is a regulatory issue that has in the past had an influence on the profitability of the cement industry in South Africa.

ii Antitrust Laws

Although not yet in force in South Africa, the Minister of Trade and Industry, Trevor Manuel, is enthusiastic about introducing antitrust laws. However, a grey area is that of tacit agreement where in practice the likelihood of litigation appears small. Antitrust laws attempt to increase rivalry between organisations.

iii History and Institutions

Industries have tended to develop institutional mechanisms that improve the ability of firms to coordinate and are often referred to as facilitating devices. These arrangements are often in response to government intervention in a market. A typical example in the construction industry is the South African Federation of Civil Engineering Contractors (SAFCEC).

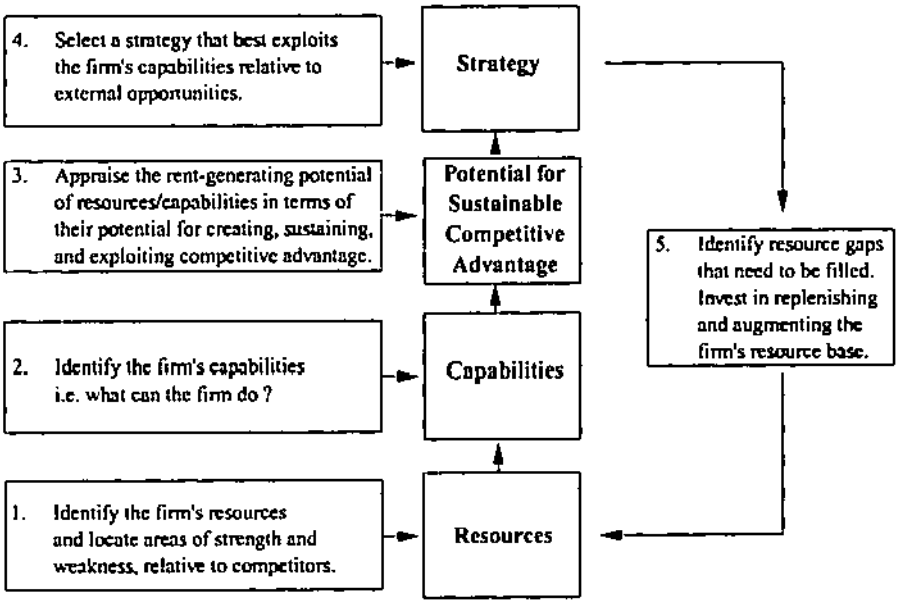
4 The Organisation

When matched to opportunities that present themselves in the external environment, a firm should be in a position to earn rates of profit in excess of the competitive level.

Notice the synergies between the competencies necessary for cement manufacture and the competencies required for backward integration into coal as well as forward integration into aggregate supply and readymix concrete. Should cement manufacturers recognise these opportunities timeously, the inefficiencies of "time compression diseconomies" associated with attempted investment in rapid accumulation of resources and capabilities can be minimised.

The analysis of an organisation's resources and capabilities can be best illustrated by the following illustration:

Figure 12: Analysing Resources and Capabilities



(Source: Grant, 1995: 145)

5 General Discussion on Service and Customer Support

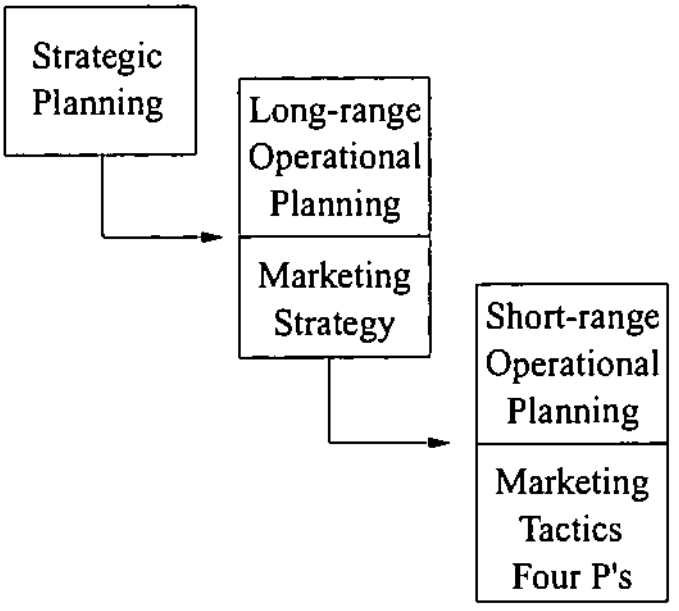
The link between service and manufacturing industries has received greater attention in recent years, as some nations face competitive challenges in manufacturing industries, and services grow to represent a large part of national economies (Porter, 1990: 252). The link that relates closely to cement manufacture is the service which occurs when the sale of manufactured goods creates a demand for associated services (Porter, 1990: 252). As an industrial commodity product, cement is clearly not useful other than as an ingredient in a broad range of applications. Porter (1990: 45) also cites technology as a source of creating competitive advantage, which includes the design of a product and ancillary services provided. Because there have not been great strides in product development in cement internationally, the latter ancillary services would appear to be the most promising source of competitive advantage.

In industrial markets, and especially with commodity products such as cement where there is little difference between the products of competing companies, the marketing function is not as important in the scheme of things as the technology and production functions. This can result, however, in a very real danger that market considerations are mostly ignored when the company develops new products (Myers, 1986: 247-249).

Greenley provides the following framework for the relationship between strategic planning

and marketing, which could clarify the role of technical marketing, as part of the product, one of the four P's in Marketing (1986: 119):

Figure 13: The Role of Marketing Strategy in Strategic Planning



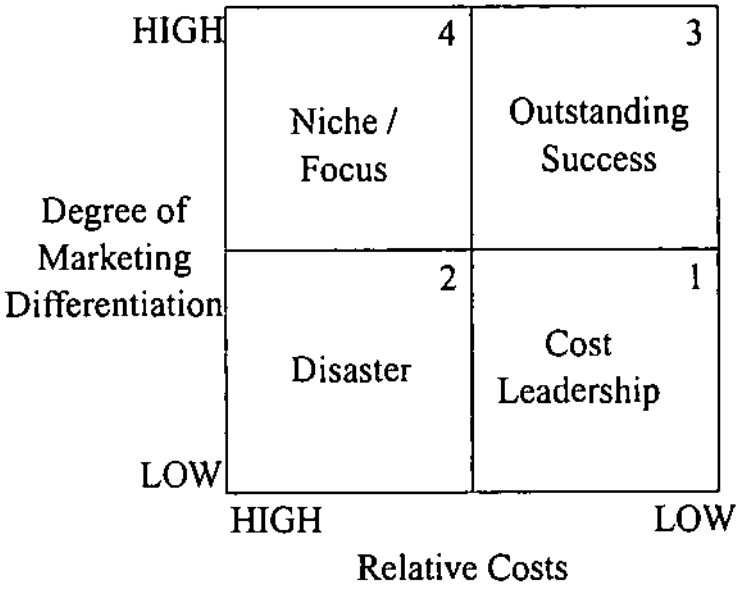
This project also deals with technical support to address customer needs and we have considered these solutions to be part of technical marketing. Most definitions of marketing refer to "finding out what the customer wants". McDonald (1989: 9) has the following view:

> The main point to remember, however, is that customers do not really know what they want. All they really want are better ways of solving their problems, so one of the main tasks of marketing is to understand the customers and their problems in depth, so that we can continuously work on ways of making life easier for them. Whether this happens as a result of serendipity or focused research and development is less important than the end result.

As a result, it is entirely appropriate that customer support issues addressed in this project require the appropriate skills and background to achieve an understanding of a customer's problems. McDonald (1989: 9) also indicates that commercial exploitation comes from technology-driven programmes as distinct from market-driven research and development. A further problem with industrial commodities such as cement is the problem of the demand for these goods being derived from the demand for consumer products. This makes for greater uncertainty to decision-making and makes forecasting extremely difficult (McDonald, 1989: 10).

McDonald (1989: 125) also refers to the following adaptation of Porter's matrix:

Figure 14: Marketing Differentiation vs Relative Costs



Box 1 represents a sound strategy, particularly for commodity-type products of which cement is a good example. However, should costs not be contained, a commodity product could slip into Box 2, which will result in disaster sooner or later (McDonald, 1989: 126).

Peters (1988: 91) provides a compelling reason to maintain a good level of service in his discussion on "service pays handsomely". Referring to a study by Technical Assistance Research Programmes, he reveals that 26 out of 27 customers fail to report a bad experience, the average person who has had a bad experience spreads the word to 10 others and it costs five times more to get a new customer than it does to maintain a customer you already have.

6 Relevant Articles

6.1 Cartel Discussion

The structure-conduct-performance (SCP) framework, which has dominated industrial economic literature, was used by Fourie and Smith (1994: 123) in their critical evaluation of the cement cartel. They conclude that, given the network of joint ownership and vertical integration, merely suspending the cartel agreement will not materially affect the situation. Unless these structural features are addressed, the cartel may simply continue in another tacit form.

In his article, "The Cartel Should Stay", Dr Daniel Leach (1995: 27) of the Witwatersrand Department of Economics concluded that cartels based on efficiency were not necessarily bad for consumers. He bases his argument on Professor Dewey of Columbia University, who suggests that cartels are usually found in industries where entry is free, with no obvious monopoly profits. Furthermore, firms collude to reduce uncertainty, and thus risk, which means lower required returns. UK economist Richardson stressed the benefits of collusion when **supply** is uncertain, as informed investment decisions are only possible when competition is less than perfect. This is necessary to avoid wasteful duplication of capacity, which is greatest when investment is fixed, durable and installed in indivisible units, which is precisely the condition of the cement industry in South Africa.

Leach also confirms that there is no tariff on cement, and ocean shipping is low enough to provide a threat of competition from imports. There are also no barriers to domestic entry, as large deposits of limestone are available to entrants. Leach is of the opinion that the Competition Board made the "politically correct" recommendation that the cartel be abolished. When considering the above argument, it is clear that prices will not necessarily be reduced in post-cartel cement industry. In anticipation of the various RDP projects to impact on demand, the cement manufacturers all have plans to increase capacity, this time uncoordinated.

Following the dissolution of the cartel, Dewey's efficiency criteria for cartels suggest less investment in the long run, due to uncertainty with lower output and higher prices. Haddock's supporting analysis suggests a large increase in the inefficient cross hauling (Leach, 1994: 274).

6.2 The RDP Dilemma

The White Paper on the RDP has the overall objective of "a better life for all". Some 60% of the money allocated from the RDP fund is expected to go, in one form or another, to infrastructure development. In the words of the late Minister Slovo, "most people who ought to benefit from the RDP are jobless and have no means of paying for their homes or services". Therefore, the Government will have to fund most of the development, either directly or through guarantees.

There are four sources of funding (Langenhoven, 1995: 19-22), namely:

- Personal savings.
- Corporate savings.
- Government savings.
- Capital flows from foreign countries.

Personal savings and disposable income are very low as a result of high taxes and inflation rates. Although corporate savings are highly positive, they are largely inaccessible. Government savings, being borrowings to fund current expenditure such as salaries and wages, have become very serious, reaching R 20 billion in 1993, and can easily result in a debt trap should fiscal discipline not be maintained. Capital flows, as indicated by the balance on the capital account, have been negative, and were in the region of R 16 billion in 1993 alone.

To fund the RDP, Langenhoven (1995: 22) thus estimates that current expenditure will have to decline by at least 0.5% per annum to allow for capital expenditure to grow, and hence fund the RDP. This implies cuts in salaries, or loss of jobs, which is not an easy task given expectations and COSATU's powerful position relative to government. A further option would be to sell off government and parastatals, a route followed by Argentina. The scenario also assumes no extra RDP funding via taxes, and a growth in the economy of 2% in real terms, with inflation in the region of 10% over the RDP delivery period.

6.2.1 RDP Delivery

The RDP delivery is under the spotlight and is broadly covered in the media. Gill Marcus, who chairs the Committee on Finance, said that the RDP "fundamentally undermines sound budgeting" (Financial Mail, August 1995: 47). A further reason for the faltering RDP has been the emphasis on redistribution of wealth and dependance on government for implementation. The alternative is accepting the disparities of wealth and relying on growth and the "trickle down" effect (Financial Mail, July 1995: 15). There certainly seems to be substantial funds to allocate to RDP projects and Minister without Portfolio, Jay Naidoo, said that government had allocated R 7.8 billion to 35 projects in the last year (Business Day, 7 September 1995).

6.2.2 RDP and the Construction Industry

The formal banking sector was prepared to get into the low cost housing market, where income levels exceed R 1 500 per month (Business Day, 18 August 1995). However, only 23.5% of South Africans needing houses earn more than R 1500, an earning level that qualifies for a R 9 500 government subsidy. The Botshabelo Housing Accord, initiative of the late Joe Slovo, brought together the key players in the housing market in October 1994. The housing backlog of 1 million houses has now been raised to 3 million. Furthermore, current figures on black housing indicate that 63% of the population live in one-room dwellings that are occupied by

three or more people (The Star, 3 October 1995).

According to Larson (Finance Week, 25 October 1995: 25), the construction sector has never really emerged from its intense recession for number of years. Approximately 40% of work available came out of the private sector. As a result, civil contractors who do not focus on private sector work will have a tough time into the foreseeable future. However, infrastructural spending cannot be contained indefinitely, and R 24 billion worth of roads is reported to be on the drawing boards, with a potential to create 960 000 jobs (Engineering News, 6 October 1995).

6.3 Customer Support Strategies

Manning (Marketing Mix, March 1991) indicates that no company has unlimited resources, so it is vital to identify the few customers who are most important to the business and focus on them. Furthermore, business is learning that they have to know their customers to be competitive in a world of endless choices, since value is a customer perception.

Dr Pitt (Marketing Mix, January 1990) is of the opinion that paying lip service might be the most expensive and disastrous mistake an organisation can make. Furthermore, an organisation can strive to be the service leader, style leader, technical leader amongst other things, but it is very difficult to be all of these things.

Finally, we recognise that the customer is the most important person to the business. If this is so, then the people who serve them must be the most important people within the business. However, these people normally are the most junior employees, such as the sales assistants, service technicians, receptionists and drivers (Maguire, 1991: 23).

The abovementioned literature review has the potential to contribute to the findings of this project to a greater or lesser degree. The industry analysis discussion will form the framework for the next chapter where the cement industry is evaluated.

CHAPTER 4 : INDUSTRY ANALYSIS

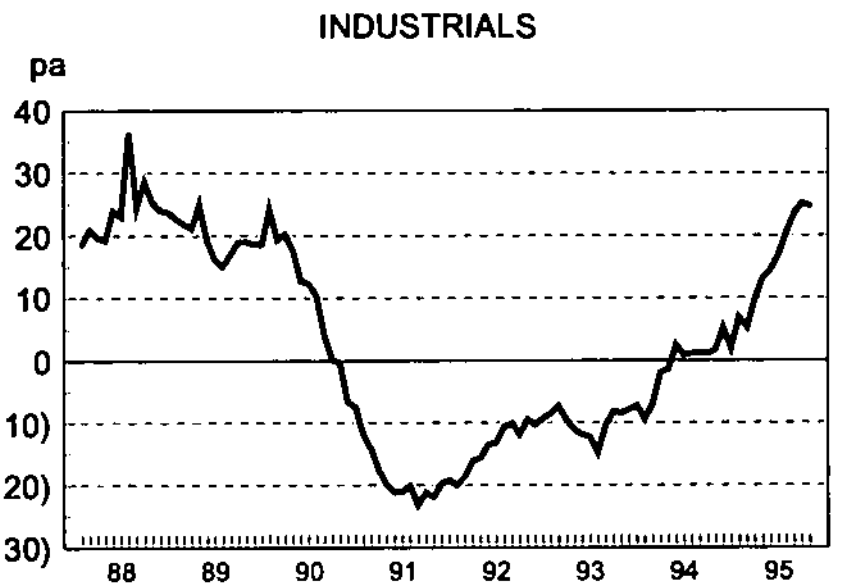
This chapter will start off with a brief macro-economic perspective based mainly on the views of Nico Czypionka as noted during his address to the SAFCEC Convention at Mmabatho in October 1995. In his address, he dealt with the key economic indicators during the period following the April 1994 elections which he referred to as the "honeymoon." This will be followed by a brief micro-economic evaluation of the cement manufacturers and an industry analysis based on Oster's adaptation of Porter's five forces.

I Macro -Economic Perspective

The key aspects of the South African economy beyond the "honeymoon" were the recovery of economic activity during 1994 and 1995 tempered by high wage demands, the 5% transition levy and the poor performance of the primary sector, which continued its typical boom, bust, boom trend. The underlying factors mainly related to the world economy as well as monetary and fiscal policy. The political dynamics, where "expectation management" of the electorate had to be dealt with, were also considered to be important implementation considerations. The secondary sector showed a consistent recovery while the performance of the service sector was running strongly. Further, the world economy staged a turnaround in 1991 and 1992 while gold mining also showed signs of a recovery in Rand terms.

As far as the industrial sector was concerned the elections of April 1994 provided the catalyst for economic recovery as can be seen from the real growth in earnings in Figure 15 below.

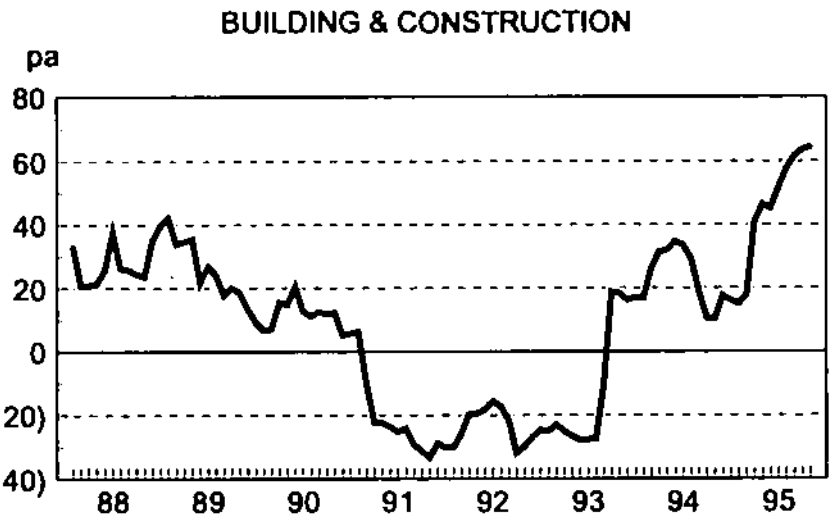
Figure 15: JSE Trends : Real Growth in Earnings



(Source: M. Van Diggelen, PPC)

This was achieved despite the demands on the price of labour by the unions. However these demands were already discounted by the market. The real growth earnings for the building and construction sector support the above trends. The trends in the building and construction are a lot more variable as they are strongly influenced by government infrastructural spending. As a result, high expectations in 1993 were briefly becalmed during the election period of April 1994 as shown in Figure 16 below.

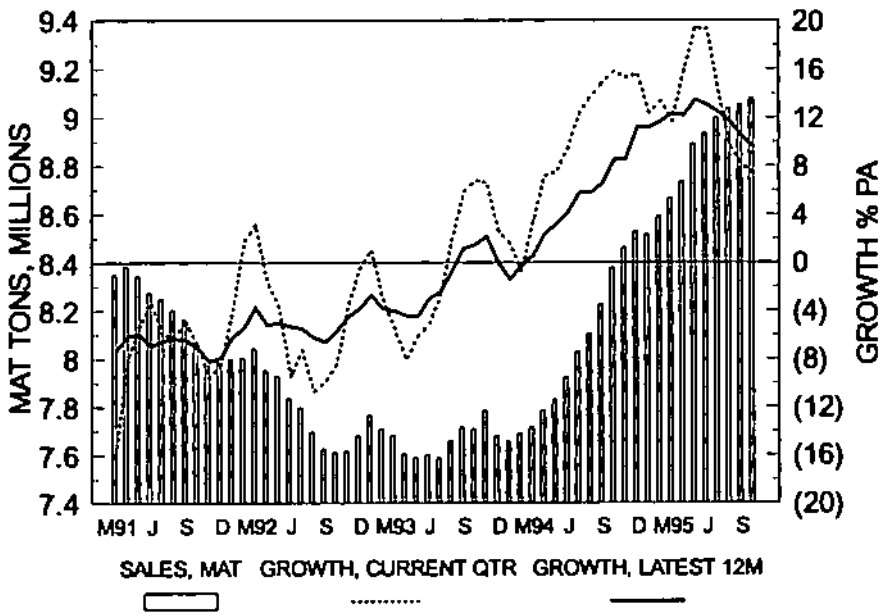
Figure 16: JSE Trends : Real Growth in Earnings



(Source: M. Van Diggelen, PPC)

A similar trend is observed when looking at cement sales and again the effect of the elections can be clearly seen in Figure 17 below.

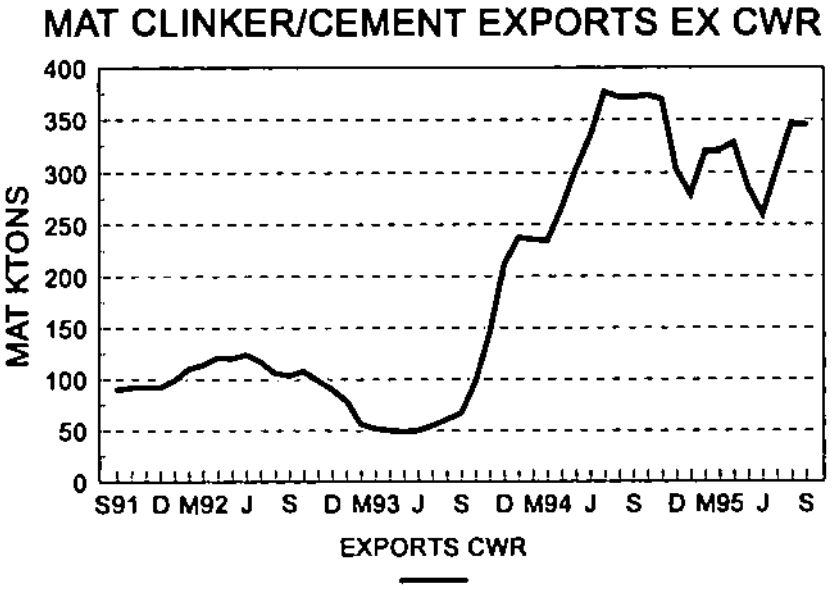
Figure 17: RSA Domestic Cementitious Demand



(Source: M. Van Diggelen, PPC)

An indication of South Africa's international acceptability can also be interpreted from the export of cement to Dubai from PPC's De Hoek factory in the Western Province as illustrated in Figure 18 below. The cement export also indicates that South African cement prices are realistic in global terms and that the South African cement industry has the capacity to defend the coastal regions against imports in the current international market.

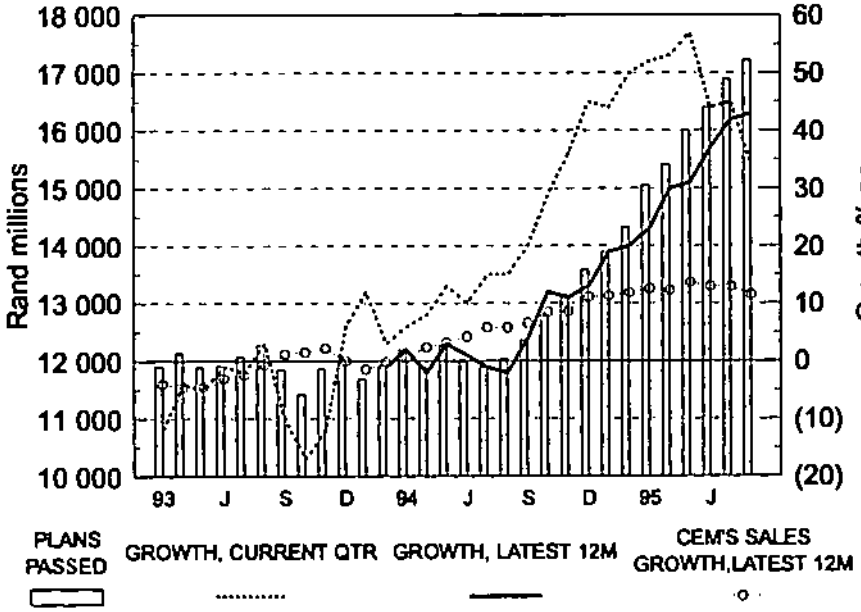
Figure 18 : Cement Exports



(Source: M. Van Diggelen, PPC)

The growth in building plans passed, further accentuates the "kick-start" effect of the April 1994 elections. Interestingly however, the building plans passed showed a lack of confidence leading up to the elections as many potential buyers prepared to "pack for Perth" and only picked up once the elections had taken place in a relatively peaceful manner. An upward trend in cement demand can be seen to be associated with the growth in the value of building plans passed.

Figure 19: Building plans passed



(Source: M. Van Diggelen, PPC)

Hotel room occupancies showed a similar growth trend and there was a 25% growth in intercontinental flights, indicating a substantial increase in visitors to South Africa (Czypionka, 1995). The increase in tourism is even more significant given the exceptionally high levels of crime and violence which receives world wide media coverage.

Furthermore, there was a surge in fixed investment which is a good indicator for lasting confidence and does not share the possibility for a sudden slump which is typical of cyclical phases of growth in consumer expansion during the apartheid era. This was due to negative interest rates and consumer spending, which was not sustainable as the fundamentals for growth were not in place. The optimistic business confidence index, even during pre-election days, and retail sales which took off before the elections were further indications that individuals were confident about prospects in South Africa. New car sales are equally buoyant but are heavily dependent on credit demand and are thus prone to collapse and it is therefore critical that this does not occur (Czypionka, 1995).

Stability and confidence is vital to sustain fixed investment, an important component of which is imported machinery used to expand production capacity. At the same time, inflation needs to be driven down relentlessly, through an astute monetary policy, to ensure that positive interest rates are maintained. In doing so, the monetary authorities will avoid the short-term attraction of "cheap money" such as negative real interest rates and depreciation of the Rand, which run the risk of an overheated economy to the detriment of long-term growth. The efforts of the Reserve Bank Governor, Chris Stals, in this regard has resulted in the cost of borrowings, as measured by the prime rate, to exceed inflation and, as a result, the South African currency has one of the highest "costs of money" in the world (Czypionka, 1995).

Czypionka (1995) indicated the following pitfalls that run the risk of compromising the current gains in economic growth :

- Labour problems : Industrial Relations based on a process of consensus run the risk of not being pragmatic.
- Political "Silly Season" : The Kwazulu-Natal situation is serious and should be resolved as it still has the potential to erode overseas investor confidence.
- Criminality : The judicial system is clogged and prisons are over-crowded. This also has the potential to wreck investor confidence.
- Competition : Policies need to enhance competition.
- Agriculture : Poor seasons of rainfall have impacted adversely on subsistence agriculture, resulting in the urbanisation of this population further adding to urban land invasion and squatter problems.
- Gold : Continues to suffer labour and structural problems.
- RDP : The delivery and expectation management process must progress while unions consider themselves to be custodians of the original RDP.

- Fiscal discipline : Good principles need to be maintained and the budget needs to remain on track. Expenditure needs to remain under control and taxation has reached a ceiling. Local government is functioning poorly and needs to be downsized following the November 1995 local elections. Although inundated with overseas offers, government needs to avoid the debt trap through government borrowing to fund expenditure. Social and political expenditure, such as MK pensions and the truth commission, need to be contained to avoid a further slowdown of the RDP among other priorities.
- Privatisation : Funds are needed to finance the RDP, but privatisation is being resisted by COSATU.
- Inflation : This has led to expensive money in the past as every expansion period was always accompanied by inflation peaks.
- Trade policy : Tariff and quota reforms need to continue while price and quality need to be institutionalised as competitive yard sticks.
- Balance of payments : The squeeze on the trade balance continues as imports increase and exports are down as a result of the poor performance of gold and agriculture. The balance on the current account of the balance of payments is an important concept, especially with a view to economic policy, because it indicates whether or not a country has been living within its current means (Fourie and Van den Bogaerde, 1991: 196-197). Capital inflows are vital to support foreign reserves while the stabilisation of the Rand, interest rates and the containment of inflation are part of the monetary policy containment. It is also important to maintain fiscal and political stability to repay capital borrowings.
- Borrowings : South Africa is currently under borrowed by international standards, as indicated by a debt to GDP relationship of 18% compared to an acceptable 30%. This indicates a level of credit worthiness and borrowings could be used to afford fixed investments. (Czypionka, 1995)

Czypionka forecasted a 3% growth for 1995 and 4% for 1996. Some of the factors that may affect these forecasts are:

Down-side:
- Growth without performance.
- Low personal savings.
- Low investments by smaller organisations.

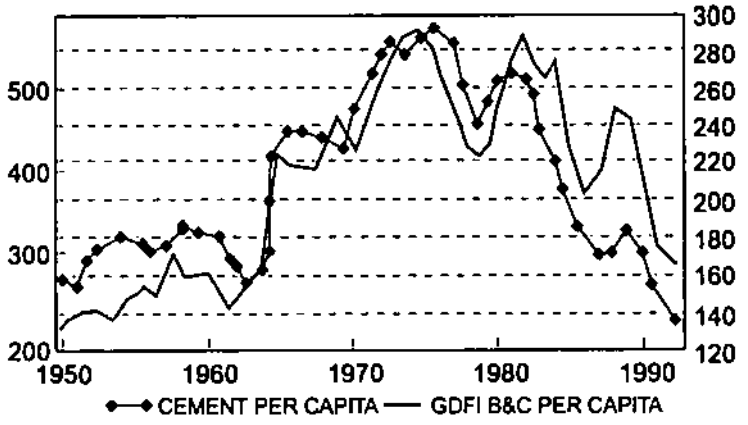
Up-side:
- Availability of funds.
- Prudent fiscal and monetary policy.
- An easing of political tension.

A panel of economists consisting of Boyd, Bethlehem and Gouws (Financial Mail, 1995:

26-32) estimated GDP growth forecasts at between 2.5 and 3.5% for 1996. Boyd further reasoned that there is currently not a lot of spare capacity due to under investment in the eighties. As a result, the economy cannot afford to grow too rapidly without becoming over-heated and inflation picking up because of the new capacity that has to be imported, causing a growth constraint approximately equivalent Stals' estimated potential of 3,5% growth for 1996.

Finally, it can be seen, from Figure 20 below, that change in cement demand tracks very closely with change in GDFI per capita.

Figure 20: GDFI per Capita vs Cementitious Demand



South Africa's cement consumption per capita at 186kg per person is also well below that of developed countries (Italy - 770kg per person). Even Botswana, which produces no cement, has a per capita cement consumption of 305kg per person (SACPA Annual Review, 1993). There thus appears to be scope for increased consumption of cement, per capita, in South Africa, provided that the macro-economic fundamentals remain positive.

2 Micro-Economic Perspective

A brief evaluation of past performance will be followed by current performance.

2.1 Past Performance

On average, the cement manufacturers displayed significantly better rates of return, on both assets and equity, than the building sector which is represented by companies listed on the JSE, as can be seen in Table 1 below. Whereas the average annual rate of return was well below the inflation rate for the building and construction sector, for the cement manufacturers it was more or less equal to

inflation, and they produced positive real rates of return.

Table 1: Standardised Rates of Return : 1986-1991

	1986	1987	1988	1989	1990	1991	Average
PPC ROA	14.1	15.8	21.3	24.1	23.1	21.9	20.1
PPC ROE	11.7	9.3	12.0	15.1	15.3	15.4	13.1
AA ROA	8.3	8.5	11.7	12.4	10.5	8.3	10.0
AA ROE	7.7	8.8	9.1	9.2	7.4	6.7	8.2
BC ROA	10.6	19.8	26.7	23.7	18.3	17.0	19.4
BC ROE	8.0	25.4	31.7	31.0	17.6	16.8	21.8
AVERAGE ROA	11.0	14.7	19.9	20.1	17.3	15.7	16.5
AVERAGE ROE	9.1	14.5	17.6	18.4	13.4	13.0	14.3
BLD & CONSTR. ROA	7.8	11.4	13.3	14.6	13.6	10.3	11.8
BLD & CONSTR. ROE	5.5	11.0	13.3	15.2	12.8	10.5	11.4

Anglo Alpha has done consistently worse than it's cartel partners, the JSE building and construction sector and the inflation rate. PPC's rates of return have been almost double those of the building and construction sector, and steadily above inflation. Blue Circle has performed significantly better than PPC and Anglo Alpha on the above indicators with a return on equity average of 22%, which is almost twice that of its opposition companies and the building and construction sector.

2.2 Recent Performance

Bear in mind that Blue Circle was acquired by the Murray & Roberts group and the company was delisted from the JSE and, as a result, the financial results are not available after 1991. This brief assessment therefore deals largely with an appraisal of PPC and Anglo Alpha's performances.

2.2.1 Capacity Constraints

The recovery in cement demand reached a peak of 13,6% annual growth in May 1995, as can be seen in Figure 17. It can also be seen from Figure 21 below that Blue Circle are not in a position to meet their quota obligations

in 1995, despite their effective declared capacity utilisation of approximately 70%, as indicated in Figure 22.

Figure 21: Quota Shortfalls

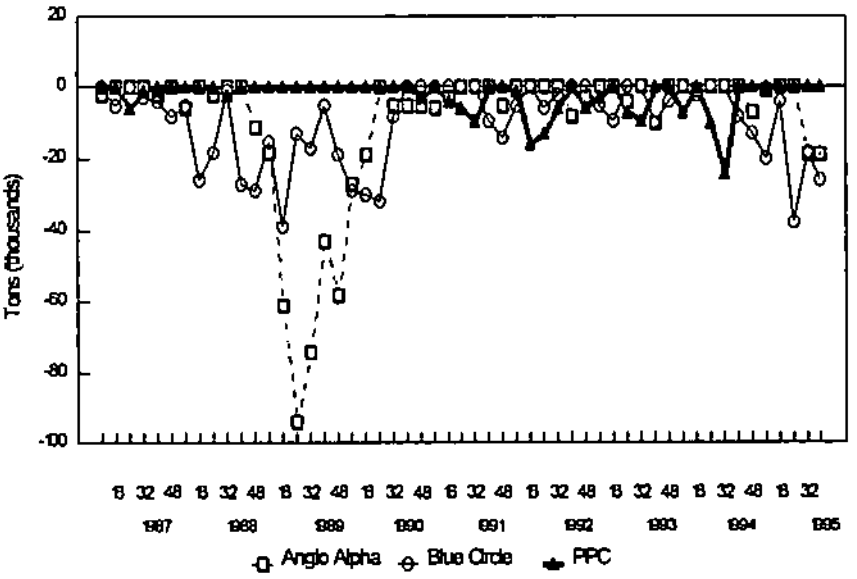
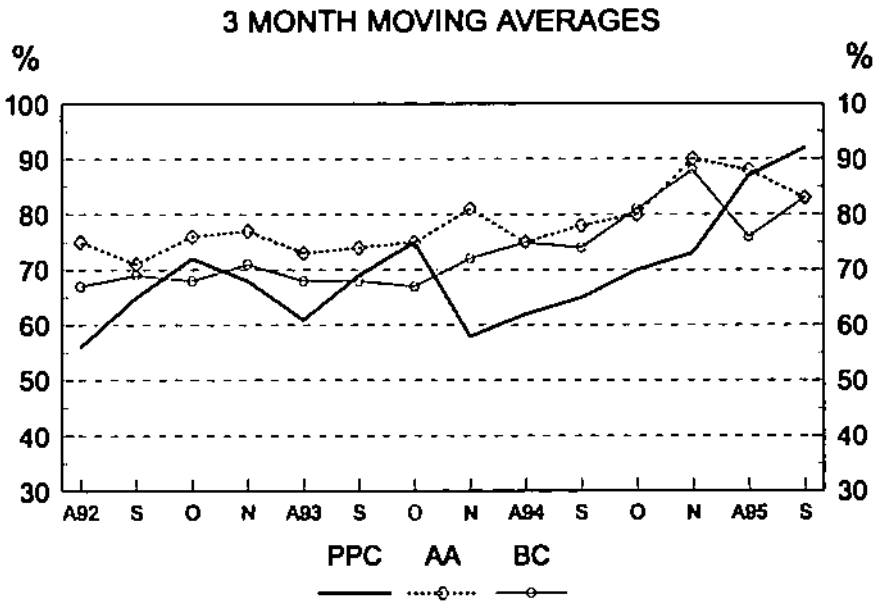


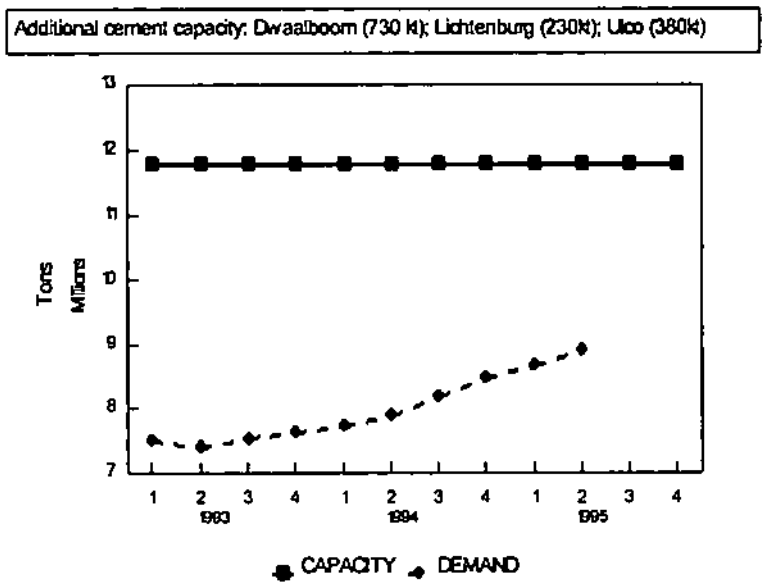
Figure 22: Capacity Utilisation - Inland



As at 27 August 1995, Anglo Alpha were 25 000 tons behind quota, and Blue Circle 21 000 tons (Van Diggelen, 1995). This is an indication that the

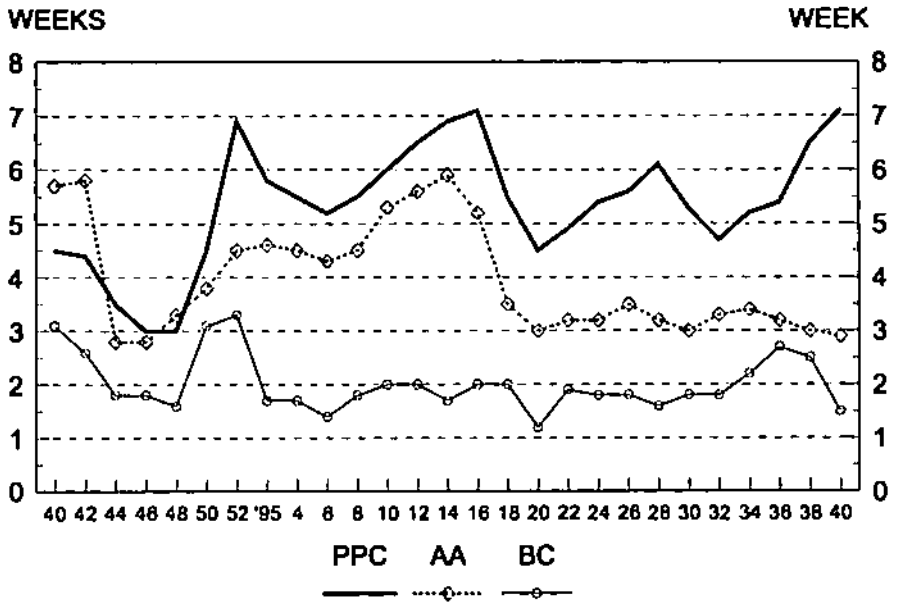
theoretical capacities are over-optimistic and the two million spare capacity may not be as comfortable as indicated in Figure 23 below.

Figure 23: Cementitious Demand vs Capacity



The above observations are supported by the stock holdings, where it can be seen, from Figure 24, that both Anglo Alpha and Blue Circle's ability to guarantee continuous supply will come under severe pressure should they experience any production problems.

Figure 24: CDSA Stockholdings



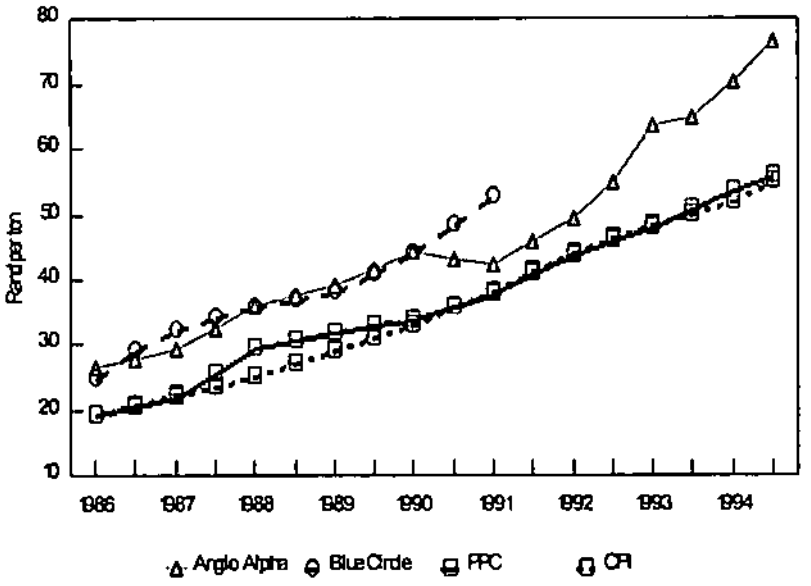
However, when PPC's Dwaalboom factory commences production in 1996, 730 000 tons of cement capacity will be added. Blue Circle will add 230 000 tons of cement capacity at Lichtenburg and Anglo Alpha 380 000 tons at Ulco.

2.2.2 Financial Performance

Anglo Alpha have produced particularly good results in the six months to June 1995, with attributable income up by 61%, while PPC posted 40% for the same period. PPC's share of the blend market is 43%, compared with Anglo Alpha's share of 25%. This means that PPC has relatively lower profitability, as the margins for blended products are lower.

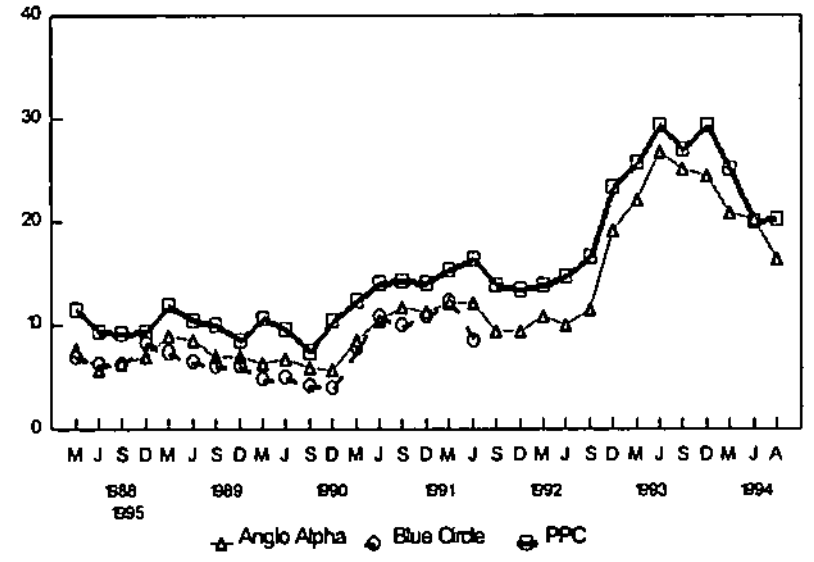
Anglo Alpha is out-performing PPC in terms of operating profit per unit of cement, as can be seen in Figure 25 below. Blue Circle could be in an even better position as an extrapolation of their last results, combined with the economies of scale of operating at maximum capacity, would tend to indicate.

Figure 25: Domestic Cement : Operating Profit



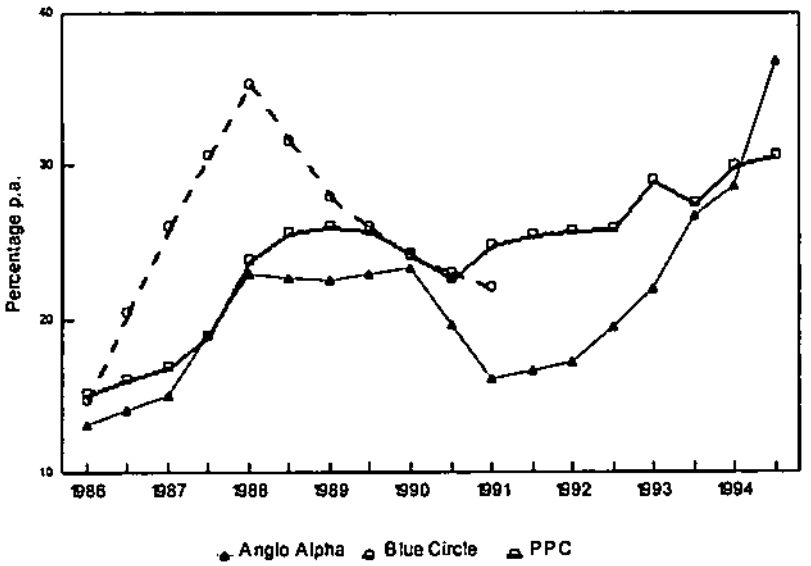
Despite this performance by Anglo Alpha, PPC's price earnings ratio has been consistently out-performing Anglo Alpha and Blue Circle as indicated in Figure 26 below.

Figure 26 : Price Earnings Ratios



Anglo Alpha has staged an excellent recovery and is currently out-performing PPC on total operating return and nett assets (refer to Figure 27 below). Not only were profits up, but assets were down, indicating good cost and asset management.

Figure 27 : Total Operating RONA



2.2.3 Profits and Cash Flow Statistics

The above performance criteria, for the six months to June 1995, are summarised in Table 2 below.

Table 2: Profit and Cash Flow

	ANGLO ALPHA	PPC
PBT	R 318 m	R 286 m
NET INCOME	R 204 m	R 161 m
TAX BURDEN	36%	45%
REAL GROWTH EARNINGS	35%	15%
CASH FLOW	R 258 m	R 155 m

2.2.4 Returns to Shareholders

The following comments relate to shareholders interests:

- In 18 years, since 1975, PPC's dividends have grown 18,4% per annum, against 17,3% for Anglo Alpha and an inflation of 12,9% per annum.
- PPC has reduced its dividend cover to 1,6, against Anglo Alpha's 3.
- Dividend growth, after the last five years, has eased to 12,5% per annum for both companies.
- PPC's dividend yield has dropped from 14,8% to 2,1% against PPC's 9% to 3% since 1977. This is a consequence of the shares being re-rated upwards during this period.
- Anglo Alpha's share price is considered to be fully priced at its R112 peak and p:e of 16,3 at six months, ending June 1995. PPC's share came off a high at R 110 at December 1994 to end at R 87.50 at June 1995.
- PPC's growth in shareholders worth is 33% per annum, having maintained a remarkable record of growing its shareholders worth at 2-4 times inflation since 1986. For the last 18 months, Anglo Alpha has produced an excellent growth in worth of 47% per annum.

In summary, despite Anglo Alpha's 3-year profit run, its p:e continues to

fall, dropping to 16,3% in June 1995. On the other hand, PPC, after a modest profit growth has a p:e that has stabilised at 20,3%. It would thus appear as though investors have recognised PPC's spare capacity to meet an increase in cement demand and the potential profits from operating at close to full capacity. On the other hand, Anglo Alpha is investing in old plant, which is less efficient, to meet an anticipated growth in demand.

3 Cement Cartel Competitive Positioning

3.1 ANGLO ALPHA

Although this is a difficult area to obtain information or market intelligence on, it is possible to interpret the position taken by the respective manufacturers to some degree. As an employee of PPC, it would obviously not be possible to discuss these issues with opposition manufacturers.

