

*In The Name of God*

The Story of  
the Concrete Man

By:

Dr. Ali Asghar Keyhani







## CONTENT

- Introduction: Interaction with the Media	11
- A brief history about Ali Asghar Keyhani	15
<b>About the Year 2003</b>	21
- The registration of the highest concrete's resistance grade	
- Savings of hundreds of millions of dollars by using machine-made street concrete curbs	
- The low-quality street curbs that cost the City of Tehran millions	
- The non-standard factories have to be shutdown	
- Certain performances lead to the closure of the production and manufacturing units	
- Cement brokers and dealers quota; four times the concrete production factories	
- Wastage of twenty five percent of the cement made in Iran	
<b>About the Year 2004</b>	33
- Hidden efforts to increase prices	
- The negative impact of the unauthorized concrete production units	
- Eight important points for producing standard concrete	
- Confronting the unauthorized concrete producer is just talk	
- Iran is among the world's countries with the concrete producing technology	
- Tehran's concrete street curbs are still made manually	
- The factory-made process for Tehran's concrete street curbs	

## 6 The Story of the Concrete Man

hasn't begun yet

- These concrete street curbs are simply not durable
- Reverse engineering; the solution to eliminating the cement issue
- Enough cement to build five standard sport stadiums goes to waste each year in this country
- Honouring the Olympiad students in the absence of the officials
- Changing the consumption trend; the only solution to fixing the country's cement problem
- Distribution of cement in the stock market in need of proper regulatory bylaws

### **About the Year 2005**

82

- Five points for five cement ministers
- Why only Lavizan's trees?!
- Each machine-made curb plays the role of one tree
- The building reinforcement measure; the major forgotten factor
- A look at the solutions for the cement problem
- Each ton of cement; the equivalent of one ton carbon gas
- Closure of civil projects 'for a fistful of dollars'
- Changing the consumption trend is the only solution to fixing the country's cement problem

### **About the Year 2006**

111

- Standard concrete industry's ten percent share of cement production
- Improper and uneven distribution; the cause of market turbulence
- Cement Distribution Committee needs a serious house-cleaning
- Drop in concrete quality is making buildings and structures

unsafe

- Issue of ‘project completion permit; subject to the use of standard concrete
- Government cement policies don’t conform to resistance principles
- Despite enforcing compulsory standards, buildings and other structures still being made using non-standard concrete
- Necessity of having a cooperation agreement
- How can cement distribution problems be resolved?
- Cement Distribution Committee Review

### **About the Year 2007**

132

- How much is the exported cement’s real price?
- Standard concrete producers first convention
- Cement shortage; concrete production’s major problem
- Quality of the domestically produced cement is dropping
- We are buying their cement at the exported cement’s price
- A fifteen-million-ton cement saving
- Cement distribution requires a transparent and clear-cut policy

### **About the Year 2008**

150

- Construction material producers’ criticism
- No excuse is accepted
- Reverse engineering plan to promote correct cement consumption
- No to non-standard measures for standard buildings
- A new record for the country’s pumped concrete pouring

### **About the Year 2009**

165

- Lack of supervision on the proper use of standard construction materials
- Promises must be lived up to

## 8 The Story of the Concrete Man

- Let's not stop talking
- Reverse engineering; the only way to make corrections and reforms
- A way to help save 9,800 litres of diesel fuel
- Let's think about preserving and protecting the construction materials production industries
- Second wave of price drop in construction materials is on the way
- They are coordinated for increasing the prices
- Government should be thinking about protecting the construction materials production industry
- Banks have not joined in the plan to construct housing
- A suggestion to the Housing Minister
- Model for optimum cement consumption has been prepared
- What if manually-made concrete is eliminated
- A record in building reinforcing and retrofitting
- Concrete industry successful in correcting the consumption model
- Commissioning the Middle East's most modern centrally mixed concrete
- Joining the 'final price reduction' movement
- The country's economy has no choice but to goal-orient subsidies

### **About the Year 2010**

- Return of 'Pozzolan' cements threatening building quality
- Reason for executing the building technical identification plan halfway
- Two ways to save the cement industry
- Unprecedented popularity of the Standard Book
- About the Tehran City Council's questions
- Investigation of the transportation of the highest consumed construction material by the Road & Transportation Ministry

- No one will bid standard farewell
- Standard building materials' producers introduction book
- Central mix concrete consumption manual has been published
- Displacement of central mix concrete based on the regulations on transporting perishable materials
- Abacus to calculate construction quality
- Cement and the law on targeted subsidies
- A picture report on the life of an entrepreneur
- IRAN FRAMECO honours and awards



*Introduction*  
*The model of interacting with the media*

Most industrial managers in the private sector have the tendency of purposefully shunning away from and avoiding the mass media. Accordingly, with the rare exceptions, which more often are due to the importance of their respective product, the overall impact of their goods or the services that they offer, the industrialists almost never put forth their views and opinions through the media. In fact, it is quite difficult to find any news, advertisements or articles by the private sector's big organizational managers of the yesteryears in the media of the time. Though, each of these great industrial managers have encouraged and stirred up significant transformations in their corresponding area of work, and are thus considered the fixed end of a wide range of important changes, yet most have never got the chance to leave behind a diary of their life and career's recurring episodes or had the opportunity to put their thoughts and views in writing. The reason for their disinterest and their refusal to take notice of and disregard the media has to be sought in the root of their society's social and cultural structure. The same thing could also be argued about the different guild officials, who only resort to the media at the times of emergency, only to put forth guild-related statistics or introduce their association's role and

## 12 The Story of the Concrete Man

importance to the society.