Through its international shareholder, Holderbank, Anglo Alpha is in a strong position to benefit from global issues. This covers a broad spectrum from marketing issues, through to technical product development and production technology. Anglo Alpha's Chairman, Peter Byland, serves on the Board of Swiss based Holderbank, and as a result, Anglo Alpha should maximise global synergies. The benefits of this link has already borne fruit in Swaziland, where Anglo Alpha's acquisition of distribution arm, Inter Africa, was secured largely through Holderbank funding. This was done at a time when South Africa's dual currency and foreign exchange controls were restrictive to investments in neighbouring states.

Anglo Alpha clearly anticipated the dismantling of the cartel, and focused its strategy on distribution, through transport and outlets. To this end, Anglo Alpha secured a 100% interest in the distribution company, Capital Cement Distributors (Pty) Ltd, in 1994. Together with transport subsidiary Macdonald & Volck, and alliances with various transport contractors, Anglo Alpha have signalled their intention to be in control of their distribution service.

To complement their transport logistics, Anglo Alpha have increased their sales outlets from four to fourteen, across a broad geographic area. Forward integration has been enhanced by securing the outstanding 50% share in Pioneer Concrete, from PPC in 1993. In retaliation to Readymix Concrete contesting the Gauteng market, Anglo Alpha have opened a Hippomix readymix operation in Readymix Concrete's backyard in Cape Town.

There was also some indication of backward integration through Anglo Alpha increasing their shareholding in Omnia Holdings Limited, from 26% to 33,4% (Anglo Alpha Annual Report, 1995: 6). Although Omnia primarily manufacture fertiliser and explosives, a useful by-product is gypsum, essential for controlling the set of cement.

At the same time, productivity plans, introduced in 1992, have been claimed to result in lower cost of cement production. (Anglo Alpha Annual Report, 1994: 4). Anglo Alpha have also invested a significant amount in expanding and replacing their information system in order to manage their post-cartel market.

Although Anglo Alpha have invested in expanding their capacity (Martin Creamers Engineering News), through a R 350 million investment in its Ulco factory, this capacity expansion is based on an older plant and will as a result be detrimental to cost of production, when compared to modern plant efficiencies.

Internally, Anglo Alpha would look to maintaining market share in the Eastern Cape, through their shareholding of Cementman, based in East London. The Western Cape would also be an area of focus and Anglo Alpha do have the raw materials, strategically located close to Saldanha.

Anglo Alpha have strongly indicated that the neighbouring countries hold opportunities for growth. Shareholding of cement production in Angola and interests in the cement manufacturers in other neighbouring countries appear to be well advanced.

All of the above indicates that Anglo Alpha, with their experienced executive team, are well prepared to maintain their market share in South Africa. This appears to be as a result of cohesive and comprehensive strategic planning. Their positioning, in terms of the value chain, supports their alleged Total Offer Concept. This refers to their ability to be able to supply the full spectrum of aggregates through Hippo Quarries, concrete through Pioneer and Hippomix concrete, and cement through Anglo Alpha. Although this strategy appears to be compelling in its logic, their exposure appears to be in over-capitalising on sales outlets that do not have a clear potential to dominate the regional market place. It is clear, however, that they will not give up market share without aggressive retaliation.

Anglo Alpha have clearly positioned themselves to address the needs of the so called emerging market, through their advertisements in print and radio media. In the latter example, they utilise their sponsorship of a football club, Orlando Pirates. Anglo Alpha have also contributed half a million Rand towards the unification of the many industry associations. This sponsorship would essentially promote the

bodies representing emerging contractors, who would be poorly funded relative to establish contractors and their various bodies.

Anglo Alpha's mission is as follows:

> "To manufacture and market concrete and concrete ingredients and other products, allied to the Company's technical and marketing expertise".

An indication of Anglo Alpha's strategic intent is clearly communicated through their business objectives:

> "To satisfy customer requirements through superior service, and to ensure the prompt, reliable delivery of quality products."

Anglo Alpha appear to have a stable, tight-knit management team, with a track record of solid performance. Their strategic planning appears to be appropriate and has manifested itself in their action plans. They appear to be intent on maintaining their market share, while being careful not to signal competing on price. Beyond South Africa's borders, Anglo Alpha, with their holding company, Holderbank, appear to be positioning themselves to be a major player in cement manufacture in Sub-Saharan Africa.

3.2 BLUE CIRCLE

Blue Circle, the smallest cement manufacturer, has tended to be the maverick in the cement industry. The interests in Blue Circle were acquired from Blue Circle UK, by Murray & Roberts in 1991. Although this implied that Blue Circle no longer had the backing of Blue Circle UK technology, it is clear that the relationship built up through their association has remained intact in terms of technology transfer. Their effective implementation of the masonry cement, Mortarcem and more recently, sulpho-alumino cement, is an indication of their responsiveness that has earned them the reputation of first movers in the industry.

Blue Circle has benefited from the synergies associated with their parent company, Murray & Roberts Holdings. Both organisations have their roots in construction in general, and concrete in particular. Murray & Roberts claim to be a customer orientated group of companies, with their core competence being provided by it's strong body of engineers. This enables Murray & Roberts to optimise synergies between individual operating groups and bring to bear a concentration of multi-disciplinary services and products, to satisfy engineering-related customer needs (Murray & Roberts Annual Report, 1994).

Three of the five executive directors of Murray & Roberts hold engineering qualifications, as does the Chairman, Mr Dave Brink. This trend is carried through to the Materials division, which includes Blue Circle Cement. Therefore, it should not be surprising that their competitive posture is closely focused on functional relationships and application-orientated developments. This aspect is further reinforced by the portfolio of operations in the Materials division, which, although diverse, covers a number of manufacturing divisions that all have the potential to benefit from RDP initiatives. An indication of the detail to which this strategy is carried through is their investment of R 25 million, in 1994, in Glass Reinforced Polyester (GRP) piping products, through Hobas in Swaziland. This system is a substitute product for asbestos cement pipes, manufactured by AC Pipes. It is well known that the provision of domestic water is of primary importance in terms of RDP delivery, in many of the provinces of South Africa.

Blue Circle's strategic intent is to improve distribution of cement and blending facilities, and in this way, enhance the level of customer service (Murray & Roberts Annual Report, 1994: 42). Blue Circle's implementation of strategies is impressive, as can be appreciated by their smooth entry into the heavily contested Readymix market, in the Gauteng province. Having established five readymix plants in Gauteng, they added a further five plants through the acquisition of SA Readymix from Group 5. In retaliation, Anglo Alpha established one Hippomix plant in Cape Town. Readymix Materials, which includes hard rock quarrying, now has a presence in seven of the nine new provinces, with an intention to add further capacity to all geographic areas.

The competitive position of Blue Circle cement thus slots into an implicit business definition of the Materials division. As such, forward integration is more developed, in terms of the value chain, than either Anglo Alpha or PPC. A further implication of this broad vision is multi-skilling. Many of the staff of Blue Circle have had exposure to concrete through readymix concrete and construction. This, no doubt, provides a culture of commitment to the implementation of their strategies as well as an appreciation of meeting programmed milestones.

3.3 PRETORIA PORTLAND CEMENT

The vision of PPC is as follows:

> "To be the most competitive and preferred supplier of cement in Southern Africa."

Historically, PPC has operated as a production-orientated organisation, managed by strict controls through a hierarchical management structure. PPC's core competence focused on well-managed factories, with a reputation in the market

place of producing high quality cements. Expansion and modifications were taken on the basis of long-term sustainable growth, and were labouriously evaluated and researched. All of this was appropriate for a fundamentally stable business environment within the cement cartel.

PPC undertook a substantial strategic planning exercise in 1993. The team participating in this planning was broadly represented at a second tier level of management. The company has since gone through a phase of dramatic transformation in order to prepare itself for a post-cartel environment. The catalyst for this process was provided by the vision and charismatic leadership of the current Managing Director, John Gomersall. His personal commitment, through his involvement in an innovative industrial theatre roadshow "The Journey", communicated the endorsement of the company's vision, mission and values by management at the highest level. The Journey was the start of an ongoing philosophy to empower employees to reassess everything they do in terms of two criteria, namely consistency with PPC's values, and coherence with PPC's vision. This had the effect of encouraging a matrix type, cross functional team approach to projects, thereby attempting to avoid the traditional "silo type" hierarchical management approach which does not lend itself to a dynamically changing environment. The approach is not without risk and the team of executive directors bears little resemblance to that of four years back. It is important to appreciate, however, that this situation was a natural consequence of senior executives not being comfortable with the challenges that lay ahead, rather than any attempt to force the pace of succession.

PPC has overcome the inertia of a product-driven organisation and is well on the road to a customer orientation which is necessary to deal with the changing environment in a proactive and responsive manner. PPC's strategic advantage in an emerging post-cartel environment is as follows:

- They are the market leader.
- They have the best factory locations, on a geographic basis.
- They have the lowest delivered unit costs.
- They have the best distribution capability.
- They possess the largest spare capacity.

With a view to maximising the leverage from the above advantages, the strategic thrust is to focus on:

- The lowest delivered cost through production and distribution logistics.
- Regional market leadership.

4. Porter's Five Forces

This industry analysis is based on Oster's adaption of Porter's five forces model as discussed in the previous chapter. The following discussion will provide an outline for the evaluation of trends, conclusions and projection of technical customer support strategies in a post-cartel market. As a result, the analysis will be limited in depth to some extent, as it is only one of the components that form the background of the exploratory research.

In Chapter 3 Oster indicated that in any given industry, coordination is to the collective good of industry participants. This principle is used consistently by Oster as a criterion for evaluating increased rivalry and thus reduced profitability. However, any thoughts of coordination would tend to be associated with the perpetuation of a cartel in the form of tacit collusion. Coordination in the broader sense is necessary for stability, the opposite of which would be an unstable, "dog-eat-dog" market place where chaos reigns. In this broader context, coordination needs to be desensitised for the purpose of the discussion to follow. In a post-cartel environment, companies will communicate their positions through their actions, positioning, advertising and the media in order to signal and co-ordinate their intentions to customers and competitors. For example, Marco Germena, Anglo Alpha's Director of the Cement Division, told the Investment Analysts Society that Anglo Alpha would certainly try to maintain its 36% share of the national 8 million ton a year cement market in a post-cartel competitive era (Sunday Times, 20 October 1995).

4.1 Porter Force I : Intensity of Competition

4.1.1 Number of Competitors

With only three cement manufacturers in the cement industry, Anglo Alpha, Blue Circle and PPC have had very little problems in coordinating their activities and as a result, would have been expected to be in a good position to produce better than average results. This is obvious as it is one of the main objectives of the cartel to reduce rivalry through coordinating sales and productive capacity, resulting in an extremely stable industry from an internal perspective. Although Blue Circle with the smallest market share played the maverick role, as can be expected, their efforts to sell products outside the cartel net were continually brought in line by the other two players, Anglo Alpha and PPC. Thompson & Strickland (1993: 115) refer to these types of tactics as guerilla offensives, well suited to small challengers who do not have the resources to mount a fully fledged attack on industry leaders. In terms of this criteria, rivalry would not be expected to intensify to any great extent, although coordination would be impersonal

and the manufacturers would play their cards close to their chests on matters such as product development and other strategic areas.

4.1.2 Size and Distribution of Market Participants

This criterion would suggest that rivalry between Anglo Alpha and PPC would be intense. Blue Circle would be expected to adopt strategies associated with a smaller player in the market by making use of their fleet footedness in product development and core competence in concrete. The latter competitive advantage has been developed through their experience in readymix concrete over the years.

The Herfindahl Index applied to the current quota market share is determined as follows:

$$HI = 10\,000\,((0,35)^2 + (0,22)^2 + (0,43)^2)$$
$$\approx 6\,149$$

Recall that any value over 1 800 indicates reduced rivalry, while at the two extremes, zero represents perfect competition and 10 000 a monopoly. On this basis, it is extremely unlikely for mergers to take place in the South African cement industry, should the envisaged antitrust laws, along the lines of those applied in the USA, be adopted in South Africa. Coca-Cola and Pepsico for example had a combined 60% of the market giving a Herfindahl index of 2 362. On this basis, the acquisition of 7-UP by Pepsico and Dr.Pepper by Coca-Cola was blocked by the Federal Trade Commission (Oster, 1994: 36-37).

4.1.3 Homogeneity of Firms

The major players in cement manufacturing are homogenous, with insignificant differences between brands and, in theory, this should facilitate coordination (Fourie & Smith, 1994: 132). In a post-cartel environment, this criterion would remain much the same in terms of the principle of symmetrical solutions. This principle is based on the tendency of managers of organisations manufacturing homogenous products to think along similar lines. Presented with a problem these managers would come up with similar solutions without consulting one another. From a customer perspective, this situation may result in the realisation of a self-fulfilling prophecy, whereby the above symmetrical solutions could be seen as collision by contractors who were sceptical about the cartel merely operating in a different form on a covert basis. In general, the goals of the

cement manufacturers would be expected to be congruent with those of the industry as a whole and as a result, one would not anticipate a major shift in market share other than through capacity considerations.

4.1.4 Asset Specificity

The cement industry is a classic example of a high degree of asset specificity. A kiln in excess of seventy metres located in a remote area would have little alternative use in South Africa. In countries such as Germany, where there is a high cost associated with the disposal of industrial waste and a high level of commitment to ecological issues, cement kilns have been successfully utilised for the disposal of waste-material. This waste disposal has the potential to generate revenues in excess of their cement sales.

In the South African context, barriers to exit from the cement industry would be expected to be exceptionally high, resulting in intensified rivalry during down turns due to the low opportunity costs of a cement plant. It is for this reason that PPC had little option than to consider their Dwaalboom factory a sunk cost and place it on a care and maintenance programme since 1972. However, the spare capacity represented by the Dwaalboom factory is an effective weapon against greenfields capacity expansion by incumbents, as well as being a barrier to entry. Solutions, such as limiting backward integration, the leasing of assets and use of general purpose equipment have limited scope in cement manufacture. Mobility of cement blending plants are a consideration that could apply to the above recommendations.

4.1.5 Changing Conditions of Demand and Supply

The cement industry can be vulnerable to variability in supply and demand on an industry wide geographic basis. The formal construction sector is dependant on government infrastructural expenditure, which in turn, impacts on demand for cement. The impact of the National Party's apartheid policies has resulted in a cyclical demand for cement in South Africa, as illustrated in Chapter 1, Figure 3. Events such as the Soweto Riots, gold boom where the gold price exceeded $800 per ounce and PW Botha's infamous "Rubicon Speech" indicate South Africa's exposure to the global economy.

On a geographic basis, Botswana's cement market, which had previously sustained a period of substantial growth has declined in recent years. Top

economists, such as Nico Czypionka, use cement demand as an indicator of growth in the South African economy.

Furthermore, there are numerous examples of the media focusing on the lack of significant delivery of the RDP and over-optimistic attempts at "expectation management" following the historic elections of April 1994. For example, the headline in the Business Times section of the Sunday Times of 23 July 1995 states that "Dithering puts housing plan on shaky ground". This is one of many such articles on the lack of delivery through the RDP. Lack of investment in infrastructure is a further example of the unpredictable nature of government and regional spending which heavily impacts on the construction industry and as a result cement demand. The fluctuating demand creates uncertainty, which makes coordination and stability within the industry more difficult.

In terms of industry structure, flexibility is one way to attempt to overcome variability. As a result, smaller companies such as Blue Circle who can take quicker advantage of opportunities that present themselves, would be expected to be less affected by these fluctuations than Anglo Alpha and PPC. Blue Circle, now de-listed, is furthermore a small part of what is now an extensively diversified Murray & Roberts portfolio. Murray & Roberts, as a result, no longer consider themselves to be operating in the building and construction sector only and are currently listed under "Industrial Holdings" on the JSE.

Following the trends in the USA and Canada, cementitious extenders such as fly ash and slag have the potential to buffer fluctuation in cement demand, especially fly ash, which has an unlimited supply in terms of volumes available in South Africa.

4.2 Porter Force 2 : Presence of Substitute Products

According to Oster, substitutes tend to be more important in narrow markets where it is difficult to increase supply quickly. This is certainly the case in the cement industry and again Dwaalboom is a good example. The decision to expand capacity was taken during a buoyant market which had gone through a complete turnaround before the plant was even complete.

As discussed under the previous item, it is possible to offset an incremental expansion in cement capacity to some extent through the use of fly ash and slag extenders. This had been done in Kwazulu-Natal by NPC with slagment from Newcastle for a number of years and, as a result, NPC does not manufacture an

OPC.

Most potential substitutes for cementitious products tend to have similar problems in increasing capacity at short notice. Steel and timber are such examples and besides the actual production, timber requires extremely long-term planning if one goes back to the establishment of a plantation.

Oster's recommendation in evaluating potential substitutes involves identifying products or industries that have the potential to substantially raise their prices while meeting similar needs of customers.

4.2.1 Outside the Cement Industry

i Steel

Steel is a potential substitute to reinforced concrete in structures. For example, the current tallest buildings in the world, the Sears Towers in Chicago at 443 metres, is made from structural steel. After the Portland Cement Association closed down its structural design service in Skokie, outside Chicago, steel has made further inroads into the high rise building market in America (Kosmatka, 1995). The structural design engineers of the PCA used to provide design information to consulting civil engineers as a service to the cement and concrete industry. The South African industry is less exposed to such a service, as our consulting engineers have shown themselves to be capable of world class structural concrete design. For major projects the ease of transporting very large structural steel members and the skills needed to erect these structures tend to limit the use of steel in major structures in South Africa. However, the use of steel in the construction of factories, warehouses and single level shopping centres is extensive, especially in areas located close to steel production. The ease of use and speed of erection makes steel a good choice for the above market to a point where it is virtually the automatic choice in large span roofing applications. Furthermore, steel is also an integral component of all reinforced concrete applications.

Concrete has largely replaced steel as the preferred material for bridge construction from small low-level bridges to the major viaducts and arch bridges such as the Blaaukrantz and van Stadens bridges in the Cape Provinces. Modern techniques, such as the sliding concrete piers and the incremental launch of the bridge decks, make the concrete solution difficult to compete with in long, multi-span bridges on tall piers, such as the remotely located Malimabatso bridge in Lesotho. The rugged terrain would

also make it difficult to transport structural steel members to site.

ii Timber

Unlike other countries, such as Canada that lends itself to timber frame dwellings, South Africa is generally a very arid country and timber tends to be a scarce resource. Timber is furthermore much in demand for its unique properties in home building, such as nailability, which makes timber useful for installing roof cladding and ceilings. Due to the rapid growth associated with the warmer South African climate, the timber is softer and lacks the structural strength of the comparable material in colder climates.

In South Africa, Timber frame houses are mainly limited to areas located close to forestry and have the advantage of speed and ease of erection. Furthermore, timber houses still need to overcome the perception of poor fire resistance, higher life-cycle cost and are not considered to be as substantial as conventional homes in South Africa. Timber flooring of yesteryear has generally given way to concrete floors finished with carpets and tiling.

iii Clay Bricks

Clay bricks were generally considered to be the preferred bricks and this perception still persists in certain areas. The resistance to cement masonry units is changing to an extent where some traditional clay brick manufacturers, such as Corobrik, are diversifying into concrete masonry units. Face bricks require a higher level of brick laying skills and most housing solutions rely on a plaster finish, despite higher maintenance costs.

iv Roof Systems

Asbestos cement roof and ceiling panels have long been used as an economical solution in house construction, especially in coastal rust belts. Although health concerns regarding the use of asbestos have had a detrimental impact on the products, polypropylene fibre and timber fibre technology is being utilised to resolve this problem.

Concrete roof tiles have been extensively developed and are widely used for housing and office complexes. Although the products have a high mass per square metre, they are durable and preferred to an extent where the low cost housing market is prepared to pay a premium for these products.

Many trendy flat-roofed townhouse complexes and up-market houses use concrete preslabs as permanent shutters which then become an integral part of the concrete roof slab. A further easy to use system is that of pre-cast beams and hollow blocks topped with in-situ concrete. Where mechanical lifting devices area available, extruded prestressed and precast concrete slabs, which can be used for both the first floor of double-storey units and the roof, are effective. The high quality surface of the sofit does not require further finishing.

v Flooring Systems

Ceramic floor tiles are still the premium quality floor system and the manufacturers of concrete floor tiles although limited still have the potential for further innovation with the application of polypropylene fibres.

Cast in-situ patterned concrete flooring may yet prove to be a cost effective solution in housing and decorative flooring systems. The trend for this flooring solution is gaining ground in the USA and has been extensively used, for example, in the exclusive "Forum" shopping mall of the Caesars Palace in Las Vegas, which is subjected to heavy pedestrian traffic.

vi Windows and Door Frames

Concrete windows and door frame systems have also been developed and have many advantages, such as lower cost and reduced maintenance when compared to timber, while avoiding the corrosion problems associated with metal frames. On the down side, the products tend to be substantially heavier than equivalent solutions. Winblock and Betram are trade names associated with window frame systems.

vii Pavements

Concrete pavement design and construction in South Africa is world class in terms of design, ridability and build quality. These concrete roads have had set backs such as the AAR problem on the N2 freeway between Cape Town and Somerset West. Concrete pavements also have a slight disadvantage in terms of tyre noise. However, life-cycle costing in areas with poor soil conditions compare favourably with asphalt systems and rehabilitation tends to consist of small areas and seldom involves rehabilitation of subgrade layers. Concrete roads do not suffer the wheel track deformation problems associated with increased road freight and overloading. However, in areas of acceptable soil types, the lowest cost

solution remains a chip and spray bitumen surface on a crusher-run base course.

Concrete segmental paving is proving to be popular in numerous applications such as parking lots, traffic intersections, garage forecourts, urban roads, residential roads and driveways. This solution lends itself to much needed labour based, labour intensive and community based methods of construction.

viii Dams

South Africa has many impressive concrete arch dams and Anglo Alpha currently provides the cement from their Ulco factory for the Katse dam. This double curvature arch dam is one of the biggest projects of its kind in the world currently under construction. Rollcrete or roller compacted concrete (RCC) dams are gaining prominence in gravity dam construction where this technique greatly enhances safety and the risk of failure is considerably reduced when compared to earth fill construction.

The above discussion indicates that cement applications have made inroads into many sectors of the market place. Concrete is only under serious threat in warehouse, factory, heavy industrial and road pavement construction applications. The American Concrete Paving Association (ACPA) lobbies on behalf of concrete pavements at a national level and provides support such as life cycle costing to various state authorities. Asphalt roads have been found to cost 10% less than the equivalent concrete design but have a service life of 13 to 15 years compared to 25 to 30 years for concrete (Knutson, 1995).

4.2.2 Inside the Cement Industry

i Cement Extenders

Portland Cement is used almost exclusively in the South African building and construction industry. There are small volumes of value added products used in applications such as grouts, mine pack systems and concrete rehabilitation. Cement extenders partially replace cement and consist of beneficiated waste material such as fly ash, slag and silica fume. However, these products are regional and the cement manufacturers hold equal shares in most extenders except silica fume which sells in relatively small volumes due to low replacement levels. Silica fume does attract a premium for specialist applications such as the corrosion resistant requirement for the new Alusaf plant in Richards Bay. The use of CSF is associated with high

strength concrete and is thus not an extender in the true sense. On the other hand, extenders such as fly ash and slag provide a buffer to cement capacity and have the potential to extend cementitious capacity at a relatively low cost. The application of extenders also carries ecological kudos, as they reduce the energy requirements of blended cements and are essentially useful waste materials.

ii Other Types of Cements (Fulton, 1994: 24-27):

- *Geopolymers*

Consisting of silica aluminates activated by alkalis, this is a new field and needs considerable further development. Geopolymers have the potential to be durable with exceptional high early strength potential.

- *High Alumina Cement (HAC)*

This product has exceptional refractory properties withstanding temperatures of up to 1800°C. The product is made from limestone and bauxite in smelting furnaces, including electric arc furnaces. HAC develops exceptionally high early strengths and high heat which make it unsuitable for mass concrete. Under the influence of heat and moisture a "conversion" process occurs resulting in strength loss. HAC has been prohibited by some codes of practice, including South African codes, due to catastrophic failures as a result of "conversion". HAC has many value added industrial applications with Lafarge Fondue International having some 70% of the world market.

Fondage, a wholly owned subsidiary of Lafarge Fondue import clinker to South Africa, which is then milled and bagged at Richards Bay. Alument, a local company, make HAC at Bronkhorstspruit and have a 25% share of the 21 000 ton South African market (Liddell, 1995). The 45% alumina product sells for approximately R1 200 per ton and the higher alumina product R2200.

- *Supersulphated Cement (SSC)*

SSC can be used in the same way as Portland Cement and has very high early strength development and chemical resistance. SSC has applications in the mining industry similar to HAC. SSC is made by intergrinding blast furnace slag with 15% calcium sulphate. Blue Circle has signalled production of this product at their Whites facility in the Free State. The

product is currently imported by Blue Circle in small volumes.

Portland cement, as a low cost high volume industrial commodity product is not under threat from substitutes in the foreseeable future. Fly ash and slag are products that have an established track record as cement extenders. Possible slag production at Saldanha has important implications for the Western Cape market and is well suited for applications in marine environments. Slag has the potential to substitute cement by up to 66% while fly ash can typically be used at up to 35% replacement levels in concrete.

HAC and SSC have potential in low volume, high value niche markets, as does silica fume. These products should show further growth potential in conjunction with Portland Cement.

Cement's role as a construction "glue" and filler remains unchallenged by alternatives, and there is no end in site to cement's life cycle. There may be glues which are stronger than cement, but they do not generate the same Rand for Rand cubic metre bulk as the mix of cement, sand, stone and water (Pretorius, 1995).

4.3 Porter Force 3 : Buyer Power

4.3.1 Number and Distribution of Buyers

In theory the larger the number of buyers and the smaller their individual purchase, the less power each one will have.

i Coastal

The Western Cape market is currently a spacial monopoly for PPC with less demand nodes than the inland market. Buyers would have little buying power and prices would mainly be contained by threats of new entrants. In the past, cartel arrangements, such as subsided transport, also had an effect on the price of cement in coastal regions.

The situation in the Eastern Cape consists of a monopoly in the immediate Port Elizabeth area. However, due to the capacity constraints of PPC's Port Elizabeth factory, the greater Eastern Cape market is largely shared between PPC and Anglo Alpha by rail from their Ulco factory. Other than occasional medium size projects such as the Wriggleswade Water Scheme, purchase sizes tend to be small and fragmented, suggesting little buyer

power.

The Kwazulu-Natal market is similar to the Eastern Cape, from a buyer perspective, where NPC serve the immediate Durban market and do not have adequate capacity to serve the greater Kwazulu-Natal market. This market is complex and all three major cement manufacturers serve this market from their inland factories.

ii Inland

This market tends to be more fragmented than the coastal market, especially in the growing "emerging market". The emerging market is highly fragmented, buys cement in bags, has little access to transport and as such has little buyer power. The contractor segment buys through retailers and directly from the respective factories, predominantly in bulk. Due to the fewer number of buyers and large individual purchases, this sector has significant buyer power. Group Five, and their subsidiary Everite, for example, have a national consumption of 153 000 tons per annum. The concrete product manufacturers and readymix operators buy bulk on a continuous basis and their fewer numbers and medium to large sized orders suggest significant buyer power.

4.3.2 Product Characteristics

Standardised products increase buyer power through reduced switching costs and allows buyers to play one supplier off against another. The buyer power is extremely high as evaluated by the above criteria and the current SABS specifications, for example is based on product categories such as SABS 471 for OPC. All manufacturers produce OPC to this specification, and as a result, customers can easily switch from one manufacturer's product to another. Switching cost only become significant for highly sophisticated users such as Everite who have specific cement particle size requirements for their manufacturing requirements. Even then, the switching costs from one manufacturer to another are low and would not attract a significant price premium.

4.3.3 Backward Integration

In principle, backward integration would allow buyers to produce goods for themselves. The purchase of Blue Circle by Murray and Roberts is an example of backward integration. Grinaker have linkages to Anglo Alpha through AngloVaal and Concor have indirect linkages through Hochtief

Germany and hence Holderbank who are shareholders of Anglo Alpha. Murray and Roberts are known to be extremely performance orientated and any arrangements with Blue Circle would need to be market related. However in a severe downturn, these factors could be more significant and the power of those buyers would be expected to increase significantly.

4.3.4 Institutional Factors

The sales function of cement in South Africa has been centralised through the CDSA in the past and factory prices of cement have been made freely available to customers. In a post-cartel environment, it is anticipated that manufacturers will attempt to provide delivered prices with volume based discounts and rebate structures, the latter to promote brand loyalty. This would increase the cost of comparative pricing by consumers, thus diminishing buyer power. However, through normal retail channels and builders merchants, comparative pricing of bags would be as straight forward as any other commodity, resulting in increased buyer power.

4.4 Porter Force 4 : Power of Suppliers

The same category of factors apply to the power of the supplier and buyer alike. In this case, powerful buyers can put downward pressure on the price of suppliers goods.

4.4.1 Numbers and Distribution Suppliers

The buyers, being the cement manufacturers in this evaluation, are limited in numbers implying reduced supplier power. However, although input costs are substantial, the buyers are relatively small when compared to other players in the market. For example if one compares the coal consumption of Sasol or Eskom to the coal requirements of the cement industry, the latter's demand for coal is almost insignificant. This extreme supplier power is aggravated due to the surge in international demand for South African coal. Electricity, another major input cost has similar characteristics, although less extreme. Manufacturers often arrange production processes, such as the milling of cement to take place at night to make use of off-peak rates and in this way also reduced electricity maximum demand.

It has only recently been possible to negotiate rail tariffs with Spoornet due to their more commercial approach as a result of competition from road transport. In this case the buyers are in a position to switch to road freight

to a limited extent and as a result the supplier power of Spoornet has diminished.

4.4.2 Product Characteristics

Much of the plant required for cement manufacturing is highly specific which would suggest reduced switching costs and increase the power of the supplier. This includes many consumable items such as grinding media, kiln bricks and large tyres for heavy quarry trucks. Much of the plant installation is on a project basis and smaller retrofits also tend to have job shop characteristics. On balance, the power of the supplier would appear to be dominant by the above criteria.

4.4.3 Backward Integration

Having discussed the power of the supplier and concluded that the cement manufacturers are vulnerable in this area, there would appear to be a need for backward integration to reduce supplier power. The most substantial would be into coal which would not necessarily reduce costs, but would contribute significantly towards quality. To some extent, this has already taken place through linkages to cement bag manufacturers, where Anglo Alpha has interests in Cappa and PPC now has 100% ownership of Kohler.

The impact of some of the above costs could be alleviated through the use of alternative fuels which would be especially useful where factories are located far from coal sources and transport costs are substantial. The utilisation of outbound transport for inbound supply is a further opportunity to maximise logistical efficiencies. The use of extenders such as fly ash and slagment also contribute towards cost reduction in terms of energy and capacity.

4.4.4 Institutional Factors

It is clear from the discussion on products that there is little opportunity for cement manufacturers to negotiate prices of major materials downwards. The project type plant installation is often complex and often includes performance guarantees and commissioning of plant. The cost of comparative costing is high and again the supplier would hold the balance of power in this category.

4.5 Porter Force 5 : The Ease of Entry

The analysis of potential ease of entry into the cement industry is based on Oster's framework discussed in Chapter 3 under the same heading.

4.5.1 Expectations of Falling Prices

Barriers to entry relate primarily to the technology of the industry and its history.

i Specific Assets

Cement manufacturers have committed themselves to assets with an extremely high specificity, which implies that they will not be able to exit the market with ease. During a downturn, the manufacturers will take extreme measures to defend their position. This will make the cement industry unattractive to outside players.

ii Economies of Scale

The cement industry has a high minimum efficient scale (MES) of production which is achieved close to production capacity. As a result there would be a significant difference in price of cement before and after entry of a substantial player in an open market. Furthermore, a ratio of MES to overall market size gives an indication of market share required for a low cost entry into the market. Cement and automobiles have a similar MES of approximately 10 while fruit and vegetable canning has an MES of 0,5, representing smaller-scale requirements and thus ease of entry (Oster, 1994: 59-63). Thus, for the cement industry the relatively high MES would indicate less risk of entry. Should entry occur however, the impact on prices could be expected to be large.

iii Excess Capacity

In cement manufacturing, in common with most other industries, it is difficult to determine the timing of extending capacity. Holding excess capacity is a tactic to deter entry and is known as the "free-rider" problem. However this tactic does involve costs for care and maintenance programmes. PPC has excess capacity through its Slurry and Dwaalboom factory, while the other manufacturers are rapidly nearing capacity. The Dwaalboom factory will however require some R220 million in capital expenditure to recommission the plant for cement production, silos and

packaging lines. This will result in an additional 600 000 tons per annum of cement production, when completed (Tasker, 1995). Anglo Alpha is also investing large amounts to re-commission old wet process kilns at Ulco which will allow for an additional capacity of 350 000 tons per annum. These old kilns are unlikely to provide cost effective clinker through, as kiln technology has advanced considerably since their installation. Blue Circle have also taken their number 4 kiln out of mothballs. This recommissioning will result in some 300 000 tons per annum (Straus, 1995).

It would thus appear to be unlikely that a new player would enter the cement industry in the medium term, based on the above criteria.

iv Reputation Effect

Blue Circle have been the leaders in terms of product innovation in an industry where there has traditionally been little scope for such product innovation. Blue Circle introduced the masonry cement "Walcrete" in an attempt to avoid the cement industry quota and in this way effectively increase market share. As a result, the product was priced at an 8% discount to OPC while the cost of production is similar to OPC. Anglo Alpha followed suit with their equivalent brand "Mortarcem", manufactured at their Ulco factory. Due to the distance involved, this masonry cement would cost even more than the Blue Circle product. The rationale for Ulco production was to make use of hydrated lime in the masonry cement which would thus be technically a better product than Blue Circle's. Despite Anglo Alpha's premium product and equivalent selling price, Blue Circle took two thirds of the masonry cement market, largely as a result of their first mover status, more focused promotion and technical support. Masonry cements have since been brought into the industry quota after pressure from PPC who signalled entry to this market. However, masonry cement still sells at the same discounted levels and at 108 thousand tons, or 1,4% market share for 1994, the margins on the product remain poor, and PPC have remained out of the market for this reason (SACPA :1994).

The above discussion illustrates that Blue Circle has a reputation for introducing products into the market, even at low margins, in order to gain market share. On the other hand, Anglo Alpha and PPC tend to adopt a "me-too" strategy. This would in theory deter entry into the market place. Potential entrants prefer rational responses to entry and any reputation of being a "loose cannon" would keep a potential entrant guessing and increase the risk of entry.

4.5.2 Sources of Incumbent Advantages

i Pre-commitment Contracts

The purchase of coal, while international demand was still depressed, would be a good example of a pre-commitment contract that would be a barrier to entry. However, the power currently resides with the coal suppliers and coal must currently be purchased on the spot market.

Implicit contracts can still, however, have the effect of deterring entrants. For example, PPC Group Managing Director, John Gomersall, made a commitment in support of the RDP to hold cement prices under the inflation rate as measured by the PPI or CPI for three years ending in April 1997. As cement has a derived demand and prices are extremely inelastic, opposition companies can not afford to increase prices beyond the price of PPC's products. With the current levels of annual month on month inflation of around 10%, as measured by the CPI, the opposition manufacturers would be hard pressed to undercut PPC's cement prices. This could only be achieved by the lowest cost producer who, by virtue of the largest margins, can beat the drum. These moves would deter potential entrants into the cement market.

ii Licenses and Patents

Patents are difficult to secure and are relatively easy to innovate around in cement manufacturing. Good quality cement production and adherence to the applicable SABS specification should deter a potential entrant to a limited degree. However the cement industry is planning to introduce the ENV 197 -1 specification as the new SABS cement specification and potential European entrants would be familiar with the requirements of that specification.

iii Learning Curve Effects

Capital intensive industries have a "steeper" learning curve, which is the reduction in unit costs with cumulative product output in a similar fashion to scale. However, if the advantage of the learning curve is not privately appropriable, the learning is subject to spill over effects and new firms can "jump onto the learning curve" and no entry barrier or asymmetry is created (Oster, 1994: 13). The above is true of the cement industry and overseas entrants such as Lafarge and Holderbank, with major global cement

manufacturing installations, would only need to overcome local knowledge in the context of the above criteria.

iv Pioneering - Brand Advantages

As an industrial commodity, cement is not heavily branded and relies on the corporate identity as the brand surrogate. Recently, however, the proliferation of downstream blenders have often resulted in poor quality blends due to the variability in levels of extender. This could lead to brand loyalty, especially among lower income consumers who have an inherent feel for "life cycle costing". Anglo Alpha for example are attempting to establish emotion selling points through their sponsorship of Orlando Pirates and their advertising in general. In a competitive market, technical improvements are easy to imitate and product innovation tends to be a given. Technical attributes would also be difficult to communicate to an emerging market which operates at an extremely low level of sophistication.

Economical shipments of imported cement are in order of 300 000 bags of cement. Any bad experience related to imported cement would play into the hands of branded local cements. National branding of products could contribute towards deterring potential market entrants.

4.5.3 Substantial Exit Costs

The primary determinant of high exit cost is the specificity of productive capacity as discussed above. This high exit cost for the cement industry, which will limit the ability of cement manufacturers to diversify or exit the market during periods of declining demand, would result in "cut-throat" rivalry and is potentially the strongest deterrent to entry. The extent of capital, in excess of a billion rand to establish a cement factory, also comes into play. However global players who have declining domestic markets may still find the growth associated with an emerging economy attractive, and idle plant could be transhipped to coastal locations at costs that would be considerably less than erecting a new plant.

5. Summary

With the macro-economic fundamentals on a relatively sound footing, stability and confidence is vital to sustain fixed investment which will lead to sustained growth. Fiscal discipline needs to be maintained in tandem with the Reserve Bank's monetary policy, aimed at keeping the inflation rate in check. As there is little scope for increasing corporate

tax or taxation on individuals, privatisation of government and quasi-government organisations would appear to be the route to follow to avoid the debt trap associated with excessive borrowings. The biggest impediment to the above route would come from the government's inability to deal with COSATU's resistance to privatisation. Investor confidence also needs to be enhanced through bringing violence and crime under control.

From a micro-economic perspective, the three cement manufacturers all appear to be in a good position to play a role in the current growth of the South African economy. PPC would appear to be in the best position to meet the increase in demand through their current spare capacity. Blue Circle and Anglo Alpha's efforts to expand capacity currently relate to re-commissioning old plant. This strategy will not be cost effective in terms of capital employed cost of production.

The evaluation, in terms of Porters five forces, can be summarised as follows:

i Intensity of Competition

The variability of demand and supply is the only factor that makes coordination, within the cement industry, difficult. The remaining four factors evaluated all tend to support industry stability.

ii Substitution

There is only a limited threat of substitution in the form of bitumen roads and structural steel in "low rise" long span buildings. Cement does not have an imminent substitute in its basic function as a cost effective "glue" which can be used in large volumes and has extensive reserves in raw materials.

iii Buyer Power

Only the standardised product characteristic plays into the hands of the buyers ability to negotiate prices downwards. The remaining three factors favour the cement industry.

iv Supplier Power

The cement industry is severely exposed to the power of suppliers, when major input materials, such as coal, are evaluated.

5.5 Ease of Entry

The cement industry has substantial barriers to entry, as six of the nine criteria evaluated tend to make entry into the industry difficult. Only a lack of pre-commitment contracts, licenses and patents, and pioneering-brand advantages tend to limit barriers to entry.

The industry, as a whole, appears to be attractive for the players involved, without making it attractive for potential entrants. These factors will be considered when dealing with conclusions and recommendations. The following chapter will deal with data gathering procedures, which is the start of the exploratory research as a whole.

CHAPTER 5: Data Gathering Procedure

1 Methodology

The project needs to be conducted with due regard to research methodology, in order to preserve the validity of the findings. Failure to do so would compromise the usefulness of the analysis, as it would allow an indeterminate degree of subjectivity, and would relegate the work to a descriptive analysis.

In the hands of an expert, a descriptive analysis could still have some validity, which would be a function of the reputation of the experts in their respective fields and the quality of their exposition. As a minimum, business research is defined as a systematic enquiry, aimed at providing information to solve problems. All research is thus problem-based and hence the validity of a descriptive analysis (Emory & Cooper, 1991 : 14).

Purists, however, would differ as they would have to elevate research to an abstract level through the application of construct which have their origin in the world of science. At the other extreme, one could simply interpret readily observable phenomena. This research is positioned at an intermediate level in the above continuum, with concepts that have their origin in the real world, represented by practical, every-day strategic issues in the cement and construction industry.

In effect, the research can be considered to be a hybrid of a new field of exploratory research and applied management research. The former makes use of open-ended questions, relying on the expert knowledge and experience of the interviewee. This exploratory research was intentionally supplemented by applied management research to broaden the base of the personal interviews. The research is thus a combination of qualitative and quantitative analyses, which presents a number of problem statements as a proxy for alternative hypotheses. In addition to the logical framework presented in section 1.7 (Chapter 1), the methodology discussed below draws heavily on the work of Emory and Cooper (1991:137-282).

The research methodology takes it's cue from the research problem. In the context of the dissolution of the cartel, the anticipation of an open competitive market has led to a considerable amount of strategic planning, at many levels. Cement has an extremely inelastic supply and demand curve, where a small movement in price would have a disproportionately large influence on quantity. As a result, competition on price by one player would result in immediate retaliation, by opposition players, in order to defend the market share.

It is obvious that other avenues would need to be explored in order to effectively market

cement in a way that would not be seen as an offensive on price. Technical support and opportunities in terms of forward integration in the value chain, are options that need to be evaluated.

This project is thus initiated by translating the above real life problem into research questions, which include the objectives of the research. The problems are clearly researchable, as conclusions cannot be arrived at through evaluating existing material. Furthermore, technical support also deals with the needs of customers, and their perceptions cannot be assumed.

2 Research Design

A research design expresses both the structure of the research problem, and the plan of the investigation, used to obtain empirical evidence on relations of the problem (Kerlinger, 1986: 279).

The dichotomy of less formalised exploratory research, as opposed to more formalised scientific research relates to the degree of crystallisation of the problem. Ideally, the results of an exploratory research would provide for focused research questions, which would then be validated by more formal research. This project is essentially an exploratory research. The questionnaires, however, used to broaden the base of the research, allow for quantitative analysis, in parallel with the more qualitative exploratory research.

2.1 Method of Data Collection

Customer support needs cannot be readily observed, and an interrogation process, through personal and impersonal means, has been adopted. Only a fraction of the existing knowledge in a field, is put into writing, which, even if published, may be difficult to find. To get an accurate picture of the current situation, we need to solicit the views of those believed to know what is going on (Emory & Cooper, 1991: 146).

The above interrogation of experts is referred to as a survey and is entirely appropriate to address the objectives of this project. Furthermore, the investigative format of a structured exploratory interview is sufficiently flexible to explore various avenues that emerge during the interview. It is also possible to further clarify issues to ensure a common frame of reference between interviews. Emory and Cooper also indicate that discovery is more easily carried out if the researcher can analyse situations that provide special insight. They further recommend that, in typical exploration, the objective should rather be to get information from sources that are more likely to provide insight, than attempting to achieve a

representative cross-section view.

2.2 Control of Variables and Time Dimensions

Unlike experimentation, which provides for the most powerful support possible for a hypothesis of causation, this research will adopt an *ex post facto* design. There will be no control over the variables or interview outputs in the sense of being able to manipulate them. Any probing during an interview will be with the intent of obtaining clarification, rather than an attempt to introduce bias. The study has also been designed to be descriptive, rather than attempting to learn why one variable affects another, typical of a causal study.

As far as the time dimension is concerned, the MBL programme is intensive and would not allow for a longitudinal study. The research is thus designed to be cross-sectional and represents a "snapshot" of the respondents's perceptions in anticipation of a post-cartel competitive scenario. However, where a matter of principle is involved, these perceptions are unlikely to alter dramatically in the short term, and would be useful in predicting the potential of technical support strategies.

2.3 Topical Scope and Research Environment

The scope attempts to achieve the breadth of a statistical study, through the use of questionnaires in support of the depth typical of structured interviews. Similar to case studies, interviews will allow full contextual analysis of the limited number of interviews, and the detail will provide valuable insight for problem solving, evaluation and strategy formulation. The study is also designed as a field study, rather than a simulated investigation typical of laboratory studies. The interviews will be conducted under normal conditions, representing the everyday working environment of the interviewee.

Having established design parameters for the research, the next step in the data gathering process is to arrive at a sample that would best achieve the research objectives.

3 Sampling Design

While probability sampling is clearly technically superior to non-probability sampling, the latter is more closely allied with the practical objectives of this research. Non-probability sampling is non-random, where each number does not have a non-zero chance of being selected. Probability sampling owes it's technical superiority to allowing estimates of precision. This allows findings of the sample to be inferred on the population.

For the research interviews, it was decided to use judgemental sampling as a category of purposive sampling. This was exercised by selecting the nine major construction companies listed on the stock exchange, from a population of the formal construction sector. If one applied the Pareto principle, whereby the selected sample is assumed to represent some 80% of the volume of cement purchased, it is logical to assume that the scope of technical support would be lacking if it did not address their needs.

Further judgement is exercised in the selection of interviewees. This selection was based on experience in the field of cement application, in addition to occupying a top management position. The reason for the above criteria is that the respondents would be in a position to significantly affect a buying decision in their area of influence. A further consideration is the requirement of a suitable qualification to address the issues under discussion. An executive, in the controller or human resources functions, for example, would not be in a position to provide the required feedback compared to a professional civil engineer with experience in the field of concrete.

For the questionnaires, the sample was an elementary form of snowball sampling, where the interviewees were requested to propose eight respondents with suitable qualifications and experience. The parameters for this system of referral were contract managers, site agents and concrete engineers and concrete technologists.

4. Primary and Secondary Data

4.1 Primary Data

Primary data comes from original sources, collected specifically for the task at hand (Emory & Cooper, 1991: 286). Primary data forms the backbone of this project and is accumulated through the survey, using structured interviews and questionnaires. Primary data obviously has the advantage of being problem-specific and relevant to the research questions. The implication is that primary data has a far better potential to achieve the objectives of the research, as extraneous influences can be eliminated. A further source of primary data is through personal discussions with experts in the field of cement and cement application.

4.2 Secondary Data

Secondary data represents material and studies by others, done for a different purpose (Emory & Cooper, 1991: 286). In this project, secondary data forms an integral part of broader issues and also deals with an evaluation of the external environment within which the cement industry operates.

The literature search through the UNISA library did not yield appropriate material on technical support , or technical marketing issues. The literature obtained tended to deal with generic marketing, customer service or strategic issues. This secondary data is useful for the desk study and industry analysis discussed in Chapter 2.

Computerised databases are becoming more relevant in data retrieval. The McGregor's database allows one to establish the linkage between the nine JSE listed construction organisations and their shareholding. This database also allows one to obtain the names and functions of the various directors. The CSIR database, Quantag, carries useful information on cementitious and related products, while Databuild gives data on specific projects planned, awarded or in progress.

The bulk of the secondary data is clearly best sourced through books. Periodicals are a further source of secondary data and would tend to be more focused on certain topics than books. Periodicals would, however, tend to lack depth and are not as well referenced.

5 Survey Methodology

The function of a survey is to question persons and record their responses for analysis as a source of primary data. In general, surveys are exceptionally versatile, more efficient and economical than research through observation.

The quality of information obtained through a survey depends heavily on the ability and willingness of the respondents. It is important to appreciate that, should a respondent merely rely on secondary data, the implication is reduced in accuracy of information. It is clear, therefore, that the respondents should be uniquely qualified to provide the desired information.

5.1 Personal Interview

The personal interview has two distinct advantages over phone or mail survey techniques (Emory & Cooper, 1991: 320). The depth and detail of information secured is superior to alternative methods. Secondly, more control can be exercised than is the case with other methods. This can be achieved through pre-screening of respondents, referrals, establishing a common frame of reference, and probing during the interview, amongst other techniques. The personal interview, however, is the most costly alternative, compounded by the geographic spread of respondents or stringent sampling requirements.

Emory and Cooper list three conditions for a successful personal interview:

- Availability of the needed information
- Understanding, by the respondents, of their role
- Adequate motivation, by the respondents, to cooperate.

The approach used in this project was to ensure the optimum selection of respondents, to best deal with the above factors. This was achieved by selecting the nine construction companies listed on the JSE. Representatives of these organisations would tend to maintain a high level of integrity, being ultimately responsible to shareholders. A further objective was to secure interviews with respondents at an executive, or top management, level where possible. Where interviewees were not at executive management level, the consideration was for specific knowledge and expertise of the respondent, as based on a referral by executive management. These skills were either in the field of concrete technology or experience with procurement of major materials.

Respondents often react more to their feelings about the interviewer than to the content of the questions. To this end, the writer's significant experience in the construction industry was of great assistance. The anticipation of a post-cartel cement industry would also be expected to provide an added motivation to the respondents to communicate their expectations. The above factors would tend to offset the lack of specific interviewing experience of the interviewer, at the level discussed above.

A major draw back of targeting a high level of management and big business is the availability of the respondents. This places pressure on the logistics of the project, as these respondents are being relied upon to supply other suitable respondents to the mail survey discussed below.

5.2 Mail Survey

It was considered that telephone interviewing would not achieve the desired depth of response, and would be restrictive in terms of the number of questions tolerated. The lack of visual media would also limit the complexity and ability to rate the measured questions.

It was decided to make use of a self-administered questionnaire to broaden the scope of the survey. Mail surveys are typically cost effective, but have non-response as a major weakness. Mail surveys, with a return of 30% or so, are often considered to be satisfactory (Dillman, 1972: 6).

In mail surveys, there is a limit to the type and amount of information that can be secured. It is generally not possible to secure large amounts of information, and

one cannot probe deeply into questions. As a rule of thumb, respondents should be able to answer the questionnaire in no more than 10 minutes (Emory & Cooper, 1991: 333).

Techniques to minimise the non-response rate were used where appropriate. It was also decided to fax the questionnaires to the respondents, to reduce the response time. This does carry some risk as respondents would have to return the questionnaire by fax at their own expense, bearing in mind that the project has a national base. Thus the opportunity to use reply paid envelopes, which is a known technique for reducing non-response, is foregone.

6 The Survey Instrument : Question Hierarchy

The process of moving from the general management objective or problem, to specific measurement questions goes through four major levels of the question hierarchy (Emory & Cooper, 1991: 348-351):

6.1 Management Question

A management question stems from a problem that must be answered by the management. For this project, the primary problem is to establish if the need exists for a spectrum of customer support strategies in the construction sector of the post-cartel cement industry in South Africa. The secondary problem is to establish the effectiveness of an array of proposed technical marketing strategies, as perceived by a number of experts representing the formal construction industry.

6.2 Research Question

This relates to the information questions, which the researcher must answer in order to contribute to solving the management question. For this project one needs to establish if the customers expect technical support in a post-cartel environment, or whether they would they prefer the cement manufacturers to concentrate primarily on manufacturing cement and keeping the cost of production to a minimum, inclusive of overheads. Should the former be established, it would then be necessary to establish the level of resourcing and broadness of technical support necessary to meet the customers needs. The role of the existing bodies needs to be established as does the cement manufacturer's integration in terms of the cement value chain. The product requirements of the customers will also have a direct bearing on the broadness and level of technical support necessary.

6.3 Investigative Question

Investigative questions relate to those specific questions which the researcher must ask, in order to answer the research questions as the research moves from the general to the specific.

The major investigative questions are as follows:

i. Should cement manufacturers be involved in technical customer support ?
ii. What is the scope of technical support required ?
iii. To what extent do manufacturers get technically involved with industry issues ?
iv. Should manufacturers pursue forward integration, in terms of the value chain, into aggregate and readymix concrete supply ?
v. Which customer support options are preferred and considered to add value?

6.4 Measurement Question

These questions must be put to the respondents in a clear and unambiguous manner, in order that the necessary information is gathered in a way that can be related back to the investigative question.

The measurement questions are discussed in the five categories as listed under the above investigative questions.

i. Manufacturers involvement in technical support.

This question is considered to be an important point of departure and is thus exclusively dealt with in the personal interview to maximise the control should there be any uncertainty around the frame of reference.

ii Scope of technical support.

This issue will be discussed in broader strategic terms in the personal interview. The mail survey will devote a number of questions to specific product related issues. This will indicate the scope of technical support required should manufacturers pursue these product related strategies. If customers perceive the product range, under the cartel paradigm, to be too narrow and to lack flexibility, addressing these needs would imply that manufacturers would need to commit significantly more resources to technical customer support.

iii Technical involvement in industry related issues

The role of industry bodies such as the PCI need to be dealt with as many of their activities will be in direct conflict with customer support initiatives of cement manufacturers. The PCI is dealt with in depth in the personal interviews and briefly in the mail survey.

Other industry issues relate to the degree of lobbying required to promote concrete in the face of competing solutions. Further issues relate to the manufacturers responsibility to contentious technical issues in the industry such as AAR and long term durability. These issues will be briefly dealt with in the mail survey.

iv Cement Value Chain

Forward integration into aggregate supply and readymix concrete would to some extent rationalise the technical support required. Many of the quality assurance responsibilities would be built-in to the delivery of concrete and the variables would be greatly reduced where readymixed concrete is supplied. For example, the readymix operators would be responsible for the cement and aggregate choice and mix designs. The customer would, in most cases, focus on the performance measurement of the specified concrete. It is anticipated that these issues need to be probed in some depth , and will thus be dealt with in detail in the interview and to a limited extent in the mail survey.

v Ranking of Customer Support Options

In this case, the contracts managers and site agents were perceived to be closer to the coal face and would be the decision makers as to which customer support strategies would be considered to be of value. As a result a section of the mail survey questionnaire was dedicated to the ranking of technical customer support options. This question also contributes significantly to the practical use of the findings in this project.

7 Interview Questions

7.1 Structured Questions

The questionnaire for the research interview is attached in Appendix C. The parameters and scope of the interview were laid out in the introduction to the interview questions. The critical elements to establish a common frame of reference were as follows:

- The interview related to the construction sector of the cement industry.
- The introduction differentiated between the inland and coastal regions, due to the different prevalent market forces, i.e. open competition in the inland market as opposed to a spatial monopoly in the Western Cape Province.
- The anticipated post-cartel environment should be considered.
- Technical marketing strategies were the primary consideration rather than pricing strategies.
- Technical marketing, for the purpose of this project, was defined.

QUESTION 1

Having experienced trading conditions under the cement cartel, do you feel that the cement manufacturers need to become more technically involved with cement application, as a value-added service ?

Alternatively, should manufacturers concern themselves with the production of cement, and leave the technical application of cement to the customer ?

Assuming that technical support was desirable in the construction industry, in some form or another, the following questions relate to technical support strategies that could be developed to add value to cementitious materials.

This question was necessary as a point of departure and relates to the first investigative question. A dipstick survey was verbally carried out, to establish the appropriateness of the question and establish what could be anticipated as a response. Classically, this issue would be the subject of an exploratory research, which would, as an output, develop a hypothesis for a formal research.

Should the first question put to the interviewee not be supported, many of the subsequent questions would be irrelevant or limited. The boxed text was included in anticipation of a negative response to this question.

QUESTION 2

Other than specific application problems, do you feel that it would be reasonable for cement manufacturers to relate product support effort to volume of cement purchased ?

This measurement question relates to the second investigative question dealing with the scope of technical support and relies entirely on a positive response to question 1. The purpose is to establish the level of resources to commit to technical support

and the validity of applying the Pareto or 80/20 principle. The question indicates that the level of support would be over and above a manufacturer responding to typical application problems experienced in the use of cement.

QUESTION 3

Does the construction sector need a broader range of cementitious binders than is currently on offer ?

This question also relates to the second investigative question. The scope of technical support will be directly influenced by the extent and complexity of products available. The purpose of this question was two-fold. The first objective was to establish the compatibility of the current product range of cementitious materials on offer, with the application needs of the construction sector. Under a cartel environment, the old Henry Ford adage of "You can have it in any colour as long as it is black" may well have been relevant, with the prevalent production orientation of the cement manufacturers. On the other hand, the construction sector, which is known to have first world capabilities, may have progressed to a point where additional cementitious products may have become attractive. It was secondly necessary to establish whether products with enhanced performance or quality would support the higher price necessary in order to differentiate the product.

QUESTION 4

Assuming that the cement manufacturers were to offer a range of product support services, such as training and mix designs, what should the future role of PCI be?

In the above question an important industry related issue will be discussed in depth to explore the synergies between the PCI and cement manufacturers in a post cartel paradigm. This question deals with the third investigative question dealing with industry related issues. The PCI was established as a body that would carry out technical support and training in cement application and concrete in particular. The future of the PCI needs to be considered in the light of the dissolution of the cement cartel and the new competitive environment which is anticipated between the cement manufacturers.

Furthermore, this question was aimed at gauging the relevance of the PCI to the various big construction companies, as well as an attempt to establish the preferred role for a future PCI, as perceived by the construction sector. In it's current form, the PCI would be in direct competition with the manufacturers, who would contribute towards some 90% of the PCI's revenue.

QUESTION 5

Does forward integration, by cement manufacturers, into aggregate supply and readymix concrete provide opportunities or present a threat to your business ?

The purpose of this question is to support the fourth investigative question dealing with forward integration in terms of the cement value chain. Most of the readymix capacity is in the hands of Anglo Alpha and Blue Circle. This question attempts to establish the desirability of forward integration into aggregate supply and readymix concrete. This is an important issue, as it can bee seen to be part of the delivery mechanism in terms of the cement value chain. Alternatively, cement manufacturers with linkages to aggregate supply and readymix may be seen as a threat by the construction industry, with cement manufacturers having an unfair advantage through cross subsidisation. Manufacturers could also be seen to be in direct competition with their customers with these forward integration initiatives.

QUESTION 6

Do cement manufacturers need to be more flexible in tailoring cement blends to meet specific requirements for contractors ?
(i.e. three-way blends or vary the percentage of extenders such as fly ash or slagment in cement blends)

This deals with product-related issues in a similar context to question three and will have an impact on the scope of technical support discussed under the second investigative question. The emphasis here is the degree of flexibility required in producing specific cementitious products. When fly ash or slag is added with Portland cement, it can result in certain desirable characteristics. Examples are a lower heat of hydration for the likes of the Katse Dam project, a reduction in alkalis to reduce the risk of alkali silica reaction (ASR) and many other durability aspects. France, for example, has 166 different cements on offer. (Reference).

The objective was to gauge a level of awareness of the potential of these blends, to address specific requirements, and thus determine what opportunity existed. The "dial a blend" concept would require a considerable amount of capital expenditure, which makes it even more important to establish to what extent it adds value. The relevance to the customer support issues is the level of technical support necessary to choose the appropriate product to achieve the desired result.

QUESTION 7

Should the industry introduce SABS performance specifications in place of the

existing specifications and, in this way, avoid a "strength war" and encourage product consistency ?

This question also deals with product related issues on an industry wide basis and as a result, technical marketing would need to be supportive of quality issues synergistic with total quality management principles. This question thus relates to the third investigative question and deals with technical involvement in industry issues. The cement manufacturers are intending to introduce the current European specifications (ENV 197-I) as a new SABS requirement for cementitious materials. The current SABS specifications revolve around the product being specified. For example, Ordinary Portland Cement is specified by SABS 471, while PFAC and PBFC are specified through SABS 1466 and SABS 626 respectively. This approach results in a gap in the product range, which cannot be justified on a technical basis. For example, SABS 831 allows for a fly ash blend of 10% to 15% with Ordinary Portland Cement, while SABS 1466 allows for a 25% to 35% level. A product containing 20% fly ash would technically be quite acceptable and yet would not currently conform to SABS.

The European specification, ENV 197-I, on the other hand allows for strength classes, which go a long way to simplify the buying decision. The specification is performance based and allows for a continuum of cement blends. These blends are classified by the type and level of extenders used. The above represents a brief overview of what is obviously a more complex debate. The issue, however, is that the cement manufacturers and their respective bodies, such as SACPA, have not seen fit to adequately consult the construction fraternity through the South African Federation of Civil Engineering Contractors (SAFCEC) or Consulting Engineers through the South African Federation of Consulting Engineers (SAFCE).

The importance of a performance based European specification is that it sets a lower and upper limit to the results obtained from the standard ISO mortar test. The implication is that these limits prevent the cement manufacturers from competing on strength, the so called "strength war", to the detriment of long-term durability.

Again, the level of current awareness is of interest as well as the degree of acceptability of the new specifications. This would indicate the degree of support needed to educate the consumers as the performance characteristics of the products will need to be altered to synchronise cement performance with the new strength classes. This will be preceded by the strategic positioning of current products within these categories, with due consideration given to competitive moves by opposition manufacturers.

QUESTION 8

Would a national account, similar to national fuel accaunts for contractors, be an attractive strategy to offer your arganisation ? In addition to product pricing and delivery packages, manufactures could offer technical support based on volumes of cement involved.

This question further explores the second investigative question in an attempt to rationalise the level of resources a manufacturer should commit to technical customer support. It is easy to create a shopping list of customer support issues that could be offered to customers. It is clearly an altogether different prospect to apply all these services with the required effectiveness. When one further considers that this is only one market segment in the cement industry, the task becomes somewhat more daunting.

To address technical support issues in a meaningful way, it would be necessary to explore criteria by which one could apply these services, in an attempt to secure a competitive advantage. One such possibility is to apply customer support which reflects volumes consumed by a customer, and to reward the degree of loyalty shown by major customers. This could be best achieved through a national account, where the relevant type of support is discussed. The technical support arrangements would be supportive of pricing and delivery strategies.

By way of an illustration, technical brochures such as a table of trial mix designs, could represent a relatively low commitment to customer support. A continuum of tender mix designs and on-site concrete testing, through to the highest level of commitment represented by the management of on site concrete quality assurance, could also be considered. The cost implications are self-evident, and could only be sustained on the basis of volume and customer loyalty. Note further that the above example only illustrates mix design strategies. Other support functions, such as technical training in the use of cement, skills transfer, and so on, illustrate how the variables can become unmanageable.

It is important to appreciate that the above question does not imply that small consumers would be totally ignored. It would be reasonable to assume that a relevant level of customer support, such as a technical hot-line, would be available. However, a high level of support could not be sustained for a customer who only consumes a nominal volume of product. In terms of technical marketing strategies, this question is one of the most meaningful to guide manufacturers to apply an appropriate level of commitment to technical support.

QUESTION 9

Other than what we have discussed in this interview, are there any specific technical support issues that you feel need to be addressed by the cement industry ?

This is an open question and the response will determine the categorisation of issues discussed in terms of the question hierarchy. Although the previous questions were put together with a considerable amount of thought and care, it would be reasonable to expect that certain technical support issues had not been addressed. The interview should provide a valuable opportunity to record any discussions that may have a bearing on technical marketing strategies.

7.2 Interview Arrangements

The construction companies listed on the JSE can easily be confirmed through financial periodicals such as the Business Day newspaper. The exception to the regular building and construction sub-category of the Industrial sector is Murray & Roberts, which is listed under Industrial Holdings. The nine companies to be approached for interviews are thus Basil Read, Concor, Goldstein, Grinaker, Group 5, LTA, Murray & Roberts, Ovcon and Stocks & Stocks. Clifford Harris was added to the list go get further representation for the coastal regions.

A printout of the Board of Directors and Holding Companies was obtained from the McGregor online database. A selection was then made on the basis of discussions with colleagues in the PPC Marketing department, as well as utilising normal marketing intelligence records. Although some of the respondents will be known to the writer, the issues are not of a sensitive nature and a significant level of bias is not anticipated. The issues also do not relate to a specific manufacturer, but rather concern the cement industry in general.

The short list of executive management was contacted telephonically for an interview. This initial contact included a commitment by the writer to fax the questionnaire to the respondents, as well as a letter of introduction from the SBL. This was done intentionally, to allow the respondents to be comfortable with the issues to be addressed. This procedure also allows the respondents to collect their thoughts and review relevant material where necessary. The writer also indicated that he has had some ten years experience in the Construction industry in an attempt to secure interviews at the required level.

The interviews were held in the offices of the respondents at times and dates suitable to them. Should the contact person not be available for the interview, or

consider themselves not to be authoritative on customer support issues, they were requested to refer the interviewer to an acknowledged expert in the field.

The interviews were to recorded on audio tape to allow the interviewer a higher level of concentration and interaction with the respondents. Transcripts of the interviews will be printed and included in Appendix D. During the wrap-up of the interview, the respondents were requested to nominate eight candidates, at contracts manager, site agent or concrete engineer level, who would be suitable to respond to the mail survey. If the interviews were arranged too far in advance, the interviewee would be faxed with the latter request.

7.3 Mail Survey Questions

Administrative data was restricted to the questionnaire identification number and the respondents name, which was optional. Respondent characteristics were limited to a range of typical managerial positions in the organisation, the category of construction, and the location of the current project.

The questionnaire consisted of two sections of closed questions. The first section required the respondent to rate the customer support strategies in order of preference. For the second section, use was made of a five category Likert scale (Mouton, 1995). The five categories measured are strongly disagree, disagree, neutral, agree and strongly agree. Note that although the response scale would allow for a middle value tendency, the "neutral" term was preferred to the often used "Uncertain" response. This allows for a respondent who may in fact be certain that he has neutral views on an issue.

The topic under discussion was not sensitive or of a personal nature. As a result, the questioning was intended to be unambiguous and direct, without having to resort to techniques such as objective disguise or proxy codes typical of indirect questioning. The questionnaire could be answered with relative ease by the respondents, and as a result, problems such as shared vocabulary and technical language would tend to be minimised.

Other guidelines and checklists were utilised in developing the questionnaire, specifically those recommended by Emory & Cooper (1991 : 347-381) relating to survey instruments. An example is the question clarity checklist based on recommendations by Payne in "The Art of Asking Questions" (Emory & Cooper, 1991 : 384).

Recall that the measurement questions in the questionnaire are aimed at providing information for the investigative questions. The questions are generally grouped,

but occasionally varied to avoid monotony and attempt to prevent the respondent from not reading the questions properly. The questions below are grouped according to the investigative question discussed under section 6.3 above.

7.3.1 Manufacturers Involvement in Technical Support.

This investigative question was dealt with exclusively in the personal interview, as a result of it's fundamental importance to the project.

7.3.2 Scope of Technical Support

(Note that the reference numbers with the prefix "Q" below relate to the questionnaire numbering, a sample of which is attached in Appendix E).

Q2.5 It would be useful for cement manufacturers to take over concrete site testing , evaluation and presentation of results as a service on contracts.
Q2.7 There is a need for independent cement and concrete testing organisations.
Q2.8 Cement manufacturers should actively advise consultants on technical matters relating to cement and concrete application, such as durability issues, specifications etc.
Q2.9 The range of cement types should be kept to a minimum
Q2.10 Contractors buy only on price
Q2.12 Chemical admixtures will be used, on an increasing basis, in concrete mixes
Q2.13 Cement manufacturers should be capable of supplying multiple blends, in proportions that meet the requirements of contractors.
Q2.16 Cement manufacturers need to supply silica fume for specific concrete applications.
Q2.17 Contractors are not prepared to pay a higher price for better quality cement and technical support.

Based on the responses, these questions will give cement manufacturers and indication of the level and broadness of technical support required to address the needs of customers in the formal construction industry. For example, assume that all but a few respondents indicate strong agreement with the statement that "contractors buy only on price", one could infer that only a nominal level of technical support would be justified. A strong affiliation with the SABS mark would imply the maintenance of quality systems. Furthermore, additional products would indicate broader customer support and a higher level of technical proficiency.

7.3.3 Technical Involvement in Industry Related Issues

Q2.1 Cement manufacturers should be actively involved in lobbying for appropriate cement and concrete applications, such as concrete pavement construction.
Q2.6 The PCI will be irrelevant in a post-cartel cement industry.
Q2.11 All cementitious products should carry the SABS mark.
Q2.14 Alkali Aggregate (AAR) is not the concern of cement manufacturers
Q2.15 Cement manufacturers need to be actively involved to improve durability of concrete in practice (i.e. corrosion, carbonation, sulphate resistance, curing, cover to reinforcing, etc).

Note that the reverse wording used in a statement such as Q2.14 is intentional to induce the respondent to read the statement with care. Issues relating to AAR, often referred to as "concrete cancer" in the media, and durability are in fact industry issues rather than matters relating to a specific manufacturer's product. The industry could take a long-term view as responsible citizens, or a short-term view through reduced involvement in these issues. The responses will provide the contractor's perspective on these matters.

Q2.9 is an example of commitment necessary to lobby, on a technical basis, for areas of cement application where effective competing solutions could threaten cement volumes.

7.3.4 Cement Value Chain

Q2.2 Cement manufacturers should further increase their ownership of readymix concrete organisations.
Q2.3 Manufacturers should not be involved with aggregate supply to the construction industry.
Q2.4 The cement industry should provide batching plants on site, as an alternative to readymix.

In terms of the cement manufacturer's value chain, there is often intense debate as to the extent of forward integration. Although the responses will be of great interest, it would be difficult to evaluate the motivation behind the response. It is for this reason that this item will be dealt with in greater depth in the research interview.

7.3.5 Ranking of Customer Support Options

A menu of ten options will be put to the respondents for ranking in terms of perceived value added. These options are listed in the first section of the questionnaire as Q1.1 through Q1.10. (Refer to Appendix E). This section is placed first to create a sense of anticipation of what is to come. This section would also require the most thought.

Note that care has been exercised in the introduction to the statements in the questionnaire, to obtain a unique ranking for each statement. Q1.6, site testing of concrete, carries a much higher commitment of resources. For this reason, the following statement was inserted in the second section of the questionnaire, as a measurement question :

Q2.5 Would it be useful for cement manufacturers to take over concrete site testing, evaluation and presentation of results, as a service on contracts ?

8 Pretesting

Pretesting for this project consists of consultation and plot surveys before embarking on field surveys.

8.1 Consultation

The interview questions were circulated to colleagues in the marketing department, in order to evaluate the contents and relevance of the questions. The aim of this pretesting was to determine respondent interest and check for respondent modification of the question intent.

Certain questions were re-worded to improve clarity, based on the feedback obtained. No further questions were forthcoming and it was felt that the existing questions would adequately deal with issues that would have the potential to provide parameters for technical marketing strategies in a post-cartel cement industry.

For the mail survey, pretesting consultation was carried out with the assistance of the UNISA Department of Statistics, and the Department of Computer Services, User Support Group. Many of the questions were edited to avoid double barrelled questions and, to a lesser extent, ambiguity. This was achieved through shorter, more focused questions and further questions being generated where the implied

secondary question was considered to be of value.

Consultation with the Department of Computer Services was aimed at ensuring that the questionnaire for the mail survey was in a format suitable for computerised evaluation. The result was the number coding that was brought into the questionnaire sheet, where attention to detail was necessary. For example, the section dealing with the ranking of support service options required a double digit option to allow for the tenth ranking in any one of the listed services. Failure to do so would have resulted in manual evaluation or omission of the tenth choice, which would not have been satisfactory.

The system used by the Department of Computer Services is a RISC based computer running under UNIX owned and maintained by the UNISA main campus. The data is down loaded and processed on the SAS statistical package.

8.2 Pilot Survey

An interview was arranged with a former colleague of the writer. The respondent, a Director of a listed construction company, had the appropriate profile of the respondents who were to be approached for interviews in the field survey. It was anticipated that this pilot survey would be included in the field survey for evaluation if only nominal adjustments were required. Sufficient time was allowed for between the pilot survey and the field survey in order to alter the structured questions without having to recall the questionnaire or postpone interviews.

It was established, from the pilot survey, that the interview could be carried out within the targeted 30 minutes. This allowed the researcher to make a commitment to potential respondents that the interview would take no longer than 30 minutes.

As far as the contents and relevance of the questions were concerned, it was felt that the questions were sufficiently broad to deal with most of the important issues without lacking focus. The ninth general question would act as a dragnet to reveal any issues that a respondent felt strongly about, and that had not been catered for in the previous questions. The scope of the exploratory research and qualitative analysis allows for sufficient flexibility to deal with individual responses of this nature.

For the mail survey, colleagues who were not previously involved with the evaluation of the questionnaire were timed while responding to the questionnaire. As a result, it was established that the questionnaire could be completed within the targeted ten minutes. The instructions relating to the ranking of technical support options were also altered for clarity as a result of the pilot survey.

9 Field Survey

9.1 Personal Interview

The level of management targeted for personal interviews tended to have extremely busy schedules. This can be seen from the timespan from the pilot interview with the Basil Read Director on 21 August 1995, through to the final interview with LTA on 8 November 1995.

The interviews were preceded by faxing of the structured questionnaire to the respondent, together with a letter of introduction from the SBL. None of the interviews were shorter than twenty minutes or exceeded thirty minutes. All interviews were recorded on tape, with prior consent of the interviewee. This allowed the interviewer to concentrate on the issues at hand, ensure a common frame of reference and probe for questions where necessary. The respondents were also very cooperative in their referrals for suitable candidates for the mail survey.

Although forming part of the Basil Read Group, Clifford Harris was included in the personal interviews to supplement the coastal interview of the Cape Town based Ovcon. The introduction and discussion in these two interviews was slightly modified to take cognisance of the spacial monopoly enjoyed by PPC in the Western Cape region, as well as the influence of the coastal environment on technical matters.

9.2 Mail Survey

The mail survey was administered by fax and also included a covering letter of introduction from the SBL, as well as an acknowledgement of the organisation's involvement following discussions with the interviewee within that organisation. Where extreme difficult was experienced in trying to fix an early interview date, the list of candidates for the mail survey was supplied in advanced by the interviewee. The introductory note to the mail survey requested that the questionnaire be returned by fax within a week of receipt.

In total, 90 questionnaires were administered by fax. A follow-up request, which included the full mail survey questionnaire, was faxed to all participants who had not yet responded within two weeks. A low response to this request would indicate that a third and final request would not be effective.

The response to the mail survey was tabulated on a lotus spreadsheet, saved to an ASCII file and submitted to the UNISA Department of Computer Services for

statistical evaluation. The results will be dealt with in Chapter 6.

CHAPTER 6: DATA ANALYSIS AND FINDINGS

1 Introduction

The personal interviews were carried out between 21 August 1995 and 8 November 1995. Transcripts were made from the recordings of interviews and are attached in Appendix G.

The analysis of the personal interviews will summarise the main issues and will be followed by examples of specific responses from the transcripts that are relevant to the question. This will then be followed by a qualitative interpretation of the above, in Section 2.

Section 3 will deal with the analysis of the mail survey, at the measurement level of the question hierarchy. This will be followed by an interpretation of the mail survey on a quantitative bases, at the level of the investigative question, in terms of the research hierarchy.

2 Analysis of the Personal Interviews

The transcripts will be analysed on a qualitative basis, as is appropriate with personal interviews in exploratory research. As a result of the strategic value of the project, to my employers, a request for confidentiality was granted by the SBL. The names of individuals and companies are referred to where relevant to allow one to cross-reference the interviews more easily, and follow up on certain aspects where necessary. For the personal interviews, the analysis will be carried out on a question for question basis.

Question 1

Having experienced trading conditions under the cement cartel, do you feel that the cement manufacturers need to become more technically involved with cement application, as a value-added service ?

Alternatively, should manufacturers concern themselves with the production of cement, and leave the technical application of cement to the customer ?

i Main Issues

There was a unanimous response and all ten respondents indicated that cement manufacturers need to be involved with technical support.

It was generally acknowledged that a level of technical support did exist, but that this support should be more open and less biased. There was a degree of scepticism that the dissolution of the cartel would in fact become a reality, as tacit understandings could persist in the place of past formalised arrangements.

ii Specific Responses

Harding felt that, as a commodity, cement prices were unlikely to vary considerably, partly as a result of the high transport costs involved. As a result, he saw technical support as a viable means of differentiating ones product.

Boyd indicated that many contractors were stipulating a minimum cement content and there was, as a result, not much scope to save on cost through reducing the cement content in concrete mixes. He thus felt that guaranteed quality was important in order to achieve peace of mind.

The coastal regions, represented by Ovcon and Clifford Harris respondents, had a limited choice of cements in the absence of fly ash and slagment. Ralph indicated that information on cement and aggregates was needed to assist contractors in complying with the specifications aimed at avoiding AAR. These issues were of great concern in the Western Cape, and tended to dominate discussion on concrete production and competitive issues relating to concrete.

Grinaker and Group 5 respondents felt strongly that technical support should be aimed at reducing costs and assist in decision making.

Sears equated the cartel to poor service. He felt that no attempt had been made to try and market the product or help contractors in any way. This was essential for aspects such as more complex mix designs where contractors did not have in-house facilities. Dr MacDonald summarised it well when he indicated that the only time contractors received technical support was when they experienced problems and "called in the storm-troopers". Technical support from the cement manufacturers was perceived to be negligible and contractors have been supplied cement and only obtained back-up service when requested.

MacDonald believed that if one was going to sell cement, one should sell the product with the full back-up service. He gave the following as examples of the nature of service needed:

- Readily available information on what the plants are producing in terms of quality of cement.
- Documentation required by contractors in order to comply with the ISO

9002 quality system.

Question 2

Other than specific application problems, do you feel that it would be reasonable for cement manufacturers to relate product support effort to volume of cement purchased ?

i Main Issues

There was a mixed response to the above issue, with five of the respondents supporting a level of service related to volumes of cement purchased. Four respondents felt that smaller customers should not receive lesser technical support, and one respondent was neutral.

ii Specific Responses

Sofianos, a well-respected concrete technologist, felt that smaller users required a basic working knowledge of cement application, such as rule of thumb proportions, and transfer of skills. Larger users of cement, on the other hand, were concerned with backup service at a higher level of technical support, dealing with issues such as heat evolution and strength development.

Johnson had a well balanced and pragmatic perspective, indicating that a good level of technical support was required across the board, after which business practice dictates that bigger customers should receive added value. Sears concurred, and added that you would expect a high level of support with a big order. He gave the following factors which he considered to have the best potential to swing a buyer if cement manufacturers were to out perform their opposition:

- Price.
- Quality (product reliability).
- Technical Support.

Goldstein pride themselves on quality buildings, and Le Sueur feels strongly that technical support should be accessible to all parties. As a possible benchmark, he suggested the service offered by Plascon. In terms of accessibility, their technical support could be equally useful and was easily available to a spectrum of users ranging from the housewife to the professional builder. If one did not make the service available across the board, it would result in bad publicity and one would then be better off not providing the service at all. He based this on his belief that word of mouth publicity was a particularly powerful medium in the building sector.

MacDonald indicated that technical information, such as cement performance, was extremely useful for contractors to be competitive on large tenders. This could be achieved through more accurate estimating by knowing the performance trends of cement.

All the respondents indicated that the "small guy" or unsophisticated user needed considerable support and the following were typical comments made:

- A lot of small customers are quite important.
- There shouldn't be a bad level of service.
- Education of your first half of your spectrum (unsophisticated user) is going to be difficult.
- Everyone using cement needs a level of technical capacity.

Significant mention was made in one form or another to **relationship marketing** as an area that needed more attention in order to successfully implement technical support strategies.

Question 3

Does the construction sector need a broader range of cementitious binders than is currently on offer ?

i Main Issues

Three respondents felt that the range of cementitious binders is currently adequate. The remaining interviewees were cautious and felt that any such moves should have a cost benefit attached.

The main issues that were raised by respondents were as follows:

- Existing products were generally suitable for most applications.
- Additional products should have benefits that outweigh their addition cost.
- Unless otherwise specified, the choice of binder tends to be based on the cost in application.
- High-tech products for specific applications need to be specified by architects or consultants.
- Unless specified, transport costs preclude the use of extenders in the Western Cape.

ii Specific Responses

Harding indicated that Hochtief, Concor's major shareholder, did not use specialised binders for most applications in Germany and there was therefore an even more limited market for these products in South Africa. He was of the opinion that Concor would use additives or procure overseas high-tech products, should they be required, for specialist applications.

Sofianos speculated that most cement users were not fully aware of the range of cements currently available in South Africa. Group 5 also tended to site blend their cements purely on a cost basis. Sofianos said that pre-blended products would provide considerable benefits if they were found to be competitive in cost to the individual components.

Good off-shutter finish to concrete could save considerable patching costs according to Le Sueur. Any product that enhanced off-shutter finish would be of value to Goldstein who had built their reputation on quality.

Dr MacDonald gave an example where LTA had erected four silos for the Columbus project which allowed for many concrete blends with fly ash and slag. He also gave the following examples that indicate that LTA was in fact willing to pay the addition price premium for RHC:

- Malimabatso bridge, where the RHC allowed for higher slide rates on the piers and earlier stressing of the bridge deck.
- At Oshakati, a lower cement content was possible with RHC which translated to a total cost reduction in the transport component. This made the use of RHC more cost-effective than OPC in this case.

A further factor was the earlier stripping of shutters. This would typically have a considerable impact on productivity and hence reduction in cost.

Question 4

Assuming that the cement manufacturers were to offer a range of product support services, such as training and mix designs, what should the future role of the PCI be ?

i Main Issues

Only one respondent saw no role for the PCI in a post cartel environment, and even then conceded that they utilised the library as well as engineer and foreman training courses which they considered to be very good. Two of the respondents were

uncertain and put forward a case for a "watchdog" function in the industry. The remaining seven organisations saw some role for the PCI and, in two cases, indicated that the PCI was either irreplaceable or that it would take some time before cement manufacturers could match their capabilities.

Due to their funding by the cement manufacturers, the PCI was not seen to be independent or were, at best, middle of the road. Despite this view, two respondents felt that the PCI had a role to play as an expert witness in mediation or arbitration.

ii Specific Responses

Harding saw the PCI as leaders in technology, a semi-academic function. He considered that smaller customers could benefit from their series of "How to build" booklets, libraries and laboratories. He also thought that they had a role to play as an umbrella body for specialist organisations and associations such as the prestressed division of the CSSA. He even suggested that the PCI kept the industry in the first world in terms of concrete technology.

The Western Cape respondents spoke glowingly of the PCI, indicating that their historical background on aggregate suitability would be difficult to replace. Ralph felt that the PCI had a fundamental role to play and stated that "they talk my language".

There was a general call for the PCI to be more independent. Part funding by the construction industry was discussed as a possibility and this could be done through SAFCEC for example. There was also a reported trend towards the use of independent commercial laboratories such as Concrete Testing Services.

LTA on the other hand had based their decision to close down their in-house laboratory on the level of service provided by the PCI. They had since used the PCI extensively and saw them as a "one stop shop" for a broad spectrum of technical support requirements which MacDonald felt could not be replaced by the cement manufacturers. The service ranged from general technical support, mix designs, aggregate information and general problem solving where sites were experiencing difficulties of a technical nature. Regarding the integrity and impartiality of the PCI, MacDonald's view was that contractors were a "suspicious bunch of people" by nature and would not make use of their services if they were not considered to be impartial.

I have considered it necessary to expand on the above viewpoint as LTA clearly make full use of the PCI, and having run an in-house facility, are aware of the value

for money and leverage that they obtain through using the PCI. Unlike LTA, there were indications that other respondents were not aware of all the services available from the PCI. Should this be the case, they would clearly not be in as strong a position to advise on the future positioning of the PCI.

Question 5

Does forward integration, by cement manufacturers, into aggregate supply and readymix concrete, provide opportunities or present a threat to your business ?

i Main Issues

This is a typical issue where a questionnaire alone would not adequately provide the required information. The response was situation dependant as well as regional. Three of the respondents saw forward integration as a threat, while a further five were not opposed to forward integration into aggregates and readymix as such. Two respondents indicated that readymix operators provided both threats and opportunities to their organisations.

The three respondents who were against forward integration were all based in the Gauteng region. They either felt that integration into readymix would either merely perpetuate the cartel at a different point in the value chain, or would result in a major concentration which would reduce competition.

Readymix concrete was generally favoured where the sites were congested or where lesser volumes of concrete were required over a long period. Thus, convenience and peace of mind in terms of quality was a major factor in favour of readymix concrete. On the down side, for activities that had a twenty four hour continuous demand, control over one's own batching was preferred. Readymix was often considered to be restrictive in terms of volume and time. In general, it was apparent that the readymix concrete option carried a significant price premium.

ii Specific responses

Boyd indicated that as long as there was open competition, forward integration did not present a problem.

The Western Cape companies had recently experienced a new entrant into the readymix concrete market, namely Hippomix, in opposition to RMC who had previously enjoyed a spacial monopoly in this market. While the competition was welcomed, both organisations maintained their site batching capabilities against

which they benchmarked readymix prices.

Interestingly, Sofianos observed that cement manufacturers who were involved in readymix had an advantage, as they would have a better understanding of contractors business and performance of their products in practice. When asked if Murray & Roberts / Gillis Mason retain their site batching capabilities, Sears responded as follows:

> Yes. We also don't find readymix concrete efficient. It always amazes me that we go onto a site and put up a batching plant capable of 1 000 cubic metres per day and Pioneer is two kilometres away from the project and were not competitive. They were there, they had the plant there, it doesn't add up. They seem to be suited to the small builder and those sort of guys. We seldom make use of them. We do the same projects but you go through the exercise and find we can do it a lot cheaper ourselves.

Le Sueur concurs and estimates the price premium to be some R90 per cubic metre. He indicated that on significant projects, contractors would simply not be competitive if they based their tender on readymix concrete. In heavy building construction, typically high-rise, space restrictions often mitigate against site batching. Readymix is also typically utilised in the establishment and in the rundown phases of projects.

MacDonald was concerned where in one geographic area, an organisation had ownership of cement manufacture, aggregate supply and readymix concrete as commercial operations. This allowed one to play the number game around the triangle and have more opportunities for a bite at the cherry. MacDonald also conceded that such a strategy was probably good business practice for the players involved. Harding also conceded that it made good business sense.

Although quality and achieving strength were obvious requirements from any readymix operator, Le Sueur explained that by far the major factor was continuity and reliability of supply. The reason for this was the financial impact of falling behind on programme.

Question 6

Do cement manufactures need to be more flexible in tailoring cement blends to meet specific requirements for contractors ?
(i.e. three-way blends or vary the percentage of extenders such as fly ash or slagment in cement blends).

i Main Issues

Two respondents saw merit in an increase in product flexibility. The remaining eight respondents generally felt that the current product mix was suitable for most applications. Alternatively, large contractors made use of site blending, which allowed for a large degree of flexibility.

An important aspect was the role of the architect and consulting civil engineers. Once these professions specified a product on a project, there was little opportunity and scope for alternative products. As a result, these disciplines need to be included in the information process to keep them abreast of current developments. The consulting engineers represented by the resident engineer on site, usually had to approve all trial concrete mixes or alterations to such mixes. As a result, they were also an important part of the process and would need to be aware of the implications of using alternative products.

ii Specific Responses

Johnston felt that flexibility, within the parameters of the manufacturing facility, would have benefits for large projects, especially if cost cutting strategies were taken into account.

Sofianos reasoned that users become accustomed to the characteristics of existing blends, and the consultants were also comfortable with specifying these products. Most large contractors used bulk cement, which lends itself more readily to on-site blending, while small contractors used pockets where pre-blending would be more practical.

The respondents from the Western Cape, Groenhof and Ralph, were occasionally required to use cement extenders on large projects. These blends, however, were typically specified as fly ash or slagment and could not compete with OPC on cost in this area due to the large distance from the source of the extenders.

Question 7

Should the industry introduce SABS performance specifications in place of the existing specifications and, in this way, avoid a "strength war" and encourage product consistency?

i Main Issues

All the respondents supported this initiative. Consistency was important to the

large contractors. The European specification which provided for a 28-day window, which stipulated a maximum and minimum strength, was perceived to promote consistent cement performance. There was also an understanding for the necessity to avoid competing on strength to the detriment of long-term durability. It was also indicated that durability problems were not in the best interests of the construction industry.

ii Specific Responses

Boyd again mentioned that specifications stipulating minimum cement content gave contractors little opportunity to reduce the cost of their concrete mixes. Sofianos indicated that when contractors took advantage of cement that had a temporary high strength development, severe problems would be experienced when the strength of cement was corrected downwards.

Sears gave a typical example of difficulties experienced with the existing range of SABS specifications dealing with cementitious materials. Murray & Roberts had evaluated a mix design for the Hoedspruit airbase contract. When the cement strengths took a serious dive, the concrete strengths fell through the floor. However the cement strengths were found to exceed the minimum requirements of the relevant SABS specifications. As a result, hundreds of cubic metres of concrete paving had to be broken up. It is not surprising therefore that Sear considers consistent cement performance to be more important than high strength. Sears also recommends that a service that gives consumers an early warning of fluctuation in cement performance would be of value.

Question 8

Would a national account, similar to national fuel accounts for contractors, be an attractive strategy to offer your organisation ? In addition to product pricing and delivery packages, manufacturers could offer technical support based on cement volumes involved.

i Main Issues

Eight interviewees thought that the concept had merit while the remaining two respondents had mixed feelings on the matter.

There was a concern that it may not be practical on a national basis, and one may need to look at regional accounts as delivered costs, at the lowest prices, were necessary at all sites. A further concern was that one would "have all your eggs in one basket". There was also an appreciation for developing relationships as a way of easily dealing with contractors' requirements from the initial order through to

technical support on site.

ii Specific Responses

Boyd's perception was that it would perpetuate the cartel as the fuel industry had similar prices and operated in a similar fashion to a cartel. MacDonald had mixed feelings and suggested that the manufacturers should look at the situation on a project for project basis.

Harding emphasised the need for low prices, but indicated that, at some point, reliability of delivery could be even more important and non-performance in this area could be catastrophic.

In Le Sueur's opinion, discounts that were closely linked with volume turnover were accepted practice world wide and as a result considered it to be a question of economics. The two Western Cape respondents had no problem with the concept. This would largely be due to the monopoly in this area and lack of alternatives.

Question 9

Other than what we have discussed in this interview, are there any specific technical support issues that you feel need to be addressed by the cement industry ?

i Main Issues

This catch-all question was included to address any areas that had not been discussed, or had not emphasised important issues.

ii Specific Responses

Basil Read and Stocks & Stocks respondents indicated that a new level of product support was required, based on free market principles. Manufacturers needed to be involved with cement, concrete, aggregates, extenders and admixtures. Three of the respondents referred to a specific problem with one of the cement manufacturers' products, to emphasise the need to get to the bottom of problems of this nature in an open manner.

Concor in particular and Group 5 to a lesser extent had experienced severe problems with the loss of cement, or so-called shrinkage. Cement had been signed for on-site, but could not be accounted for through stock-taking. The problem was restricted to major centres where whole truck loads were thought to have been unaccounted for.

The Western Cape respondents appeared to have few customer support problems of note, even though there was a spatial monopoly by PPC in that area.

Sears touched on a very important issue by indicating that the cement manufacturers would have to work exceptionally hard to change the way of thinking and the mind set of employees in the cement industry. He was of the opinion that cement manufacturers never had to be competitive in the past. As far as relationship marketing was concerned, Sears also indicated that each project consisted of a team of people and as a result, negotiations should recognise the uniqueness of each project rather than provide a blanket offer.

MacDonald also touched on this issue by referring to examples of past strong arm tactics by the sales body of the cement industry, namely the CDSA. LTA had not received a railed cement consignment for which they were billed and had as a result not yet settled their account. LTA had then received letters warning them that their entire account would be closed should they not settle their outstanding payments. The issue is not one of credit control and non-payment but one of arms length relationships with CDSA apparently adhering to well established credit control procedure while not appearing to resolve the cause of the problem, namely the non-delivery of the product. If this were the case with a major account such as LTA, it is quite feasible that similar situations were experienced by smaller consumers of cement.

3. Interpretation of the Personal Interviews

While it was expedient and logical to deal with the analysis of the personal interviews on a question for question basis, it is necessary to revert back to the research structure in terms of the questions hierarchy in order to ultimately deal with the original management question. This is achieved by evaluating the analysis in terms of the five categories of the investigative question, bearing in mind that the personal interviews and thus the measurement questions are evaluated qualitatively.

3.1 Involvement in Technical Customer Support

Should cement manufacturers be involved in technical customer support?

The above investigative question was the exclusive domain of the personal interview as it was an important point of departure and thus held a degree of risk for the project should it not be supported. The writer has had considerable experience in the field of civil engineering construction and as a result of this background and the pilot survey had some confidence in a positive outcome.

Nevertheless, it is a fundamental objective of research to confirm opinions which in retrospect may appear to be relatively straightforward. These point of departure issues need to be resolved at an early stage of the problem solving process as much of the subsequent research will be based on the outcome. For example, it took many years of the empirical research to show that cigarette smoking was detrimental to one's health. Intuitively, it was common knowledge that cigarette smoking would not benefit one's health, but the size of the industry mitigated against mere assumptions unsupported by evidence. Without this evidence supporting the detrimental effects, it would not have been possible to effect the health warning legislation which is now common practice in most developed countries. Similarly the need for the cement industry's involvement in technical support needed to be established before proceeding with related issues.

The respondents were unanimous in their support of further technical service and back-up in a post-cartel cement environment. The extent to which this issue was supported would indicate that, as a management problem, testing a hypothesis of this nature in a more formalised scientific research would largely be of academic interest. Recall that exploratory research is often utilised to establish a research question that would be evaluated for incorporation into a hypothesis.

There was a significant degree of scepticism that the dissolution of the cartel would in fact become a reality and it was thought that the cartel would continue through covert means and tacit coordination. The following is an indication of some of the comments made in this regard:

- We feel that the cartel will be back very quickly. Whatever they say, and what happens, will be two different things (Interview 1).
- The cartel is not broken yet, we have heard that for three years (Interview 2).
- There is a certain amount of scepticism in the market at the moment as to whether the cartel really will dissolve (Interview 3).
- We hear that the cartel is breaking down on the 1st of January, the same as we heard that there was no cartel (Interview 4).

The respondents from the Western Cape did not mention the cartel even though it was mentioned in the introduction to the personal interview to establish a common frame of reference. This was not surprising as a result of the current spacial monopoly by PPC in that region. However, in both cases, mention was made of the potential for importation of cement. This is a clear indication that the cement industry operates in a global environment which presents both threats and opportunities, especially to the coastal regions.

Groenhof mentioned an example of some five years ago where overseas cement could be landed at considerably lower costs than local cement. However, the importer would have to allow for full ship loads, and there were no handling facilities for cement at the receiving ports.

Ralph alluded to the globalisation aspect of cement when he stated the following:

> It is a case of the price, but what everyone has to be careful of is that the price is obviously determined by the manufacturers, but always on the fringe are the overseas manufacturers and some of the guys in this town (Cape Town) are importing cement.

There was a general misconception that the cement industry was protected against the importation of cement. Morel was of the opinion that contractors in South Africa were paying an average of $150 per metric ton for cement, while in the world market, typical average prices were in the order of $52 to $55. South African cement, at $54,67, is the third lowest after Hungary at $52,13 and India at $33,10. The above prices relate to bulk cement per metric ton, ex-factory for 1994. If one compared prices between Australia, France, Germany, Italy and the USA, South Africa has had the lowest bulk cement prices since 1986 barring the USA who's prices were slightly lower between 1991 and 1993. (SACPA Annual review, 1994: 14)

With regard to globalisation, Le Sueur made the following remarks:

> ....in terms of the GATT agreement with free trade now going to happen. Let us look at the cement industry from Zimbabwe now? Is there going to be a free flow from the East? You know what happened in the past, everyone started importing from the East. We could bring it through Durban, rail it up to Jo'burg, drop it off on site cheaper than we could buy it from Pretoria. With GATT, those restrictions will disappear and everyone has to gear themselves up now. Lets face it, competition will come from overseas, same way as with the free market, the cheapest price will win eventually.