Notwithstanding, ‘Ali Asghar Keyhani’ may be considered an exception in this regard. Despite the fact that Keyhani’s stepping into the world of media was first initiated by the urgency to pursue what the industry, particularly the construction materials producers, rightfully deserves, but this delicate pursuit of wants and claims most certainly seems to have sat in well with addressees. On par with this, he has planned his business enterprise in such way as to place it at the industry’s forefront of growth and development, which undoubtedly is the society’s obvious and essential need, to use the advancement and promotion of the industry as his main objective of opting to have a presence in the media. To cite an example, when Keyhani happens to be talking about the high durability machine-made street concrete curbs, he intentionally uses the results and data of the relevant official scientific studies and reports to point out the multi-million dollar loss and damages incurred through the utilization of non-standard, low-resistant street curbs in order to ascertain that such a national economic catastrophe does not go unheeded by the media. ‘By using manually-made street curbs, we’re literally throwing away and wasting the equivalent of five standard-sized stadiums annually,’ he says. Although, Keyhani is assertively pursuing the introduction of highly durable, factory standard concrete street curbs into the country’s market, but his determination and efforts in achieving this goal will decidedly benefit the entire community as well. In fact, he is always quick to remind everyone that his Company’s interests are directly tied to that of the nation’s collective interests. So, the topic of standard concrete centres and evolves around this very notion. The utilization of grade quality construction materials is a chief element to strengthening building and structure resistance. This

is why part of Keyhani's constant efforts in pursuing the regulation of standard concrete production and consumption is to create the right market to supply IRAN FRAMECO's (the country's largest producer of standard concrete) manufactured goods.

The realistic approach in dealing with and handling self and collective interests, taken by Keyhani has drawn the media's attention. The method of cement distribution has always been a controversial issue in our country. While many view themselves as the sole possessors of the cement distribution mechanism, it is actually Keyhani, who has succeeded in earning the Building & Housing Research Centre's 'Top Plan Award' by presenting a unique model of cement distribution process from production to consumption. What's more, Keyhani has also been very successful in introducing the concrete and concrete parts and components' industry as one of the main cement distribution contenders. The model, which Keyhani calls the 'reverse engineering model,' defines the correct cement consumption also emphasizes on cement as the major ingredient in making high quality concrete or concrete parts. This is something that is true about all the developed countries, and thereby Keyhani singles out durable, grade concrete's positive effect on the national economy and the preservation of the environment. He argues that when we use one hundred and twenty five litres of fossil fuel to make a ton of cement, whereby releasing over a ton of gaseous contaminants into the air, we shouldn't let workers make it by hand on site. And, the work should be delegated to the concrete production plants equipped with the right type of industrial machinery and accredited laboratories and well-planned quality control systems. In any event, Keyhani can be thought of as the symbol of correct interaction with the media since he was able to

## 14 The Story of the Concrete Man

adequately apply their power to convey his message to entire municipalities across the country regarding the advantages of using fine grade and highly resistant standard construction materials.

This book is comprised of a series of some of Keyhani's recent press articles and interviews, which have been collected in their original context within the pages of a single book. The best thing about this collection is that Keyhani's views have not been subject to editing due to the passing of years and are the exact same views that he still thinks and holds firmly. So, they are now being made available to the public intact, so that people can make a fairer judgment for themselves.

### *All about Ali Asghar Keyhani*

**W**e honour and pay homage to those that never stopped for a moment in their entire lives to diligently work toward the development and betterment of this country. Ever since childhood he sought to put his talent into construction materials and by making an assertive presence in the brick manufacturing industry - as the then most widely used building material - he was able to leave behind a legacy of changes and transformations throughout the industry. In spite of that, earth and soil did not prove to be a strong foundation for the big goals he nurtured in mind, and hence he stepped onto an even larger world called the 'cement and concrete industry.' At the onset, he started off the work with a small mosaic tile production workshop, which required only fifty kilogram of cement daily. However, through effort, due diligence and perseverance, he eventually succeeded in laying the foundation of the country's biggest concrete and concrete parts production factory, namely IRAN FRAMECO and PARS LANEH, which incidentally broke the national concrete production's record in a single day by producing 10,633 tons of concrete. Indeed, an incredible feat considering the staggering increase from just 50kg of cement per day in the early days to 1,620,000kg. Throughout the years ever since IRAN FRAME-

## 16 The Story of the Concrete Man

CO was established under his above exceptional management, he has personally defined many principles for his production unit, but he, unequivocally and without a shred of doubt, has always emphasized on placing ‘honesty’ and ‘quality’ right on the top among them.