Although the cement industry did subsidise the transport of cement to the coastal market under threat of imported cement in the 1980's, there are no protective trade tariffs or quotas imposed by government to protect the cement industries against the importation of cement.

However, it is important to appreciate that the cartel was disliked in the industry, irrespective of the relative stability of cement prices achieved. As such the past situation generated little loyalty to the national industry and as long as there is a perceived opportunity to import cement, the industry would need to be ever vigilant against the threat of imported products. Even though the implementation of GATT will not impact on the protection of cement, the perceived protection could trigger international suppliers and national buyers to import cement when the

implementation of GATT comes into effect.

Therefore in summary, the construction sector do believe that the cement manufacturers should get involved with technical customer support. The cartel was synonymous with poor service in the past, and given a post-cartel environment, contractors are in general looking forward to the competitiveness that comes with a free market. Technical service was seen to be a natural component of competitive strategy where a manufacturer would need to outperform his opposition.

All of the respondents had a need for cement at the lowest delivered price and taken to its logical conclusion, the lowest cost in application. We also know that needs remain constant, the ways of satisfying them may change (McDonald & Morris, 1990: 5). This need can thus be considered to be generic to the construction sector.

Other than price, technical support, in its various forms is an area in which cement manufacturers have the potential to differentiate their products in the quest for a competitive advantage. The degree to which one attempts to satisfy these needs will be dealt with in the research questions to follow.

3.2 Scope of Technical Support

What is the scope of technical support required?

In a simplistic sense, the need to bind materials together with the end result of achieving a usable end product, such as a shelter for people, is a basic need that has remained constant. The ways of satisfying these needs has varied considerably and cement as a component of one of these solutions is no exception. Many of these solutions were acquired through transfer of skills as is the case in the masonry trade with a bricklaying artisan. In a more sophisticated market, the application of cement is exceptionally varied and hence the ways of satisfying basic needs become more complex and the variables increase to an extent where it is not feasible to address all of the requirements.

In order to become more competitive than their opposition in a free market, cement manufacturers need to select the options that have the potential to achieve a competitive advantage, in a rational manner. These choices are effectively a management problem that have to be made in the face of limited resources. As a result, a number of the structured interview questions were designed to deal with evaluating the scope of technical support required and will be dealt with below.

3.2.1 Question Two

Other than specific application problems, do you feel that it would be reasonable for cement manufacturers to relate product support effort to volume of cement purchased ?

The analysis of the responses indicated in one form or another that technical support needed be broadly based. It was acknowledged that the informal sector required considerable support although most respondents did not venture to put forward proposals as to how to deal with this matter. One respondent acknowledged that this would be a difficult area to address and that he in fact did not have any answers. The research required for evaluating the specific needs of the informal market would require appropriate techniques such as focus groups and workshops. Having said that, the respondents tended to turn to their own requirements, correctly so, as this project deals with the formal construction sector.

The interviewees appreciated that the scope of technical support is constrained by scarce resources. Johnston for example indicated that its was good business practice that bigger customers should receive added value. Sears placed technical support in a competitive perspective where cement manufacturers had the opportunity to outperform their opposition through technical support.

The following responses suggest that to satisfy the needs of the construction sector one should focus on specific projects:

- But if there was a big order, I would expect you to offer a lot of support to get that order (Interview 8).
- If you have an order on a huge dam or something like that, ... (Interview 4).

When asked if it was almost like putting in a bid, MacDonald responded, "absolutely, that's what you are going to be doing, you don't have a closed market."

A further theme is one of relationship marketing as indicated by the following typical responses:

- Closer ties between organisations (contractors and cement manufacturers) (Interview 8).
- Representatives from the guys who buy a lot of cement from you

have regular meetings (Interview 6).

The following responses indicate that the principle of allocating resources related to cement volumes is a rational one:

- You spend more, and you expect more service (Interview 1).
- The amount of money you spend (on customer support) would depend on the size of the customer (Interview 3).
- Better service would be for bigger users (Interview 7).

In support of the above, some of the respondents attached the level of support to the notion of adding value. Johnston put it this way, "I'm your biggest customer, I want more than just the product off the shelf, you need to come and give me more value-added service and product support".

Sofianos' argument was that more sophisticated users' needs should be satisfied through higher levels of support and back-up, while unsophisticated users required education in the application of products and transfer of skills.

In summary, the level of technical support should take the following into consideration:

- Project based.
- Relationship building and closer ties.
- Volume related.
- Add value.

3.2.2 Question Three

Does the construction sector need a broader range of cementitious binders than is currently on offer? Would the market support higher prices for products with enhanced performance or quality?

A broader range of products would require additional technical support in order that customers may select the appropriate binder for the intended range of applications. Value added products that were product specific would require specialist knowledge to allow for the correct application of these products. Typical examples of the low volume high value products are high alumina cements, sulphur alumina cements and extenders such as silica fume. Typical applications are those that require high early strengths to minimise service disruptions such as repairs to freeways and bridges

subject to heavy traffic. Repairs to airport paving and taxi ways are further examples where the value added concept goes beyond the pure material costs and includes incidental costs such as potential disruption to traffic.

Other aspects that relate to the choice of binder are such issues as serviceability life, or life cycle costing of structures. Typical examples here are AAR, corrosion, sulphate attach, sulphate resistance, freeze thaw and carbonation.

There was a disappointing amount of technical depth evident in the responses received. This is not surprising as cement users have been operating in an education vacuum under the cartel paradigm. A production orientated culture is comfortable with a limited product range. As a result of the cement manufacturers operating well below their capacity, they have been understandably reluctant to promote extenders that will further dilute capacity. Boyd put his argument in the following words:

> "It is cheaper to put slag in, it is cheaper to put FA in, and don't try and push for a total cement package (OPC) and try and say what the benefits are."

South African contractors are known to be innovative in their application of cement. However, it is clear that the consulting civil engineers have a considerable input as to what materials are used on specific projects in the construction industry. In the building industry, architects have a similar role to play and tend to be more receptive to innovation. However, even in this field, civil engineering consultants are responsible of the structural integrity of these buildings. The architects area of influence would be more focused on finishings such as the types of cladding, choice of masonry units and so on.

The above discussion was based on the following comments made:

- You have to talk to the architects and consultants before you talk to the contractors (Interview 1).
- Unless it is specified in the document we will go for OPC. (Interview 5).
- Unless an architect specifies colour or something and there may be a special reason for it, we as contractors very seldom have any influence over that, we must purchase what is requested (Interview 8).
- The parties you really have to convince are the consultants.

In one example Goldstein had proposed a fly ash blend for their Armscor headquarters contract to which the consultants had requested that Goldstein show them a building that had been standing for twenty years, where the proposed blends had been used. The response from Le Sueur was that "with your attitude, we would be driving on wooden bridges in this country." This illustrates the resistance in accepting new products that have not taken the requirements of all the stakeholders into account.

Dr MacDonald added that there was in fact scope for value added products. He gave the following examples for RHC:

- Higher slide rates in cold weather.
- Earlier stressing of structural members.
- Earlier stripping of shutters.
- Lower long distance transport cost component due to lower cement content, which in turn leads to a total cost reduction.

A further trend was for large contractors to do their own site blending by setting up silos to store cements and extenders. This allowed for rapid response times and a significant degree of flexibility to blend cement and extenders to meet specific site requirements and even adapt to the changing weather conditions.

In summary, the respondents generally felt that the range of cementitious products were satisfactory. It was speculated by respondents that consumers were not even aware of the current range products on the market. Any additional products would need to exhibit a real cost benefit such as the example given for RHC above. Products that enhanced quality could also result in significant indirect savings according to Le Sueur.

Finally, the development of any future products would have to take into account the due process institutionalised by the tender procedure in South Africa. As a result, although consultants are reluctant to specify brand names, they would need to be confident that new products had been extensively developed and researched. Products should preferably be of recognised quality such as those that carry the SABS mark.

3.2.3 Question Six

Do cement manufacturers need to be more flexible in producing cements that meet specific requirements of contractors?

eg. Three-way blends or vary the percentage of extenders such as fly ash or slagment in cement blends.

Much of the above discussion relating to architects and civil engineering consultants also applies to this measurement question. The emphasis here was on the degree of flexibility required of cement manufacturers to provide contractors with differing levels of cement extension and tertiary blends. The German cement industry, for example, successfully uses a "dial-a-blend" concept. The implication is that technical support would need to be highly responsive and manufacturers would need to be exceptionally customer orientated.

Analysis of the responses indicates that there was not a compelling requirement for this service other than some potential for smaller consumers. The rationale was largely based on the fact that most large contractors were in a position to establish silos on site and blend their own mix requirements. As the contractors were in direct control of their site batching it would be difficult, if not impossible, to improve on the degree of flexibility and responsiveness through pre-blending at cement plants. A further factor was that contractors and consultants alike became accustomed to the cement blends available, as well as their relative performance.

Although Johnston and Sears recognised an opportunity for manufacturers and contractors to reduce costs through reduced capital on silo and screw conveyer installation, this alternative can hardly be seen to be a pressing need based on the interpretation of the data. Furthermore, the separate delivery of cement and extender to site would always optimise the transport distance when compared to preblending.

3.2.4 Question Eight

Would a national account, similar to national fuel accounts for contractors, be an attractive strategy to offer your organisation? In addition to product pricing and delivery packages, manufacturers could offer technical support based on volumes of cement involved.

Most respondents were of the opinion that a national accounts deal had merit, but had their reservations as to whether it would be practical to implement. Their reasoning was that contractors had no control over their fuel account and as a result it was a matter of aligning oneself with a supplier, as all were capable of matching the price and delivery of the opposition. The respondents reasoned that the competitiveness of the

cement manufacturers was a function of the location of their cement factories.

The respondents who agreed with the concept in principle expressed the following reservations:

- A national account would be great, but I don't see it working (Interview 1).
- We would also, on the down side, be putting all our eggs in one basket (Interview 3).
- They would have to be competitive in all of those areas.

In summary, while the majority of the respondents supported the concept, they were cautious about being tied to any one cement manufacturer for fear of being uncompetitive in certain areas or vulnerable due to the inability of a manufacturer to supply once production capacity had been reached. Alternatives suggested were to deal with this issue on a regional basis or treat each major project as a separate bid.

3.2.5 Question Nine

Other than what we have discussed in this interview, are there any specific technical support issues that you feel need to be address by the cement industry?

Respondents suggested that manufacturers technical support should cover cement, concrete, aggregates, extenders and admixtures. There was also a requirement that manufacturers test cement performance for consistency and trends and communicate these to customers in an open manner.

3.3 Manufacturers Involvement in Industry Issues

To what extent do manufacturers get technically involved with industry issues?

The future role of the PCI and technical support by opposition manufacturers will have an impact on the level and extent of national technical support in the cement industry.

3.3.1 Question Four

Assuming that the cement manufacturers were to offer a range of product support services, such as training and mix designs, what should the future

role of the PCI be?

According to the analysis of this question it appears that the PCI has a role to play in some form or another a post-cartel cement industry. There is an awareness that the PCI School of Concrete Technology is widely respected and utilised by the construction sector. The training provided was highly rated, as were the library facilities.

The main criticism of the PCI was that costs tend to "run away", typical of industry funded services. A further concern related to the impartiality of the PCI.

All of the respondents were of the opinion that a future PCI should continue with the training which was highly utilised and highly regarded. Although not as widely utilised, the library was also considered to be an asset which was supported by all respondents.

Dr MacDonald, who had a good working relationship with the PCI, would like to see a continuation of their current activities. This view was supported by the Western Province respondents regarding the PCI's Cape Town branch.

During the interview, respondents recommended that the following future activities, other than the training and library functions discussed above, should be carried out by the PCI. The frequency of responses is given in brackets:

- Mix designs (3).
- Research and development (3).
- "Watchdog" or nerve centre of the industry (2).
- Aggregate information (2).
- Mediation or expert witness (2).
- Umbrella body for industry associations (2).
- Higher technical level of referral (2).

Respondents also indicated that it would be difficult for the cement manufacturers to match the services of the PCI initially. It would also take time for the cement manufacturers to build up the required level of expertise.

Having had experience with in-house laboratories at LTA, Dr MacDonald stated the following:

> Obviously it (PCI) has to have a wide range of expertise. It's better to have that in one place because it's no ways that PPC, Anglo Alpha or Blue Circle can provide the wide spectrum of information, I think that it is up to the cement suppliers to provide cement specific information. I think that when it comes to mix designs and all the rest of it, that must come from the PCI.

The PCI has built up a considerable reputation for customer support and training since its inception in 1938 and cement manufacturers contemplating taking over certain functions of the PCI would have to out perform the PCI in these areas. One should furthermore bear in mind that the main criticism of the PCI is their lack of independence and this will be even more relevant to an in-house facility.

3.3.2 Question Seven

Should the industry motivate the introduction of SABS performance based specifications in place of the existing product based specifications and, in this way, avoid a "strength war", and encourage product consistency ?

The proposed SABS performance based specification deals with the requirements for cement manufacture. As a result, the respondents were not expected to have an in-depth knowledge of the proposed new European specifications.

Once the essential aspects of the specification had been explained, all of the respondents supported the introduction of the specification based on ENV 197-1. This was based on a perception that a higher level of consistency and quality could be achieved through the implementation of the European specification. Sears, for example, considered an inconsistent product to be worse than a stronger product. A further advantage is that a more consistent product had the potential to help control costs in the hands of sophisticated contractors.

3.4 Cement Value Chain

Should cement manufacturers pursue forward integration in terms of the cement value chain, into aggregate and readymix concrete supply, thereby building in quality and reducing the broadness of the scope of the technical support required.

3.4.1 Question Five

Does forward integration, by cement manufacturers, into aggregate supply and ready mix concrete provide opportunities or present a threat to your

business?

Most large contractors had a site batching capability mainly due to the fact that they evaluate the readymix option on a project for project basis and generally find readymix to be uncompetitive.

In general, the use of a readymix gave contractors peace of mind regarding quality. They were however extremely concerned about consistency and continuity of supply.

Although two respondents conceded that it probably made good business sense, the area that created the most concern was where cement manufacturers had secured forward integration into aggregate supply and readymix concrete in the same geographic area. This was specifically mentioned by two respondents. However two further respondents who equated this form of forward integration to the perpetuation of a cartel in another form probably alluded to the same argument. Two of the above respondents did, however, concede that the abovementioned forward integration strategy was good business practice.

Readymix concrete was considered by most respondents to have a significant role to play under certain circumstances. The issue tended to revert back to the need for open competition. For example, in the Western Cape where the aggregate and readymix market was dominated by RMC, a Blue Circle subsidiary, the contractors welcomed a new entrant in the form of Hippomix, an Anglo Alpha company. This tended to indicate that contractors were concerned about competitive issues rather than any threat by readymix to their site batching capabilities. In fact it appears that most large contractors would welcome the convenience of readymix should they match the cost of site batching.

3.5 Customer Support Options

Which customer support options are preferred and considered to add value?

This matter was considered to be more effectively dealt with by way of the mail survey which would allow for a larger sample size to rank the usefulness of the technical support options which were put forward in the mail survey.

4. Analysis of the Mail Survey

4.1 General

Eight questionnaires were submitted by fax to each of the nine construction companies listed on the JSE, giving a total of 72 potential respondents. Of these, 48 questionnaires were returned of which one was spoilt due to inconsistent recording of the response to question one, and one further questionnaire was received too late for evaluation. This gave a response rate of 68% which exceeded expectations for a mail survey of this nature.

Clifford Harris is a subsidiary of Basil Read operating in the Western and Eastern Cape Province, and was thus included under Basil Read in the mail survey. Clifford Harris was also included in the personal interviews in an attempt to get a broader representation from the coastal region.

Basil Read had the highest response rate, of eight out of eight, while Stocks and Stocks had the lowest response rate of two responses out of a possible eight. The breakdown by provinces, both inland coastal, is given below:

Table 3: Respondents by Province

Province	Responses	Inland or Coastal
Western Province	6	Coastal
Kwazulu Natal	1	Coastal
Free State	4	Inland
Gauteng	25	Inland
North West Province	1	Inland
Northern Province	6	Inland
Mpumalanga	6	Inland

Table 4 indicates the senior level of management of the respondents, most of whom were contracts managers, who would typically be decision makers and responsible for multi-million Rand projects.

Table 4: Levels of Management

Managerial Position	Number
Company Director	3
Controls Manager	27
Site Agent	16
Estimator	1
Concrete Technologist	2

A section of the questionnaire was left open for comments. The seven responses received will be dealt with in a qualitative manner. The responses to the questionnaires were captured on a Lotus spreadsheet with the responses in columns and the respondent in rows (Refer to Appendix H). The relevant portion of the spreadsheet was saved in an ASCII format. This format was input into the SAS software package by UNISA's Department of Computer Services.

4.2 Involvement in Technical Customer Support

This investigative question was dealt with entirely in the personal interview, as it was important to be in a position to further discuss this issue with the respondents and probe for additional information where necessary. Most of the subsequent investigative questions would depend on the outcome of the discussion of this issue as a point of departure and as a result, the limitations of a five point scale were considered to be inappropriate.

4.3 Scope of Technical Support

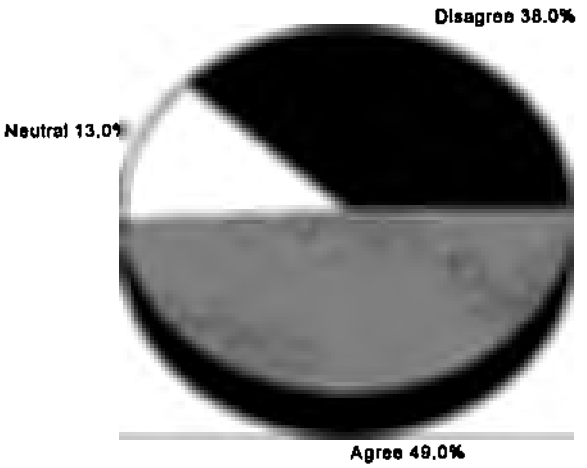
What is the scope of technical support required?

The mail survey contains groups of measurement questions that deal with the above investigative question. The analysis of each measurement question will be discussed, in turn, based on the output of the SAS statistical package. The item numbers with a "Q" prefix relate to the mail survey questionnaire numbering. All negatively worded questions were reversed when they were input into the SAS programme. As a result, all of the questions in this analysis will also be reversed in order to compare apples with apples. It was also found that there were relatively few respondents who *strongly agreed* or *strongly disagreed*, and as a result, the responses have been aggregated into *agree* and *disagree*, while the neutral

responses have been left unchanged.

Q. 2.5 It would be useful for cement manufacturers to take over concrete site testing, evaluation and presentation of results as a service on contracts.

	Frequency	Percent
Disagree	18	38
Neutral	6	13
Agree	23	49



Q. 2.7 There was a need for independent cement and concrete testing organisations.

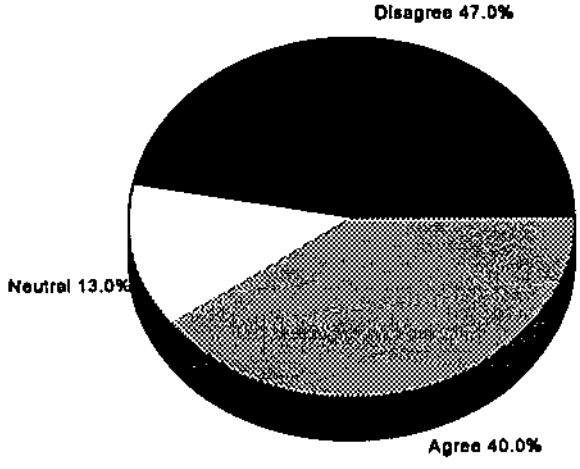
	Frequency	Percent
Disagree	0	0
Neutral	1	2
Agree	46	98

Q. 2.8 Cement manufacturers should actively advise consultants on technical matters relating to cement and concrete application, such as durability issues, specifications, etc.

	Frequency	Percent
Disagree	0	0
Neutral	1	2
Agree	46	98

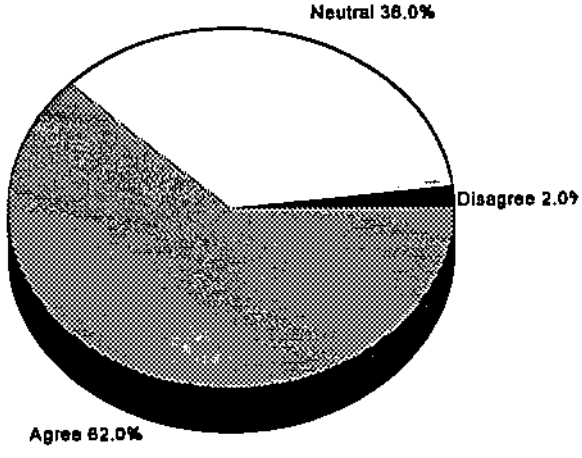
Q. 2.9 The range of cement types on offer should be kept to a minimum.

	Frequency	Percent
Disagree	22	47
Neutral	6	13
Agree	19	40



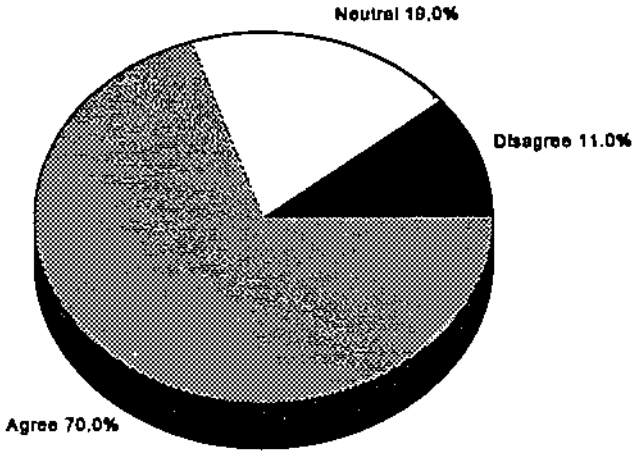
Q.2.10 Contractors only buy on price.

	Frequency	Percent
Disagree	22	47
Neutral	6	13
Agree	19	40



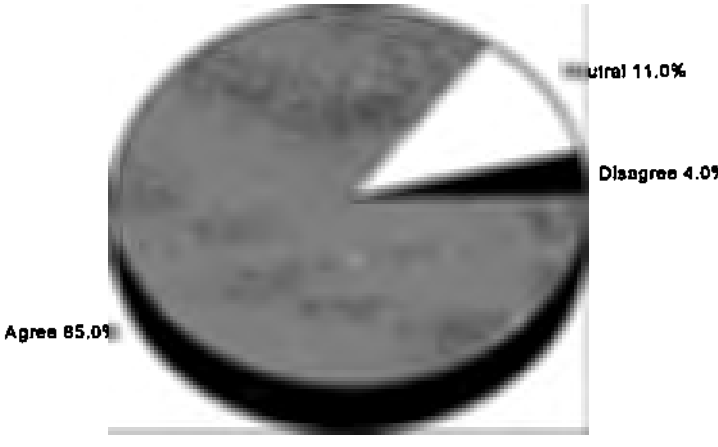
Q.2.12 Chemical admixtures will be used on an increasing basis in concrete mixes.

	Frequency	Percent
Disagree	5	11
Neutral	9	19
Agree	33	70



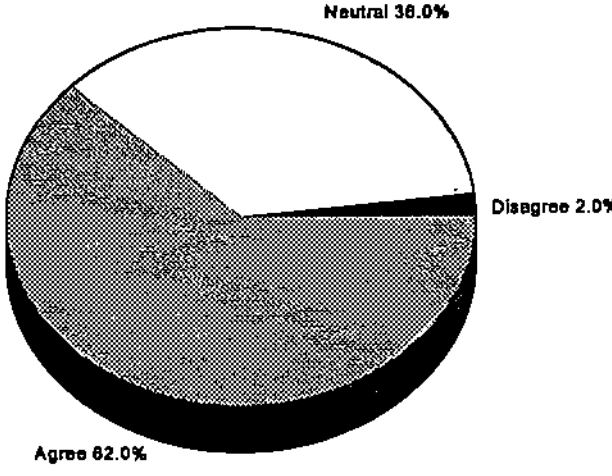
Q.2.13 Cement manufacturers should be capable of supplying multiple blends in proportions that meet the requirements of contractors (eg, Blends of Portland Cement, fly ash and slag).

	Frequency	Percent
Disagree	2	4
Neutral	5	11
Agree	40	85



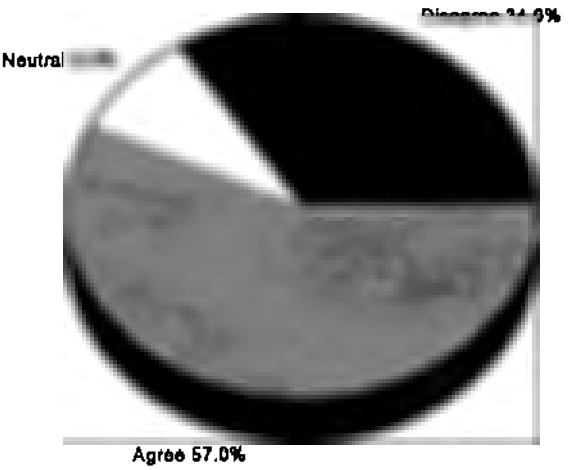
Q.2.16 Cement manufacturers need to supply silica fume for specific concrete applications.

	Frequency	Percent
Disagree	1	2
Neutral	17	36
Agree	29	62



Q.2.17 Contractors are prepared to pay a higher price for better quality cement and technical support.

	Frequency	Percent
Disagree	16	34
Neutral	4	9
Agree	27	57



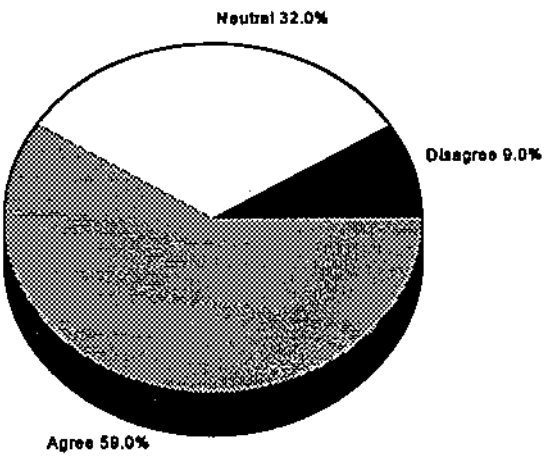
4.4 Technical Involvement in Industry Related Issues.

To what extent do cement manufacturers get technically involved with industry issues?

The preamble to section 3.3 above applies equally to the analysis of the following measurement questions:

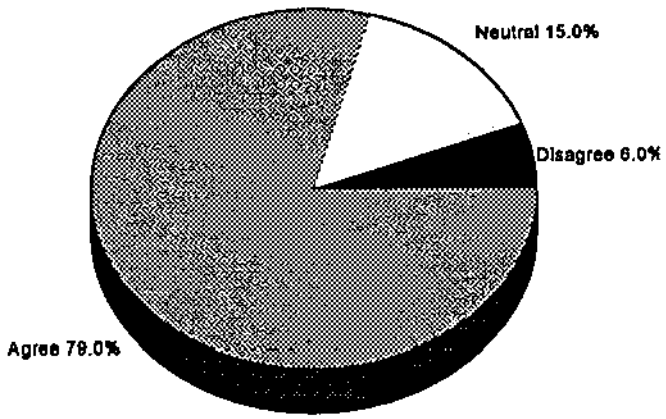
Q. 2.1 Cement manufacturers should be actively involved in lobbying for appropriate cement and concrete applications such as concrete pavement construction.

	Frequency	Percent
Disagree	4	9
Neutral	15	32
Agree	28	59



Q. 2.6 The PCI will be relevant in a post-cartel cement industry.

	Frequency	Percent
Disagree	3	6
Neutral	7	15
Agree	37	79

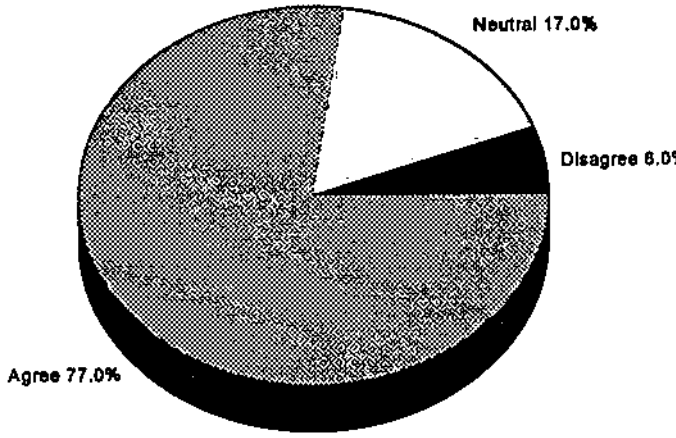


Q.2.11 All Cementitious products should carry the SABS mark.

	Frequency	Percent
Disagree	0	0
Neutral	2	4
Agree	45	96

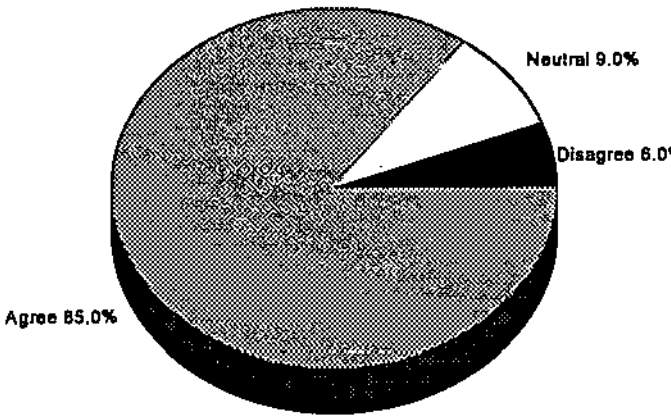
Q.2.14 Alkali aggregate reaction (AAR) is the concern of cement manufacturers.

	Frequency	Percent
Disagree	3	6
Neutral	8	17
Agree	36	77



Q.2.15 Cement manufacturers need to be actively involved to improve the durability of concrete in practice (ie. corrosion, carbonation, sulphate resistance, curing, cover to reinforcing etc.).

	Frequency	Percent
Disagree	3	6
Neutral	4	9
Agree	40	85

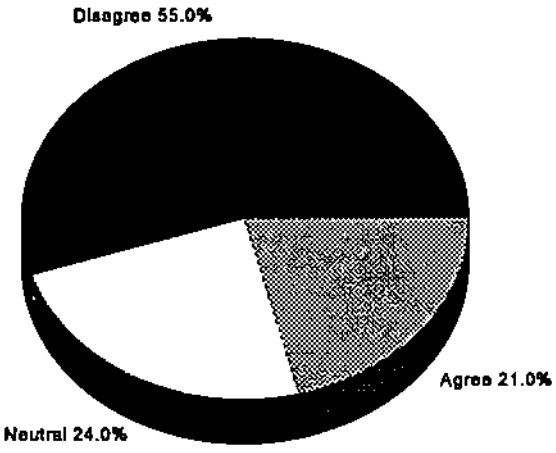


4.5 Cement Value Chain

Should cement manufacturers pursue forward integration in terms of the value chain, into aggregate and readymix concrete supply?

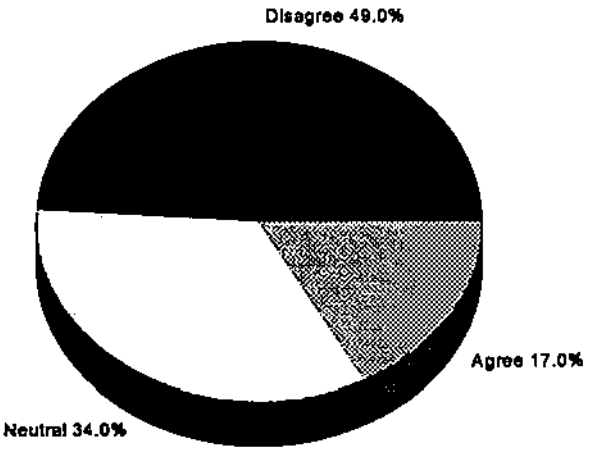
Q. 2.2 Cement manufacturers should further increase their ownership of readymix concrete.

	Frequency	Percent
Disagree	26	55
Neutral	11	24
Agree	10	21



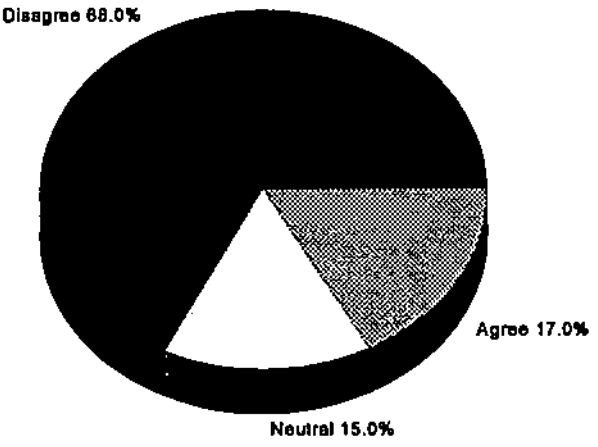
Q. 2.3 Cement manufacturers should be involved with aggregate supply to the construction industry.

	Frequency	Percent
Disagree	23	49
Neutral	16	34
Agree	8	17



Q. 2.4 The cement industry should provide batching plants on site as an alternative to readymix concrete.

	Frequency	Percent
Disagree	32	68
Neutral	7	15
Agree	8	17



4.6 Ranking of Customer Support Options

The analysis of the ranking of customer support options, which are preferred and considered to add value, are tabulated below. The ranking has been carried out accordingly to two criteria, namely the "mean" and "frequency". The standard deviation associated with the mean is also tabulated as in the percentage associated with the frequency.

Table 5: Ranking of Customer Support Options

Item No.	Item Description	Mean	Rank 1	Std Dev.	Rank 2	Freq.	%	Rank 3
1.1	Product information	5,74	6	2,67	4	8	17	6
1.2	Cement database	5,43	5	3,00	8	9	19	1
1.3	Aggregate database	6,36	7	2,85	6	10	19	10
1.4	Concrete courses	5,30	4	2,60	3	8	17	5 or 6
1.5	Mix design	3,72	1	3.12	9	19	40	1
1.6	Site testing	5,06	2	3,19	10	10	21	2
1.7	Trouble shooting	5,21	3	2,59	2	11	23	5
1.8	Product application	6,34	10	2,71	5	10	21	4
1.9	Hotline	5,85	8	2,88	7	8	17	9
1.10	Skills transfer	5,98	9	2.36	1	17	6	9

The "mean" tabulated in Table 5 is the arithmetic mean of the score allocated to each item by the 47 respondents, where 1 is the most preferred option and 10 the least preferred option (Rank 1). The lowest mean is thus judged to be the most preferred option. The standard deviation indicates the degree of certainty associated with this ranking. The lowest to highest standard deviation was also rated (Rank 2). The "Freq". Column refers to the ranking that received the "majority vote" or frequency for that specific option. For example, most respondents, in fact 17% ranked Item 1.1, Product Information, as their 6th choice, as determined by the SAS programme output. These were also ranked in the last column (Rank 3).

4.7 Comments made by Respondents

The comments are included under Appendix F of the report and are summarised as follows:

i Nel of Stocks Construction indicated that the manufacture of PBFC (OPC 50% : Slag 50%) should be stopped.

ii Tomes of Concor Group Laboratories anticipated differentiation amongst the cement manufacturers in terms of technical support and product quality in order to achieve market penetration.

iii Beaumont of LTA Civil Engineering cited a recent experience and felt that cement manufacturers should be more open when experiencing problems with their cement.

iv Laidlow of LTA's piling division indicated that consistency in concrete supplied by readymix was not satisfactory for their requirements. He also indicated that technical support was needed to assist with grouting applications.

v Parker of LTA Civil Engineering vented his frustration at the cement cartel and anticipated a more competitive market, closer relationships, higher standards of service and greater technical input from cement manufacturers.

vi Greenfield of LTA Civil Engineering questioned the need for chemical additives in many cases.

vii Vos of Goldstein Building predicted an increase in the use of pozzolans as extenders and felt that cement manufacturers and consultants were generally biased towards cements (OPC).

5. Interpretation of the Mail Survey

5.1 Procedure Adopted

Other than issues relating to forward integration in terms of the cement value chain, which could be seen as a threat to certain contractors, there were relatively few strongly disagree and strongly agree responses. As a result, and based on the recommendation of the statistics consultants at the UNISA Computer Service Department, the SAS programme was re-run combining items one and two as well as four and five on the measurement scale. There were three examples where respondents selected *strongly disagree* or *strongly agree* options throughout the questionnaire or with the exception of one response which was neutral in one case and *agree* in another. On closer examination, two of the respondents were from the Concor Group Technical Services division responsible for their in-house concrete laboratory. It is thus not surprising that these respondents would feel threatened by increased technical support by cement manufacturers which could render their in-house service unnecessary.

The nature of the data was categorical which usually lends itself to presentation by contingency tables on which one runs the CHI squared tests for association. Once these groupings are arranged in terms of the categories of the investigative question, the sample size becomes too small to show association. The same rationale applies to factor analysis where one is attempting to measure support for one specific factor. This was however anticipated as the questionnaires in this explanatory research were never intended to provide the sample size required to support a hypothesis as is the case with more formal scientific research. Furthermore, the samples were not a random selection of the population consisting of formal construction sector, but were selected based on recommendations of the respondents in the personal interview.

5.2 Scope of Technical Support

The analysed responses are summarised in Table 6 below having reduced the measurement to a three point scale as discussed above.

Table 6: Response frequency expressed as a percentage.

Item	Description	Disagree	Neutral	Agree	Rank
2.5	Site testing	38	13	49	6
2.7	Independent testing	0	2	98	1
2.8	Advise consultants	0	2	98	1
2.9	Cement types (max)	40	13	47	7
2.10	Do not buy on price	40	13	47	7
2.12	Chemical admixtures	11	19	70	3
2.13	Multiple blends	4	11	85	2
2.16	Silica fume	2	36	62	4
2.17	Pay for quality & support	34	9	57	5

Note that although item 2.9 was not negatively worded, the minimum cement types has been converted to maximum cement types in the above table as agreement with the maximisation of cement types on offer would imply additional technical support which is what one is trying to determine.

Similarly item 2,10 which was previously worded "contractors only buy on price"

implies that if contractors agree that they do not buy on price only, there is an opportunity to differentiate ones technical support. This in turn would indicate additional commitment of resources to achieve this differentiation. This now reads "contractors do not only buy on price" in the above table.

The table is thus now aligned to measure an increased commitment to technical support in the case of all *agree* responses and the converse in the case of *disagree* responses.

The responses in this category of investigative questions will be dealt with in order of the highest frequency of agreement as indicated by the ranking, starting with 1.

Q. 2.7 Independent cement and concrete testing

There is almost a unanimous agreement that there is a need for independent cement and concrete testing with only two respondents who are neutral on this issue. Although this is an industry issue in as far as it relates to the PCI, each cement manufacturer would need to be aware that the benefit of an effective and professional technical service facility would be eroded by a lack of independence, especially where the testing related to a point of conflict between supplier and contractor. This supports the trend found in the personal interviews where the PCI was not considered to be entirely impartial or at best, needed to maintain a level of autonomy or integrity to survive.

The alternative is for the manufacturers to establish an autonomous commercial laboratory similar to those established by the civil engineering consultants in their attempt to diversify that business.

Alternatively, should a manufacturer proceed with a high level of commitment to this aspect of technical support and were the PCI to commercialise their facility, the cement manufacturer would have to significantly out perform the competition in this area to overcome the perceived lack of independence.

Q. 2.8 Advising consultants

The need for cement manufacturers to actively advise consultants on technical matters relating to cement and concrete application, such as durability issues and specifications, received the same support as the previous item. Although one could consider certain aspects such as durability to be generic industry issues, it was clear from the personal interviews that research and development as well as the marketing of products would need to be communicated to the consulting engineers and architects as a basic requirement. It would be preferable for these professions

to be included in the process.

Q.2.13 Multiple Blends

A total of 85% of the respondents felt that cement manufacturers should be capable of supplying multiple blends in proportions that meet the requirements of the contractors while only 4% tend to disagree. This is surprising as it was in contrast with the trends discussed under the evaluation of the personal interviews section 3.2.3, Question 6, where only two respondents favoured multiple blends. The general opinion was that the diversity of existing blends was adequate and did not make the multiple blending option viable. Multiple blends would require dedicated and highly responsive technical back-up.

Q.2.12 Chemical Admixtures

Some 70% of the respondents saw chemical admixtures being used on an increasing basis in concrete mixes, while 11% did not agree. An LTA respondent agreed but questioned whether chemical admixtures were in fact needed. It is clear, however, that cement manufacturers would need to become more familiar with the application of admixtures or align themselves with admixture suppliers who have been actively promoting their product to a point where it may in fact not always be necessary, as alluded to by the LTA respondent.

Q.2.16 Silica Fume

While 72%supported the need for silica fume for specific concrete applications, only 2% disagreed and 36%were neutral.

Anglo Alpha currently supply silica fume and the strong showing from the respondents for the supply of this product may indicate a competitive advantage for Anglo Alpha should the other manufacturers not respond. The source of this material is limited and significant capital expenditure and working knowledge of the product is necessary. Silica fume is best known for its high strength concrete applications when blended with cement. This would indicate that a relatively high level of technical backup would be necessary in the application of this product.

Q.2.17 Pay for quality and support

Although it was found in that respondents to the personal interview stressed the importance of cost, 57%of the respondents to the above measurement question indicated that contractors were prepared to pay a higher price for better quality cement and technical support. However, 37% were not in favour, reinforcing the

contractors generic need for cost effective products. This is a signal that quality cement and technical support is important and warrants the attention it receives.

Q. 2.5 Site Testing

While 41%of the respondents saw some merit in the cement manufacturers being involved with site testing, evaluation and presentation of results, 38% disagreed.

This service would require a substantial commitment of resources and thus financial outlay and running costs. It should therefore be carefully evaluated as a more focused objective of further research or alternatively be dealt with on a project basis for major consumers. One would need to take care when sampling for further research, as it is not surprising that the two Concor respondents responsible for their in-house concrete laboratory, strongly disagree with the above statement.

Q.2.10 Contractors do not buy on price only

The 47% support for this broad strategic question to determine the scope of technical support was slightly higher than the 40%who opposed it. This would tend to support the trend in *Q 2.17* above and would indicate that technical support would need to be focused.

Q. 2.9 Cement Types

The support for producing a broader range of cement types made available to contractors received the same level of support as item *Q. 2.10* above. The response again suggests that introduction of new products needs to be focused. This was discussed at length during the evaluation of the investigative question dealing with this matter, section item 3.2.2, Question 3.

5.3 Technical Involvement in the Cement Industry

The trends analysis will be dealt with in a similar manner to section 5.2 above.

Table 7: Response Frequency expressed as a percentage

Item	Description	Disagree	Neutral	Agree	Rank
Q.2.1	Lobbying for cement applications	9	32	59	5
Q.2.6	Future PCI (relevant)	6	15	79	3
Q.2.11	SABS mark	0	4	96	1
Q.2.14	AAR	6	17	77	4
Q.2.15	Concrete durability	6	9	85	2

These responses will be discussed in order of importance ranked by the frequency of *agree* responses converted to percentages.

These issues deal in the main with industry matters although certain issues will impact on the scope of the technical support by cement manufacturers.

Q.2.11 SABS Mark

All but 4% of the respondents, who held neutral views, felt that cementitious products should carry the SABS mark.

In the light of the adoption of the European performance based on specification, ENV 197-1, cement manufacturers will all need to inform and educate specifiers, clients and customers alike, on the implications of the proposed new SABS cement specifications. However, the impact on the scope of technical support will be equally applicable to all cement manufacturers.

Q.2.15 Concrete Durability

A total of 85%of the respondents felt that cement manufacturers need to be actively involved to improve the durability of concrete in practice. This included issues such as corrosion, carbonation, sulphate resistance, curing, cover to reinforcing and so on. Only 6% of the respondents felt that there was no need for manufacturers to get involved with these issues.

This industry wide matter again has implications on the scope of technical support but primarily indicate the long term nature of product development and the fact that the manufacturers have a role as responsible citizens with regard to durability.

Q. 2.6 Future of PCI

The PCI was considered to be relevant in a post-cartel cement industry by 79% of the respondents, while 6% disagree. This industry related strategic issue bears out the findings of the discussions carried out through the personal interview.

Q.2.14 Alkali Aggregate Reaction (AAR)

The statement that alkali aggregate reaction is in fact the concern of the cement manufacturers was supported by 77%of the respondents while 6% disagree.

This is an industry issue, and not only the responsibility of cement manufacturers, as the aggregates of the Western Cape, for example, also contribute towards AAR due to their reactivity with cement. These aggregate sources are mostly owned by cement manufacturers.

Q. 2.1 Lobbying for cement applications

The need for cement manufacturers to be actively involved in lobbying for appropriate cement and concrete applications such as concrete pavement construction was supported by 59%of the respondents with 23%taking a neutral stance.

This response does give an indication as to what support could be anticipated from the construction sector in lobbying for cement applications at various levels. The level of support indicates that this lobbying should be focused on meaningful applications such as concrete roads, where the threat of substitution is greatest.

5.4 Cement Value Chain

The three statements relating to forward integration into aggregate supply and readymix concrete are summarised below.

Table 8: Response frequency expressed as percentages

Item	Description	Disagree	Neutral	Agree	Rank
Q.2.2	Readymix concrete	55	23	21	2
Q.2.3	Aggregate supply	49	34	17	1
Q.2.4	Site batching plants	68	15	17	3

The above are essentially strategic issues and were found to be a threat to contractors where ownership of cement supply, aggregate supply and readymix concrete were all owned by a cement manufacturer in one geographic area.

On the other hand, where aggregate and readymix already existed, the entry into the market by another player was welcomed. Most large contractors surveyed indicated that they carried out site batching and maintained this capability. As a result, it is not surprising that the prospect of cement manufacturers batching on site as an alternative to readymix concrete received a *disagree* response of 68%. This proposal also attracted the highest *strongly disagree* response of 30% indicating strong feelings on this matter. As a result of the depth of discussions and analysis carried out for the personal interviews, these items will not be further evaluated individually. This is not to say that the strategies have no potential for the cement manufacturer. Two of the respondents to the personal interviews considered the forward integration to be sound business practice from the cement manufacturers point of view. Q2.2 and Q2.3 in the above table follow a similar trend and are consistent with the above argument.

5.5 Ranking of Customer Support Options

The customer support options are discussed in the order established by ranking of the means. Reference is made to Table 5 under the analysis section 5.2.

Q. 1.5 Mix design support

Mix design support and materials costing from tender stage to on-site batching and placing was ranked the best option by the *means* evaluation as well as frequency of respondents who placed it as their first choice (40%). This choice is clearly ahead of the alternative customer support proposals. It is however associated with the largest spread of opinion as indicated by the standard deviation. The rationale for some of this spread is thought to be due to respondents who are responsible for the in-house laboratories of some of the contractors. Respondents number 15 and 17 from Concor, for example, have such a function and both rated this as their least desirable customer support option for their organisation and would thus tend to skew the results and increase the standard deviation.

Q. 1.6 Site Testing

The site testing of concrete, including assistance with the evaluation and presentations of results for quality control and compliance with specifications was rated a distant second together with four other options that had a mean of between 5 and 5,5. The option also obtained the highest frequency of votes at 21%.

Q. 1.7 Trouble-shooting

On-site trouble-shooting, including non-destructive testing and coring was placed third by evaluation of the means. This was associated with the second lowest standard deviation indicating a smaller spread of opinion in this selection. However, under this option 23% of the respondents rate this item as their fifth choice.

The trend in the above three choices of options is the selection of the back-up services that can be of practical value on site.