Though, cement and the related technology had had a history of eight years in Iran, and the science was being taught in the country’s higher learning centres, still the final product was a far cry from ideal and lacked the necessary conformity with the accepted norm. And so, he set his mind on changing things. During the devastating Iran-Iraq war he dedicated his entire efforts to making pre-fabricated concrete bunkers and field hospitals in the frontlines and by doing so literally saved thousands of lives. In point of fact, he was dispatched to the fronts over twenty one times - something that he is still boasts about proudly. Many war veterans will never forget his innovative concrete bunkers that protected them under heavy enemy artillery bombardments. Next to commissioning advanced production lines with the sole aim and objective of producing an array of high-grade and durable concrete products, drawing the public attention and interest to promoting concrete products’ quality is yet another major step undertaken and managed by this remarkable man. Perhaps, the increase in the concrete street curbs’ durability ratio, made possible by him through twenty five years of ceaseless work and continuous effort, was the initiative’s real achievement. Indeed, all the country’s executive apparatuses and municipalities have finally come to terms and accepted the fact - albeit without so much as a simple thanks to him - after nearly twenty years that the factory-made street curbs, whose process and method was founded and introduced first by IRAN FRAMECO, is the best way for their money.

The change in concrete structural design and production process from the traditional to the industrial is also owed to this man's innovativeness and due diligence. Moreover, the concrete production and consumption literature, which from the beginning of the industry's formation in this country, was derived unscientifically and without giving much attention to the correct engineering specifications, was also completely revised by the gentleman to have it conform to the accepted and conventional global standards.

Although, after the catastrophic earthquakes in the Cities of Rudbar and Manjil (both located in Iran's Gilan Province in the north of the country) his inquisitive mind became focused more than ever before on the importance of using standard building materials, whereby the housing units, which he constructed in 'Manjil' for the earthquake victims were so high quality that they could hardly be matched anywhere across the country. But, in fact, it was the devastating earthquake in the City of Bam in January 2002 that he began to persistently dedicate all of his time and effort to drawing the public's attention to how crucially important observing the building construction standards was, particularly in relation to those that concern construction materials. As a matter of fact, his constant appearance in the media at the time to emphasize on the necessity of confirming to the relevant construction mortars' standards during the entire production, distribution and consumption stages in conjunction to his tireless pursuit and host of conducive proposals and recommendations that literally forced the country's Commission of Ministers to ratify and approve a bill, which ultimately paved the way for significant transitions in building materials' production and use throughout the nation.

## 18 The Story of the Concrete Man

The list of successful initiatives undertaken by him ought to be topped off with the proposal on cement production and consumption that he put forth in the mid-80s to the Ministry of Industries. Though, at the onset, the idea led to the establishment of a specialized company to set up and commission new cement factories, it eventually changed direction and got off the main course, it still managed to have a noticeable impact on the production and consumption equilibrium in the years that followed. The model that the kind gentleman presented called for allowing all the cement consumers to become shareholders in cement manufacturing plants in order to break the monopoly. His unique style of thinking in respect of making and using cement was always critically aware of the importance of bearing the national interests in mind while protecting the environment. Throughout this country's history, the number of those individuals, who concerned themselves with the environmental issues number but few; and he is unquestionably one of them. The cement production process is highly polluting, and that is the reason why most developed countries have prioritized the correct consumption of the material on the top of their national agendas. This is, indeed, the direction that IRAN FRAMECO has taken in recent years in our country. Next to this, he has also kept his eyes and mind on the national wealth and resources, which again is quite admirable and unique in its own right. The low cost of fuel has without a doubt demolished innovation and modernization in Iran's industrial sector. Regrettably, most people getting into production in our country to simply take advantage of the hidden rent-seeking or the manipulation of public economic conditions to reap a profit and not necessarily to help roll along the economic machine. So, hearing something like 'we haven't inherited the earth from our ancestors, but rather have been given it by our

children for safekeeping' is only expressive of the depth and scope of thinking, foresightedness and loyalty to the national interests of a truly one-of-a-kind entrepreneur.