Q. 1.4 Concrete courses

Appropriate concrete courses for staff was rated fourth. By frequency, 17% of the respondents rated this choice as their fifth or sixth choice.

Q. 1.2 Cement database

Access to a database on cement performance, strength and consistency was rated fifth by the means evaluation. Interestingly, for this specific option, the highest frequency namely 19% rate this option as their first choice together with option 1.5, mix designs. It was observed that the management of in-house laboratories considered this option to be their first choice. The disadvantage of mail surveys is the inability to interrogate the respondent. It is possible that those who are concerned with site batching and the tuning of mix designs to minimise costs would consider cement data to be of great value.

Q. 1.1 Product Information

Product information, including basic cement application and trial mixes in the form of booklets and brochures, for example, were rated sixth by means, and by frequency. This option is relatively easy to satisfy through marketing promotional material.

Q. 1.3 Aggregate database

Access to a comprehensive aggregate database was rated seventh by means while 19% of the respondents rate this option least useful.

There is a trend in that the requirement for data relating to concrete cement and aggregate are clustered together in terms of choice when evaluated by means. This also applies to the following choice.

Q. 1.9 Technical Hotline

The option was rated eighth by the means evaluation and ninth by frequency of respondents when looking at the option in isolation.

Q.1.10 Skills Transfer

Appropriate practical training and skills transfer for production staff was rated ninth by the means analysis and frequency. What is noteworthy is that this item did not achieve a similar rating to appropriate cement and concrete courses for staff. Care was taken to differentiate when designing the questionnaire between **practical training** and **skills transfer** and **cement and concrete courses**. The option had the lowest spread of responses as evaluated by the standard deviation of the means, indicating congruence among respondents.

Q. 1.8 Product Application

Product application and innovation such as lightweight concrete and high strength concrete was rated least desirable by means analysis. It was considered to be the fourth choice by frequency, when dealing with the specific question, by 21%of the respondents.

5.6 General Comments and Trends

The evaluation of the minimum and maximum values on the SAS output for the 10 customer support options received the broadest possible spread of rankings as the respondents most preferred choice through to the least preferred choice. In other words, all of these options received a rank of 1 or 10 with the only exception being the option dealing with product application, *Question 1.8* which had a best rating of second choice by two respondents.

The respondents can be seen as a sample with divergent, individual choices and one would need to further segment this sector to get more consistent responses. For example managers of laboratories would have different needs to site management who don't have access to laboratory services. However, herein lies the value of exploratory research.

5.7 Statistical Evaluation

A number of processes were carried out to search for the level of agreement between the various measurement questions administered through the mail survey.

5.7.1 Chi-Squared Test

This test was carried out to determine association through cross tabulation. The respondents were split into coastal groups, and inland groups, senior and site management. Respondents were classified as senior management if they held the position of contract manager and higher and classified as site management if their position was that of site agent and lower.

Only Questions 6 and 9 approached a probability of 5% when considering the associations of higher and lower levels of management. The questions dealt with the relevance of the PCI in a post-cartel cement industry and the range of cement types on offer. This indicates that both levels of management held similar views on these two issues.

The Chi-squared test evaluates whether differences observed among sample proportions are significant or only due to chance (Levin & Rubin, 1991: 417).

5.7.2 Factor Analysis

This analysis groups questions that measure one factor as determined by running the data on the SAS package. Six factors were arrived at and were further reduced to four by "forcing" the programme to reduce the categories.

The reason for doing this was that the last three categories in the default run only contained one question each.

An example of the results of the second run were the grouping of the following questions listed below:

Q.2.8 Cement manufacturers should actively advise consultants on technical matters relating to cement and concrete applications such as durability issues, specifications, etc.

Q.2.7 There is a need for independent cement and concrete testing organisations.

Q2.13 Cement manufacturers should be capable of supplying multiple blends in proportions that meet the requirements of contractors (Eg. Blends of Portland cement, fly ash and slag).

Q.2.11 All cementitious products should carry the SABS mark.

Note that question 2,7 above was negatively worded in the questionnaire but positively worded for the SAS analysis.

The analysis indicated that the above questions were grouped together based on a similar response by respondents. This would be useful in a situation where the measurement questions related to a single investigative question. In this project, the measurement questions were grouped together to feed information into the investigative questions and the above grouping is as a result of insufficient value to warrant further detailed evaluation other than observing which questions obtained a similar level of support.

5.7.3 T-Test

The T-test was run on the two categories, namely higher and lower levels of management, and inland and coastal responses. This test is appropriate when evaluating the averages of the above two groups on the grouping of questions established by running the factor analysis for the four factors. The paired T-tested detected a significant difference in all of the questions grouped under the four factors discussed above, other than factor two for higher and lower levels of management. In other words, there was no significant difference and both these levels of management had a similar choice on the five-point scale for the questions listed under "Factor 2" in item 5.7.2 above. Strictly speaking the assumption for the validity of the T-test is based on measurements on a continuous scale for sample sizes of 30 or less (Levin & Rubin, 1991: 369). However, we have observed that many of the respondents are divergent in their views as can be seen from the responses, which typically range from one to five on the five point scale resulting in large standard deviations for the means calculated under the T-test.

To summarise, once the interviews were complete, the transcripts were analysed qualitatively. The main issues were established and expanded on through reference to specific responses. This was followed by an interpretation of the data under the five groups of investigative questions. The mail surveys were similarly analysed, but on a quantitative basis, where use was made of the SAS programme of UNISA's computer department. The customer support options were ranked by evaluating the means.

In the final chapter, the above findings will be used to ultimately deal with the management question.

CHAPTER 7 : DISCUSSION AND RECOMMENDATIONS

I. INTRODUCTION

Having evaluated the personal interviews and mail survey in Chapter 6, this chapter will deal with the relevance of the findings in terms of the research problem. This will be followed by recommendations aimed at achieving an acceptable level of technical customer support and have the potential of achieving a sustainable competitive advantage.

Entering into a dramatically new environment, as represented by a shift from a protective cartel environment to that of intense competition in an open market, a paradigm shift in crafting strategic solutions necessary to deal with the needs of customers is required. If this process is not managed at all levels of an organisation, the transition to an open market environment could degenerate into chaos where opposition companies would respond through the most tangible form of competition, namely by cutting price in an attempt to gain market share.

The following would represent a typical scenario. A "loose cannon" from a maverick opposition company with the lowest market share undercuts the cement price in a market node that is the natural market of the market leader, without signalling the reason of such a move. In retaliation, the market leader takes a short term view and further cuts prices which no longer effects only the specific project, but impacts on the entire region involved and quite possibly the whole industry. It can thus be seen that a "price war" is potentially the easiest trap to fall into while alternative forms of competition require a well thought through, cohesive strategies that extract synergies from the core competencies within an organisation. These strategies when coupled with organisational structure, management process, attention to human resources issues and culture (Stonich, 1982: xviii) allow an organisation to realise the paradigm shift necessary to implement these competitive strategies. It was the objective at the outset of this project, that the recommendations and future projections, as to the potential for these strategies to achieve a competitive advantage, should be based on the findings of this project and be consistent with theory.

2. Involvement in Technical Customer Support

Although seemingly obvious, it was vital to establish that technical customer support was in fact a customer need in the construction sector of the cement industry. The unanimous support for technical service and back-up indicates a generic requirement for customers to have access to effective solutions that address these needs. This creates an opportunity for cement manufacturers to craft strategies that are appropriate in dealing with these needs. The need is essentially a requirement for a consumer in the formal construction sector to

be able to make an informed and appropriate choice of cementitious binders and aggregates that will meet their requirements in the construction or fashioning of an end product, in such a way that meets the requirements of contractors, clients and representatives. In meeting these requirements such as appropriate quality, cost, durability and aesthetics, the cement consumer must maintain and enhance his capability of remaining competitive in the market place.

The respondents indicated that there was scepticism that the cartel would in fact be dissolved. They felt that the cartel would merely be perpetuated through more covert coordination and tacit arrangements. The extent of their perception of a controlled and closed cement market extends to the customer's belief that the industry has been protected against the importation of cement through tariffs. In implementing various strategies, cement manufacturers will therefore need to build relationships with customers in such a way that they are comfortable that the cement industry is in fact competing in a free and open market in a post-cartel environment.

The apparent contradiction in the above recommendation is that an industry's ability to protect itself against entry on a national basis, will largely depend on the forces that raise the barriers to entry as discussed in Chapter 4, based on the work of Porter and Oster. A common factor that raises entry barriers is the ease of coordination of industry players, the extreme example of which is a cartel. Cement manufacturers will thus still need to coordinate their activities to some extent to protect themselves against entry. Little or no coordination would otherwise have the effect of increasing rivalry and eroding profitability. This tactical coordination would need to be carried out in a manner that does not compromise the integrity of cement manufacturers or allow the construction sector to realise their self-fulfilling prophecy, being the perpetuation of the cartel. The signalling of competitive moves will thus require astute public relations and communication through the media to deal with the above sensitivities.

The following represents the key aspects of the discussions held with respondents to the personal interviews. This section deals with the first investigative question, namely the scope of technical support required.

3. Scope of Technical Support

3.1 Personal Interviews

3.1.1 Volume Related Customer Support

All of the respondents in one way or another indicated that a certain basic level of technical customer service and support was required. This service

should be broadly based and accessible to cement consumers big and small. It was appreciated that the so called emerging sector required training and skills transfer. However this market segment falls outside the scope of this project. Having said this, a five to four majority felt that it made good business sense for large volume customers to receive a level of service commitment which would reflect volumes purchased. This is in line with the findings of McCarthy and Perreault (1990: 404) who said that "very large customers often require a special selling effort - and are treated differently." They provide an example of a manufacturer of plumbing fixtures, who have a "regular" sales force and an "elite" national accounts sales force that sells directly to large account holders. In attending to technical support it would be important to develop solid relationships with large customers to an extent that such customers would contact the person responsible for their key account should they experience any problems with cement applications.

3.1.2 Broader Range of Binders

None of the respondents came out in favour of a broader range of binders and indicated that there would need to be a cost benefit attached, such as a better off-shutter finish and as a result reduced finishing costs. Cement manufacturers should not be biased towards OPC at the expense of extenders and the importance of including architects and civil engineering consultants in the product development process was emphasised.

3.1.3 Flexibility in Cement Production

Only two respondents saw an opportunity for such a "dual-a-blend" facility. Most of the respondents felt that the existing range of products were adequate to cover the applications encountered in the construction sector. Furthermore, contractors and consultants were familiar with the properties and performance of existing cements. It was generally felt that multiple blends could confuse the specifiers and consumers alike.

3.1.4 National Account

National accounts were seen to have a lot of merit. However, the implementation of such a strategy was considered to be impractical as the various cement manufacturers would not be able to compete in regions where they did not have a presence. There was some merit in doing this on a regional or project basis.

3.1.5 Catch-All Question

A manufacturer's technical support service needed to be competent in cement, concrete, aggregates, extenders, admixtures, mortars and grouts. This emphasises the need for technical support on a broad base. A further trend was the request for manufacturers to supply information on cement performance to contractors on a proactive and regular basis. It was also felt that manufacturers should deal with problems in an open and unbiased manner. The latter implies that manufacturers need to get closer to their customers and develop meaningful relationships, based on a thorough understanding of the requirements of the construction sector.

3.2 Mail Survey

The responses will be briefly discussed in the order of the highest frequency of agreement on each statement.

3.2.1 Independent Cement and Concrete Testing

There was a near unanimous requirement for independent cement and concrete testing. There are thus three main avenues available to cement manufacturers.

i PCI

Cement manufacturers could place the PCI on a SBU footing and market their autonomy, integrity and impartiality. Individual manufacturers could then leverage their technical support strategies through the PCI, such as the branding of their training for major customers. An example may be a customised training road show for a key account holder. This would be done at a venue of the contractors choice and may for example be carried out over a weekend or by making use of on the job training.

ii Manufacturer Owned Testing Laboratories

This strategy would require considerable capital and would have to be of such a standard that the service provided would need to be highly professional to overcome the perceived lack independence.

iii Independent Testing Service

Cement manufacturers would align themselves with, or establish, a testing

service as an SBU. This facility would need to operate on a strictly commercial basis and would need to outperform the PCI.

3.2.2 Advise Consultants

Consultants and architects need to be informed about the technical attributes of cementitious products from a product development stage through to the selection, specification and application of products.

3.2.3 Multiple Blends

This product development issue received more support than the equivalent question in the personal interviews. A possibility would be to further explore the potential for such a strategy in major market places, such as Gauteng, where the application of cementitious binders is broad and often sophisticated.

3.2.4 Chemical Admixtures

Only eleven percent of the respondents felt that the use of chemical admixtures in cement applications would not show growth. A possible strategy would be for cement manufacturers to provide "generic" admixtures for everyday applications and leave the specialist products to admixture suppliers. The "generic" admixtures could be manufactured from local products using the expertise of overseas cement manufacturers, some of who do manufacture additives and admixtures in-house. Alternatively, cement manufacturers could negotiate volume discounts on behalf of their cement customers. The benefit to the admixture supplier could be the preferred use of their products.

3.2.5 Silica Fume

The supply of silica fume or condensed silica fume (CSF) in its more manageable form, was supported by 72 percent of respondents and only two percent felt that there was no merit in cement manufacturers supplying this product. Anglo Alpha currently supply CSF and the other cement manufacturers need to seriously consider supplying the product while a suitable source for this product still exists. The product is usually associated with high strength and durability. It was for this reason that CSF was extensively used for the expansion of Alusaf at Richards Bay. This product could also provide a marketing spin-off by promoting a manufacturer's product quality and high strength image in their portfolio of

cementitious products.

3.2.6 Pay for Quality and Support

The above statement was supported by 57 percent of the respondents, indicating that there is some scope for enhanced support and that contractors are prepared to pay for quality. However, it has been shown that cement customers have been swung from Anglo Alpha's Roodepoort factory to PPC's Jupiter factory due to a five cents per 50 kilogram reduction in cement price. This illustrates the extreme inelasticity of supply and demand for cement. However, the measurement question did not indicate a monetary value and the scope for differentiation on quality and service would appear to be limited and would need to be carefully evaluated.

3.2.7 Site Testing

There was a slight majority support for site testing and management of cement quality control statistics. This indicates that the above service should be highly focused. A possibility would be to only make this service available to major projects and national account holders. This commitment would be extremely costly and hence it would not be attractive unless it was considered to be meaningful to key customers and had the potential of achieving a sustainable competitive advantage.

3.2.8 Contractors do not Buy on Price Only

The impact on the level and extent of technical customer support would be similar to what was discussed in section 3.2.6 above. Manufacturers need to exercise caution and take into account the theory discussed under section 2.4.2 (Chapter 3). Essentially for a commodity product it is important to keep the cost of achieving differentiation below the price premium that differentiating attributes can command in the market place. Alternatively the value created should be well signalled to enhance the buyers perception of the delivered value. The desk study also revealed that a low cost strategy can beat differentiation where buyers are satisfied with a standard product and do not perceive the additional differentiating attributes to be worth the higher price (Thompson & Strickland, 1993: 110).

3.2.9 Cement Types

There was a 47 percent to 40 percent majority support for cement manufacturers to maximise the range of cements on offer. Again this is at

odds with the findings of the personal interviews where the current range of products were considered to be adequate. Future product development would need to be focused and would need to provide some value, preferably by lowering the cost of the final product, such as concrete, or by adding value.

4 Manufacturers Involvement in Industry Issues

To what extent do manufacturers get technically involved with industry issues?

4.1 Personal Interviews

4.1.1 Future Role of the PCI

The PCI currently has 95 employees and requires some R13,4 Million to cover it's costs. Annual revenue comes to approximately R1,9 Million and the cement manufacturers stand good for the balance being R 11,5 Million per annum (PCI Budget, 1995).

The PCI services do not appear to be well marketed as many respondents were unaware of all the services on offer. The PCI School of Concrete Technology is widely used and was highly regarded, as was the library facility.

All respondents felt that the PCI should continue in some form or another and the school and library would appear to be an obvious choice. There was some scepticism of the impartiality of the PCI due to funding by the cement manufacturers. Most respondents felt that PCI staff acted with professionalism and integrity, but were too conservative in their mix designs and were biased towards OPC.

One way of dealing with the above issues would be to place the PCI's laboratories on a commercial footing and in this way enhance their independence and autonomy. Their mix design consultation to contractors should be phased out as it is clear that the cement manufacturers, admixture suppliers and independent test laboratories will make PCI's "stuck in the middle" position uncompetitive. Cement manufacturers would want to provide a mix designs service in order to support the use of their products and in this way increase switching costs. A manufacturer should deploy technical sales staff, rather than order orientated sales people. These technical specialists would have qualifications in their field of expertise.

The PCI's involvement in research and development was recommended by respondents. However, this would be more appropriately dealt with by cement manufacturers for strategic reasons. A further recommendation was that a higher technical level of referral may be appropriate for the PCI. However, it would appear as though this opportunity could again be better exploited by cement manufacturers who would want to promote a reputation of leaders in concrete technology.

Some of the respondents indicated that the PCI could be the nerve centre for the concrete industry, a umbrella body for associations or serve a "watchdog" function. This should be an automatic choice as it ties in with Oster and Porters' discussion for creating barriers to entry, by contributing to, and providing opportunity for coordination without actually resorting to collusion. This needs to be handled sensitively as contractors could be excused for having a perception that such an arrangement would merely be a perpetuation of the cartel.

4.1.2 Performance based SABS Specifications

The proposed implementation of the European specification, ENV 197-1, was well received as it was seen to be a mechanism for improving the consistency of cement performance. There was also an understanding by respondents for manufacturers to avoid a "strength war." Competing on cement strength would have provided opportunities for contractors by reducing their cement content for a given specified strength and hence reduce their cost per cubic metre of concrete. However, this opportunity would be limited as many specifications require a minimum cement content to reduce durability problems.

4.2 Mail Survey

Again the responses will be dealt with in the order of the highest frequency of agreement on each statement.

4.2.1 SABS Mark

There is little doubt regarding the requirement for cement manufacturers to continue manufacturing cement in accordance with SABS specifications and the value of maintaining the SABS mark. As an industrial commodity product with a derived demand, cement cannot be subjected to visual inspection and as such, the SABS mark and the quality associated with it form an integral part of packaging and the product in general.

4.2.2 Concrete Durability

Concrete durability is an industry issue which is an entire topic of its own. Much of what can be done to enhance concrete durability is beyond the control of cement manufacturers. Civil engineering consultants have a role to play in stipulating minimum cement contents, adequate cover to steel, accurate detailing of reinforcing steel, specification of curing procedures and so on. Contractors need to see that they achieve the stipulated cover to reinforcing and exercise good concrete practice. However, cement manufacturers do have a role to play, as the long term health of the industry is obviously of fundamental importance to their long-term viability. As a result, product development should include the evaluation of durability. In general, cement manufacturers would gain a lot of credit by promoting good concrete practice.

4.2.3 Future PCI

The support for the PCI to continue operating in some form or another, mirrored the findings of the personal interviews with 79 percent of the respondents being in favour of the status quo. This was dealt with in depth in section 3.2.1 above.

4.2.4 Alkali Aggregate Reaction

The cement industry need to be actively involved in combatting AAR according to 77 percent of the respondents. Many of the aggregate suppliers would not have the technology to evaluate their products and due to the seriousness of AAR and the high cost of repairs, cement manufacturers need to play an active role such as assisting consultants and contractors in avoiding AAR. Refered to as "concrete cancer" in the media, AAR can become a damaging and emotive issue.

4.2.5 Lobbying for Cement Applications

There was some support for cement manufacturers to be actively involved in lobbying for concrete solutions and concrete pavements would appear to be a case in point. This would place cement manufacturers on a competitive footing with regard to substitute solutions and would ensure that they were timeously informed of the threat of competing solutions.

5 Cement Value Chain

Should cement manufacturers pursue forward integration in terms of the cement value chain into aggregate and readymix supply?

5.1 Personal Interviews

This issue was dealt with in question five of the personal interview. Recall that most respondents were not opposed to forward integration as such while three respondents saw forward integration as a threat. Two respondents felt that forward integration made good business sense. This is in fact valid as Oster indicated that it did create a barrier to entry into the industry. However Oster cautioned that such a decision would tie up inconsiderable capital and would concentrate risk. Furthermore in an economic downturn readymix concrete would come under pressure as it would be difficult to exit the market due to the specificity of the assets deployed. This would increase rivalry and result in a "cut-throat" market environment.

Contractors were generally comfortable with readymix concrete where there was open competition, as they generally maintained their site batching capability in order to bench-mark readymix concrete prices. As a result, PPC being the only cement manufacturer without a presence in aggregate supply and readymix concrete would be well received by contractors should they enter the market and increase the competitiveness of that industry to the benefit of the contractors.

5.2 Mail Survey

Three questions were designed to broaden the scope and representation on this issue by way of the mail survey.

5.2.1 Site Batching Plants

This proposal was not welcomed by 68 percent of the contractors, as a result of their own site batching activities. The question was included as a possible way to compete with readymix off a lower capital base. There was also the potential to raise switching costs once a cement manufacturer had erected a site batching plant and where a project was already in progress. In so doing one of the tactics of raising barriers to entry would be realised, as theorised by Oster. The combined neutral and agree response of 32 percent indicate that the above strategy is not without merit and it may be possible to implement in a focused manner. It would contribute towards

removing the conflict between cement and concrete performance, and manufacturers would need to focus on guaranteed concrete performance on site. The solution would allow manufacturers to optimise flexibility of blending in a highly responsive manner, as well as allowing the optimal material supply logistics.

5.2.2 Readymix Concrete

A disagree percentage of 55 % again indicates a threat to contractors own site batching capabilities. The combined agree and neutral response of 44 % does still indicate some merit in pursuing entry into readymix concrete should a player such as PPC find themselves to be losing ground to their opposition who already have learning curve and scale advantages.

5.2.3 Aggregate Supply

Although less sensitive than the previous two items, there is still disagreement on cement manufacturers getting involvement in aggregate supply by 49 % of the respondents.

From a strategic perspective, becoming involved with any three of the above solutions would make for important and appropriate hands on experience and would enhanced the understanding of the contractors business by the cement manufacturers. PPC being the only player with no interest in aggregate supply and readymix concrete is at a distinct disadvantage to Anglo Alpha and Blue Circle who have been in this business for many years.

6 Ranking of Customer Support Options

The customer support options are discussed in the order of their preference as ranked in Chapter 6 section 4.6, by evaluating the means of the responses.

6.1 Mix Design Support

This area presents important opportunities for cement manufacturers to pursue in order to differentiate their services. It should not come as a surprise, as Dave Tite's Concrete Testing Services already provides this service to the construction segment in the Johannesburg region. Jim Horton has found a similar niche for his organisation, Prostruct, in the Durban and surrounding areas. It is clear from the interviews that this is one area where the PCI does not rate highly on the basis of

their being too conservative and biased towards OPC. Cement manufacturers would also stand to learn a lot by getting involved with concrete mix designs and on site support. This solution would require suitably trained and experienced field technicians who would be best deployed through the sales and distribution functions and should ideally be located at the major demand nodes.

Cement manufacturers would have a distinct advantage over the independents, as they would be able to incorporate the trends in cement performance when fine tuning mix designs, by utilising their production database. The independent consultants would first have to obtain and evaluate their own results and would only then be in a position to respond by adjusting their clients mix designs accordingly. This service would provide an opportunity for cement manufacturers to evaluate their cement performance in end applications on a hands on basis. There is also an opportunity to build meaningful relationships with contractors through mutual respect by being an integral part of the solution.

At an early stage, there would be a considerable learning curve, especially for PPC who does not have ownership of aggregate and concrete readymix outlets. PPC would thus need to recruit and train appropriate staff with civil engineering qualifications or considerable construction experience. The initial accumulation of data would require an acceleration phase until some 80 % of the aggregates were accounted for in an appropriate database. The service would also be aimed at providing customers with accurate estimates of cement contents for tender purpose.

6.2 Site Testing

Roving or dedicated site technicians for specifically identified projects, could be a valuable service to contractors. However, this service would tend to be expensive to operate. Again, cement manufacturers could gain valuable information through the application of this strategy. Typically, the site technicians would test concrete on site as required by the relevant specifications and present these results to the contractor in a graphic form, together with the required statistical evaluation. The mix design would be fine-tuned in conjunction with the contractor and would also utilise the results obtained from cement testing at the factory as an early warning system where necessary. An alternative would be to provide user friendly software to manage and evaluate test results. By carrying out site testing, cement manufacturers would have an ideal opportunity to evaluate the performance of their products first hand, in real field applications. Meaningful trends could be fed back to the factories and research and development teams where applicable. A further opportunity would be to defuse conflict areas before they degenerate into disagreements that require litigation, mediation or arbitration for resolution. The mechanism would allow for backup cement samples which would be split between

the site testing facility and an independent accredited laboratory in the event of disputed results. In this way one could determine if either the cement was the cause of certain performance problems in concrete, or the other components of the mix, such as admixtures, sand and so on.

6.3 Trouble-shooting

A relatively high level of technical proficiency would be required to attend to this customer support strategy. It would also represent an opportunity for the Technical Service departments of the various cement manufacturers to get closer to application problems and factor this experience back into product development and production.

This type of testing is usually non-destructive and at worst, it would be necessary to take cores from existing structures where the strength development of the concrete was in question. Typical techniques are the use of the Schmidt hammer or rebound test, Pundit ultrasonic sensor, cover metres and X-Ray technology.

The above three customer support services all require an on site presence and present opportunities for closer working ties with contractors and a closer understanding of their business.

6.4 Concrete Courses

Appropriate concrete courses require a teaching culture which has been successfully developed as a core competence by the PCI's School of Concrete Technology over a number of years. This service was highly regarded by all respondents and should be leveraged by the cement manufacturers in the promotion of their products. There is an opportunity to market and brand this service with a manufacturer's major customers by providing customised courses for selected major projects.

For example, mass concrete in dam construction would focus on heat of hydration and thermal stress. On the other hand, segregation, early age drying shrinkage, texturing and curing will be the focus where concrete road construction was involved. Likewise with building projects, optimum mix designs to obtain good off-shutter finish and consistent early age strengths would be more appropriate for building divisions of the major contractors. These strategies would signal to the construction sector an understanding of their business and that you "talk their language."

One could contribute to the depth of the learning experience by applying the

technical competencies in cement technology to supplement the PCI courses where appropriate. To outperform the opposition in this area, a package which provides the best solution to each major contractors training needs would contribute towards a competitive advantage in securing a national or regional sales account.

6.5 Cement Database

This can be interpreted as a call for a more open relationship with concrete manufacturers. In the personal interviews, respondents had an understanding for occasional problems with cement performance. Their main concern was the need for early warning in order that they could respond by adjusting the cement content in their concrete mixes, for example. Failure of manufacturers to inform contractors was considered to be extremely irresponsible by contractors as they:

- Tended to look elsewhere for the cause of the problem.
- Experienced test result failures and as a result, partial payment clauses were invoked.
- In extreme cases, concrete had to be broken up, as was the example given by Brian Sears of Murray & Roberts.
- The consequences of falling behind on programme would be severe as concrete structures are typically on the critical path of construction projects.

When taking the above factors into consideration, there is clearly less risk in the long run in being open with contractors where problems were experienced. Many of the contractors do their own mix designs or have an in-house capability to adjust mix designs. As a result, the above information, if received timeously, could be used to avert many of the problems experienced with cement and concrete performance.

6.6 Product Information

The opportunities for product promotion through technical information are considerable. Manufacturers could provide basic volumetric mix proportions for various products and applications for small works. A further development would be to provide mix design tables which would allow for different levels of compaction or aggregate sizes. Taking this theme one step further, manufacturers could provide material that goes through the mix design procedure and includes "alpha-curves" for specific cement types. An example would be to provide contractors with software which would be pre-loaded with the performance trends of their products. Should opposition products exhibit inferior performance, these could be indicated for comparative purposes.

For specific applications comparative heat evolution characteristics could be provided for mass concrete applications such as large dam construction. There are many other examples such as alkali levels, particle size analysis, setting times and so on.

6.7 Aggregate Database

The synergies in the above customer support options now become apparent, as the last three options all relate to the contractor's needs to be provided with information that would allow them to optimise concrete performance.

Blue Circle have already secured considerable mileage out of their sand database which they have referred to as a "phial of sands". Opposition organisations would be well advised to neutralise this advantage held by Blue Circle as they are perceived to be an authority on aggregates, a perception that no doubt did a lot to limit the damage caused by the recent poor performance of their cements. This problem was referred to by most of the respondents in the personal interviews.

Contractors are often required to ensure that the aggregates they use are suitable and are not susceptible to AAR for example. A possible solution that would allow one to leap-frog Blue Circle's advantage would be to evaluate the relevant geology on a national foot-print on a Geographic Information System. This package is ideal for overlaying a number of variables and allows for easy access to data. When aggregates are evaluated for mix design purposes, this information could be fed into the database to confirm or modify the existing information.

6.8 Technical Hotline

This customer support option provides for an ideal opportunity to provide broad based and cost effective technical support accessible to all customers, big and small. This hotline could provide the basic level of technical support in conjunction with technical literature in the form of DIY brochures and product specification sheets. The Plascon service referred to by Le Sueur could be used as a bench mark. However, this service must be done in a professional manner. An enhanced version could make use of an expert system to assist hotline operators. This system would allow the normally captive information of experts to be distributed to staff who are not at a similar level of technical proficiency.

6.9 Skills Transfer

Some of the respondents indicated that this would be a difficult option to service.

The low ranking of this option is surprising particularly when one considers the affirmative action initiatives and the impact that the proposed adjudication of tenders will have on contractors.

It may be however, that this area of skills transfer in concrete is too narrow, as contractors have many other activities that make up construction. Furthermore, training organisations such as BIFSA, to whom the contractors contribute financially, carry out this broader training. With this in mind, it may be preferable to support and brand the initiatives of the existing training organisations.

6.10 Product Application

We note from the theory discussion, that customers are often not aware of what solutions will meet their requirements. Innovation in product application is best achieved through small SBU's, as it is often not compatible with the cement manufacturer's business definition.

Joint development on product application needs to be carried out in conjunction with entrepreneurs where this has the potential to "grow the cake" for cement demand. This work can also be carried out with relevant organisations such as the PCI and universities.

7 Recommendations

The various cement manufacturers would need to customise their competitive strategy to best match their organisation and culture, while best attending to the findings dealt with in Chapter 6. These recommendations will be dealt with in the form of scenarios. They will be based on the findings of the project and subsequent discussions contained in this report. We will firstly briefly deal with the emerging and process market segments that were not the focus of this project, but which were mentioned in the various interviews.

7.1 The Emerging Market

The respondents conceded that this would be a difficult market to reach, train and educate. Very few respondents ventured to put forward proposals or sketch their vision of what was required to address the needs of this market segment. More work would be required to address these issues, through techniques such as focus groups and workshops. In a broad sense, this sector requires a certain capacity to utilise cement as indicated by Boyd of Grinaker. Training would need to be focussed on skills transfer and basic rule of thumb techniques that have practical applications. As this sector is fragmented and buys cement in pockets, the current

practice of basic volumetric mix proportions on the back of cement pockets is a good example of communicating on a cost effective basis. With some creativity, it would be possible to alternate the back of bag information to cover a broader range of topics. This has been utilised to good effect on many household commodities, such as on the back of match boxes.

Organisations such as BIFSA have been lobbying extensively for greater expenditure on training for the building industry. The use of cement is one of the many skills required in building. As a result, cement manufacturers could leverage existing training opportunities, as duplicating these programmes would be costly and the supply and demand of cement is too inelastic to differentiate customer support, through training, in opposition to existing organisations. Cement manufacturers could provide input into a relevant cement specific module in the more successful training programmes and brand them accordingl6y. Other opportunities would be to make best use of retail outlets to educate this market through point of sale material. This market would also be most responsive to product promotion due to their limited capacity to physically evaluate products. The perception of product quality in this market is thus all important and manufacturers need to focus on aspects that enhance brand loyalty.

7.2 The Process Sector

As far as technical marketing is concerned, this sector is technically competent and ease of access to the highest level of technical support and information would be appropriate. This sector would benefit best from a good working relationship with the cement manufacturer's technical services department. Cement manufacturers with a customer orientation and high level of technical competency would have a distinct competitive advantage. However, the relationship should be evaluated in terms of anticipated returns which will not always be quantitative and thus would require management on a project basis.

The strategic planning of the respective technical services departments thus needs to address the needs of this market segment in preparing for a post-cartel competitive environment.

7.3 Construction Sector

Also referred to as the project sector, this sector is the focus of this study. The assumptions for the following scenarios, based on the findings of this project, assume a post-cartel competitive cement industry. The spatial monopolies, such as the Western Cape, are also considered to be in competition with the global cement

industry.

7.3.1 Involvement in Technical Customer Support

As a point of departure, cement manufacturers clearly need to be involved with technical customer support. The level of resources committed to customer support is critical as the respondents have indicated that price is vitally important. The cost of the implementation of customer support strategies should be estimated upfront and adjusted from time to time in relation to the value added as perceived by the customer. The importance of the customers perception has been discussed in Chapter 3, where Thompson and Strickland stress the importance of signalling differentiation strategies. All attempts at dealing with technical marketing in the form of customer support in the cement industry would as a result need to be highly focussed and compatible with the relevant generic strategy. The suggested hybrid strategy which combines the best of low cost leadership and differentiation, or best cost of production, would appear to be appropriate for cement manufacturers in a post-cartel competitive environment for the medium term. This strategy would be most suited to the market leader and according to Thompson and Strickland is most vulnerable to low cost leadership.

7.3.2 Scope of Technical Support

i Personal Interview

Without exception, respondents felt that a basic level of technical customer support should be broad based and accessible to all customers. There was also an understanding that it made good business sense to provide a higher level of customer support for large customers or key account holders.

On this basis, a cement manufacturer could provide a technical "help line" on a national toll-free basis. This facility could furthermore be part of "super-exchange" where the person receiving incoming calls would be highly trained and would patch the caller through to a technical help desk, which would in turn form part of a sales hub. The professionalism of the above scenario should be supportive of the "window of opportunity" and "moment of truth" concepts to a point where they would have the potential to create a sustainable competitive advantage. The technical help desk would typically be staffed by technologists, who would be capable of dealing with everyday technical issues and basic sales issues in a number of the official languages. This service could use Plascon as a benchmark

and should be available during construction hours as well as on weekends for the DIY market. This would contribute to a caring image to neutralise the perceived heavy handed image of the industry as represented by the CDSA under the cartel paradigm. In the Plascon situation, Dulux were forced to respond and hence the costs became relative. The technology transfer from an organisation's top technologists and scientists could be made available through the application of an "expert system". This computer software package once programmed, guides a user at a lower level of technical competence through a hierarchy of problem solving steps. Through the help-line service, customers could in this way be provided with the most effective solutions. Customers could also be sent a hard-copy of what was discussed through the most effective routing, such as "e-mail", facsimile or through the post. The above scenario could provide the basic level of service which besides tapping into the highest levels of technology, would provide an opportunity for the accumulation marketing intelligence.

Major customers, such as the nine construction companies listed on the stock exchange could be handled by an elite national accounts sales force as suggested by McCarthy and Perreault (1990: 404). This sales force would have well-rounded staff, with the relevant experience, to champion key accounts and would be delegated the required level of authority and discretion.

Where logistics do not allow for a cement manufacturer to be competitive on a national basis, the above scenario could be applied on a regional basis. The objective would be to achieve brand loyalty through a process of relationship building and value-added technical support to the construction sector. Should customers be reluctant to lock themselves into a nation or regional deal, the alternative would be to start with a project based package as suggested by MacDonald and Sears.

In such a scenario technical sales staff would evaluate upcoming projects on databases such as "Databuild". They would attend site inspections of selected projects and would draw contract specifications. Key customers would be offered personalised mix designs and cost estimates for tender purposes. The mix designs would be very competitive as they would be based on a production database that would include current trends in cement performance which would normally be beyond he scope of what is required of an estimator. The proposals would also comply with the specifications in all respects. This would have the added advantage of a cement manufacturer always being up to date with changes in contract documentation. Cement manufacturers would also be fully aware of the

penalties and contractual obligations relating to failure to duly perform. The concrete prices submitted could also be compared to readymix concrete as a benchmark.

Once a contract was warded, the concrete mix designs would be guided through the site batching and approval stage and later fine-tuned to match the appropriate degree of confidence compatible with prevailing site conditions. As tender estimating takes place under extreme pressure, the diseconomies associated with this time scale would substantially reduce the power of the buyers as this type of relationship developed.

A broader range of binders and flexible blends of cementitious materials did not receive a high degree of support by the respondents and should thus be dealt with through the normal marketing approach to product development.

ii Mail Survey

The PCI laboratories should be placed on a commercial footing to enhance their independence and autonomy when dealing with cement testing. It was suggested that they could even play the role of the expert witness in mediation and arbitration. Manufacturers could either leverage their site testing through the PCI or align themselves with an independent testing service.

However, major projects would allow for manufacturers to carry out on site testing as a value added service to these major customers. This relationship will allow valuable technical information to be fed back to product development and the manufacturers quality management programmes. The staff involved would gain invaluable practical experience which would be mutually beneficial to both parties.

In general, consultants and architects need to be informed of product development matters such as multiple cement blends or cements developed for specific applications. Cement manufacturers also need to be involved with the application of chemical admixtures and be familiar with the technology involved, as respondents felt that chemical admixtures would be used on an increasing basis in the future.

Based on the support for the supply of CSF for specific applications, cement manufacturers would be well advised to secure a source of CSF and become involved with this technology. This option would, however, need to be evaluated for its financial viability as is the case with all business ventures.

There seemed to be some agreement that contractors will be prepared to pay a premium for quality and value added products. However, as discussed previously, the cost of the differentiation needs to be lower than the cost of achieving differentiation. This suggests that each product should be evaluated on its merits and this exercise should be an integral part of product development.

Finally, the current range of cementitious products would appear to be adequate in the medium term. However, customers are not always aware of the solutions available to address their needs and a proposed increase in the range of cementitious products must follow the course of normal marketing product development procedures.

7.3.3 Manufacturers Involvement in Industry Issues

Manufacturers need to be more focussed in directing the PCI as to what industry related issues they should pursue. In general, they should focus on technology that is most exposed to the threat of substitutes or those that have the greatest potential to increase cement demand. Concrete pavements and single story large span structures were considered to be the most vulnerable in the industry analysis in Chapter 4, while mine backfill and cementitious support systems could result in significant cement demand.

There was wide support for maintaining the SABS mark, as well as the introduction of the proposed new performance based specification based on the European specification (ENV 197-1). Cement manufacturers also need to be actively involved with durability, AAR and to a lesser extent the development of cement applications.

7.3.4 Cement Value Chain

Cement manufacturers who are already involved in aggregate supply and readymix concrete are at a distinct advantage during periods of economic growth. From a technical point of view, the quality of concrete can be controlled to the point of despatch and hence the possibilities for conflict are substantially reduced. This simplifies investigations, should problems arise, as the criteria for evaluation focuses on strength development. In the case of cement supply only, technical problems are often complex and are often not resolved as indicated by the respondents in the personal interviews.

Readymix concrete and aggregate supply by cement manufacturers results

in a readily available database on the performance of the relevant materials and their technologists would have developed a competence in the laboratory tests involved. The cost of obtaining this data would be built into the overheads of the individual readymix or aggregate organisations. The same logic applies to technologists required for concrete mix designs. They would have extensive experience in this field, to a point where the knowledge of the performance of the cement in practice could be considered to be a core competence. The synergies and opportunities of forward integration into aggregate supply and readymix concrete are therefore fairly obvious from a technical marketing perspective.

PPC is currently the only cement manufacturer who does not have readymix concrete and aggregate supply and any attempts by them to supply the technical information and customer support will come off the bottom line, without the contribution to costs through the readymix concrete and aggregate divisions. It was strongly recommended that mix designs be provided for major customers, which in turn implies that an aggregate database would be necessary. PPC's disadvantage will increase with the growth in readymix concrete and further buying out of readymix concrete opperators and aggregate suppliers who are not currently linked to cement manufacturers.

On the other hand, in a declining market, readymix concrete and aggregate crushing plants do have a relatively high asset specificity resulting in severe competition as ease of exit becomes difficult. However, the outlook for economic growth looks positive and PPC should thus pursue entrance into this market. This would be costly and partnership with overseas investors with experience in readymix concrete would reduce the diseconomy of time compression and would allow an entrant to leapfrog the learning curve.

7.3.5 Customer Support Options

In the following discussion, the customer support options have been grouped together where it was found that there were obvious synergies. They will be discussed in the order of preference as determined in the findings in Chapter 6.

i Practical On-site Support

Respondents to the mail survey selected mix design support, on-site testing of concrete and trouble shooting as their top three options for technical support. This reinforces the above recommendation for cement

manufacturers to be involved in on-site support for major customers in the construction sector. As this group of customer support options was most preferred by the respondents, it should receive the highest priority by cement manufacturers, starting with a concrete mix design service.

ii Information and Databases

Besides concrete courses for staff which was rated the forth most desirable option, a cement database, an aggregate database and product information where the next grouping of customer support options. These three options would require a concerted effort and an increased level of commitment to implement. However once implemented, the level of resourcing could be normalised to maintain and implement these databases through point of sales material, the customer hotline and in general, access to a hierarchy of technical support services, depending on the level of sophistication required. Sales staff should have basic knowledge of cementitious products and concrete technology, which could be backed up by the deployment of technical sales staff. The technical sales staff could form part of an "elite" team, who would be responsible for key accounts on a regional basis. Being at the "coalface" this team would provide feedback to the database for cement, aggregates and chemical admixtures. Finally the highest level of referral would be the technical services facilities of the cement manufacturers, which should be developed as the highest level of technical competence as is appropriate for an aspirant market leader in a sophisticated segment of the cement industry.

The technical hotline was the next most popular choice in the mail survey and could form an integral part of the solution to the above three options. A hotline could be one of the mediums through which a broad spectrum of customers at all levels could access a wide range of product and technical information.

iii Courses and Training

Courses for contractors staff was the fourth rated option, while skills transfer and training for production staff was rated ninth. As discussed above, the best option would be to brand and leverage the implementation of the above options through existing organisations such as BIFSA and the PCI. Cement manufacturers could provide written material and have the appropriate technical staff give presentations as a module of these courses where they deal with cement and cement application. The PCI's School of Concrete Technology should be supported and maintained in the

restructuring of the PCI as this function was highly regarded by the respondents and has clearly developed a core competence in this field that would be difficult to match by cement manufacturers in-house.

iv Cement Applications

This technical support option was rated least useful to the respondents in the mail survey and as such would not warrant immediate attention. The best option would be to integrate cement application into a cement manufacturer's R&D programme as a value added service to key account holders, primarily in the process market segment. It would also provide an opportunity to extend or stretch the technical services function of the cement manufacturer through working on these projects. This suggestion would also provide an opportunity for a technical services function to become an integral part of a customer support team and would ensure that their R&D activities had practical relevance in the market place. Cement manufacturers should dedicate a budgeted amount towards such R&D projects, rather than proceeding in an ad hoc fashion.

8 Implementation

The above suggestions should be incorporated into an action plan for implementation. Although there is an apparent structure within the various cement manufacturers to deal with technical marketing, it is not well communicated or effective in the construction sector. None of the respondents to the personal interviews commented on effective customer support by cement manufacturers other than Dr MacDonald's reference to Project Eagle. In this case PPC's assistance was requested at the highest level and when PPC responded, their input was highly regarded.

The required resources and competencies need to be rapidly developed. Staff need to be trained and have a thorough knowledge of the required focus and objectives. For example, they should be aware of the importance of the "moment of truth" whereby they will create an impression in the minds of customers who will develop a perception toward a cement manufacturer as a whole. This takes place in a short period of time and cement manufacturers should commit themselves to the procurement and development of quality staff that would maximise these relationship building opportunities. Finally, while promotional activities can contribute substantially towards developing relationships, the construction sector typifies a no-nonsense culture where reputation of customer support and service needs to be earned by developing a track record of effective practical performance. This track record could sustain one of the most efficient forms of advertising, namely word of mouth recommendation and endorsement as indicated by Le Sueur in the personal

interview.

9 Limitations of the Research

Although the scope of the report was narrowed by concentrating on the largest market segment, namely the construction sector, the topic of technical marketing was broad and as a result, the investigative questions were limited in depth. Furthermore, the nine major companies listed on the JSE were sampled and considered to represent the entire construction sector. Consequently, large construction companies such as CA Brand, Wilson Bayley Holmes and WJM, were not included in the survey.

The research was also exploratory and as a result, respondents were selected for their expertise in the field of concrete. These respondents for the personal interviews in turn nominated respondents for the mail survey. This method of referral is thus a form of non-probability sampling of the population. The findings can therefore not be inferred on the population in a statistical sense and must therefore be considered to be trends. The interviewees largely represented their specific experience gained in the construction industry. As a result, the opinion expressed is that of experts with extensive experience in the construction industry, rather than a large sample of unknown expertise drawn form the population on a random basis. The research method adopted was thus a matter of choice with the former being more appropriate to applied management and exploratory research.

10 Suggestions for Future Research

Many of the issues discussed would require extensive further evaluation due to the level of capital commitment required to implement these strategies. For example, forward integration into aggregate supply and readymix concrete would warrant a study of its own. This would largely take the form of a more focused and intensive industry analysis and feasibility study rather than research per se.

Product development issues would require focused market research, which would concentrate on the target market and would have certain parameters based on the attributes of the product involved. For example, general purpose cement would have a broad application while a value added product would focus on a market niche.

11 Conclusion

The research does provide considerable direction for pursuing technical support strategies as a service to major customers in the construction sector. If one considers the three basic options available to cement manufacturers, as suggested by Harris (1993), the research does provide adequate guidelines with which to pursue the "solution" option.

Quicksand	Do not manage the crisis	No action/give up
Struggle	Crisis management	Reactive/"headless chicken"
Solution	Manage the crisis	Pro-active/"the opportunity"

Implementation of customer support strategies through flatter management structures, top management commitment to the strategies and resources required as well as teamwork are all important in establishing a service culture. Cement manufacturers could be currently considered to be adopting a "headless chicken" approach with regard to customer support. Blue Circle has a more focused and well communicated customer support strategy, but in a dynamic, post-cartel market runs the risk of using "the old cake mix". Other pitfalls include avoiding thorny issues as well as not correcting weaknesses and countering threats through building on strengths and creating opportunities (Harris, 1993).

In the rapidly changing environment of the post-cartel cement industry, cement manufacturers will need to develop the core competencies and culture required to move an organisation from a production orientation to a customer focus. Tony Manning's (1993) matrix is appropriate and amusing.

STRATEGY

Clear

NERDS	PITBULLS
NAFI'S	PARTY GOERS

Unclear

Low High

SPIRIT

The temptation to adopt a "party goer" stance without strategy, focus and substance should be avoided in the construction sector of the cement market. The focus and intent of a pitbull with its limited "moment of truth" in its encounter with the postman (the opposition), is an appropriate analogy for the implementation of the customer support strategies discussed in this project. The remaning options are self evident.

12 Summary

It has been established that cement manufacturers need to develop comprehensive technical customer support strategies. The recommended strategies will be summarised in a order that reflects the priority of implementation.

12.1 Basic Technical Support

As an initial measure to deal with the opportunity that presents itself in a post-cartel technical service paradigm, it is recommended that a basic level of customer support is put in place. This service must be available to all market segments and the broadest possible spectrum of customers. Given the necessary commitment and adequate training, a technical help-desk should be in a position to deal with most customer requirements. This help-desk could be accessed through a toll-free number and backed up by written material that confirms what was discussed in a personalised and responsive manner. Such a help-line would promote a caring image signalling a break from the past production orientated paradigm. This needs to be done on a professional basis and should include concepts of a "supper-exchange" to receive the calls and should also be integrated into the sales service.

12.2 Construction Sector Technical Support Strategies

i Project Support

Practical on site technical support and backup would include mix design, on site testing of concrete and trouble shooting. The level of commitment should reflect the importance of the customer through a hierarchy of national or regional accounts packages, championed by a designated person responsible for the key account and supported by an "elite" team. The same argument would apply to major projects such as a Katsi or Columbus project.

ii Information and Databases

A second priority would be to make relevant data available on a basis that embraces time based competition, one of the few sustainable competitive advantages that can be developed in a first world marketplace. This would include access to cement performance, aggregate characteristics and product information. Cement and product information could be made available with a limited amount of further development.

iii Courses and Training

It is recommended that cement manufacturers leverage existing facilities in the market place for this service. Manufacturers could brand and customise training packages for major customers and provide input into cement specific modules.

iv Cement Application

Cement manufacturers should further investigate opportunities for R&D as part of a budgeted commitment to cement application. The focus should be on applications which exhibit potential for growth in cement demand. This would also apply to the process sector and should be based on marketing principles. It should also be appreciated that R&D is an entrepreneurial activity and this should be reflected in the subculture of those involved.

v Industry Related Issues

Industry related issues such as the strategic positioning of the PCI (or future C&CI), maintenance of the SABS mark, durability issues such as AAR and promotion of concrete where it is threatened by competing solutions, need to be institutionalised and receive their appropriate level of commitment.

It must be emphasised that each of the above developments must be weighed up against the costs involved, remembering always that a generic low cost strategy has the potential to out-perform a differentiation strategy. Any attempts at differentiation must have a benefit, perceived or otherwise, that exceed the cost of achieving differentiation. These differentiation attributes need to be well signalled in the market place.

In a post-cartel market, cement manufacturers will operate in a dynamic market and would need to be highly responsive in their relationship with the construction sector. In fact in this new paradigm suggests the four P's of marketing need to be supplemented with the following four R's as knowledge products reach maturity (Abratt, 1995). Refer to Appendix I for the attributes of knowledge products.

- Risk reduction.
- Recommendation and references.
- Relationships.
- Realisation of performance.

If we recall the issues discussed in the personal interviews, all respondents alluded to the four R's as being vital issues in their business. Their application in the recommended technical marking strategies as summarised above is thus an appropriate conclusion to this project.

The Portland Cement Institute (PCI)

The PCI was established in 1938 for the purpose of providing a technical service to all users of cement. It is funded by the cement producing companies, namely Anglo Alpha, Blue Circle, PPC and NPC.

Objectives

- To act as a clearing house for information and technical data on the many uses of cement and concrete.
- To extend the scope and use of these materials.
- To promote the improvement of construction methods.

Current Services Available

Advisory Service:	Head Office
Laboratories:	Midrand, Durban, Cape Town and Port Elizabeth. SABS 0259 accredited.
Education and Training:	School of Concrete Technology, Midrand.
Library:	Main library in Midrand.
Concrete World:	Permanent exhibition of applications.
Urban and Rural Development:	Training to make and build with cement bricks and blocks.
Publications:	Leaflets, booklets and books including Fulton's Concrete Technology.

The PCI charges for laboratory tests, site inspections and SCT courses.

The PCI is currently undergoing strategic planning to evaluate its position with regard to a post-cartel cement environment in South Africa and will, in all likelihood, emerge as the Cement and Concrete Institute.

South African Cement Producers Association (SACPA)

The following information was sourced from the SACPA Annual Review of 1994.

Mission

To coordinate the affairs of the Cement Industry in South Africa and provide its members with a forum for dealing with matters of mutual interest.

Objectives

To formulate industry policy on matters such as research, market development, education and public affairs.

To negotiate on behalf of the industry and generally represent its interests.

To promote the development and general welfare of the cement and concrete industries.

To inform and educate all external contacts of the position and role of the cement industry in the South African economy.

SACPA is currently undergoing strategic evaluation and rationalisation of administration, together with the PCI and will, in all likelihood, emerge as CEMPRO. SACPA is located in the grounds of the PCI Head Office in Midrand.

Interview Questionnaire

A sample of the interview questionnaire is attached. Alterations in the introductuion to the questionnaire were made in recognition of the different coastal environment, such as the spacial monopoly that exists in the Western Cape.

Research Interview

Construction Sector

This research interview deals with the construction market segment of the cement industry, for the **inland region** of South Africa. The inland region is considered to be that area where the three Cement manufacturers - Anglo Alpha, Blue Circle and PPC - compete in an open market.

To establish a common frame of reference, this investigation will deal with the anticipated post-cartel market environment. Although there will be a dynamic situation of supply and demand, periods of equilibrium will result in price stability. For the purpose of this interview, the investigation will focus on technical marketing issues.

Technical marketing issues refer to an array of customer support strategies that have the potential to add value to cementitious products.

Question 1

Having experienced trading conditions under the cement cartel, do you feel that the cement manufacturers need to become more technically involved with cement application, as a value-added service ?

Alternatively, should manufacturers concern themselves with the production of cement, and leave the technical application of cement to the customer ?

Assuming that technical support was desirable in the construction industry, in some form or another, the following questions relate to technical support strategies that could be developed to add value to cementitious materials.

Question 2

Other than specific application problems, do you feel that it would be reasonable for cement manufacturers to relate product support effort to volume of cement purchased ?

Question 3

Does the construction sector need a broader range of cementitious binders than is currently on offer ? Would the market support higher prices for products with enhanced performance or quality ?

Question 4

Assuming that the cement manufacturers were to offer a range of product support services, such as training and mix designs, what should the future role of the PCI be ?

Question 5

Does forward integration, by cement manufacturers, into aggregate supply and readymix concrete provide opportunities or present a threat to your business ?

Question 6

Do cement manufacturers need to be more flexible in producing cements that meet specific requirements of contractors ?
(eg. three-way blends or vary the percentage of extenders such as fly ash or slagment in cement blends)

Question 7

Should the industry motivate the introduction of SABS performance based specifications in place of the existing product based specifications and, in this way, avoid a "strength war" and encourage product consistency ?

Question 8

Would a national account, similar to national fuel accounts for contractors, be an attractive strategy to offer your organisation ? In addition to product pricing and delivery packages, manufactures could offer technical support based on volumes of cement involved.

Question 9

Other than what we have discussed in this interview, are there any specific technical support issues that you feel need to be addressed by the cement industry ?

Personal Interview Transcripts

The original questions, for the personal interview, can be found in Appendix C. Further probing by the author is referenced as "SS" in the transcripts and consists of an abridged version. For example, a fuller explanation of the proposed performance-based specification, as discussed during each interview, has not been included.

INTERVIEW I
J.S. JOHNSTON: Marketing Director:
Basil Read Pty. Ltd: Boksburg (Head Office)
Monday 21 August 1995

QUESTION 1

Yes, I think so, definitely. Comparable with any other industry, you are going to have to provide the service. Similarly, we are beginning to get that way with the fuel companies. You had a cement cartel. You wanted cement, you phoned up and got cement. The salesman came around, gave you his card and chatted to the buyer. Nowadays, you are going to want a bit more out of the whole thing, so I think definitely, you are going to have to look at what your service is going to be.

QUESTION 2

Ideally, they should all get the same, but practically, it is not going to work. General business practice, you spend more and you expect more service. I think what you're going to have to do is have a general product support for all customers and then business is going to dictate. I'm going to say, hang on, I'm your biggest customer, I want more than just the product off the shelf - you come and give me more value-added service and product support. So, I think that normal business practice should dictate, but you certainly will have to give a good level product support in general, across the board. Your guys can go out and sell, but you make sure that it is available for them.

SS *I'm referring to the application of the 80/20 rule, rather than a continuous sliding scale, with more effort for the bigger customers.*

JS In general business, you are going to want to hang onto them, especially if this cartel breaks up as they say the intention is, you want to hang onto them. You know, we are demanding that of the fuel companies, that are in a very similar situation to what you are in. In fact probably more pertinent for them is the fact that they can supply products at the same price all over the country. If they do want to give us a bit extra, albeit in the way of discounts.

SS *What are they tending to do ? Do they give you more on-site facilities as part of the package ?*

JS Well, we are trying to push it that way, it is slowly coming. If I want fuel on a site, just provide me with the service, don't give me hassles. It is normal business, the more I spend, the more I want back in the way of discount kick-backs to the

company, or product support services.

QUESTION 3

There are a couple of points here. When you refer to the construction sector, you have to talk to the architects and consultants before you come to the contractors. The contractor, at the end of the day, in most cases gets the document and looks at what is the cheapest he can do. A broader range of cementitious products is really going to have to be cost-related. If you are going to give me, in a pocket or a tanker, a 50/50 blend of slag/cement, which may not normally be your product and is more cost-effective, I will use that. As far as hi-tech is concerned, like that stuff in there (referring to an article on high strength concrete in a French construction magazine) that is for specific applications. If I'm looking for an alternative product, provided that there is room for it in the market, must have a cost benefit for the end user or client at the end of the day. If it is a normal tender, where the playing fields are level, I have got to give the best prices. If you came and gave me a 75/25 blend in pockets, cheaper than I can mix it together, that is obviously better. I'd say that possibly you need to target further upstream with the architects and consultants and say to them, this is what we can do. Apart from mixing what you've got, what else can you give us. Can you give us white cement with a better surface finish ? Yes, it will cost R5 or R10 a pocket more, it is up to you to provide the choice, we cannot provide that service. So you really have to come along like the banks are doing, and saying well I've got these services, are you interested ?

QUESTION 4

That's difficult, I think if the cement companies are going to offer some kind of support service, mix designs, etc. you need a watchdog. The story at the moment with the cement problem (Blue Circle forum with customers at PCI to explain recent performance problems) where we had low strength gains, and which they haven't got to the bottom of, you get all sorts of rumours in the market place of a cover up and now that it is in the open, we are trying to bring it up in the market place. That is where, if you had it in-house, you would have to be in total trust of what is being done and see that nothing is being swept under the carpet. Then PCI would become a watchdog, but I don't know if that is what they want to become. To me, under your support services, if I say I'm going to be your client and buy your cement, and I want 30Mpa at Pofadder, give me the mix design. I would expect it of you guys, you know where the crushers are, you know the aggregate, you provide me with a mix design and I don't want to have to go to the bother of going through the whole rigmarole again. So that is the product support side, it is very difficult to say, but certainly training and mix designs they will have to have anyway. What happens to the PCI is difficult to say.

SS *Would the PCI be perceived to be independent enough, by the industry, in the form*

of an ombudsman, as they are still funded by the industry ?

JS I think if all the manufacturers are chipping in, you would expect them to be as straight as anyone will be if they were to be the watchdog. Otherwise, you will have to go to the SABS and I'm not sure they will be interested. They are supposed to be the experts. The other way to look at it is to say, well, you fund PCI to a greater extent and cover the whole of the industry, but then it takes your edge away as they will be providing more than you will. It is very difficult to say, but maybe at the end of the day, it is maybe the watchdog role that comes out of it.

QUESTION 5

I think that's a major threat, all you do is create another cartel. Take the M&R setup at the moment with Readymix Materials at the Richards Bay quarry, we got prices and the prices are loaded, you can see it a mile away.

Who has said they are going to be loaded, I don't know. However, if you start tying up the material supply which is snapped up in the country anyway, it is very easy for a single company to get total control. At least if I had the choice to get cement from this company and the stone from that company, I can at least get the price down. If it is all coming from one guy, whoever you pick, I think is dangerous. Let's put it this way, it is just another cartel.

QUESTION 6

I think so, there are obviously limitations to it. I initially said not generally, but changed my mind when I thought about it again. The 50/50 slag blends have cost cutting benefits, although I don't know how you get together with the slag guys or whether you get it in pockets or in tankers. There should be flexibility within the parameters of your factories. If I'm doing a major building and wanted seventeen and a half percent blend for example, the moment the volumes are there, can you do a run of that. To my mind, it shouldn't be a major issue, if you put 15% in, why can't you do 18 or 19. So I think yes, that has got to be looked at, flexibility. Obviously, you can't just have every Tom, Dick or Harry wanting two bags of this, that and the other. I think the flexibility has to be there, although there always has to be a cost involved.

On the technical side, if you are talking slag blends as a cost cutting strategy, that has to be there, even if it is just for a small building for example, in the interest of cutting cost for the RDP through a 50/50 blend. As long as you make sure that the users know how to work with the stuff. If slagment is half the price of cement, then there must be a major benefit in producing a blend. If you look at it as two markets, one being the construction market, if you don't bring the price down to a reasonable enough level, I can go and buy a tanker

load myself. The other market is the small builder and he is going to have to pay a little more for that mix, but if he can get it at say 20% less than pure OPC, it is another market, another area.

QUESTION 7

It makes some sense that you don't want to reinvent the wheel. I don't know enough about what the specs have been, but from our side, you want to bring costs down, so if you can bring in controls that can limit costs, it is obviously to our advantage. The only problem is that I don't know if our market is big enough to actually do that.

SS *The implication of the 28 day window would be to encourage consistency and avoid, in so doing, a runaway strength war with the industry trying to upstage each other, by grinding finer and finer.*

JS With all the problems that I understand, consistency will become more important, but if it can keep costs down, then it is a must. When I buy a pocket of cement, it mustn't be different to what I bought last week. The only problem though is with your mills, do they have the tonnage and flexibility to play around with ?

SS *The grinding of cement is one of the easier areas to control in terms of finer grinding. More skill is required in the burning conditions in the kilns and hence the performance potential and consistency of the clinker.*

JS You either have to do it or not, just thinking about it is not good because you can't stockpile the stuff for long periods. If I need it for a road or high strength concrete structure, for you guys, you can't work ahead and stockpile 60 tons for me, but then if they set that window, it would be a distinct advantage.

SS *To explain another implication, instead of having a pocket that had 15% slagment or 15% fly ash, what you as a customer would be buying would be a certain category of strength, unless otherwise specified. The industry would tend to use the extender closest to the specific source, in an effort to keep costs down.*

JS We would want to know what went into the blend, but from our side, that wouldn't be a bad idea.

QUESTION 8

A national account would be great, but I don't see it working for the simple reason that, taking the fuel industry for example, if I wanted fuel in Pofadder, BP can't beat Total as it all comes from the same depot, so then they give me a discount. You guys are slightly

different, you have different sources. Where are all your factories ?

SS *The inland region is very competitive although there do tend to be natural markets such as Bloemfontein for AA's ULCO plant, where PPC and Blue Circle would have difficulty in competing. The coastal regions, however, tend to be a spatial monopoly for PPC in the Cape, and NPC in Natal.*

JS I think that that is where such an arrangement will fall down, it would be very nice to have a national account but you would have to look at each area. If I wanted a national account, you could all probably give me the price cheaper, but that is not what I want, I want cost delivered on the job. It would be very nice to have that, but it is not going to work because of the distribution of the cement factories. If it was done per region, then it is open to negotiation. Then you sit down and say what you are going to give me, and what is the next guy going to give me anywhere in that region. You would have a bit of a war every year, similar to the fuel companies. We would like that, but nationally or any bigger than regionally, you would have a problem and I don't know if it would function ... might do. As far as your additional service is concerned, I think we have covered that, it has to come anyway.

SS *A possible strategy is to take over the site testing function of a big account holder, such as cube crushing and submitting of results.*

JS That, as a product or technical support service wouldn't be a bad idea, you know our problems with trying to get cubes crushed. If someone could at least come around and monitor what is being done, because then you have a responsibility for your cement, you'll make bloody sure that the guys have the curing baths at 22 degrees, and that the cubes are made correctly on site. That would actually be pretty good if that was tied in. Obviously, there would be limitations such as someone in Lesotho pouring 5 cubes of concrete a day and he wants his cubes crushed. I think that technical support would be appreciated. Certainly, from the clients side, it will be as well and they would be very keen. It would be in their interest to see that strengths are being met.

QUESTION 9

I have listed on-site monitoring of your product to make sure that we are using it correctly, and are getting the desired end result that we are expecting.

The only other general comment is that we feel that the cartel will be back very quickly. Whatever they say, and what happens, will be two different things.

On-site monitoring of your product, adding value through mix designs, has got to be done. If you go back to having a national area account, I'm only going to take that account if I get value added. Apart from the money, you will have sweeteners such as testing your concrete for you and doing your mix designs. I think, certainly from the mix designs point of view, there will be a lot of PT initially. Once this has been done, there are only a limited number of quarries, you will have the sand and stone details and you can provide a good mix design. If it is a major tender, you can do a lab mix. Up to that level, it is a case of Spence, fax me a mix design for Marble Hall or Naboomspruit, giving me two or three sand sources I could use.

SS *Then fine tune the mix design when the tender is awarded.*

JS Yes, for example Richard's Bay, we are taking samples from three quarries and having them tested for pump mixes and so on. You feel as though you are reinventing the wheel as someone must have tested the material before, such as alkali levels. If you were supplying a product service, you would be talking to these guys on a regular basis and collecting samples. You may know that certain quarries may have suspect areas and advise your clients that there is a risk of reaction. I think that is taking your product support to the next level, cement is concrete and concrete is also stone. The other thing is the admix market. I think you have to be involved. As far as I know, the recent problem I mentioned involves the use of cement, slagment and an additive and something just happens on a random basis. If you take that to the logical extreme in product support, you are going to say what can I add to this, and what can't I add. Obviously, if you develop your own additives, that is my decision as to what I will use.

For product support, you will want to look at crushers, additives and mix designs. Further, on an 80/20 basis, it will be to major customers and the other guys are going to pay. I don't know, but I think that the service should be provided. At the moment, all the guys only send me cement and the difference is in the price. The likes of Fihrers provide the service. I'll collect the cement from you, I'll spread it, I'll be there at 6 in the morning, they are adding value. That also has to come from the cement companies. It is a question of how far and how much you are prepared to spend. The moment the cartel reforms again, we will be back to the same position, certainly the big users.

SS *Thank you very much, Jim, you have given me a lot of food for thought and I appreciate your time and input.*

INTERVIEW 2
G. MOREL: Chief Buyer:
Stocks & Stocks, Rivonia
Friday 25 August 1995

QUESTION 1

The cartel has not broken yet, we have heard that story for 3 years. I only believe what I see. Technical support and technical data, not everybody playing in his own little corner like an Artimus. It must be open otherwise you create a monopoly and if you create monopolies you kill a country.

QUESTION 2

No it should not be related to volume. I think that in all types of business and activities, you know I've always said, my philosophy line, what ever you do, in whatever trade you do it, because if the trade was stupid it wouldn't exist so any trade is important. If you want to share your top of the cake, you must take the shit with it. Is that a fair answer? In other words, I believe very much that a properly run buyer or buying department should not be an office organisation but a site organisation because they are the blood stream of the site to get the material, the right material, at the right time, with the right spec, with the right people, on site. When you get guys sitting on their ass it costs you more than a cheap price. You never forget how cheap you bought it and I think it is the duty of every supplier, manufacturer, distributor or whatever to back up his product and give the follow up at all times, rather than come and see a buyer to give a quote as they call that, which is useless. What I mean by that is us people who manufacture, cement in this case, need to open the mind of the various site foremen, site agents, etc. and give them all the potential and capacity of each of the cementitious products so that he doesn't use the wrong product. For example, if you work in the winter, you do not use PC25 because of the curing problem, due to the temperature. Maximum is PC15 and it depends where. Is that an answer ?

SS *Using the 80/20 principle, should large contractors and users of cement get additional effort as to the level of service provided by manufacturers ?*

GM I think that there shouldn't be a bad level of service. I think the small guys, to make them big, should be taken care of as much as the big guys.

QUESTION 3

Look at the documentation and technical data (points to a wall unit full of files), in other words, I do have an idea of what we are talking about. It comes down again to the right

product of a manufacturer in the right system. Let's say, for example, Wallcrete; if you want to save money, I use PC15 or PC25 to save a few cents, don't forget then that you have to apply plaster key, because otherwise your bricks are so dry because they don't wet them as they should. Ok, especially here and then eventually when you add the cost of the labour of applying the plaster key, and not the day before, to all the walls when the guy comes to plaster, when Wallcrete will do two in one, because plaster key sticks like hell if properly done and you do not need to rewet every 15 minutes.
So, don't mix one bloody cubic metre and when all the mix is getting dry, add water. It doesn't work like that because the properties of polymerisation are already on the go. Is that an answer ?

SS *So there are instances where a better product would attract a slightly higher price ?*

GM If you want to drive like a grandad at 60km per hour, you a buy a two-horse power Citroen, if you want to speed, you take a Jaguar 22 you know.

QUESTION 4

Well, the PCI is an organisation, I have worked with them for years. I used to know Mr Walker in those days, I am sure you know the name. I think it is supposed to be a neutral organisation, but how can you be the controller of your own system, which in a way they are. It is like when the builder is the architect and the engineer, he controls his own work, so it is always right. Is that an answer ?

SS *What direction should the PCI go in when the cartel breaks down ?*

GM I think a control company ..... like Masterlab, Civil Lab, you know all these guys or Concrete Testing Services, Dave Tite and those guys. I like very much more to work with Dave Tite than PCI because he is not connected to any particular company.

SS *So, independence is important ?*

GM Yes, exactly. Because how can you make a neutral fair comment if you are actually backed up by the industry you are supposed to control ?

QUESTION 5

There, I will give you this answer, and you will understand that I won't mention the name of the company. Most of the major manufacturers of readymix concrete are linked to one of the major cement manufacturers, which also simultaneously own, to some extent, the

quarries, where they can get the stone. Be it dolomite, be it granite, etc. dependant on the shrinkage factor, what ever you want to look at, related to the sizes of slabs you are pouring, etc. I don't think that it is healthy and I have proven that. I must not give names as that would be unfair, I end up putting my cards on the table and purchase from the very supplier of the cartel of which the readymix manufacturer is part. I buy his raw material cheaper than he buys it ... why ? Because that particular raw material supplier says that he takes it for granted that he has got no alternative than to buy from me because they are part of the same group. Is that an answer ? It is in fact a reality. If you take Pioneer, RM, all of them, it is the same situation and that is not healthy economically speaking. That is why we are paying in South Africa, an average of $150 per metric ton for cement, while the world market is paying an average of $52 to $55 in any part in the world, it is not justified. I'm sure you know that. We are paying three times too much for what we are buying and it is all BS78, ISO or whatever, while the SABS is there as a big brother to stop guys coming in.

QUESTION 6

I hear what you say. In other words, manufacturers should not say from this moment we are mainly supplying that. They will give you all the reasons on earth to use that and the next day they say the opposite, because it falls into another chain of manufacturing.

SS *If you wanted a different percentage of fly ash, say PC30 instead of PC25, should manufacturers be flexible to supply either ?*

GM The mix design is the key and that is if you do a proper mix design. That is where the independence is important. The guy doesn't give a damn about slag or ash. He works out a proper mix design where you do not have to add too much water because, on the contrary, people say it is simply the mortar of the concrete that is better. Wrong ! You have to hydrate it properly and then you get no problem, or don't let your concrete readymix truck stand there for 20 minutes. Answers correct?

QUESTION 7

You know what the SABS spec is, it is the confirmed copy of the ASTM, an American standard, they just changed the name.

Within a certain time, because all curing graphics are exponential and of course it never reaches total capacity of curing because it is exponential. Theoretically you should reach 95 to 96% of your final required strength within 28 days.

SS *For a manufacturer, the implication of the European spec is to go for consistency*

so that you can stay within the strength window.

GM To be able to come back with advice from the manufacturer the site, to in a way help the construction company directed by the construction director, site foreman, etc. to follow up the required application rules, to keep the product in its best shape, because if you don't do that, you can come up with the best product in the world, but if you don't apply it, it is as though you mix concrete, batching plant on site or readymix concrete, the coffee mills, and then make cubes. But very often they play with that. They make, for example, a set of say 3 cubes per batch, they do 12 cubes, so that you don't have to do cubes for the next two or three batches. Are you with me ?

SS *Would you support the introduction of the European style spec, where they have a maximum and minimum 28 day window ?*

GM Absolutely.

QUESTION 8

That is exactly what I have done (with the fuel account) and I have done that 14 years ago.

SS *Would that be an attractive strategy for cement ?*

GM My philosophy would be to you get all the manufacturers of a particular product, it doesn't matter which one, you get them all around the table, one at a time, because you don't sell anyone out to anyone. You tell them, listen guys, I want your very best answering to this particular spec. You know, what I would call "SGI": Swiss quality, German time and I don't mind Italian style. You give me the very best and you stick to it, realising that once you are the one chosen, the moment you break the law you have committed yourself to, you are opening the market again. Is that an answer ?

That is exactly what I'm doing with Shell for the last eight years, country-wide. But they know I didn't take it for granted, you know the human is fallible, so here and there I just jump in and you make tests on bricks, for example. You go to the manufacturers, pick up a brick here and there, you don't ask him to supply bricks, the one they make specially for the test, and the moment they fail to comply with the agreement, then he is killing himself.

SS *In return, you would expect a good level of service, and on top of that extra value in terms of technical support, customer support and all of those issues ?*

GM Yes, it is also in their interest.

QUESTION 9

They don't do enough (customer and technical support). I think there is a lot of similar activities in the industry that are totally useless, they are social things, I don't go for those things. But, if we can make a real technical kind of brainstorming with people who are supposed to know what they are talking about, and sit together with manufacturers, technical departments and say listen guys, and when I say brainstorming, I mean to come out with specific problems related to specific use of specific materials, and have an exchange of questions and answers that makes everybody happy. Because, if there is one loser, it is a bad deal, technically and price-wise.

SS *Obviously you would support technical backup on site ?*

GM Yes, the site is the bloodstream of a construction company. I have spent 25 years on site, you see. My philosophy as a so called chief buyer and site coordinator in the group, is to work very closely at all times with staff from the bottom to the top, from the so called stupid bossboy, if he is stupid, he shouldn't be a bossboy, and if he is stupid, the foreman is stupid. Because the management of an organisation ... for example, a few years ago there was a rumour that that contracts manager is an absolute asshole. I say excuse me, you put the guy there, he was a quality surveyor and you put him to this level of incompetence. So therefore, it is bad management, it is not his fault. You are the culprit. You should put the guy back where he belongs, and you should be fired.

SS *Anything else you think we should be aware of ?*

GM Mr Gomersall was the last one I spoke to. I think the reinvestment concept of properly run industry should be taken into consideration in South Africa. You know what there has never been one because of a protected market. They didn't have to answer to anyone. BIFSA are the very same guys who are in the construction industry. There again, you are the judge of your own work. It is not neutral. As long as South Africa, for example, doesn't build up the concept of a free market, they are going one way ... down. You have to be answerable to a customer, to a neutral body that is not linked to the manufacturer, a kind of auditor. Because an auditor should not be involved with the company they audit and should not be involved with the Minister of finance.

SS *Mr Morel, thank you very much for your time, I really appreciate it.*

GM I hope I didn't waste yours.

SS *Not at all, I have got some valuable comments, thank you.*

INTERVIEW 3
L. HARDING: Commercial Manager:
Concor Construction Div.: Head Office: Johannesburg
Thursday 31 August 1995

QUESTION 1

Yes, I think very much so. There is a certain amount of scepticism in the market at the moment as to whether the cartel really will dissolve. But lets accept, as a point of departure, that there will be a reasonable amount of competition between different players. If that is the case, then I think that technical customer service could be some form of differentiation that various players should be looking at, because basically you are selling a commodity, aren't you ? Cement is basically cement. I know there are differences in strength, between manufacturers, etc. Having said that, and the prices should be very much the same presumably, some might be closer to their source of raw materials and some may be further away, because of transport, etc. Transport is quite a big factor, but the actual product itself probably won't vary to any large extent once the cartel breaks up. I would imagine one way to increase a customer base is to offer technical support. So I think it is quite important to be able to offer that service.

QUESTION 2

Yes, I think that is right. I think your effort must be guided by what returns you are expecting. If it is a big customer, you will put a lot of effort into it. But, by the same token, you don't want to be seen to be just looking after the big customers, because a whole lot of small customers are quite important, so there has to be a subtle way of addressing that problem.

SS *Possibly by applying a standard level of service with add-on technical support being associated with higher volumes ?*

LH Yes, the amount of money you spend would depend on the size of the customer.

QUESTION 3

I don't really think so. Spencer, I reckon that in South Africa we will probably have two types of product. One is going to the first world type, the other a third world type. I think the bulk of the work is probably going to come from the third world and I don't think that it is going to be hi-tech. I think the materials that we will be using will be the ones we have got at the moment, they will be adequate for that I think.

To some extent, we might get involved as technology opens up more to us. I don't think we were ever really excluded. I think we may become more exposed to hi-tech applications and maybe there will be a market for different types of binders. But I don't really think to that extent. I don't think it will be that necessary. I think we have reasonable binders and I think they will be adequate at the moment. There are various additives that you can add, to do just about anything you want at the moment.

I know in a place like Germany, as we have a very close tie-up with Hochtief, a big international construction company, and we do have access to technology from that side as well. Even they, who get involved with projects like nuclear plants, don't use very specialised binders to a great extent. They use tried and tested products. Within the range we are talking about seems quite adequate. My personal opinion is it would not really be worthwhile, they are not a huge market. You know for odd things like hi-tech products, we would probably import it - the volumes would not be that great.

QUESTION 4

I reckon there will very definitely be a place for the PCI. I think there are a lot of things they can do. I don't think that there is any doubt that they should be the leaders in technology, almost a semi-academic function, which would be seen to be impartial and independent and it was quite important for us, as a consumer, as opposed to believing everything that PPC or Blue Circle will tell us. We could obviously make use of their laboratory or functions to do research, but there will always, and I think it is natural, be bias to their own products. I think we have to accept that, but the PCI could always be an organisation that you could go to to get independent advice.

I think the other thing that PCI could be useful for would be services such as mediation and arbitration. If there are any disputes in the cement industry, like quality and whatever, they could have a core of respected expert witnesses and people that could be active in disputes or even give advice. I think there will always be a place for them, their laboratories and their libraries. I don't think that would be threatened when the cartel breaks up.

SS *So they could, for example, down-size on some of their services, such as mix design, because the manufacturers may take over that function, and focus on other areas, such as schooling and training at all levels.*

LH That could be, I agree with you. The other thing is that, depending on who funds the PCI and to what extent they are going to continue being funded, there may be a place for the small guys to go if the big guys are being looked after by the big manufacturers. The could still produce their booklets on how to build a farm road and that sort of thing. If they had to market themselves and make themselves available to people, then I think that it could be a function of theirs.

SS *What comes up time and again is how independent are the PCI perceived to be, by the contractors, as a result of the PCI being funded by the cement manufacturers ? Maybe a possibility would be for the contractors to contribute. The PCI would then be neutral.*

LH That may not be a bad idea. The other thing is also a home at the moment for specialist organisations such as the prestressed division of the Concrete Society. That is also quite good. I would be quite sad if we didn't have facilities like that, it keeps us in the first world.

QUESTION 5

I think it does provide some threats. You take Anglo Alpha for instance. They have Hippo Quarries, so they supply aggregates as well. What this tends to do is concentrate suppliers of resources that we are very dependant on. That, maybe, is not a good thing for us strategically. I don't think it is a massive threat and it is not something that we probably would be very upset about. I think one of the problems that we do have in South Africa is this huge concentration question. I think the more concentration you have got, it reduces competition to some extent. We probably wouldn't favour it, but probably couldn't do much about it. I understand why the guys do it, it makes good business sense. I think, to some extent, it would inconvenience us and disadvantage us.

QUESTION 6

I really don't think so. I think the range of ... for example PFA's that we get 15% or 25% ... I'm not an expert on concrete technology ... but the graphs I have looked at, there is no doubt that there are differences, but the differences don't appear to be that marked. So, if you really want to go to the one extreme, you can get say 30% fly ash in the binder and that would be fine. To make it 35%, or 5% different, I don't really think that there would be a massive advantage. There is sufficient differentiation for our kind of work.

QUESTION 7

Yes, I think so. You see my inclination would be that there shouldn't be a limit on what manufacturers could produce. If they could produce a stronger, better cement, that is great for us as a customer. But, like anything, if you don't have controls, it can get out of hand and as you say, something else will suffer further down the line and it is not really in our interests. I would say yes, that is probably the right way to go, have a window.

SS *The implication is that it encourages consistency. If you, as a contractor, required a higher performance, you would buy the next grode cement.*

LH Absolutely, I would agree with that.

QUESTION 8

Yes, I think it has got its advantages, that is no doubt. As you say, we could then, with our bigger purchasing power demand a bigger rebate, etc. We would also expect better technical support, mix designs, etc.

SS *Mix designs at tender stage, for example.*

LH Yes. You know, there are certain problems. First of all, if we did that, our natural inclination would probably be to go for someone like PPC as they are the biggest and have the most depots around the country. We tend to work in a lot of different areas and we need to make sure that the availability is there. This means that a lot of guys will probably do that as well, and that means you might get a situation where you have a concentration of one of the suppliers, which could be a problem for the whole industry. The other thing is, we would also, on the down side, be putting all our eggs in one basket. If we found that, for some reason, the RDP takes off and it is going to have to take off, otherwise we have a massive problem in this country, the cement producers will have difficulty in servicing our orders. We could then have a problem because we would be tied to them. So if we did come to some agreement, there would have to be an out if they couldn't supply, then we would be entitled to go somewhere else.

SS *Possibly an annual arrangement, volume rebates, etc.*

LH Yes, volume rebates would be good, and also if they couldn't deliver within a certain period, we would be entitled to get from somewhere else. So yes, something could be tailor-made to work around that. I think the major fear on our side would be putting all of our eggs in one basket. That wouldn't be a great thing. I think transport is quite a big proportion of the total cost and if we were tied to one supplier and he doesn't have a depot close by. We would have a problem. What the cement manufacturers seem to be ding now is getting a whole lot of transporters into their fold and getting the subbies to be part of them, like Cooper & De Beer and Fihrers are part of PPC, etc. If we are far away from a depot, then transport costs start going up and we wouldn't have the automatic option of going to someone else, who was closer, and so save transport costs. So I don't think it is as simple as a fuel agreement.

SS *Does the alignment with a transporter present a problem to you and do you do a lot of your own transporting ?*

LH No, it is convenient for us. It is part of integration, I assume, with you guys.

SS *Yes, the objective is to make certain that you can deliver, and control the quality of the delivery service.*

LH I tell you, Spencer, it is perhaps obvious that in the construction industry, especially the civils industry, prices are of critical importance, the margins we are working to, and I don't think I have to tell you, are horrendous. Price is helluva important. But, having said that, actual delivery, reliability of delivery, and service is even more important. If we are doing a pour, and can't get cement, it just has horrendous consequences.

SS *Road stabilisation and slides for example.*

LH Absolutely. If you are busy with a huge pour, you can't just stop or you will have a major problem. If you are doing a pump, such as a slab, you just have to finish the pour.

QUESTION 9

I'm not sure if you would call it technical support, but I feel we are not alone as Concor in this. A massive concern, certainly in our company, is that we are not getting the cement that we are paying for. We have proved by following tankers that they don't all come us. We have traced tankers that come to us. We have a huge problem. We have been keeping records and we know that whole tankers are disappearing. We are in cahoots because our batch plant operators are signing delivery notes for stuff that they are not getting, and they are getting 200 bucks, the tanker is getting maybe R1000, and the concrete block manufacturer, in wherever, is getting helluva cheap cement ! So that is a huge problem and it would be great if some company had to come up with a way of sorting that out. I have thought of flow metres, a computer printout that can't be tampered with or something like that. But, that is a massive, massive problem, as far as contractors are concerned. Part of it is our own problem. But I think it starts with the transporters who are approaching our guys and saying that they'll give you 200 bucks if you sign this. We are losing tons and tons of cement. It is not technical support.

SS *It is certainly customer support. One possible solution is to use satellite tracking, which also monitors the cement pump, etc.*

LH It tell you it is such a big problem with some of the suppliers we are dealing with, that when we've tried to solve the problem together, they have then started not giving us agreed information like tachographs and things like that. The only reason we can think of is that they know if they disclose that information to us, it is going

to involve them in huge costs. So we are reasonably sure in our minds that it is a massive problem. We are losing around 20 tons at a time. You can see the graph, it suddenly drops down when you do your stock taking. We have thought of putting load cells on our silos and all sorts of things like that. I have information here on portable weigh-bridges.

The problem is that it goes even beyond the money. It has caused bitterness between companies. We have a case that is going to blow up into all sorts of problems and I am in fact trying to mediate between the two. The sides are not happy about it and our industry is too small to have that kind of thing, bad vibes.

SS *There are obviously opportunities to collectively deal with the problem. In terms of a new competitive environment, it may be an attractive part of the service, and a means of differentiating oneself.*

LH Absolutely. The big centres are where the biggest demand is. After they got rid of influx control, this whole urbanisation trend has come about. People need to build houses and that is where the demand for cement is. That is where the small contractors are springing up and where the small block factories are.
Last night, they had them on television, Alexandra and places like that. One of the houses we came across in Soweto, they had pumped cement into the house and they use one of the doorways to take it out by the wheelbarrow. There are reasonably big concrete product manufacturers where the guys are accepting illegal shipments of cement tankers and know they are getting it. It is widespread, we are not the only guys, as we speak to each other.

SS *Besides that, anything else in particular ?*

LH No, that's fine. We have our own concrete technologist. I know he does make a lot of use of the different manufacturing companies and PCI. Certainly, I think we are pretty happy with the service we get. When we did development of new products, especially on the Technicrete side, because they are involved more with innovative type of ideas and they do a lot of work with cement manufacturers.

SS *OK Lee, thanks very much for your time, it is really appreciated.*

LH No problem. I hope you have found it to be useful.

INTERVIEW 4
BRIAN BOYD: Director Construction:
Grinaker Head Office : Elandsfontein
Friday 8 September 1995

QUESTION 1

I think from past experience, and this may go right through this interview, we have found that we have had a level of support from the cement industry, but it has been very much a biased level of support, if I may say so. If you want mix designs done, anything you want done, it has been with a heavy emphasis of pushing their product. I don't think there is anything wrong with that. We have actually gone away from using the cement industry for technical assistance. We use people like the admixture people and we have found that people like Slagment have a more balanced view. A lot of the clients are saying that that is your minimum cement content, you can't get away from it. You know that that is going to give you your strength anyway. So what really is the point, we have to look at providing the lowest price, and we have to then use 50/50 slag or 70/30 PFA and the cement people are not really interested in discussing those issues, they plug for as much cement as they can. I think it is natural, but in the old days, we used to decide what our cement contents were going to be, and then there was a better level. But now, with what we get given, we don't use the cement people, they are much more on the technical side.

SS *Brian, given that most manufacturers will be getting involved with mix designs and other forms of customer support such as a database of their materials, how their cement is performing, etc, there will inevitably be competition in terms of value-added backup.*

BB That is one area that I have here (referring to his notes), they need to look at customer peace of mind, if I can put it that way. We have had bad experiences lately on the toll roads with Blue Circle, where their cements weren't up to scratch. Those are the sorts of things you need to have, you need to have peace of mind. If you are going to buy someone's cement, then it must perform like it should perform and not cause plenty of grey hairs and a lot of people getting uptight. I think that, call it quality guarantees, is what is needed.

SS *OK, but you are not suggesting that manufacturers should be totally divorced from product support and concern themselves only with cement manufacture.*

BB No, what I am saying is that the manufacturer of cement should be more realistic. It is cheaper to put slag in, it is cheaper to put FA in, and don't try and push for a total cement package and try and say what the benefits are. There are benefits, we

know that, but when you are going for the lowest price, like in our industry, you have to have the lowest price.

QUESTION 2

No, I think in other industries, volume may need that. When I say other industries, if you are selling lots of bits and pieces, a lot of technical know-how, if you have a great volume, you may need that. Here, cement is being sold that has a certain amount of technical capacity. Everybody who uses it needs that technical capacity, so on that question, I would say no. Obviously, if you have an order on a huge dam or something like that, you may want to get into heat of hydration and help on that side. I think in the run of the mill, it shouldn't be biased towards bigger organisations.

SS *Interestingly, as capacity does get filled, manufacturers will tend to make use of extenders to increase capacity.*

QUESTION 3

I think that our type of industry, where it is lowest price that always has the major impact on whether you get the job or not, it has got to be economically based. I don't know what you can come up with that is going to save a lot of money, but silica fume at one time was the new thing that was going to come and save our lives. It has taken a bit of a back seat now, it is expensive, you have to look at it realistically. If something came along like in the electronics industry, something new each day, where suddenly you can make this little silicon chip that is much cheaper, it makes a big difference. In the cement industry, and construction industry, it has been the same and nothing has changed in the last ten years. I say that in inverted commas, but changes are very slow. Unless it is going to be something that is really going to change the world, it is no good making it a little bit better if the costs outweigh the benefits. I see no need for it. We are talking costs per cubic metre and other things come into it like workability, durability and that sort of thing. That is the one item that the clients are very hot on at the moment.

QUESTION 4

I have got there nil (referring to his notes). To me, PCI is performing a function at the moment, and doing quite a good job of it. Whether it is cost efficient, or not, I don't know. Once you get into those service industries, you find the costs tend to run out. We have the same problem in our business. If you had that in-house, within the cement manufacturers, I see no role for PCI. At the moment, I would say that the PCI are a PR department for the cement industry.

SS *Did you organisation make some use of the PCI for foreman and engineer concrete technology training ?*

BB Yes, that is the only thing where we use the PCI, unless we are told to for mix designs, because they favour the cement side, you can see it. But we do use them for training. That is where the PCI courses for young engineers and foreman are very valuable, there is not doubt about that. It gives the guys an insight into concrete. I went 18 to 20 years ago and they don't seem much different, they haven't slacked off, they are good courses are we are very happy with them and we still send our staff on them.

But that is the only thing we really use PCI for, besides it's library. If we have a major problem, we do have a chat about things, but more as a library to go and read up, so there is still some value.

QUESTION 5

I would say only a threat if the cartel continues and we all hear that the cartel is breaking down on the 1st of January, the same as we heard that there was no cartel. We are still very suspicious if I may say so.

SS *No problem, don't pull any punches.*

BB If the cartel carries on, and they want to buy out all the places, then they just become another cartel. Then we see it as a threat. We have to keep prices down. If you are looking at the RDP and things like that, and we have been doing some work for the RDP, you are into a job and they say that is your price and there are no claims, no escalation, no this and no that. You have to do it, there is so much money to do the job, now do you want the job or don't you, and we want the job. It is essentially a fixed price. Now, if you have inflated prices due to the cartel, it is just going to make that work dry up and that we wouldn't want. If it was open competition and the problem is we see a lot more of it in the industry, not only in cement but other areas too, the people are getting together. The steel reinforcing suppliers are one of them, they get together and they inflate the prices, and we don't enjoy that. We obviously want to see straight competition. If they are going to go into straight competition and go into supplying readymix concrete and reinforcing, or whatever they want to, we are quite happy with that. I see that as just opening up the market, there is no problem there.

QUESTION 6

I think this answer will come from me as one who is working in a fairly large sector, in heavy civils. In our business, I don't believe that at all, because you put up large silos and

can blend it as you want to on site. There is no real need. If you want to change the percentage, it is very easy. When it comes down to the smaller man, maybe it will help. I don't see that in our size of business that it will help at all. We very seldom use pockets anymore unless it is a really small job, and even then, we tend to put up a silo or two.

QUESTION 7

The problem is the way things are structured at the moment, as I was saying earlier, with cement water ratios and cement content. We are usually bound (by specifications) and it is becoming more and more so. In the earlier days you weren't bound, it was strength criteria only. Nowadays, you are becoming more and more bound by people wanting a certain cement content or cement water ratio for durability purposes. So, I am saying, to get those variables there (referring to the proposed European specification as indicated in the question), does it cost money ?

SS *In fact, I think the implication will be, instead of buying a PC15FA or slagment, you would leave that up to the manufacturer, because you want a certain performance. The result would be that, if the manufacturer was closer to a slag source, he would make that product to meet your strength requirements and similarly for a fly ash source. So effectively the results should be regional to provide a cheaper product.*

BB It takes quite a bit for things to change in the consulting fraternity. You also have your stripping time requirements on your formwork, related to the specific products that you use. So I would be quite happy with that window where people say to you that is what you are going to get. We have had quite a few problems with slow sets and things like that. I don't believe that in the cement industry there is enough done to make sure that the cement fits an envelope or whatever you have got there (referring to diagram used to illustrate the concept) or that the people test enough. I don't think that they see that what is being despatched is actually what is required and I think that it should rather be left up to us to decide and just give us a window.

QUESTION 8

The problem there again is I use the word cartel because we have never liked the cartel. Would it prolong the cartel ? What seems to have happened in the fuel industry, which is slightly different to the cement industry as it is regulated, it is like a cartel, there is nothing much you can do about it. You can choose and you can get a bit of a kickback from your fuel supplier, but your fuel is all the same price. I wouldn't like to see that, if we are going to break the cartel in the cement industry, then break it completely, because the fuel industry and the cartel are similar.

SS *One of the implications for construction organisations, such as Grinaker, is that larger volumes could attract larger rebates.*

BB I think only again if it made economic sense. I think price is a thorny issue with us, because our clients are like that. Clients want the job at the cheapest price and if we are to stay in business, we have to do the same.

SS *For interest sake, while we are on the issue of clients, how is the new mechanism for adjudicating tenders progressing ?*

BB There is only one criterion - lowest price.

SS *What about RDP issues, training and labour intensive issue ?*

BB Oh yes, that will chuck you out, no doubt. That is becoming normal in the industry, it is like a cement water ratio of 2.08, that percentage must be RDP in the spec.

QUESTION 9

The only thing, as I have said before, is that we get a product that conforms to the specifications. That can be extremely costly for us at the end of the day. When something goes wrong, it is very difficult to find out what has gone wrong. If you are using admixtures, and this and that, the cement people say it is the slagment and the slagment people say it is the admixture and so you go around in circles. This last one we found out was the cement. We don't have facilities for checking cement on site, which maybe you say we should have, but the tests are out of our range.

I think that, as long as the cement industry, at the end of the day realises that price is very important, and accepts that extenders are going to make it cheaper and go along with that. To try and push cement for cement's sake at the end of the day is going to ruin the cement industry as someone is going to find something else that can do the same. It could happen one day, but you actually have to come to the table and say that you understand that that is the story with slagment and maybe work hand in had with those people.

SS *Who do you actually use to do your mix designs ?*

BB We use slagment quite often and we use Samsons, the old Sternsons and Multi Construction Chemicals, and we do our own as well.

SS *So depending on the specifications you would choose, because they would also tend to push their products, wouldn't they ?*

BB No. Actually, Slagment are very good. Slagment will come and do a mix design for you free of charge if there is no slagment in the mix. They will actually come to you and say do you want us to do your mix design, and the spec says no slagment. They say OK, we'll give you one without slagment and one with slagment that you can put in as an alternate. Again plugging a little bit to get more work.

SS *Would the admixture consultants not tend to have their own product in every design?*

BB Yes they do and we use them, but they understand. Quite often we use them for the mix design and then take the admixture out, and see that it works without the admixture or this is how much water we are saving. We tell them that although you have to put your tank here already, it is not working well enough for us, and we are pulling the admixture out. They still accept that and say well, that's fine, we made some assumptions at the beginning of the contract and if it is not working out cheaper, we accept it.

SS *Brian, thanks a lot for your time, I value your input and you have contributed with some valuable information, it certainly has been interesting.*

INTERVIEW 5:
MIKE RALPH: Contracts Manager:
Clifford Harris, Clifton Beach, Cape Town (Oil Pollution Contract)
Tuesday 5 September 1995

QUESTION 1

In our area, (Western Province) the guys are pretty pro-active. I think the technical involvement is OK. You have a question later on, where you deal with support services and the PCI.