Defining a specific structure that prevents infractions and selling goods at expensive prices has been a main concern of his since early on. And surely, this is the reason that he received the 'Consumers' Protection Certificate' for two consecutive years. In nearly forty years of work and activity, there has never been a single report or complaint about overpricing or underselling goods by the conglomerate under his management. He always warns his personnel about the consequences of these two bad habits in business. At the time that cement prices had skyrocketed, he still sold his based on the government's approved rates. We didn't think that anyone in the cement business could be so fair and not commit any infractions,' he was told by the committee that presented him the 'Consumers' Protection Certificate.' He simply never did and never has believed in the black market. In fact, he prefers to close down his factory than get involved with the cement dealers and brokers. If a customer makes an enquiry into something that he does not believe in producing, he just explains his reasons patiently for refusing. He fought off different elements in Tehran's municipality, who wanted him to just supply hand-made street curbs, and was finally able to convince the City of Tehran that what he had insisted on for twenty years was the right thing despite losing numerous business opportunities throughout all those years. In all the meetings that he had with the different government ministers and other public officials, he just settled on discussing the industry's general interests and welfare, and not once did he speak about his own production unit. 'Our Company's interests are tied to the collective interests, and whenever we do something that the benefits the entire com-

## 20 The Story of the Concrete Man

munity, our Company will surely benefit too,' he maintains.

People tend to update themselves according to the experiences that they gain over the years. And while some may not succeed in retaining them in the long-term, others keep them for years to come. What has been accumulated in his conglomerate ever since the beginning is the derivative of Ali Asghar Keyhani views regarding the most important building and construction mortars, namely cement and concrete - views that undoubtedly express one of the industry's most proficient experts and his firm conviction and commitment to standardization and high-end production.

### *About the Year 2003*

**T**he Year 2003 marks the start of the efforts and endeavours to communicate the importance of addressing the production, quality and consumption of cement and concrete through the mass media. This was the first time that the application of high-grade concrete and concrete-based products was being publicized on a very large scale. The greatest accomplishment of this initiative was the circular that the City of Tehran issued making the use of factory-made and durable concrete street curbs compulsory throughout the City.

#### **Iran Labour News Agency**

**Unified Concrete Industry Association's Managing Director Standard concrete's resistance grading is registered for the first time in the country**

IRAN FRAMECO Production Unit is the country's first company to have ever succeeded in obtaining the permit to use the C50 concrete durability grading sign; the most recent resistance category issued by the country's National Standard Institute.

According to what Engineer Ali Asghar Keyhani - Unified Concrete Industry Association's board member and managing

## 22 The Story of the Concrete Man

director of IRAN FRAMECO - told ILNA news agency, ‘The use of standard and durable-grade concrete not only saves cement and concrete, but also makes buildings and structures more resistant.’ ‘Based on different world bank reports, the volume of investment in Iran’s housing sector is twenty five percent of the total private and national investments.’ By specifying the average age of buildings in Iran to be around thirty five years, Keyhani reiterated, ‘The use of standard and fine quality construction materials can increase the structures’ useful to over one hundred years.’ ‘He further requested that the municipalities across the country make the use of high-quality building and construction mortars compulsory and not issue the necessary permits unless the developers or investors completely comply with the requirement.

### **Iran Labour Report Agency**

#### **The use of factory-made concrete slabs and street curbs can save millions each year**

Using standard machine-made concrete slabs and street curbs can lead to the savings of millions of dollars. Based on what Ali Asghar Keyhani told ILNA Report Agency, the City of Tehran incurs millions of dollars in loss each year due to the use of low-quality street curbs. According, IRAN FRAMECO has offered to provide the City’s municipality with concrete slabs and street curbs that are guaranteed to last for as long as fifteen years. IRAN FRAMECO managing director believes that the country is not facing a cement shortage, but rather wastage due improper use and lack of sufficient know-how in making concrete. ‘By setting up a suitable distribution scheme, we can eliminate the dealers and even be hopeful about importing the product abroad,’ Keyhani said. ‘The building construction industry takes about fifty to sixty percent of the country’s produced concrete. Currently, the cement production standards

are 32.5, 42.5 and 52.5, but given the rich national resources, we can get to 52.5 in nearly every cement factory across the land. However, for the time being, most producers – mainly due to the absence of sufficient technical knowledge - use the 32.5 standard. Though, the Ministry of Industry has specified standard 32.5 for Type 1 cement, it is also encouraging all the producers to use the other standards as well. Furthermore, pursuant to the implemented policy, sixty percent of the country's produces cement is for use by the people, another twenty percent is for various national plans and projects and fifteen percent is allocated to production.'

By citing the non-existence of ample supervision on production as one of the sector's most serious challenges, Keyhani said, 'the lack of necessary supervision on the production has led to the low-quality and high-priced products and caused extensive customer discontent. According to the Act passed by the Construction Engineering Organization in 2002, the use of standard concrete is now compulsory. But, unfortunately despite having such law, there's still literally no supervision on how concrete is made. Most construction projects use C25 and C30, but through extensive research and utilization of novel and up-to-date knowledge IRAN FRAMECO has succeeded in producing C50 grade, which based on the National Standard 6044, is the highest. The Housing & Urban Planning Ministry has also made the use of standard concrete in home construction mandatory, yet the law hasn't been executed effectively.' He points to the delivery of cement to disqualified producers, failure to take action against unauthorized production units and supervising engineer's negligence as the root cause of the sector's problems. 'The municipalities must issue construction permits only to those developers that legally undertake to use standard concrete.'