PCI offer you a service on cement in the use of concrete. Where PPC could get talking to the guys , is something like this question of AAR. We are sometimes getting into higher strength concrete with 400 kg of cement per cubic metre and at the same time we are restricted by the maximum sodium oxide equivalent and hence restricted to what aggregate we can use. It's a hassle and there could be a lot of technical involvement there. When you talk to the guys in the know, I would always phone Christina, but now she's at Head Office and you would get results back from them that the sodium oxide equivalent was 0,6 and that's on the limit. From my point of view, those are the most important issues, the ingredients of the mix. You open up any spec. This is Knysna and if you look under concrete. This as an addendum to a CPA spec. Your maximum allowable cement is so many kilograms per cubic metre, but also your maximum alkali's are so much. Then there's a big table, I think it is in CASRA. If you are using a highly reactive aggregate, you have a certain limitation on your sodium oxide equivalent. If you have a moderately reactive aggregate like, a granite then you can go to 0,6. That all relates to how much cement you have got in a mix. It's a major headache for us because you will go to an area such as our last contract in Oak Road, where we couldn't batch our own concrete because we didn't have the facility to put in an extender. We were forced to go in with Readymix. We could have probably produced a cheaper concrete and been able to use hornvels and straight OPC if the alkali's were OK. That's where the guys can help address that problem.

SS In general, do you agree with customer and technical support ?

MR Yes, I do. I don't believe that you would be going into a field where PCI are. I've been in the factory when the guys are making cement and I'll talk to Christine and ask why are you adding this and that. They'd say we are allowed to add 5% impurities. I believe that they could spend more time looking at that.

QUESTION 2

Yes I do, but I believe that it should be organised so that you have representatives from the

guys who buy a lot of cement from you and have a regular meetings and some sort of follow-up system where the guys are talking to each other. Then you are not out on a limb trying to please this guy and that guy, if you had a representative forum from all of them. At the end of the day, that is technically your bread and butter and if you are keeping them happy then the consultants are more or less obliged to follow on. The guys say right, we are going in this direction and we want to use RHC. There was a rumour that they were getting RHC to be more cost effective in concrete than OPC. Everyone would be obliged to follow suit. You guys used to make LA SRC. It was an adjustment for the little guys, but once you made the adjustment you can carry on with it.

QUESTION 3

Provided you can deal with them all, we've got slagment, PFA and silica fume, which appear to be the most common extenders. As you say it is inland and railage cripples us. The last time I needed an extender at Palmiet, we were using slagment and the price was 80% of cement. We had to use it because we had temperature constraints in the big bases and we were obliged to use them. If you could get something going where you had direct contact with the steel mills and you can get the stuff (slagment) and make a mix which is cut back like that. It removes the guys having to mix it on site and removes the error in the accuracy at the blending. It will make your headaches a lot less when the guys are crying that the strength was not up to scratch. It will also make the whole set-up on site a lot easier picking up one silo full of blended cement they so they can go for it.

SS The second part of the question deals with how sensitive the cement is to pricing.

MR Yes it does, it goes back to question two when you said cement manufacturers, you obviously refer to PPC and other manufacturers in the North. When we were at Juaneng, we bought from Lichtenburg (Blue Circle). It is a case of the price, but what everyone has to be careful of is that the price is obviously determined by the manufacturers, but always on the fringe are the overseas manufacturers and some of the guys in this town (Cape Town) are importing cement. I think some of the pipe manufacturers are importing cement and they are landing it cheaper than the local manufacturers price. For us we just buy the necessary bulk volume. You need to look at that because if suddenly you get the big guys getting wind of it then you have to tie it up.

SS In the industry there are no protective tariffs and it's an open market.

MR The guys bring cement in from the Far East and have certificates and the product performs satisfactorily.

QUESTION 4

Look, historically the PCI have been the guys that contractors go to get mix designs done and to get information on concrete. Some of us, like I do, use PCI as a library. I do all my own mix designs. But if I need to know something about an aggregate, in Knysna say, I'll phone up PCI and ask how the sandstone behaves. They will say that we have done a mix design and this is how it behaves, it may be moderately reactive, but sometimes it is quite bad and it is also not a very strong aggregate. That's where the cement manufacturers won't even get near them, you just don't have the historical feel for it. That's why I feel the PCI have a fundamental role. You guys get involved in the extenders and the chemistry of cement, but when it comes to making good concrete, PCI are there and I don't think you can ever replace them. What could be something to look at is for PCI to become incorporated with the manufacturers. We spoke in question one about meeting with the major suppliers, on that list should be someone from the PCI. Especially when you hear about what is happening in America with these high strength mix designs. I don't know when it will get here, but consultants are sure to introduce it at some time.

SS Are PCI seen to be objective ?

MR Spencer, in my experience, I find them completely middle of the road. I deal down here with Steve Crosswell all the time. I've never had to deal much with PCI in Jo'burg. I sent the samples to Jo'burg for analysis and thats all I got from PCI. They also talk my language and understand what I want.

QUESTION 5

It won't affect us. It will affect guys like Hippo, rather Anglo Alpha and Readymix, they'll have a problem with that and jump up and down. What we have welcomed is competition for Readymix in this town. When Anglo Alpha started batching as Hippomix, that was dead right as it controls things and makes John Horsefield sit up and take note. I haven't had to get involved with any pricing yet, but I'm pretty sure that I will. I always look at the point of view; can I batch it myself first of all. I always prefer to control the concrete batching myself and then I know that if I have a problem, I don't have to phone the PCI up. I believe that if I bought everything from you guys it wouldn't be a threat at all.

SS Would you still maintain your site batch capabilities.

MR If I can do it and it is not a big hassle for me, yes, then I'll batch on site. You see the big problem buying from a supplier is this thing where you are tied down to a time, you are tied down to a programme and you are tied down to a volume. You invariably have concrete over. If you're clever, the guys will say plan it and make sure you have blinding cast every day. You may make paving slabs as a

side-line. It is difficult to handle, where as if you were batching on site, you could set the whole thing up and go for it. The big problem that I have with readymix is being held ransom sometimes. The last time I was at Oak Road, it wasn't any different, I was fighting the guys all the time. The more guys in town, the better as competition is healthy. The thing is that getting into the quarries is difficult. Especially quarries like Hornfels, you can sort that out, but granite is a totally different thing, those are very tied up.

QUESTION 6

Spencer, I believe that that would become a horrendous headache for you. One guy wants 20%, one guy want's 40% and you'll lose it. I have watched the guys at Riebeeck when they used to change from OPC to another product. It was a big thing. It would take days to clear silo's download programmes. It's a headache. I think that goes back to question two where the guys say that I need an extender. What is the most common extender, is it FA or slagment ? Are we substituting 40% and should we maybe two blends? You make say 50% substitution, which is the maximum you can go to and then half of that, say 25%, finish and klaar. Then the guys must design around that. The moment you start putting in more variables, the whole equation becomes that much more complicated and the guys will just lose it. I don't think it will be a good thing at all.

QUESTION 7

Yes, definitely, I would support that as it will remove a lot of the hit and miss and it will remove the guys going for higher strength cement. I also believe that it is a good thing as it will keep the consultants in check. These out of date statements like maximum cement contents. We should be allowed some flexibility. Our cement at 7 days would represent a target of about 80% of the 28 day strength. I think that it would be a good thing. The consultants don't ever look at 7 days, or they glance at it, and if they see there will be a problem, they start reacting. It will actually force them to sit up and take note. It will get you a lot more down the road when they can accept a 7 day result and get things tied up earlier.

MR Is that an American or British spec ?

SS It is a European spec which the industry intend to introduce next year.

MR Those guys know what they are talking about. It is obviously to control these horrible top ends that you get in the graph.

QUESTION 8

Yes, definitely. That's the way to go as it makes it easier to deal with when establishing in remote areas. We could just phone up our manufacturer and order a tanker of cement on our national account and indicate the silo needed. At least you deal with one person and say I'm in Knysna and I want a blended cement, the nearest siding is Sedgefield, etc.

Although I would seriously look at what cement is coming into the country.

SS Do you know of anyone using imported cement ?

MR Sure, there are about two or three of these pipe manufacturers out in Blackheath.. They are importing, but they can do it because they have a bulk order.

QUESTION 9

All told, I don't have a problem with PPC because I work very closely with them. Where I did have a problem and this will probably answer your question. I almost had to buy cement from someone in PE, a little branch. I couldn't get through to someone who could give me decent technical advice, I just couldn't. At the end of the day, I had to phone up Cape Town and ask who you speak to in PE. I had a bit of a hassle getting through, so I don't know how the other guys get on with things. Generally, I don't have any problems, obviously the price is always a problem.

SS Any problem with delivery ?

MR No, the only problem is when you need small quantities of RHC in areas remote from the factories such as Knysna. We needed RHC to gain early strength during bridge rehabilitation, say about 20 pockets, and couldn't get any.

SS Do you make much use of admixtures ?

MR Not if we can help it. Let me give you a typical situation at the Palmiet job. You give an operator a small "Lucky Star" pilchards tin to dose admixture. Next thing you see, someone has stolen his tin and he now starts using a empty cling peaches tin and you end up trying to find out where the problem is. There are situations where you need admixtures, but I prefer to keep it simple.

INTERVIEW 6:
PIET GROENHOF: Divisional Director : ESTIMATING
Ovcon : Constantia : Cape Town
Tuesday 5 September 1995

QUESTION 1

Well, absolutely, we have had a few minor problems in the past where, I must say PPC did help a great deal with the marketing side down here. Craig Waterson has been useful if not trying to be helpful with minor problems. It is obviously quite important. We don't have the same selection of cement here that you have in the Transvaal. I don't know if it will happen here or not. The sheer transport cost (of extenders) is a problem. May I ask a question ? With the Cartel breaking up, at the moment here in the Cape we are dealing with Cement Sales, but we contractors don't buy through Cement Sales, we buy through a third party agent. How do you see this happening in the future, will it be the same, or could we buy from Cement Sales? Cement Sales being a marketing organisation representing PPC, NPC everybody, or not?

SS *Yes, absolutely. Each of the cement manufacturers will have their own sales and marketing teams and as from the 1st January, they will be processing sales through their respective books. Cement Distributors, as it is referred to in the Transvaal, will fall away entirely and you would be dealing directly with the individual manufacturers in those areas. In the Cape, PPC would sell directly to Contractors.*

PG Would I be able to buy offshore cement ?

SS *There are no import tariffs or quotas on cement, it's an open market with no barriers to importing.*

PG A friend of mine once won a contract in Luderitz about 5 years ago and the country had just become independent. I must give the guy a mark for trying. I was at Luderitz airport. Now, Luderitz airport, I don't know how you find the telephone number, let alone the airport. This guy phoned me from Jo'burg somewhere as I was about to step on the aircraft, and said "I have a very good offer for you, I can sell you cement at a very good price". The price he quoted, don't forget, cement by the time it is landed in Luderitz, it's railed in and even those days it was R15.00 per pocket with cement here (Cape Town) R6.00 or R7.00. He quoted me a figure that was very attractive, very good. What was the catch ? "Not a problem at all " he said, but you had to take a whole shipload of whatever it was. Obviously it was out of the question as the job was not big

enough, only a tenth of the overall shipment.

SS The SA cement is the second lowest in the world in dollar terms, not including Chinese cement though..

PG Unless if they flood the market with surplus.

QUESTION 2

Ja, that's very nice, but the fact is that the guys who buy very little cement who are the one's that need the support. I hear what you are saying, if I buy a million bucks of cement, I would be very good customers to you and you would give me good service. The guy who only buys a thousand rands of cement per annum is the one who needs the assistance. At the moment we make use of PCI. Where does PCI come in ?

SS I have a question relating to the PCI and would like to hear your views. The PCI is funded by the three manufacturers.

PG We make very good use of them in fact. Every time we have a job, we put mix designs through them and through the contract we monitor the concrete through cube crushing, etc. We put our guys through the courses they offer, it is very beneficial.

SS The cost of PCI is proportionate to volume of cement sold, so at the moment in Cape Town PPC picks up 100% of the cost of PCI.

QUESTION 3

This obviously is related to a specific contract rather than anything else. All contractors are trying to get work and need the cheapest price. I'm afraid that's the way with work at the moment. Not necessarily ideal, as one foregoes quality. Unless it is specified in the document we will go for OPC. LAC we only use if its specified in the documents and there's no premium on the price. The mixes you have up North with the additives etc which only start coming into their own when you do large pours. For dam construction, obviously it is essential that you don't have problems. The run of the mill building, you can make do with 90 or 95% of the work with LAC or OPC's

QUESTION 4

Basically we have been asking the PCI, will the manufacturers be taking that role over themselves?

SS *Manufacturers will want to brand their products, especially in the Transvaal where the competition will operate on basis of an open market, where the manufacturers are looking for some form of advantage. That would translate in the Cape to PPC for example, offering a service such as mix designs, trouble shooting and site calls of a technical nature.*

PG We have been finding the training very useful for foremen and junior engineers. We have made good use of PCI in the past and certainly would like to carry on on the same basis, whether it was PCI or PPC direct.

SS *Do you find the PCI to be impartial, or do you find that because of their linkages to the industry that they are not really independent and neutral ?*

PG We find them reasonably impartial. We have never found any problem with the PCI. PCI have the training and the accessibility. We can always phone the guys and give them approximate designs for a particular contract, or if we want to put in a quote and do not have the facts and figures, then perhaps in their files they may have figures on the local stone and what is available in Saldanha, say. On the strength of that, they give us an estimated design. We have a good relationship with the PCI.

QUESTION 5

Not really, we have obviously got a bit of competition where before we only had Readymix. Now we have two readymix organisations, and both of them are in the aggregate business as well. We do welcome the competition of having more than one. I would imagine if there was one man that had his finger in all three pies, (cement, aggregates and readymix concrete) I could see another problem in readymix.

SS *What about your own site batching, you do not see readymix concrete as a threat ?*

PG No. Most of our jobs are site batching, depending where it is and the length of the contract. For example, if there was a job where the concrete volume was not all that great and the length of the contract is relatively long, it pays to use readymix. Also depending on whether there is space to put up a batch plant in town, you may be obliged to use readymix.

SS *So, will always keep your capability to site batch ?*

PG Many years ago, we had a big batch plant, 30 cubes an hour. We only used it once. After that job, whenever we had a big job, we used to negotiate. We had the plant in the yard and used to paint it up and discuss with Readymix in those days.

QUESTION 6

Generally it doesn't apply here (Western Cape). Fly Ash was quite popular and specified quite a lot. They seem to have gone away from it now. But then in those days we used to blend it ourselves from bulk silos.

QUESTION 7

I hear what you are saying. There are dangers attached to this way of doing things. The SABS is a reasonably conservative spec.

SS The current SABS spec does not allow a maximum cement strength and manufacturers could try and outdo themselves in terms of strength. In Europe they have a maximum and minimum at 28 days and the emphasis is on product consistency.

PG Consistency is very important.

SS Would your organisation support the European philosophy ?

PG Indeed, but there must be a minimum and a maximum, an envelope. On site they will always try and reduce the amount of cement in a mix.

QUESTION 8

It could well be attractive, our main operation is in the Cape, but we have operations in Natal. Also just to point out to you, we are going into a merger with Wilson Bayley Holmes and will end up as a national organisation. In principle, I would see no problem with that. We need to know what the deal of such a package would be. I remember the days with M & R when they had a special deal with Caltex for a system like that. Services, fuel tanks on site and in some cases even service trucks. They don't do that anymore.

What I think is very important, especially nowadays is the training of people in any way, to make people understand what concrete is all about.

QUESTION 9

No, not as far as the cement industry is concerned, we have not had any serious problems.

SS Have you had much of a presence from admixture suppliers giving you mix designs?

PG Yes, in some cases we use them. In building contracts what seems to be the norm is that people go to specialist sub-contracts to do their pouring such as trowelled

floors. We do it ourselves in fact. For concrete like that we have admixtures put in. The PCI helps us with that as well, but not always. Quite often the manufacturers of admixtures come along with their own mix designs. There is only one principle supplier and that is ABE, I suppose. Most of the others have been swallowed up.

We use Fosroe in Abu Dhabi. We have six contracts on the go there. It is a long way from home and not very profitable and quite difficult to manage. We can be justifiably proud and many owners come to us to tender. The problem is to beat the lowest price. It is a very competitive part of the world.

SS Do you have any problems with loss of cement during delivery ?

PG A few years ago we had a problem like that, a few suspicions. Generally, I don't think much recently. We are aware of it and that makes people think twice.

The following notes were not recorded :

PG indicated that they did have a bleeding problem at their Waterfront contract. They used the best sand, Klipheuvel, and PCI had looked at the mix design. The problem was as a result of single sized fine aggregate and bleeding was evident on the inclined shutter of the retaining walls.

SS Discussed that controlled permeability form work was a possible solution. The best situation would be for the client to pay for this as an extra-over item.

PG Indicated that the consultants saw this as being the contractor's problem.

INTERVIEW 7
CLIVE SOFIANOS: Concrete Technologist:
Group 5 : Spartan : Gauteng
Monday 2 October 1995
(Included input from
DAVE MOCHRIE: Commercial Director
in preparation for interview)

QUESTION 1

The short and sweet answer is yes, for all the positive spinoffs. The larger companies tend to manage these issues on their own, but there is always a need, even for the larger companies, to fall back on technical backup, particularly in instances where there are cost implications and decisions to be made. I think it is big advantage to the smaller companies who have always had to rely on organisations such as PCI, that they can rely and fall back on something like that. So a definite yes there, I'd say.

QUESTION 2

As a big user, I think it may be a little selfish, but I would say yes. I think that you would also find that smaller users don't really need back up service, if I can put it this way. A lot of the smaller users just go and do their 1:2:4 mixes, etc. and are not really concerned about heat problems, strength development, and that type of thing on a smaller scale. So, I think that the better service would be for the bigger users.

QUESTION 3

My biggest concern is, if you just go out to the average market, even guys in the construction industry where they are working with cement every day, and gave them a list of all the cements that are available, I think they would be astounded. To them, it is either OPC or a common extender like PFA or Slagment. When they talk about all these various blends, I think a lot of them aren't even aware of the PBFC's. They are aware of them but they don't really know if it is a rapid hardening blend, slagment blend or OPC blend, whatever. I think this can tend to confuse the issue if you have too many.

Now, speaking of our sector, and our point of view, we found it more economical if we need a special blend, to spend the extra money to erect the plant to cater for it, than to go and buy a pre-manufactured product that tends to be a little bit costly. On the other hand, the smaller contractors who don't necessarily have the equipment to go and set up a bigger plant will most probably be prepared to pay a bit extra for a premixed product. In our case,

it would certainly have to justify it and we would probably do it ourselves.

QUESTION 4

I think two-fold really. I think originally it was basically set up to do research and development and I personally feel that is where they should be going back to. There are too many private labs that can cater for these services as well, if the cement industry is heading in that direction. So I think, personally, research and development and secondly, if there is ever a dispute that they still remain an independent authority to be able to stand in for any dispute and mediation purpose.

SS Clive, do you see the PCI, considering their funding by the cement manufacturers, being satisfactorily independent ?

CS My honest opinion, no. The way they are at the moment, I don't believe they are independent anymore. Unfortunately they do need the funds from the industry, but it would be really nice if there ever was a problem, that they would fight it on your behalf. Not to say that the need has arisen. Should any event require it, the contractor can go to PCI, instead of us standing behind SAFCEC to get a point through. We could confidently go to the PCI and get a point through to the industry.

SS What about if some level of funding came from the construction sector, resulting in funding from both parties, which would force the PCI to be impartial in situations of conflict ?

CS At this point in time, the industry use SAFCEC, being members, and put their funds in that direction. In the event of any dispute, we would get behind SAFCEC and fight it that way. So there would be conflict of interest if one asked contractors to split their funds. Maybe SAFCEC and PCI could look at something.

SS Do you see PCI's mix design service declining, considering that cement manufacturers, admixture companies and independents may cater for this function ?

CS I think what will happen is that initially it will still be provided. People will still be a little bit dubious. I think it will take time for the cement industry to be able to offer that service. I think that people will wait and see how thorough the service will be, and whether they will be able to meet all the contractor's requirements. Then, if the cement industries backup service proves itself, the function of the PCI will certainly reduce. The mix design function will then down-size.

QUESTION 5

What we basically find, and in fact we have a classical example of a dam in the Cape area where we would have preferred to have done our own concrete. The cement manufacturer owns the local readymix company and also owns the local quarries in that particular area. Hence, his prices are based in such a way that it would be silly to set up your own batching plant. On a financial basis, it probably does pay us to be able to use their product and rely on them to supply the material. On the other hand, being a concrete slide in particular, we normally like to be more independent as it is an activity that carries on for 24 hours a day, for a week or so. If you are dependent on a third party for supplying the concrete, you can run into problems, particularly through the night, with that supply arrangement. This was a good example where it was not cost-effective to become independent and so we will have to rely on the readymix company to do it. But I think, on the positive side, there is a closer understanding of the problems that construction people face when they go into readymix. They get a better hands-on feel for what is going on out there. If there is a dip in the performance, their own people pick it up as well.

SS Given that there was already a player in the readymix market, would you welcome opposition to avoid a regional monopoly ?

CS Yes, it would be a good thing. We are not at all anti-readymix. Many times, where a site is congested and you don't have facilities to put up your own plant, then it is actually quite a relief to rely on the readymix supplier.

QUESTION 6

My concern is that, if there are standard blends available, we tend to work with them and become more familiar with them. Also, the specifiers will know what is available and will specify around that, and the contractor at the end of the day will be comfortable with past experience of using these products. When you have too many variables, in the cement blends, etc. I think this can lead to, first of all, manufacturing problems, handling problems and that the right blend has to go to the right destination, and so can throw a spanner in the works. But that said, depending on the size of the job, if you have a job big enough that it warrants a particular blend, it is always nice to know that you can go to a supplier and say, hey look, we have x volume that warrants that extra effort and it could financially help both sides. Then I think there is a need for it, but it should be more volume related. Again, for a smaller contractor, it would be best for him to buy one product, pre-blended to what he is looking for, and use it in a bagged form. The bigger companies, because of cost related issues, would tend to blend it themselves.

QUESTION 7

Yes, I think as an end user, we would be looking for consistency. If you knew how a product was going to perform, whether it be good early strength development or poorer than average, as long as you knew what you were dealing with and it remained consistent. We have a problem where one day it performs very well, and as you say, you take advantage of that, and you get caught with your pants down. So definitely, if it promoted consistency, we would be a lot happier with that, I think it makes a lot of sense.

QUESTION 8

Yes, I believe that there would be a lot of benefits to an organisation. Also, you are getting to know certain names. If you have a problem on a particular site, there are a handful of people you need to contact. You don't have to have a diary with all different suppliers, as well as transporters. Generally, if you are using a particular brand of cement, and a particular transporter, in a lot of cases the transporter may be related to the manufacturer. I think it makes it a lot easier as we are in an industry that moves around a lot, but you are still dealing with the same people and contact names, etc. and that I think is a big advantage. Also, as you say, having a national account one can maybe use that to your advantage to link up with technical services and that will enhance the sort of backup support you can expect from the market.

QUESTION 9

SS *Have you experienced any situations where you have not received all the materials ordered ?*

CS We have actually had a number of those. One of the classic cases was a recent project that we finished in town. We tried everything to see where the problem came from and if the problem was on our side. We eventually installed a weight bridge and we couldn't pick up anything faulty on the supplier's side, although we certainly couldn't prove anything on our side. We checked everywhere, we checked our scales, our results did not show any problems and we couldn't see the loss of the cement on the contract. Yet there was no way that we could prove that something was happening, that cement was being swindled on the site or something. I don't know how one can go about controlling it, because it is not an easy one. We have looked at everything, we have sealed tanks from top to bottom, followed trucks, and so on. I think it is something that needs a good control on our sites to monitor what is coming in. I think the biggest problem is where our people don't check the tankers when they leave. You break the seal and the chap pumps out the tanker. Assuming the driver is up to something, he just gets his delivery note signed and drives out. Nobody really checks if the tanker is empty

and I honestly believe that most of the problems come from that, cement left in the tanker.

SS *One of the possibilities is satellite tracking, that would also monitor when the compressor is started up. Would that peace of mind have value to you in the major centres ?*

CS Yes definitely, it would make disposing of the cement very difficult. But I think our guys must not get complacent and just assume the cement is delivered. It is nice if you can get it. We do need to be on our toes a bit more though.

SS *Is there anything that comes to mind that hasn't been addressed, and that you feel we should be aware of in the cement industry.*

CS Something that I have noted that we should think of quite seriously, due to problems with certain cement as such. Very seldom do we use OPC on its own. In most cases we use extenders and admixtures, depending on the volumes involved. I believe, particularly the more expensive cement becomes, the more necessary it becomes to use extenders and admixtures and to possibly understand the chemical reactions between these three better. In fact, with recent problems that we have had with a particular manufacturer, we have actually given them a programme to run for a certain length of time and prove to us that the cement does perform on its own, as well as with extenders. I think in the past everybody has just accepted that cement has a particular envelope, and provided it falls in that envelope, it is fine. Recently, things have shown that when you put an extender in, as well as an admixture, things can go wrong. It is fair enough to say that our product meets the spec at the end of the day, but the end user is the one that suffers, and the industry gets a bad name. So I think it is for the industry to better understand the chemical reaction between admixtures and cements, and to get a better grip on what is actually happening, and what causes the severe dips every now and again, that catch everyone off guard. We are busy looking at that as a programme. I think that information could be very useful to the end user at the end of the day. So that is an area which the cement industry can look at. In other words, other products that your cement is used with, so that if something does go wrong, you are at least monitoring the various combinations or blends, so that the end user will still get a product that meets his requirements.

SS *Your are also implying that admixtures are a feature of everyday concrete ?*

CS I think so. We generally have a policy in the company where we have a number of fully computerised batch plants which we would only use if the volumes justified using them. If the volumes justified using these batch plants, they would

inevitably justify using an admixture. On the smaller plants, we tend to steer away from it. We don't go near volume batching. I am also talking about admixtures. If the volumes are small, we would rather not use a hand dispensed admixture. We would rather bite the bullet and put that extra cement in and have that peace of mind.

We had that situation five years ago, at Majuba power station, where there was a cement, a slagment and an admixture used, and that particular combination did not perform for a period of six weeks. To this day, no one really knows what happened. This has recently happened with another cement manufacturer and unfortunately, I think if we had managed to solve it then, this problem would not have come to that. It tends to point towards the SO_3 and C_3A's, when they drop a little on the low side, and you have the particular problem of a particular admixture and extender, the wheels fall off. The cement manufacturers do own the cement extender companies and a closer liaison to deal with these problems is necessary, rather than going in different directions.

Another small issue is that we were meant to be getting PCI results on a regular basis, so that we can monitor cement performance, but this has fallen by the wayside, and I just need follow-up on that.

SS *If the industry offered the results of regular concrete tests, as opposed to mortar tests, would you find that useful ?*

CS Definitely, yes. I think it would show a trend and I think it is all we are looking at, consistency and a trend. If we see a slight dip and notice the same trend on our side, we can deal with it. At the end of the day, no one really wants to point fingers, but rather keep the channels of communication open. When a problem arises, we tend to spend so much time looking at ourselves, our batch plants and all our controls, and by that time, three days may have passed. If we were forewarned, we could deal with it.

SS *Clive, thanks a lot, thanks for your time and depth of input, it is most appreciated.*

INTERVIEW 8
BRIAN SEARS: Director:
Murray & Roberts/Gillis Mason : Bedfordview (Head Office)
Thursday 12 October 1995

QUESTION 1

Yes, I think it is clearly going to be very healthy for the industry, because it has certainly been a major frustration as far as I am concerned, as the cartel has resulted in us getting poor service. I remember when we did Columbus at the start when we were trying to get cement companies interested in offering any kind of service. An arrangement was made, whereby we were going to get cement from a certain source and really there was no attempt to try and market the product or help us in any way. The only company that did help us was in fact Anglo Alpha. I am not that sure that we went to PPC, but certainly Blue Circle did not come to the party at all. So, clearly, now that the cartel has gone, you have to market your product and try to get that business, and I think it is going to be extremely healthy. It is definitely going to suit us.

Certainly, people like Slagment give us good service as they are not in the cartel, and are trying to work their way in.

Anglo Alpha certainly did help us at Columbus. At the start there were complicated mixes with Silica Fume, Slagment, PFA and OPC. What we have done over the years is have our mix designs done by Samson, and obviously what is in it for them is that they sell their additive, but they give us a good service. We don't have an in-house mix design outfit, we rely on Samson, PCI, Anglo Alpha or whatever.

QUESTION 2

Obviously they are in business and must decide what business they want to get into. The small guy also needs assistance. But if there was a big order, I would expect you to offer a lot of support to get that order.

You are going to have to out-perform the other guys. The technical support that whichever company offers, and really cement is cement, so what will swing you to a supplier is obviously price, the quality of the material does come into it, there are cements that seem to have different setting characteristics and are less reliable and less consistent, but technical support will obviously be a factor as to who you go to.

QUESTION 3

I reckon that higher prices must have a real cost benefit and at the end of the day, it is cost that is going to win a tender. So if you are going to have a higher price for rapid hardening cement, you are going to make a valuable for that. In the long term, it must make a project cheaper, otherwise it is not going to fly. There obviously are highly specialised products like Fondage, and those sort of things, but I am sure that market is covered and, I don't know, you okes are obviously into bulk products, you don't want to run small highly specialised products. I don't think there is any value in paying more, unless there is a real cost benefit, unless an architect specifies colour or something, there may be a special reason for it. The spec will determine that we as contractors very seldom have any influence over that, we must price what is requested.

QUESTION 4

I guess the PCI was really formed out of the need of the cartel situation. I would expect that the PCI would lose its importance and in fact, each of the cement companies would offer that service. You know you are no longer offering a service to everybody, you are trying to offer a better service. Obviously, there is R&D and those sorts of things that must take place I'm sure that that would happen. But I'm sure you said that you are going yo do that in-house, not going to do a central R&D (PCI) because you are now competing against Blue Circle and Anglo-Alpha. You are trying to sell a product, you have to better than the next guy.

SS What about the training offered by the PCI, as you do require different stills for training?

BS We certainly do. I reckon the PCI could really only be there for two reasons and the one is R&D and the other is training, there is no other need for it. But certainly training would have to be replaced.

SS The other activity handled by PCI is site investigations in areas of conflict. Do you feel that in such a scenario they would be seen to be independent concerning their linkages with manufacturers?

BS If they offer that service now, I'd never use it. But I doubt that they could be seen to be impartial in any case. We have certainly not used the PCI in any bug way other than training. Their courses are excellent, in fact someone would have to do it if they didn't do it. As far as mix designs are concerned, we find that they don't actually produce competitive mix designs. They don't seem to be too keen to go out on a limb at all they are far too conservative. We get far more competitive mix designs from other sources.

SS Brian, do you make any use of independents, such as concrete testing services?

BS No.

QUESTION 5

No, obviously M&R do have their own aggregates and those sort of things. In fact, Anglo-Alpha are linked to Hippo and Pioneer and Blue Circle are linked to Readymix Concrete. It is really no threat, maybe the market is saturated with aggregates at the moment but it certainly isn't a threat.

SS Relative to overseas readymix and aggregate operators, it is rather limited geographically. Do you see readymix in SA shrinking or expanding?

BS It will only expand for a big project. You can't afford to have two big crushers in Witbank unless you have it specifically for a big project.

SS Would you always reserve your capability in this area?

BS We don't actually keep the capability of crushing but there are many sources in the industry that do it, such as Blasting and Excavators and those sort of guys who do it for a project.

SS You obviously retain your concrete mixing capabilities.

BS Yes. We also don't find concrete readymix efficient. It always amazes me that we go onto a site and put up a batch plant capable of 1000m^3 per day and Pioneer is two kilometres away from the project and were not competitive. They were there, they had the plant there, it doesn't add up. They seem to be suited to the small builder and those sort of guys. We seldom make use of them. We do on some projects but you go through the exercise and find we can do it a lot cheaper ourselves.

QUESTION 6

I don't think that's too difficult. Blending is a simple operation. I think increasing that product and will certainly give you a better opportunity. I think one has to be careful from a quality point of view. If one does site blending, there is always a risk of the wrong product going into the wrong silo. I think from a quality point of view, there is a bene fit in having a pre-blend to a certain specification. It takes away that risk, seeing that the quality of the blending plant was adequate. That could be a pretty useful service. It would also reduce the number of silos and screw conveyers that one would need.

QUESTION 7

We had a hell of a bad experience at Hoedspruit airbase in 1977, where we getting cement from Palment Palaborwa Cement, that has closed down now. In those days there was only a minimum strength specified. SABS only gives the minimum. The cements were all well above the minimum and people obviously design around the strengths that they are getting. Some way through the paving contract, there were massive volumes, something went wrong in their process and cement strengths seriously dived but still stayed above the minimum. So they thought they were doing fine, but all the concrete strengths fell through the floor. It had major implications and we broke out hundreds of cubes. So I think it is essential that we have an envelope that you have indicated. It forces manufacturers to supply a consistent product. There is nothing worse that when cement is up and down. What we did after that experience with Palment, we insisted on 24 hour tests and every single day we had to know what the strengths were to adjust our mix. If you use this envelope and provide a consistent product it is more important than a stronger product. As long as it is consistent, you know where you are going. Maybe you also need to offer the service of early warning somehow, that if something has gone wrong you need to get that out bloody quickly that there's a problem. If you have that narrow envelope, it won't be necessary to have that service.

SS The implication is that customers would buy into strength category. This would generally simplify the buying decision. Manufacturers would use the appropriate extender, fly ash or Slag that gave the lowest production cost but the required performance would be the same.

BS You have to be careful is you just put Slag or fly ash in as certain clients have an absolute rigid dislike for certain products. God knows why.

SS Even though it was specified, or don't they specify it?

BS We would often try and introduce Slag or PFA as a cost saving measure. Many clients are absolutely against it.

SS Should manufacturers be more interactive with the clients and explain the technology?

BS Yes, but obviously the cement manufacturers are not trying to push those products are they?

SS As the industry approaches capacity extenders will be more important and the technology is well known.

BS I have no bad experience with them. I think they are excellent.

QUESTION 8

I just wonder if it is really practical. With fuel, it is fairly easy. With Shell, if you want to fill up with fuel, there are Shell garages everywhere. We do work nationally. We did Mossgas, Columbus, we are all over the place. If PPC wanted to get the Murray & Roberts order they would have to be competitive in all those areas.

I think the cement companies have to appreciate that they are dealing with a company of a certain size. They know that. Fuel is a little different; the benefit is indirect, as we are told to use say BP, and everyone uses BP, but you pay the pump price, you don't get it cheaper at the pump. The group at some level puts together a whole account and tries to get a discount out of BP of so much.

As far as I'm concerned, the cement manufacturer that will get the order will be the cheapest on a project. If we are stuck to a deal that says we have to buy everything from PPC and Anglo-Alpha come in with a better price on a project, we would be foolish to use it.

SS If through a national deal you could negotiate a rational deal, you could negotiate a better rebate through the volumes involved, would this meet your criteria?

BS Ja, sure. But then it would have to be competitive everywhere. It would be a serious problem if one was forced to use a product that was more expensive. You don't win a tender and that's the bottom line.

QUESTION 9

SS (Also mentioned cement leakage and asked if M&R were experiencing any problems).

BS I'm sure it is. Everyone is getting ripped off somewhere along the line. That's life in this business. I haven't really picked it up. That's not to say it is not happening. I don't know how one would control it.

On general note, the cement guys are going to have to work very hard at changing their thinking. Obviously, this cartel has been there forever. I don't know, ever since I can remember.

SS Before the cartel there was government price control, which may have had the same end result.

BS Ja, they have never had to be competitive and they have quite a long way to go. Certainly, some are doing better than others. PPC, are certainly, and Anglo-Alpha

have started their marketing efforts a lot quicker than Blue Circle, as far as I'm concerned and Blue Circle is a Murray & Roberts company. But I think they (the cement manufacturers) have a helluva lot of work to do in changing the mind set, you know. I think that there are also other things that can be offered, like offering storage facilities such as Petermix. I don't know if you guys do, but there are these mini silos and mini-bulk. There are lots of things that one can offer to get that business.

SS Obviously you would expect someone to discuss your requirements with you.

BS Yes, if there is a specific project, one should come in early and negotiate that project. How are we going to blend it? There is room for interface.

SS I would imagine your projects are all different, as well as on a regional basis.

BS Ja, and the people are different. You mustn't offer a blanket package to the Murray & Roberts Group. You just have to get closer to your customer and understand their needs. Just because they are my needs, they may not be the guy-next-door's needs. Everybody has slightly different needs. But I am delighted it's happened (dissolution of the cartel).

SS Unless there is anything else, Brian, thanks a lot for your time. I realise you very busy. Your input is most appreciated.

INTERVIEW 9
PAUL LE SUEUR : Director
Goldstein Building : Midrand (Head Office)
7 November 1995

QUESTION 1

Look, what has really been happening in the industry in terms of the technical service side of things .... . I think the majority of principle contractors source from different people. For example CTS, Concrete Testing Services, Dave Tite, we have done a lot of work with Dave and what we have actually found is that Dave comes on board pretty early, we pay him a rate per cube, effectively he does all our testing of our cubes. The whole idea and the way Dave sells his service is that he has to pay for himself. If you are paying him R5.00 or R5.50 per cube, in terms of tweaking the mix design and supposing that failures don't occur, he actually pays for himself. I think in the majority of contracts that we have done, we have just used him on the Standard Bank Super Block, my personal feeling is that it has actually been money well spent, quite honestly. For other contracts you are looking at every cent spent, is it necessary or is it unnecessary and on the whole when we haven't used sources like that, what it really means in terms of your own internal controls, say for instance on your silos you need load cells because you got to be able to check. Possibly a weight bridge or axle scale .... an axle scale isn't that accurate in any case ... but you see the internal control that you actually need. You take a job like the Stadium (new Johannesburg Athletics Stadium) when you are pouring that volume of concrete at that speed, unless your controls are there we could be losing cement and We actually don't know. We did at one stage have a cement loss problem for a very short period. Luckily we actually picked it up very quickly. We thought that there were short deliveries and sat down with the guys , the suppliers and worked together with them and there was nothing, no problem at all. We actually found that the problem was in the design mix. The guys were overdosing and that is where the problem actually was. Quite honestly it is a case of penny wise and pound foolish. If you have got it internally, I don't think that it is up to the standard of CTS. Dave is good at his game and he provides that constant service.

Just to go back to the original question, there certainly are people like that in the industry that have worked with the principle contractors, but as an added service, there is certainly nothing wrong with it. You take for instance your medium guys that do have concrete technology questions. If they know that they can actually turn to their suppliers, I think there is a lot of merit in that service. Concrete technology is something, Spencer, that has changed. In the old days, it was a case of 3:2:1 and there it is. But look at it now when you are using the likes of PFA, your different additives such as retarder, speeding it up, slowing it down, looking at your stripping times together with your design mix, it all comes into it. It has become a very high tech industry as such, not the same as the old 3:2:1 industry.

SS Having mentioned the services of Dave Tite and obviously there is a lot of scope for independents and professionals like that. However, he is not looking at a national foot print, he's operation is more localised while the industry has a responsibility to provide a service nationally.

PLS Correct.

QUESTION 2

I think it is economics. I think the services and support should be accessible to all parties, what we are really saying is that if you are big and ugly, does that mean you can get 80% of the service. Just because you are a new company to the business and don't consume the same as the larger groups, you get second rate service. Lets draw a comparison and look at the technical service of Plascon. Anybody has access to that, even the homeowner. In terms of that they have actually built up a damn good reputation. The same applies for the opposition Dulux they have had to actually put that service in. The housewife can pick up the phone and say that I want to paint this table, now what operation do I have to do, what undercoat, what do you recommend as the finishing coat. Now if the question was answered with how many litres of paint do you use, and she says I use 20, he says well I don't want to talk to you. It's all wrong in terms of that, in terms of marketing , in terms of advertising. It's the old story, your greatest form of advertising is by word of mouth. A small contractor for instance is doing some concrete works, he's doing a good job, you can't fault him. He strips the shutters off nicely and he sees it has honey combing and the guy says hell what's happening here, the concrete is not going off or something like that. He phones the guy up and gets lip service. What is he going to do if say next time he sees his mate and he's the cousin of the chairman of Anglo American and he says hell I must tell you a story about this cement crowd. That's advertising in our game. Forget about magazines and TV, its by word of mouth. Now you can try and introduce a secondary service and first rate service in other quarters. I believe that you need to provide a service to all parties accessible to all parties. I'm possibly speaking against myself now but I believe it. Otherwise don't do it because it will give you more bad publicity than anything else.

SS One of the aspects I had in mind, and your point is well made, is the cost of customised service for major projects such as setting up a laboratory for major projects such as Columbus. There would be a substantial commitment to resourcing that perhaps needs to be based on volume and returns.

PLS When you set up a localised laboratory on site, it obviously relates to the size of the projects, the likes of the Katse's, the Columbus, etcetera, they are major projects and warrant their own labs. On the whole, you take for instance the stadium, big concrete job and Standard Bank Super Block, you don't have a lab on site, we use external

laboratories. It's not worth our while. I think there is another point as well, in terms of having internal labs, that I don't think you get the same degree of trust from the consultants. The guys, are actually saying trust me I'm a doctor. We did the cubes, we did the crushing, there are the results, we are right and yet the concrete fails. If it is going to a reputable external source, your consultant will say fine and eventually go with it. So you can understand his opinion.

QUESTION 3

I think on the whole, what is available on the market in terms of cementitious binders and our localised industry, you know, is adequate and I think the cement industry has been pretty proactive in terms of the South African conditions as such. Obviously we can't talk for other types of markets and I'll give you an example. We had an office in Moscow for eight months looking to get into the Russian market. The first concrete we poured was at minus forty, It was a rude awakening. Effectively we had to have electrodes and blankets. We were clueless, really clueless. We know our market and realised hang on a second, we can't just go walking across the water, stick up a batch plant and carry on as you normally would.

So getting back to the original question. I think the local market on the whole, in terms of your various binders etcetera, it's really there. You know, look I'm sure it's the old story, progress is progress. In terms of innovation we will see different things. The big thing these days is the whole reputation of this company is quality, we regard ourselves as a high quality company. If you went down to, quote an example, to look at the Standard Bank Super Block, which is going in for the Fulton Awards, and you look at the quality of the off shutter concrete. You know from your basements ..... and please don't get me wrong, we are not patting our own backs ... we take pride in our concrete, we have always done good concrete. We would rather take it down than leave it up, just in terms of reputation. The actual nature of design internally and the actual office block is exposed coffers with acoustic panels and to make matters worse, the lighting is uplighting from desk level. Every imperfection is exposed.

What I'm saying is that the biggest improvement in the industry is a material that will give you a better quality of finish. That's where the contractors biggest problem sits when it causes to off shutter work. He strips down those shutters and he puts those hands together and says please God. Because what you actually save on patching is phenomenal, absolutely phenomenal. The trucks of polyfiller arrive after that.

QUESTION 4

Look, and possibly I'm wrong, I've always looked at the PCI as being not really the

watchdog but the nerve centre of the concrete industry. I've been to a number of their lectures. They do provide guidance to the industry and I think that any contractor would agree with me. I think that if you look for the ultimate knowledge you going to the CSIR, the SABS or something like that. But in the concrete mode the PCI has always been that nerve centre. I think that in terms of an authoritative body, there will always be a place for them. Let's face it, if you have a body that stands alone, that is independent, I think the PCI don't have to tie into what they are selling, a commodity, they aren't selling cement. Therefore they are going to remain autonomous which is important because they don't have their own agenda. Whereas, let's be honest, if you're selling a product and something's wrong with it, you don't want the market at large to hear that you have got a problem. How do you remain unbiased and autonomous in such a situation, so I think there is a place for the PCI.

SS What I hear coming out of what you say is that if they are seen to be professional, the fact that they have linkages in terms of funding, they do have that autonomy.

PLS You know, it's up to them. If they allow their standards to drop as a result of their funding, they effectively allow anything that they put out to be clouded, they will disappear into the wilderness, because it is the old story, it's market confidence in something and reliability. How if people feel that they're actually going to rise above that, I mean, there are many different types of bodies, say medical research, Main Centre in Durban, they receive a lot of finding. Do you think they are going to fudge the results? I think that on that basis as long as they maintain their integrity and the rules as such, and their standards, they'll survive. Effectively if it is hindered by the source of the funding, its as though the medical research has put out incorrect results or the likes of the fund providers has said we supply you with so much money and therefore you will say this is a fantastic drug and it is in fact no better than the common aspirin. How long will they last. The same way the industry would find out if they are not sending out the correct results and their phones would stop ringing, as simple as that.

QUESTION 5

No, look at what happens in this country. The majority of your large contractors all site batch. You have to be, your premium on readymix is R90 per cube. Take any job of any significance, if you contemplate readymix, you just wouldn't be competitive, as simple as that. So what do you have to do, in terms of your start up, you need readymix and possibly in terms of your completion too. Your main output would be site batched. Another point is that site batching also relates to being able to put up a batch plant in terms of access and space on a particular site. If the space is so confined that you can't site batch and you are sitting in the middle of town, you need place for your bins and place for your silos, you're dead in that particular situation. Funnily enough I had a call from friends in Abu the other

day and all they use is readymix, and nothing else, absolutely nothing else.

SS You don't see that price premium coming down to a more competitive level to an extent that readymix becomes quite strong such as in France and the UK.

PLS I would quite welcome it quite honestly, if readymix was as competitive as site batching. Let' face it, in construction, we have enough problems and providing that the service is there, trucks come when they should come in and we can complete a pour. The last thing you can afford when you are busy with a major pour is that the trucks stop halfway through, you are in trouble, big trouble. You have to put in a stop end. But you also have a programme implication, when you schedule your concrete, it needs to run to that schedule.

In terms of them buying up the quarries and buying up the readymix plant, I think that you started off by saying the end of the cartel. Now as long as it is free market and lets face it Spencer, there is no industry in this market that is more free market than the construction industry, we all end up cutting each others throats. Effectively what has happened, they say that they breakdown the cartel system, which is a form of oligopoly and as long as we don't replace it with another one. I don't know quite what the situation is, but in terms of the GATT agreement free trade is now going to happen. Let's look at the cement industry. Is there going to be free flow of cement from Zimbabwe now? Is there going to be free flow from the East? You know what happened in the past, everyone started importing from the East. We could bring it in through Durban, rail it up to Jo'burg, drop it off on our site cheaper than we could buy it from Pretoria and with GATT those restrictions will disappear. Everyone has to gear themselves up now. Let's face it, the competition will come from overseas, the same way as with a free market, the cheapest price will win eventually.

If you could get rid of that premium and we didn't have a problem of batch plant breakdowns, a start up could be much quicker, I think it would be definite plus but then the premium would have to come down. Otherwise it will never ever work.

SS You could always keep your site batching capacity?

PLS Plant costs a lot of money and once you start keeping 750 pan mixers in the yard, in the event of a breakdown in service and that sort of thing, that would be a sorry state of affairs. Let's take a look at the high tech equipment that they have, it gives them what they need. The moment that happened and you want the readymix route and all of a sudden there was a breakdown in service ... and lets face it in this industry what is the worst thing that can happen to you is going off programme ... you can forget about your cost of concrete, I mean the cost of your supervision on a large contract is huge numbers. So when the reliability disappeared, people would say hang on a

second, I'm not in control of my destiny, why on earth should I put myself on the line. Let me get back my 750 pan mixers, my reversible drum mixers and you guys disappear, all you can give me is headaches. I think the two have to come, price would have to be right and service would have to go alongside it.

QUESTION 6

I think that you are to an extent covered by your consultant, lets face it, any design mix that is put together is subject to the approval of a civil engineering consultant. We did the Armscor Headquarters and we were one of the first users of PFA. It was a definite cost savings, not a huge figure but more importantly it gave us a better quality of finish. You can see going back to my earlier statement that economics is one thing but quality of finish where you can stand back from a job and say we built that and we're proud of it. The last thing you want to say is that I wish someone else had built it. So in terms of that question, you can only go so far. The parties you really have to convince are the consultants. When you put a design mix together that flies in the face of convention, you have some difficulties. The Armscor example when it came up for the PFA solution, blended with OPC, the guys said well look, I tell you what, show me a building that has been standing for twenty years and I'll go with it. I said with your attitude, we would be driving on wooden bridges in this country.