### News Agencies

#### **Member of Concrete Producers Guild:**

#### **Poor quality street curbs have cost the City of Tehran hundreds of millions of dollars in the past thirty years**

The resistant and seismic-proof buildings in Japan are the constructed with the same materials found in Iran. However, because of the non-scientific methods used in producing construction mortars and materials together with the supervising engineer's disregard for complying with construction principles, the building materials in Iran are unsafe and tend to deteriorate at a much quicker pace. 'Sand and gravel are considered strategic commodities nowadays that are closely regulated in many countries. But, we, in Iran, are dealing a serious blow to the non-renewable sand, gravel and limestone resources and all countries regulate, which will undoubtedly cause problems for the country's future generations,' Keyhani said.

On a visit by the manager of Tehran Province Industries, Mine & Trade to IRAN FRAMECO Research & Development Centre, which was set up and established with the sole aim of aim of finding ways to raise the resistance of concrete products, Engineer Keyhani told the reporters, 'Concrete is the century's strongest material, and once used correctly, it can last up to a hundred fifty years. However, the methods used in Iran to make concrete are non-scientific and unsuitable, and that's why concrete's lifespan in this country is relatively short.' 'The manually-made concrete slabs and street curbs literally fall apart after just one season of rain and snow,' he added, 'But, the same products that are made by factories without human interference in the production process last incredibly long. In fact, some of our products used in Tehran's colder districts have survived the test of times for over fifteen years

and look just as new as the day when they were first installed. We, actually, project that they'll easily get through another forty years with no problem.' 'Based on the reports by Tehran municipality's experts, the use of poor quality street curbs has cost the City hundreds of millions of dollars in the last three decades. This is while if the hand-made concrete slabs and street curbs are replaced with standard ones, the City won't have to worry about losing any more money for at least twenty years.' Engineer Keyhani put the country's annual cement production at thirty million tons. He also mentioned the plan to build another six cement factories that can raise that number by 8.5 million tons per year. 'While huge investments are being made and we're doing all that we can to standardize the industry, each year something like 35% of the country's produced cement goes to waste,' Keyhani regretted to say. 'Just to give you an idea of the scope of the disaster, five hundred tons of cement as well as 2.8 million tons of sand and gravel are wasted every year in Tehran alone because the City has to continuously reinstall new concrete slabs and street curbs. Next to the economic burden, 600 acres of land is also turned into construction debris graveyard.'

According to Engineer Khatibi, IRAN FRAMECO Research & Development Centre, every year the equivalent of five cement production factories' is literally thrown away. 'Low-grade cement loses its resistance and durability features in a short time, and hence deteriorating concrete slabs and street curbs are readily visible all over town. However, what concerns the officials the most is the poor quality concrete that is being used to construct buildings, where the extent of its deterioration over time is not easy to determine. This is a great concern, given the fact that Tehran is so earthquake prone,' he said. 'Taking so much demolished concrete structures to

## 26 The Story of the Concrete Man

construction debris' graveyards is literally throwing away a noticeable part of the country's cement production. The producers that use traditional methods and hand make concrete products seem to think that adding extra cement to the mix can raise resistance. However, resistance can be markedly increased by just using a small amount of cement if products are machine-made using modern technology.' 'Indeed, concrete resistance and durability is interdependent to the manufacturing method and process and not adding more or less cement,' Engineer Khatibi continued to say, and then added, 'Concrete is made by skilled engineers and specialists in Europe, but in our country many concrete products are made by simple workers, and often on site. Standard quality concrete products not only save over a billion dollars a year for the country, but they also make the buildings and structure more resistant and much stronger.' At the same inspection visit manager of IRAN FRAMECO Research & Development Centre's QC Unit, Engineer Arabi also reiterated that the only way to turn cement into high grade concrete and make quality concrete products is to apply novel methods and use modern machinery, have fully-equipped workshops and laboratories along with the qualified workers and technicians as well as the strict implementation of quality control measures. Unfortunately, the cement supply that is given to non-specialized workshops and non-experts has created a black market.' 'Allocating cement to unqualified production units without operating permits is virtually pillaging the national wealth. The next generation will need energy and cement more than we do today, and that's why we have to be extra-various about how we use and conserve them. Supervising engineers must be required to use standard concrete made by licensed cement factories and completely comply with Iran National Standard Institute's specified standards.'

**Iran Labour News Agency**

**Iran Concrete Association's Inspector:**

**Non-standard factories must be closed down**

‘We have asked the experts in the field to present scientific and economic solutions to retrofit the building’s that have been constructed by traditional methods,’ Iran Concrete Association inspector, Ali Asghar Keyhani said in a one day seminar on concrete and building reinforcing. He then went on to say, ‘We have been witnessing a rise in unregulated constructions mostly because of insufficient public awareness. The reason is that they still don’t believe in the importance of quality building materials very much the same way that all those souls, who perished in The City of Bam’s 2002 earthquake. Building retrofitting has to start today.’ In answer to the question of who is responsible for and oversees the country’s construction sector posed by one of the seminar attendees, Keyhani replied, ‘Frankly, to find the right person for the job, we must first make the people understand that they have to look deeper than just a building’s facade and kitchen cabinets when shopping around for a home. One measure is to make the use of standard construction materials made by qualified factories compulsory.’ To add to a Keyhani’s comments, the head of IRAN FRAME-CO Research & Development Centre said, ‘Most neighbourhoods in west Tehran are sitting on earthquake faults - something that we’ve been cautioning the officials about for quite some time. The best solution is to apply the ‘sustainability triangle,’ whereby one corner of the triangle is planning while another one is supervision and execution and the third corner is standard construction mortars and materials.’ The Centre’s manager emphasized on the point that not just anyone should be permitted to build, and vehemently criticized the existing building reinforcement and retrofitting solution and lax regulations that fail to generate any viable outcomes. In answer

## 28 The Story of the Concrete Man

to who really should confront the violators, the Centre's manager named the media as one of the main culprits and said, 'We need a news revolution and shouldn't wait for a tragedy like the want that happened in the City of Bam to happen in Tehran.'

### **Iran Labour News Agency**

#### **IRAN FRAMECO Managing Director:**

#### **The performance of certain governmental organizations has pushed the production units to the brink of closure**

While the government is seriously pursuing the implementation of the plan to support and protect the domestic manufacturers, the performance of certain public organizations has pushed the production units toward stagnation and complete closure. In an interview with ILNA News Agency, IRAN FRAMECO managing director reiterated, 'Because of the government's policies on cement factories, IRAN FRAMECO is currently operating at twenty percent of its actual capacity. And should the situation persist, it is not hard to envision the closure of our production unit too. In fact, the Company was forced to close for one month last September.' 'Our Company is capable of producing six hundred thousand cubic meter of cement annually. But, at the present time, out of our factory's seven production lines only the concrete workshop is up and running. If we're allowed to run at full capacity, we can create jobs for another two hundred people.'

Engineer Keyhani also had this to say about the method of distributing the factories' cement: '60% of the country's total cement production is supplied to the public while 25% is allocated to various national plans and projects and 15% is given to cement factories like IRAN FRAMECO, which considering the forty concrete production workshops that are operating

now, is literally nothing. So, a company like IRAN FRAMECO has to either work at extremely low capacity or simply pack up and go and leave millions of dollars of investment suspended and putting dozens of workers out of work.’ Keyhani believes that the quota allocated to cement factories has to be raised to 30%. ‘Giving 60% of the produced cement to the public only leads to expansion of the wheeling and dealing culture and the creation of a mafia,’ Keyhani said and further added, ‘Though the production plants produce the best cement, yet for some reason, most of it is not given to licensed factories or delivered late. But, the dealers and brokers always seem to have plenty of cement. Experts believe that 80% of the cement used in constructing residential units is non-standard, that’s why the potential of risk is always looming close by. Something like 10 to 40% of the cement allocated to the public funds its way into the dealers’ hands, and they use different tricks to adjust and control prices and reap huge profits. However, if the use of standard concrete becomes mandatory, not only is the black market eliminated, but building and structure resistance ratio is also raised significantly.’

### **Donya-e-Eqtasad Newspaper**

#### **The dealers’ quota; four times the centrally mixed concrete factories**

The cement quota allocated to the centrally mixed concrete companies is way less than their actual production capacity. In an interview with ILNA News Agency, Engineer Keyhani pointed to the inappropriate quota set aside for concrete production plants and said, ‘Based on the cement’s comprehensive distribution plan, 60% of the cement produced by the cement manufacturing plants is supplied to the public for use in private projects, 25% is set aside for national plans and projects and only 15% is delivered to concrete production fac-

### 30 The Story of the Concrete Man

tories. Since there are currently over forty production units making concrete this quota is simply not enough to meet all their demands. And thus, they're forced to operate below their normal capacity and literally waste millions of dollars in investment.' Engineer Keyhani believes that this quota has to be increased to 30% and reiterates that leaving 60% of the country's total cement output in people's hands leads nowhere except to the creation of a dealers and brokers black market and ultimately corruption. 'Although the licensed factories make the highest grade concrete, yet they don't get enough cement. However, dealers have more than ample supply. According to experts about 80% of the buildings and other structures constructed by using manually-made concrete lack any standard and are prone to virtually all sorts of risks. Something like 10 to 40% of the cement allocated to the public funds its way into the dealers' hands, and they use different tricks to adjust and control prices and reap huge profits. However, by making the use of standard concrete mandatory, not only do we eliminate the black market, but we also increase building safety quality ratio as well.' 'There are nearly one thousand contractors in Tehran Province alone, who are issued permits by the province's different municipalities to produce hand-made concrete street curbs. And as one can imagine, the only thing that isn't important to these contractors is complying with standard to make quality products. The economic loss sustained by the City of Tehran runs into millions of dollars. In fact, due to non-scientific methods in using cement to make concrete and concrete-based products, enough cement to fill five standard stadiums is wasted each year.'