All credit to the guys, they said we hear you. We made total converts of the guys. Not in terms of cost savings, it wasn't a big number, it was R200 000 on a 70 000 square metre Armscor building costing R104 million. The big thing was the quality and when the guys saw the quality once the shutters were stripped, they said that it really looks good.

QUESTION 7

Look not knowing all the details, ultimately in terms of the 28 day strength we crush at say 21 days as a check. You are coming towards what you need to achieve and this is where the earlier tweaking comes in, you are looking for 30 off a 25 and you are crushing at 21 days. If you end up with 32 , life's great there is a factor of safety, but if you are projecting 40 you are in trouble. Any contractor, from a simplistic point of view, what he wants is to achieve the desired strength and anything that gets him to that point on the most economical basis, he doesn't want 28MPa or 40MPa but can get 30 on the dot or 32, that's his objective - and he knows he won't have concrete failures.

Where people are cutting costs and strength and on top of that, have a lab on site, where the hell is the control. We don't need buildings to start dropping down all over this country. Our buildings have always stood up very well. The number of collapses have been minimal and have usually been related to formwork collapses and not concrete failures at all. We can maintain the standards. The last thing you need, Spencer, is that we lose that quality,

we need to go forwards not backwards.

QUESTION 8

Well I think it's already happening. Certainly from our side it is. We operate nationally and we are a big cement consumer and on that basis it's like any other industry, very closely linked to volume turnover. In terms of that you would be entitled to additional discount. I think anywhere in the world that will happen. It makes sense, your larger users should have that enticement, that's economics, an acceptable practice.

QUESTION 9

I think we have covered the spectrum. I agree with you on the readymix side. I have never really understood that premium. Look at the way the European, market has gone. On the European side they closed that gap, if they hadn't you wouldn't have seen the strong entry of the readymix at all. As long as we have that gap, I don't think they will make great inroads.

We are going into very interesting times with the dropping of the cartel and next the timber industry. In terms of the monopolies act they are trying to stop the sale of HL&H. The interests will be split in half, half to Sappi and half to Mondi. The timber industry is a problem, a big problem, lets hope they are next.

SS Paul, thanks a lot for your time and the insight that you have provided, it is greatly appreciated.

INTERVIEW 10
DR HILTON MACDONALD : Chairman:
LTA Civils : Spartan (Head Office
Wednesday 8 November 1995

QUESTION 1

Well I think if we just look at it first of all ... maybe I should ask the question, what's going to be the role of the PCI in the post-cartel arrangement?

SS I do have a question that deals with exactly that, the role of the PCI.

HM That obviously is a major area. If we take each of the suppliers, I suggest that there are obviously PPC, Blue Circle and Anglo-Alpha and If we look at these three suppliers, I mean the technical support varied from those suppliers considerably over the years. We have obviously dealt with PPC, for example at Project Eagle and the only time we really had anything happening is when we picked up hassles. We then had to call the storm troops in. I think up to that point the input was negligible. PPC is not alone that respect, lets be quite honest. If you are going to sell a product, I believe that you should be selling the product with the full back-up service. The back-up service being the supply of readily available information on what the plants are producing in terms of the quality of the cement, the seven day strengths etcetera, etcetera. There should be an automatic supply, to the major civil engineering projects, certificates on a regular basis. We don't get those unless we ask for them, lets be honest, its a requirement for every specification that we provide certificates. If we then look at it and take it a stage further and say that, OK LTA Civil Engineering is moving into the ISO 9002 environment that's got pretty onerous requirements. Now what are the cement people going to be doing to comply with that as well. So, to a large extent, we have been supplied with cement and only when we requested it, obtained help. I'm not denying that when we actually requested help, it has been good. It has been very good, and assistance has been provided at Eagle, they improved the grinding, they looked at all sorts of issues at stake there. Obviously cement was one of the issues and there were numerous other issues. But nothing is proactive, it is only reactive.

QUESTION 2

Lets just look at the small building guy, the guy who is building a house and that includes plastering a wall. You have an interesting problem, and I don't know how you are going to solve it, because I sit on the SACPA/SAFCEC committee as well. The first problem is educating people as to what cement is for. I think obviously moving into the new ENV

regulations where you have different cement codes, I think it's going to be a certain benefit to the major players in the market place. We can all go and look at a matrix and ENV, or type two cem, blah blah blah .... . I forget all the damn names, is going to give me that kind of cement. Now you got to actually cater for the unsophisticated user at the other end. Now your first problem is you unsophisticated user because first of all you have a lot of fly by night organisations out there, I'm not going to mention them by name, you know exactly who I'm referring to. They will sell on price. They won't sell according to any particular specification. What you are getting is a perceived problem at the bottom end of the market.

How you resolve that, you have to look at very carefully. Education of your first half of your spectrum is going to be very difficult. People understand OPC, people understand this and that. You are looing at the small guy, he wants the same thing for everything. He's not going to be able to have three or four silos like we do at Columbus, where we decide this pour is going to have this in it and this pour is going to have that in it, and we actually blend it to suit the requirements. We have computerised batching plants to do it and all the other good things. If I look at the top end of the market which is where we operate, I think the bottom end of the market you need to investigate yourself, because I don't have any real answers there, we feel that first of all, we should be getting more information on the cements, more information on the results of the cements and probably closer ties between the organisations. We don't get that information. If I take an example, when it comes to test certificates, we used Anglo-Alpha in Lesotho. We set up an arrangement for the test certificates. They came through bang, bang, there was no problem. But you have to set it up, the same thing happened at Project Eagle. Why when we actually start a job is that not automatic. There are certain things that you supply to us automatically. You should, when you provide a quote on cement, suggest it comes from the following factory. These are the historical results over the last 12 months to help you with your mix designs. At this point in time we say well OPC 360 kilos per cube or 280 kilos per cube or do what ever, and what the estimator is doing is talking information which is macro, and some of the plants, such as Blue Circle I know can produce much much higher strengths for OPC than some of the Anglo-Alpha or PPC plants. Now if you have that information at your finger tips, "A" it is not good for you guys because we are going to reduce the cement content, "B" we can produce a much more competitive price and "C" you feel very much more comfortable with what you are putting in. So we feel that there must be background information which must be provided, they are meant to be with the statistics provided to SAFCEC by the parties. But if somebody comes along and says I'd like a quote for 10 000 or 1000 tons of cement, surely there should be some basic information to say would you like the following pieces of information. What do you need when you are awarded the job. Do you want the test certificates, do you want this, do you want that, do you want the next thing?

SS It's almost like putting in a bid.

HM Absolutely, that's what you are going to be doing, you don't have a closed market.

QUESTION 3

First of all a wider range of cements, I think you stand a fighting chance of confusing the industry if you put too many different variations on the market. I think we have got an enormous amount of variations at this point in time and I think there is a certain degree of confusion already.

SS *For example France have 166 different cement types such as low heat of hydration, sulphate resistant cement, and so on.*

HM I think you have to keep it to a reasonable range. The list that was proposed at the last SACPA meeting was probably a fairly realistic list. I think there was somewhere in the order of twenty different types of cement. One doesn't really need to have 166 different types of cement, lets be quite honest about that. There will be special cases where we end up blending things in. I just take Columbus as an example, we actually had four silos on each plant. The reason that we had four silos is that we actually had various mix permutations and combinations. I wasn't that close to it, but we did have fly ash at one stage, slag, PFA. I know that all our mixes had OPC and PFA and either slag or fly ash. We started with fly ash and ended with slag because we found it performed better. In those specific circumstances, you will find the bigger contractors will blend themselves. So you don't need to have 166 different variants because the sophisticates user will generate his 166 different variants by sticking up a couple of extra silos. I think you just limit it to the same basic cements. If you are looking at high improved performance cements, quite frankly, I'm happy to pay for RHPC. We used RHPC extensively on the Lesotho highlands project on the Malimabatsu bridge for the piers and the deck. The balance of the work was OPC. The reason for that, obviously, with the piers was that we could get a better sliding rate in the colder weather because the hydration tends to chase your reaction, it doesn't set any quicker which is a bit of a misnomer and I always find that quite confusing because everybody thinks it's going to set quicker. We obviously used it on the deck because we required to stress it on the next Monday. We required 30MPa in 48 hours. So there are circumstances, I used RHPC in Oshakati because I could actually reduce the cement content and with the haulage it actually worked out cheaper than OPC. So one looks at the type of construction, one looks at maybe stripping time on shutters. In some cases we would use higher strength mixes or rapid hardening where we want to get our shutters out quickly, or in fact when it does work out to be more economical when you are looking at long haul distances.

QUESTION 4

We use the PCI extensively. We actually had an internal laboratory ourselves. I made the

decision, it must be five years ago now to close the internal laboratory down, because at the end of the day it is actually stupid to have a lab yourself and a lab at the PCI when neither party was in fact gaining the benefit to what I would call scale. I think that the PCI must be seen as an absolutely impartial body, not linked to the cement companies at all, and must be there to provide technical support when it comes to looking at contracts at the initial stages. Obviously it must be able to provide mix designs, aggregate assessment support and obviously, if you have any hassles along the way and God forbid, but unfortunately they do happen, it must be able to provide that support. I see it as being a bit more of a one stop shop. Obviously it has got to be done on a confidential basis. I know they do that right now, so I actually have no difficulty with that or else I wouldn't use them, or the various contractors. Now obviously that gets a little difficult as contractors by their very own nature are helluva suspicious bunch of people and that's why you find a lot of people don't use the PCI because they think well we can actually do it better in-house. But I think the PCI in fact have a very good role to play.

I believe it should be utilised more by the industry not that I can tell the rest of the industry to do that, that's their decision. Obviously it has to have a wide range of expertise. It's better to have that in one place because it's no ways that PPC or Anglo-Alpha or Blue Circle can provide the wide spectrum of information, I think it is up to the cement suppliers to provide cement specific information. I think when it comes to mix designs and all the rest of it, that must come from the PCI.

SS *Hilton, I'm sure one of the facilities that your organisation has made a lot of use of is the training facilities.*

HM Oh yes. We have made a lot of use of that and I think it is an excellent facility.

QUESTION 5

I think it presents opportunities and threats, lets be quite honest about that. First of all if we look at Anglo-Alpha, if I'm not mistaken they have Pioneer, Hippo and the cement suppliers, is it Macdonald and Volk?

SS *That's correct, as Cooper and de Beer and M. Fihrer and Sons have been structured as PPC transparent.*

HM That's correct, I got the letter the other day. If you are looking at aggregates, my only concern is that where you have a readymix company, a cement company and an aggregate supplier in one geographical area, lets say Johannesburg. If you want to put up a big plant, your aggregate price could be higher and that may knock you out. So my only difficulty with that is that they actually have the opportunity to play the numbers around the triangle, if I can put it in that way. On the other hand it is

probably good business practice for them, because they have more opportunities for a bite a the cherry. As long as it doesn't get to a point where you end up with just simply one player in an area and no alternative sources, then I don't see it being a problem because it is going to keep us competitive at all times. Competition must be there if you have that situation, to ensure that the three way split doesn't work against you all the time. But I can understand that Pioneer will say that we would like to supply the ready mix concrete to job "A" and to do that we will supply to you at R200 per cube. But then they say well we are going to supply it from Hippo, we are going to get the cement from there and we are going to sell the concrete, so we're going to get the entire Kish-caboodle. If I only sell the aggregate and he buys the cement from somewhere else, I'm not making such a good deal. Now if you have got an alternative aggregate source and alternative cement source and you can do what you want to, then I don't see it being a problem.

QUESTION 6

Well we do often change the blends because of the requirements. But I think again you will confuse the market place and push up the price because there is not a great volume requirement. We will stick a plant up on these big projects and simply do the blends as required. For example some mixes may get 50 percent fly ash because of specific requirements or slag or whatever the case is. I know a case where we have actually put in 70 percent slag.

You also obviously have that facility with the readymix guys who can draw from each silo as they need. So again I don't believe that you need to get carried away. It is only the small guys that actually have a problem in that respect because they don't have batch plants that can do the necessary blending.

I think you have enough categories of cement out there already. You have enough categories to confuse the whole world. In general you find the guy who will plaster the wall of your house will use the cheapest cement he can find.

QUESTION 7

I've sat and listened to all the discussion on the code and must admit I feel very positive about it, because its going to mean that everybody who puts a number on this bag will have to achieve a certain minimum requirement. Obviously there is a certain window. It still has to be proved through statistical analysis which has so far proved otherwise. I think if one looks at it properly and I think it is still subject to review at a SACPA and SAFCEC committee, is that we may end up with a cement that is a lot more consistent. Therefore the variability that we can get on site would be a lot less. My original concern was that it would result in cement that was less consistent because statistically it impacts with 0 100.

We could fall outside the realms of 0 100. It hasn't been proved either way yet but my instinctive feeling at this point in time after having extensive discussions with Graham Grieve, is that it probably will improve the situation for contractors now.

QUESTION 8

I'd have great difficulty with that. The reason I would have great difficulty is that PPC for example are very strong in ceratin areas. Anglo-Alpha and Blue Circle are very strong in others. I think that the is pure positioning of the various factories. If for example, everything was going to come form PPC we could end up being non competitive in other areas. I think that is something that is quite important, that we actually keep an open market. Fuel is nationally available. Shell will provide to us anywhere in the country. We do use within LTA, Shell the whole way through South Africa. We do have other divisions where we do use other suppliers. Outside the country at the moment we're using Total Elf. I think you have to be very careful that you actually lock yourselves in. It's a bit like joint ventures, I can maybe use that as an example. We don't actually strike up a joint venture with any contracting company and they don't with us. We look at it from project to project. We look at the benefits. We look at the upside, we look at the down side and what it is going to bring to both parties. I think we have to do the same with cement.

QUESTION 9

Let's just run though it. We obviously discussed the PCI, support that we think is needed from yourselves. On the delivery side of life we haven't discussed anything on that at all.

SS *Have you experienced any losses, product on order that has not been delivered or so called leakage. Certain contractors have experienced fairly severe losses.*

HM I think if you look at any job you find certain cases where they have actually lost cement. Generally on the bigger jobs we stick in a weight bridge to make sure you buggers pump your tankers empty. But lets be honest, there are about 4 000 new tricks that these guys come up with. They come along and blow 75 percent of their tanker out and they then disappear or blow some of the tanker off somewhere else. Lets be honest, its only the very big jobs that you can put a weight bridge on. A weight bridge costs about R100 000 so you have to have a lot of cement to justify a weigh bridge. We found that in certain cases there is up to 5 tons sitting in the tanker when the guy has left.

SS *What about a tracking system in major areas of consumption.*

HM We have discussed tanker seals at length. But everyone has decided that there are enough orifices on a tanker and they are probably, where anybody can do anything.

Tracking, probably not a silly idea because someone has to stop and off-load.

The other aspect is tankers used for different products, and thus contamination. We have had a problem in that area, I'm just trying to think where it was, in fact I think it was a tanker that was used for lime before. That doesn't cause you too much of a headache.

Another question I should ask you is that if we were to transport to a railhead in the middle of nowhere. Do you actually provide transport from that point to the site.

SS I think in the new competitive environment one needs to look at the whole bid and that should take that into account.

HM You guys ship the stuff out and say thanks very much its going to siding 37 and we would like our money within 7 days. If we actually don't pay you buy the end of the month, you will actually suspend LTA'S order. We have had a situation like this and it is actually a bit frustrating, where we have actually queried that trucks haven't pitched. We say look, we're not going to pay for those trucks as they actually haven't pitched within the time frame. Normally they're going to be dispatched and we know it takes a week. We allow a week extra, if they haven't arrived, we are not sure where that truck is. Therefore we say please tell us where the truck is, we can't pay for it until we know where the bloody truck is. Maybe its been off loaded by somebody else. We have actually had the threatening letters here saying that they will cut off our entire cement supplies unless we have actually paid our entire bill.

SS It is not really a credit issue, that sounds crazy.

HM Absolutely, we find it a little bit frustrating, its hell-of-a strong arm tactics by the cement suppliers. It goes down like a lead balloon, I'll be quite honest with you. If LTA is not going to pay you I don't know who else will.

SS The future focus will include relationship issues and if you take that to its logical conclusion, that's a situation that is not acceptable.

HM I think you need to look at your accounting side of life, you need to look at the full service, right out to the site, all of that needs to be looked at.

The above situation has happened to us twice and creates a great deal of excitement. I won't tell you what I told them.

SS Hilton thanks a lot for giving up your valuable time, I know you guys are very tied up. Your input has been much appreciated and I will certainly provide feedback to our guys on the issues you have raised.

Mail Survey Questionnaire

An example of the mail survey questionnaire, administered to eight respondents from each of the nine construction companies listed on the JSE, is attached.

CEMENT INDUSTRY : RESEARCH QUESTIONNAIRE

TECHNICAL SUPPORT: CONSTRUCTION MARKET SECTOR

Questionnaire Number [ ][ ][ ] 1-3

The following research questionnaire has been compiled by Spencer Sephton, in partial fulfilment of the MBL degree through the SBL at UNISA.

Kindly complete the following information:

Respondent's Position (Place a cross in the appropriate box).

Contracts Manager	1
Site Agent	2
Concrete Engineer	3
Concrete Technologist	4
Other (Please specify)	5

4

Nature of Site or activity (Place a cross in the box that **best** describes your main activity).

Township	1
Services	2
Roads & Construction	3
Water Reticulation	4
Building	5
Housing	6
Concrete Technology	7
Other (Please specify)	8

5

Company: _____ [ ][ ] 6-7

Site: _____ [ ][ ] 8-9

Town/City: _____ [ ][ ] 10-11

Province: _____ [ ][ ] 12-13

Respondent's Name (optional): _____

CEMENT INDUSTRY : RESEARCH QUESTIONNAIRE

TECHNICAL SUPPORT : CONSTRUCTION MARKET SECTOR

Please note that your response to the following statements represents your opinion and there are no right or wrong answers.

Would you please rank each of the following technical support services, which could be offered by cement manufacturers, in the boxes provided to indicate their value to your operation.
i.e. 1 = most valued, 10 = least valued.

Please note that each item should have a unique rating. ie. No two blocks should have the same number. Hence, try and make a choice in cases where you rate the items very closely.

1.1	Written product information, including basic cement application and trial mixes. (eg. Booklets & brochures.)		14-15
1.2	Access to database on cement performance, strength and consistency.		16-17
1.3	Access to a comprehensive aggregate database.		18-19
1.4	Appropriate cement and concrete courses for staff.		20-21
1.5	Mix design support and materials costing from tender stage to on site batching and placing.		22-23
1.6	Site testing of concrete, including assistance with the evaluation and presentation of results for quality control and compliance with specifications.		24-25
1.7	On-site trouble-shooting, including non-destructive testing and coring.		26-27
1.8	Product application and innovation (eg. Light weight concrete, high strength concrete etc.)		28-29
1.9	Technical Hotline.		30-31
1.10	Appropriate practical training and skills transfer for production staff.		32-33

Please indicate your response to the following statements by placing a cross in the appropriate box.

2.1 Cement manufacturers should be actively involved in lobbying for appropriate cement and concrete applications such as concrete pavement construction.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

34

2.2 Cement manufacturers should further increase their ownership of readymix concrete organisations.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

35

2.3 Cement manufacturers should **not** be involved with aggregate supply to the construction industry.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

36

2.4 The cement industry should provide batching plants on site as an alternative to readymix concrete.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

37

2.5 It would be useful for cement manufacturers to take over concrete site testing, evaluation and presentation of results as a service on contracts.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

38

2.6 The PCI will be irrelevant in a post cartel cement industry.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

39

2.7 There is no need for independent cement & concrete testing organisations.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

40

2.8 Cement manufacturers should actively advise consultants on technical matters relating to cement and concrete application, such as durability issues, specifications, etc.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

41

2.9 The range of cement types on offer should be kept to a minimum.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

42

2.10 Contractors only buy on price.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

43

2.11 All cementitious products should carry the SABS mark.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

44

2.12 Chemical admixtures will be used on an increasing basis in concrete mixes .

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

45

2.13 Cement manufacturers should be capable of supplying multiple blends in proportions that meet the requirements of contractors. (eg. Blends of Portland cement, fly ash and slag.)

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

45

2.14 Alkali Aggregate Reaction (AAR) is not the concern of cement manufacturers.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

47

2.15 Cement manufacturers need to be actively involved to improve the durability of concrete in practice. (i.e. corrosion, carbonation, sulphate resistance, curing, cover to reinforcing, etc.)

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

48

2.16 Cement manufacturers need to supply silica fume for specific concrete applications.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

49

2.17 Contractors are not prepared to pay a higher price for better quality cement and technical support.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree

50

Further comments:

Response to Mail Survey

A section was allowed for in the mail survey for general comments. The comment received are attached herewith.

Seven respondents made use of the opportunity to offer general comments and their details and remarks are recorded below:

A. Stocks Construction Rand Pty Ltd
Respondent No. 12
Hennie Nel : Contracts Manager

Building cement manufacturers must stop the use of 50/50 cement and slag completely.

B. Concor Construction
Respondent No. 15
Richard Taimes : Concrete Technologist
: Group Laboratory

Question 2.14 : Alkali Aggregate Reaction (AAR) is not the concern of cement manufacturers.

Response : The choice of cement in areas such as the Western Cape is limited and extenders are uneconomical to use in this area, which has mostly reactive aggregates.

Question 2.17 : Contractors are not prepared to pay a higher price for better quality cement and technical support.

Response : Perhaps one would be able to distinguish more clearly which company offers the best cement, technical support and most reasonable price once the cartel is no longer existent. Cement producers will understandably improve their quality and technical support to get a bigger slice once they start competing directly against each other in a post-cartel era.

C. LTA Civil Engineering
Respondent No.36
Chris Beaumont : Contracts Director
: Roads and Construction

Cement manufacturers should be more open when they experience problems in manufacture. A recent case led to major problems throughout the construction industry and also involved readymix suppliers. The particular manufacturer tried to remain very quiet on the whole issue instead of cooperating with contractors to solve the problem. (Referring to problems experienced by Blue Circle with poor

strength development in 1995.)

D. Ground Engineering and Piling
(A division of LTA Construction Limited)
Respondent No. 39
Mark Laidlaw : Controls Manager
: Piling

As piling contractors, 90% of our concrete requirements are serviced through readymixed concrete suppliers. Quality control and conformity between mixes is never entirely satisfactory.

Other areas involve grouts, both with or without sands. This appears to be a "mystical" area as regards to most concrete "experts". Improved technical advice is greatly needed.

E. LTA Civil Engineering
Respondent No. 40
M. Parker : Project Manager
: Industrial Plant

The sooner the cement cartel ceases to exist the better off the construction industry will be. An open, free, transparent market will in my opinion, result in the following:

1. A more competitive market.
2. A closer working relationship between both parties.
3. A higher standard of service, from tender stage to and through the construction stage.
4. Greater technical support and input from the cement industry.

F. LTA Civil Engineering
Respondent No. 41
Bill Greenfield : Buyer

Question 2.12 : Chemical admixtures will be used on an increasing basis in concrete mixes.

Response : We think the tendency to use additives will increase but question the **need** in many cases!

G. Group 5 Goldstein Building
Respondent No. 47

Ian Vos : Contracts Manager
: Building

Pozzolanic cement replacement materials will increasingly be used in concrete. The products as well as chemical additives are not in the interests of cement manufacturers as they are aimed at reducing cement contents in concrete. Consequently, literature and recommendations from organisations associated with cement manufacturers tends to be biased against their use. This attitude extends to consulting practices as well.

Mail Survey Data Sheet

The attached Lotus Spreadsheet consists of a summary of the raw data accumulated from the mail survey. The numeric data was saved as an ASCII file and input into UNISA's SAS statistical software package.

Three printouts were generated by user B. Strasheim, Room "B3-OR", UNISA main campus, Department of Computer Services.

1. Printout: Tue Nov 07, 10:13:35 1995 (P1 - P52)

   - SAS System Frequency Evaluation
   - SAS System Mean and Standard Deviation ranking
     Responses to 1 to 10 (Option ranking)
     Question 1 to 17 (5-point scale)
   - SAS System Cross tabulation with Chi-square.
   - SAS System 6 factor correlation by Eigen values
     6 factors retained by Minegan criteria.

2. Printout: Mon 06, 14:20:56 1995 (P1 - P13)

   Correlation of responses based on two levels of management as well as coastal and inland responses.

3. Printout: Tues 07, 10:34:50 1995 (P1 - P2)

   T-test on 4 factors, namely higher and lower levels of management and coastal and inland responses.

The 67 pages of printout were evaluated in Chapter 5, but were not included in this Appendix due to the bulk of material involved.

Company	Name	Position	Site	Town	Province	No.	ID	Pos	Type	Co.	Site	Town	Prov	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	2.1	2.2	2	2.4	2.5	2.6	2.7	2.8	2.9	2.10	2.11	2.12	2.13	2.14	2.15	2.16	2.17	Comments	Resp/Co
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Basil Read	Hugo Cartier	CM		Durban	KZN	1	1	1	3	1	2	1	5	6	7	6	5	2	1	3	10	9	4	4	4	4	1	4	1	2	4	2	4	5	4	3	2	4	3	2	Nil	1
Basil Read	Deon de Jager	SA	Winburg	Winburg	Free State	2	2	2	3	1	1	2	4	4	8	7	1	9	10	6	3	5	2	4	5	3	1	4	3	1	4	5	5	5	5	5	3	5	3	2	Nil	2
Basil Read	Jimmy Saydom	CM	Winburg	Winburg	Free State	3	3	1	3	1	1	1	4	6	5	4	3	1	2	7	10	9	6	3	2	3	1	4	4	1	4	3	4	5	3	4	1	5	3	4	Nil	3
Basil Read	Barry Leech	BA	Winburg	Winburg	Free State	4	4	2	3	1	1	2	4	10	7	2	6	1	5	3	9	8	4	2	4	1	4	3	2	1	4	4	4	3	4	5	1	4	3	4	Nil	4
Basil Read	Marius Heyns	CM		Boksburg	Gauteng	5	5	1	3	1	1	1	6	6	7	10	2	1	4	5	9	6	3	4	3	3	2	4	2	2	3	3	3	4	4	3	2	4	4	3	Nil	5
Basil Read	K Mazur	CM	Masaru Bridge	Masaru	Free State	6	6	1	3	1	1	1	4	5	6	10	4	1	3	2	9	7	8	4	3	3	2	4	2	2	4	4	4	4	4	3	4	4	3	4	Nil	6
Basil Read	Zybrand van Dyk	CM	Pietersburg	Pietersburg	N Prov.	7	7	1	3	1	1	1	8	8	6	9	4	3	1	2	7	10	5	3	4	4	4	4	2	2	4	2	4	4	2	4	3	4	3	2	Nil	7
Basil Read	Paul Bramhall	CM	Middelburg	Middelburg	Mpum	8	8	1	3	1	1	1	9	4	10	9	5	1	2	3	8	6	7	3	3	4	4	4	2	2	4	2	4	4	5	4	1	4	4	4	Nil	8
Stocks & Stocks	Hennie Nel	CM	Sandton	Sandton	Gauteng	9	12	1	5	2	1	1	6	8	3	9	4	1	2	5	10	7	6	4	2	4	2	2	2	1	4	5	2	4	4	2	2	4	4	2	A	1
Stocks & Stocks	Pieter van Niekerk	CM	Sandton	Sandton	Gauteng	10	16	1	5	2	1	1	6	10	1	2	9	8	4	7	3	6	5	1	1	5	1	5	1	1	5	1	5	5	5	5	3	5	5	5	Nil	2
Concor	Tonny Fernandes	CM	JHB	JHB	Gauteng	11	20	1	3	3	1	1	6	8	8	2	4	3	1	6	10	5	7	3	3	3	2	2	1	2	4	4	4	5	4	4	2	4	4	4	Nil	1
Concor	Brian Robertson	CM	Midrand	Midrand	Gauteng	12	21	1	3	3	1	1	6	5	4	8	6	1	2	3	7	10	6	4	4	2	2	3	2	2	4	3	2	4	4	4	3	5	3	3	Nil	2
Concor	John Millward	Estim.	JHB	JHB	Gauteng	13	23	5	3	3	1	2	6	6	7	5	10	1	4	3	2	8	9	3	2	3	3	3	2	2	4	4	3	4	4	4	2	4	4	3	Nil	3
Concor	S Kelgrdy-Smith	CM	South Deep	Westonaria	Gauteng	14	25	1	3	3	1	1	6	6	2	3	5	8	9	1	4	10	7	5	2	2	2	2	1	1	4	2	4	4	4	4	1	5	4	2	Nil	4
Concor	Richard Tomes	CT	Lab	JHB	Gauteng	15	26	4	7	3	1	2	6	2	1	4	7	10	9	8	3	5	6	5	1	5	1	1	1	1	5	5	1	5	1	5	1	1	5	4	B	5
Concor	Gordon Cook	SA	JHB	JHB	Gauteng	16	27	2	6	3	1	1	6	5	7	8	10	2	3	1	4	9	8	4	2	4	3	3	3	2	4	4	4	4	3	4	3	4	3	4	Nil	6
Concor	Sorbar Gertzen	CT	JHB	JHB	Gauteng	17	28	4	7	3	1	2	6	2	1	6	8	10	7	5	4	3	9	5	1	5	1	1	1	1	5	5	1	5	1	5	1	1	5	1	Nil	7
Grinaker	J Finch	CM	Springs	Springs	Gauteng	18	32	1	5	4	1	1	6	6	7	1	10	5	2	3	4	9	8	4	2	5	1	1	1	2	4	4	4	4	4	4	2	4	4	4	Nil	1
Grinaker	B Kamstra	CM	JHB	JHB	Gauteng	19	35	1	3	4	1	1	6	3	1	4	2	5	10	6	9	8	7	4	3	2	2	4	2	2	4	3	4	4	3	4	2	4	4	2	Nil	2
Grinaker	Neels Pienaar	SA	Macadodorp	Machadodorp	Mpum	20	36	2	6	4	1	2	9	1	10	3	2	6	8	4	5	9	7	4	3	2	4	3	1	1	5	4	4	4	2	4	1	4	3	3	Nil	3
Grinaker	R Evans	SA	Majuba Rail	Volksrust	Mpum	21	37	2	3	4	1	2	9	8	3	4	7	8	9	5	2	1	10	2	2	3	2	2	1	1	5	2	3	5	4	4	3	3	4	2	Nil	4
Grinaker	S O'Dell	SA	Twistdraai	Secunda	Mpum	22	38	2	3	4	1	2	9	5	10	7	3	4	9	6	6	1	2	4	2	3	4	4	3	2	5	4	4	5	3	4	2	4	3	2	Nil	5
Ovcon	Mike Lewis	CM	Not available	Not available	W Cape	23	40	1	5	5	2	1	1	5	6	10	1	3	7	9	8	4	2	4	3	3	2	4	2	2	4	4	2	3	3	4	2	5	4	2	Nil	1
Ovcon	Nick McKinley	CM	Cape Town	Cape Town	W Cape	24	41	1	3	5	2	1	1	2	4	8	6	3	1	5	10	9	7	4	2	4	2	2	2	2	5	4	2	4	4	4	1	5	4	2	Nil	2
Ovcon	C Stewart-Smith	SA	Durdenville	Durbanville	W Cape	25	44	2	5	5	2	2	1	6	9	10	4	1	2	3	7	8	5	3	2	4	1	4	1	2	5	4	4	4	2	4	1	5	3	2	Nil	3
Ovcon	Doug Gordon	SA	Brackenfell	Brackenfell	W Cape	26	45	2	5	5	2	2	1	4	6	7	5	2	3	1	8	10	9	4	2	4	4	2	2	2	4	4	2	4	3	4	1	4	3	4	Nil	4
Ovcon	Jon Jasback	SA	Kalls River	Cape Town	W Cape	27	47	2	3	5	2	2	1	10	6	7	1	5	8	4	9	3	2	4	3	3	2	2	1	1	4	2	3	4	4	4	2	4	4	2	Nil	5
Ovcon	Jonathan Stevens	SA	Goodwood	Cape Town	W Cape	28	48	2	5	5	2	2	1	6	9	10	2	6	5	3	7	1	4	3	4	2	2	4	3	2	5	2	4	4	4	3	2	4	3	2	Nil	6
M&R	Tony Mann	DIR	Bedfordview	JHB	Gauteng	29	50	5	3	6	1	1	6	7	1	6	5	2	10	8	9	3	4	3	2	3	2	1	2	1	4	2	2	5	4	4	3	3	2	2	Nil	1
M&R	A Hawcroft	CM	Nsboomspruit	Naboom.	N Prov.	30	52	1	3	6	1	1	6	10	4	3	7	1	2	5	6	9	6	3	2	3	2	5	2	2	4	2	2	4	3	4	2	4	4	4	Nil	2
M&R	Anon	CM	Nsboomspruit	Naboom.	N Prov.	31	53	1	3	6	1	1	6	3	6	7	6	1	2	9	10	4	5	2	4	4	4	4	2	1	5	3	2	5	3	4	2	5	4	2	Nil	3
M&R	Malcolm White	CM	Columbus	Middelburg	Mpum	32	56	1	6	6	1	1	9	7	8	10	2	1	3	9	8	5	4	4	1	3	4	4	2	2	4	4	2	4	4	4	2	4	4	2	Nil	4
M&R	Anon	CM	Not Available	JHB	Gauteng	33	55	1	3	6	1	1	6	9	1	10	6	8	7	5	3	2	4	3	3	3	3	3	1	1	4	2	2	4	4	4	1	5	4	2	Nil	5
M&R	Andy Blamire	BA	Nsboomspruit	Nsboomspruit	N Prov.	34	57	2	6	6	1	2	6	6	1	2	10	7	8	5	3	4	9	4	2	4	2	2	1	1	4	4	4	4	4	4	2	3	4	4	Nil	6
M&R	Anon	SA	Nsboomspruit	Nsboomspruit	N Prov.	35	58	2	3	6	1	2	6	7	4	6	2	3	1	5	10	9	8	3	2	3	3	2	3	1	4	2	4	4	4	3	2	4	3	4	Nil	7
LTA	Chris Beaumont	CM	Kempton Park	Kempton Park	Gauteng	36	60	1	3	7	1	1	6	6	3	4	9	1	6	2	7	5	10	5	2	5	1	2	1	1	5	2	2	5	5	5	4	4	3	4	C	1
LTA	S Ackerman	DIR	Kempton Park	Kempton Park	Gauteng	37	61	5	6	7	1	1	6	2	5	4	7	10	9	8	3	1	6	3	1	5	2	4	2	2	4	3	4	4	4	4	2	4	4	2	Nil	2
LTA	P Meldinger	Alt. Dir	Colombus	Middelburg	Mpum	38	62	5	6	7	1	1	9	9	8	10	2	1	3	5	4	7	6	5	1	5	2	4	2	1	5	2	2	4	4	4	2	4	4	2	Nil	3
LTA	Mark Leibbrandt	CM	Kempton Park	Kempton Park	Gauteng	39	64	1	6	7	1	1	6	6	10	9	5	4	7	2	6	3	1	4	4	2	2	4	2	2	4	4	2	4	4	4	2	4	4	2	D	4
LTA	M W Parker	BA	Wadeville	Germiston	Gauteng	40	65	2	6	7	1	2	6	10	6	7	6	1	2	9	4	3	5	4	3	2	2	4	2	1	5	2	2	4	3	4	1	4	3	2	E	5
LTA	Bill Greenfield	CE	Kempton Park	Kempton Park	Gauteng	41	66	3	7	7	1	2	6	7	8	9	6	1	2	3	4	5	10	4	2	4	2	2	2	1	4	2	1	4	4	4	4	4	4	2	F	6
Group 5	P Muller	CM	Kempton Park	Kempton Park	Gauteng	42	71	1	6	8	1	1	6	3	7	2	6	1	10	9	4	8	5	5	3	3	2	4	2	2	4	4	2	4	4	4	2	4	3	2	Nil	1
Group 5	P Keenan	CM	Kempton Park	Kempton Park	Gauteng	43	73	1	6	8	1	1	6	2	1	4	6	9	5	10	3	8	7	4	2	4	2	4	3	2	4	2	4	4	4	4	3	2	4	4	Nil	2
Group 5	W Meyburg	CM	Kempton Park	Kempton Park	Gauteng	44	74	1	6	8	1	1	6	1	2	10	8	3	4	5	7	6	9	3	2	4	3	2	2	2	4	4	2	4	4	2	2	4	4	2	Nil	3
Goldstein	A de Wet	CM	Tembe	Hammanskraal	NW Prov	45	80	1	6	9	1	1	7	7	6	5	8	1	10	9	4	2	3	3	4	4	1	2	4	2	4	2	4	4	4	4	2	4	4	4	Nil	1
Goldstein	N Brown	SA	JHB	JHB	Gauteng	46	81	2	5	9	1	2	6	3	9	6	5	1	4	7	10	2	8	3	4	4	3	4	3	2	4	2	3	4	4	4	2	3	4	2	Nil	2
Goldstein	Ian Vos	CM	JHB	JHB	Gauteng	47	82	1	5	9	1	1	6	2	1	7	5	8	10	9	4	3	6	4	2	4	3	1	4	1	5	1	3	5	5	4	1	5	5	2	G	3
+ve or negative question														+	+	-	+	+	-	-	+	-	+	+	+	+	-	+	+	-												

Notes

Column 1 : Respondent ID
Column 2 : Position in company
Column 3 : Nature of o/h or activity
Column 4 : Company ID
Column 5 : Site : Use for geographic locality, where 1 = inland and 2 = coastal
Column 6 : Town/City : Use for level of management, where 1 = Contracts manager (CM) and higher and 2 = lower than CM
Column 7 : Province : Use head office where work is national.
Column 8 -17 : Rating of technical service options.
Column 18 -34 : Questionnaire response where;
1 = Totally disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Totally agree

UNISA SBL Correspondence

1. Letter of confirmation of confidentiality of report: Prof. MA Ferreira

2. Letter of Introduction: Prof. GPJ Pelser

UNISA GRADUATE SCHOOL
OF BUSINESS LEADERSHIP

1995-08-11

Mr Spencer Sephton
P O Box 1016
OLIVEDALE
2158

Dear Mr Sephton

MBL 4 RESEARCH PROJECT: CONFIRMATION OF REQUEST FOR CONFIDENTIALITY

I refer to your letter dated 2 August 1995, and confirm that your request for confidentiality regarding your MBL 4 Research Project will be honoured.

Apart from myself, only the external examiner will read your report, and both copies will be returned to me. The external examiner has also been informed about the need for confidentiality. The report will not be made available to anyone without your prior consent.

Yours sincerely

PROF MA FERREIRA

Leadership in practice

First Street Extension Midrand 1685
PO Box 392 Pretoria 0001
Tel (011) 652-0000 Fax (011) 652-0299

UNISA GRADUATE SCHOOL
OF BUSINESS LEADERSHIP

1995-08-17

TO WHOM IT MAY CONCERN

MR SS SEPHTON (student number 0804-938-6) is a fourth year student of the Master of Business Leadership degree with the Unisa Graduate School of Business Leadership. As part of the study programme he has to do independent research on a certain topic and submit a research report.

We would appreciate your assistance in this regard.

Yours sincerely

PROF GPJ PELSER
DIRECTOR : MBL 4

Leadership in practice

First Street Extension Midrand 1685
PO Box 392 Pretoria 0001
Tel (011) 652-0000 Fax (011) 652-0299

Knowledge Products

Also referred to as experience products, these products typically have a derived demand and have the following distinguishing characteristics:

- Lack of confidence because of intangibility.
- Disadvantaged if wrong choice is made.
- Feel at risk.
- Anxiety in buying.
- Personal recommendation.
- Long-term partnership.
- Prefer not to try something new.
- Difficult to assess quality.
- Guarantees of long-term support.
- Seek opinion of someone knowledgeable.
- Enhances ability to perform.
- Appearance of staff as cue to quality.

In South Africa, cement is in the mature phase of the product life cycle in the formal market and has a demand that is highly correlated with the GDFI per capita. Many of the above characteristics accurately describe the cement consumers perceptions and hence the relevance of the following four R's:

- Risk reduction.
- Recommendation and references.
- Relationships.
- Realisation of performance.

- The above material was sourced from the lecture material of Professor Russell Abratt, University of the Witwatersrand Business School, for the short course on Product Brand Management, held from 26-28 June 1995.

REFERENCES

Abratt, A. 1995. **Product Brand Management** (Lecture Handout: Short Course) University of the Witwatersrand Business School. Johannesburg

Anglo-Alpha Limited. 1984. **Annual Report 1984.** Group Secretarial Department, Anglo-Alpha Limited. Sandton.

Anglo-Alpha Limited . 1994 . **60th Annual Report 1994.**
Group Secretarial Department, Anglo-Alpha Limited . Sandton

Ash Resources, 1994. **Materials for Today and the Future.** (Corporate brochure).
Ash Resources . Randburg.

Blue Circle Limted. 1989. **Blue Circle Limited 1914 to 1989.** Blue Circle Group, Johannesburg.

Board of Economists, 1995. How long can the upswing last? **Financial Mail,** Nr 26 September 8 1995.

Cembureau, 1991. **Cement Standards of the World 1991,** Brussels : E. Guyot (Printers).

Civil Concerns. **Finance Week.** 19 Oct 1995. Johannesburg.

Contractors Spurn Work on Cheap Housing. **Business Day** 18 Aug 1995. Johannesburg.

Czypionka, N, 1995. Change is Starting to Pay Off - **"Economic Performance and Outlook".** (Address, SAFCEC Convention). Mmbatho.

Dellman, D.A, 1972. Increasing Mail Questionaire Response in Large Samples of the General Public **"Public Opinion Quarterly,** Summer 1972.

Drucker, P.F. 1959. Long range planning : Challenge to management science. **Manegement Science.** April 1959.

Eisenhard, K, 1990. Speed and Strategic Choice : How Managers Accelerate Decison Making. **California Management Review No. 32.**

Emory, C.W, Cooper, D.R. 1991. **Business Research Methods.** 4th Edition. Boston : Irwin.

Fourie, L. J, and Van den Bogaerde, F, 1991. **Basic Macro-Economics.** 3rd Edition Pretoria : Van Schaik.

Fourie, F. C. v N, Smith, A. The South African Cement Cartel: An Economic Evaluation.**The Soutb African Journal of Economics,** 62, 2, 1994.

Germina, M, (Anglo Alpha Director) 1995. Cement Industry Stands on Solid Ground Despite Cartel's Demise, **Sunday Times,** 22 Oct 1995.

Grant, R. M,1995. **Contemporary Strategic Analysis.** 2 nd Eddition. Chambridge, Ma. : Blackwell Publishers.

Greenly,G.E, 1986. **The Strategic and Operational Planning of Marketing.** Berkshire: McGraw-Hill.

Harris, G. **Scenario Strategic Planning.** (Personal notes: Addressing the the Annual Congress of the SAICE) : Durban. April 1993.

Hodgkiss, JE, 1993. The South African Cement Industry in 1992. **Zement - Kalk - Gips.** (Magazine), Nr.3/1993.

Kerlinger, F.N. 1986. **Foundations of Behavioral Research.**3rd Edition. New York: Rinehart and Winston.

Knutson, M, **Personal Discussion,** President, American Concrete Paving Association (ACPA), Arlington Heights. Illinois.

Kosmatka, S.H, 1995. Portland Cement Association (PCA). **Personal Discussion.** Skokie, Illinois.

Kruger, Dr. R.A, 1990. **Ten Years of Research into Fly Ash Utilisation.** South African Coal Ash Association, First National Symposium. Pretoria.

Langenhoven, H. RDP and the Dilema of Funding. **The Civil Engineering Contractor.** March 1995.

Lea, Sir F. M, 1974. **Cement and Building from Roman Times to the Twentieth Century.** Public lecture, University of Leads, London, Concrete Society.

Leach, D. F. The South African Cement Cartel: A Criteque of Fourie and Smith. **The South African Journal of Economics,** 62, 3, 1994.

Leach, Dr. D, 1995. The Cartel should stay. **International Cement Review.** (January 1995)

Levin, I.R, Rubin, Rubin, D.S, 1991. **Statistics for Management.** 5 th Eddition. Eaglewood Cliffs, NJ: Prentice-Hall.

Liddel, D, 1994. High Alumina Cement. **(Memo to PPC Cement Executive),** Johannesburg.

Maguire, A, 1991. **Customer Service: Flavour of the Month.** IPM Journal. Nov 1991.

Manning, T. The New Business Environment: **New Minds - New Millennium.** (Personal notes: Addressing the the Annual Congress of the SAICE) : Durban. April 1993.

Mantel, D. G, 1992. **The Manufacture, Properties and Applications of Portland Cements, Cement Additives and Blended Cements.** Penrose Press . Johannesburg.

McCaffrey. R, 1995. Are happy days here again? **International Cement Review.** January 1995. South African Cement Producers Association. 1993. **Annual Review.** Halfway House.

McCarthy, E.J and Perreault, W.D, 1990. **Basic Marketing : A Manegerial Approach,** 10th Edition. Boston : Irwin.

McDonald, M. H. B, 1989. **Marketing Plans: How to Prepare Them: How to Use Them.** 2nd Edition. Oxford: Heinemann Professional Publishing.

Mouton, J, 1995. (Guest lecturer, SBL, Unisa, Feb 1995). Institute of Research Methodology. University of Stellenbosch.

Myers, J.H, 1986. **Marheting**. New York: McGraw-Hill.

Naaidoo and the RDP: Under the Lash. **Financial Mail.** 18 Aug 1995. (p47). Johannesburg.

Oster, M.S, 1994, **Modern Competitive Analysis**. 2nd Edition. New York : Oxford University Press.

Ouchi, W, 1981. Theory 2 : **How Amercian Business Can Meet The Japanese Challenge**. MA, Reading.

Peters, T, 1988. **Thriving on Choas: Handbook for Management Revolution**. London: Guild Publishing.

Pitt, L. 1991. **Lip Service or Funeral Service** : Strategic Marketing in a New Age of Competition (Conference Notes). Marketing Mix March 1991.

Porter, M.E, 1990. **The Competitive Advantage of Nations.** London: The Macmillan Press Ltd.

Porter, M.E, 1980. **Competitve Strategy, Techniques for Analysing Industries and Competitiors**. New York : The Free Press.

Portland Cement Insitute. 1995. **Services and Publications 1995.**
Publications Department, PCI. Midrand.

Portland Cement Institute, 1987. **Practical Guidelines on the Selection and Use of Portland cement, MEBS, Fly Ash and Silica Fume.** Addis, B.J. (Papers for Symposium) . PCI. Midrand.

Pretoria Portland Cement Co. Ltd.. 1992 . **Building on our Strengths 1982-1892.**
Murray R.J PPC. Johannesburg.

Pretorius, J, (MD Anglo Alpha) 1995., Cement Producer Plans Expansion into Namibia, **Martin Creamer's Engineering News,** 2 Oct 1995. Johannesburg.

R24 bn Worth of New Roads on the Cards. **Martin Creamer's Engineering News**. 6 Oct 1995. Johannesburg.

RDP Fund Might Roll Over R2bn. **Business Day**. 7 Sept 1995. Johannesburg.

SACPA. 1994. **Annual Review**. SACPA Halfway House.

Schutte, F.G, 1993. **Integrated Management Systems**. Pretoria : Butterworth Publishers.

Stonich, P.J, 1982. **Making Strategy Happen**. (The Staff of Management Analysis Center : Edited by Stonich). USA. Ballinger Publishing Company.

Strous, P, 1995. Producers Dust off Capacity, **Financial Mail,** 18 Aug 1995. Johannesburg.

Tasker, C, (MD PPC Cement) 1995. Producers Dust off Capacity, **Financial Mail,** 18 Aug 1995. Johannesburg.

The Wasteland Option. **Financial Mail.** 28 July 1995. (p15). Johannesburg.

The Housing Shambles. **Sowetan.** 25 Oct 1995. Johannesburg.

Thompson, A.A, Strickland, A.J, 1993. **Strategic Management : Concepts of Cases.** 7th Edition. Boston : Irwin.