#### **Hamshari Newspaper**

##### **Twenty five percent of Iran's cement is wasted**

According to the managing director of IRAN FRAMECO,

eight million tons of cement valued at a staggering five hundred million dollars goes to waste in Iran annually. 'The country's cement supply and demand ratio is proportional, and the correct use of cement literally eliminates any shortages. The non-scientific methods of applying construction materials coupled with the inattentiveness of the supervising engineers' to the construction principles has led to the quick deterioration of buildings and structures and lack of safety. This while the same kind of construction mortars and materials are used in Japan to make highly resistant buildings,' Engineer Keyhani said, and then added, 'In the past thirty years the City of Tehran has incurred millions of dollars in lost revenues because of incorrect use of cement in producing concrete street curbs. Despite having suitable resources to produce grade cement in Iran and the potential of complying with the necessary standards for high-resistant cement, unfortunately, cement production's standard is rather low. And as a result of the non-scientific methods, we're literally throwing away five cement factories' productions each year. However, by using modern equipment and machinery and putting skilled people to work, we can make resistant cement, and thereby use a lesser volume annually. Producers making manually-mixed concrete wrongly believe that increasing cement proportion can increase the resistance. But, concrete resistance depends on the production and maintenance process and not the mix. People recruit proficient experts and skilled engineers to make concrete in Europe; whereas, the same thing is done by simple workers and often right on-site. Concrete production has been regulated for some time now, but regrettably, many projects are still being constructed using non-standard concrete. The average building lifespan in Iran has been put at thirty five years, but this can be easily increased to over a hundred years by using standard construction materials. Once we consider the world banks'

## **32 The Story of the Concrete Man**

reports that about twenty five percent of the country's national wealth and capital is invested in the housing sector, then we can realize the scope of tragedy inflicted by short lifespan of buildings and other structures across the nation.'

### *About the Year 2004*

**T**he devastating impact and aftermath of the January 2002 earthquake in the City of Bam was the most important event to be followed by the media in 2003. Ensuring the utilization of standard construction mortars and materials was the main concern preoccupying the minds of the building and construction sector's managers, experts and officials. The review of the country's general policies on cement was another important issue posed in 2003. The executive approaches working against the national interests resulted in improper cement consumption across the country and a drastic drop in the quality of concrete buildings and structures.

#### **Hidden attempts to increase cement price**

We have heard many comments from the concerned authorities and industry players about raising the cement rate or price in recent years. A large number of statics have been published, and most managers, Ministry of Industries' high ranking officials and newspaper and journal reporters and writers believe and unequivocally agree that raising the cement price is the only way to save the industry. After nearly seventy years since the formation and establishment of the cement industry in Iran, the issue of correct cement distribution and market

### 34 The Story of the Concrete Man

still poses innumerable challenges. Due to the climatic conditions and unavailability of modern technology, construction projects can only be carried out within specific seasons and months. Therefore, the demand for cement and over one hundred more cement-based products fluctuates often and can go extremely high or experience severe reduction and stagnation depending on the time of the year. However, the country's cement production is constant throughout the year, so when demand increases suddenly, the black market elements begin to re-emerge, and as a result the price goes up causing a noticeable difference between the government issued price and the black market's going rates. The attempt by the employers and investors to complete their projects during the peak construction season fuels the wheeling and dealing within the black market even further. This is mainly because they have come to the understanding that obtaining their needed construction materials through the black market is much less costlier than having to stop their projects. indeed, the cement dealer use a totally calculated psychological scheme that is based on the wrong distribution system and alternating demand rate in different months to rake in millions of dollars in profit.

One measure undertaken by the cement production factories to create balance in supply and demand is the construction of silos to store clinker. Of course, the initiative's aim is basically to have sufficient supply on hand in order to prevent cement factories' shutdown when demand is low; otherwise, it really hasn't had any effective impact on curbing the black market activities. Actually, the clinker silos, which play an important role in markedly maintaining the supply and demand's balance, have, in certain cases, turned into a exploitation tool for some factories and buyers alike. The notification that the manager of a factory has recently communicated to his major

customers demanding that they act immediately to release and haul out the cement that they have purchased months before is clearly indicative of the unethical action of some buyers. They purposefully leave their cement at the factory silos and wait for the right opportunity to get their order and distribute in the market. So, the clinker silos, which extremely expensive to build and highly costly to maintain essentially turn into a storage facility for the buyers. On the other hand, cement factories demand advanced cash payments for their good too and if the market rates go up from the time when they sell their product up to the time that it is actually released by the buyer, they will readjust the customer's invoice and either add the difference to the bill or deduct a proportional amount from the order's total volume. Something like this is not practiced anywhere else in the world. The cement factories are well aware of the importance of their product in the months, when constructions are peaking. They also know how much their commodity means to the customer. So, invoice readjustment is simply unfair since it will leave the buyer with no choice except to transfer the added costs onto the housing project. Currently, there isn't a defined pricing system or specific sets of rule governing the cement prices, and hence factories determine their final price based on the free market's going rate, which, of course, is directly affected by the equations that the cement factories use to calculate prices. If this wrong mechanism, which has taken up a legal form over time in the cement's comprehensive plan, is implemented correctly, the factories can then make any changes they want in the cement price.

Another problem with the said pricing method is that cement factories essentially turn into cement dealers, and thereby attempt to neutralize dealers' activities by creating a balance between the real and the black market's rates. However, the prob-

### 36 The Story of the Concrete Man

lem is that the difference black market rate and the factories' balanced rate is the result of the existing distribution system, which simply is not capable of self-restoring. The volume that cement factories can supply during the construction seasons is enough to meet and satisfy the market's demands, and it is actually the improper distribution market that helps create the black market. It is also noteworthy to mention that the market demand for cement during the working months is not entirely because of the civil projects and a huge part is actually unreal. The best way to price cement is to calculate the final price plus the reasonable profit expected for the shares invested in the cement factories, which has been defined as the 'base price' in the cement's comprehensive plan. While cement factories use the government subsidies to obtain their energy and minerals, allowing cement to be priced based on the free price system goes against the national and public interests. Accordingly, if the plan is to use a mechanism of resource allocation that relies upon monetary prices set by the interchange of supply and demand, then the cement factories must get their required resources like energy and minerals in accordance with the existing global tariffs. At the present time about 125 litres of fossil fuel is needed to produce a ton of cement, which considering the world's going rates, the domestic cement factories are getting a huge break by receiving really cheap fuel. This is while cement price in countries like India, China and Turkey, where producers don't government subsidies to buy fuel is the same and in certain cases is lower than Iran. So, the claim that the industry's modernization and new investments without raising the cement price is simply not achievable is not really true. Indeed, cement factories are profiting greatly in proportion to the invested shares base price, and no other industrial activity in the country is as lucrative as cement production. Actually, pursuant to Fuel Consumption Optimization's report, cement

factories can save over one hundred million dollars per year in energy costs alone if they observe the necessary standards through implementing correct management. Cement price in Iran is often compared to that of other countries, and you often hear people speak about the cement's price differences in Iran and the rest of the world. However, cement does not have a set price, and the rate of this important commodity is constantly fluctuating between thirty five to one hundred dollars based on the production conditions in different countries. The price of cement in Iran is at the same level as India, China, Russia and Turkey.

### **Correct concrete consumption; the missing link**

The cement consumption in our country, whose total production output reaches over 32 million tons annually, is much higher than the world's per capita. A big part of increase in consumption is due to incorrect processing of cement, and a noticeable cut-down is readily attainable if the relevant principles and standards are observed. To give an example, according to Tehran municipality's data, each year something close to five hundred tons of cement is discarded in cities and towns across the country because concrete street curbs, which have been made manually, are not durable enough, and as a result need to be replaced regularly. This level of unnecessary wastage can be remedied readily if people start using factory-made curbs. The scope of the tragic economic loss; however, is not limited to concrete street curbs alone and the building and housing sector also faces the very same dilemma. For instance, the normal building lifespan is thirty five years in Iran; whereas, the same extends over one hundred years in the developed countries. The use of poor quality construction mortars and materials, in particular concrete, is the chief reason for the buildings' short life. Based on the annual statistics, each year,

### 38 The Story of the Concrete Man

over one hundred fifty thousand buildings are demolished in the country because they have outlived their usefulness. This is a deeply shocking rate since on the one hand, the economy is dealt a serious blow, and on the other hand an astonishing volume of building mortars are junked and thrown away. Pursuant to a separate report, while compliance with cement consumption standards can easily stop such incredible waste, the equivalent of five cement factories the production output ends up in the cement graveyards each year. Of course, the incorrect distribution system is also to blame because while nearly sixty percent of the country's total cement production is allocated to the public and another twenty five is set aside for the civil and governmental projects, the cement factories receive a fifteen percent share only.

The conversion of cement into the final product or concrete and concrete parts requires technical know-how, highly skilled workforce and modern equipment and machinery. Therefore, allocating cement to the people, who lack sufficient knowledge to process it properly, is the main reason for the wrong cement consumption. Cement should only be given to the people by the concrete and concrete parts' production units. In other words, the said units are the best way to distribute cement because they process the material in the most optimized way possible. More than ninety percent of the country's cement is used in the form of centrally mixed concrete or concrete parts and components in different construction projects. And the remaining ten percent can be supplied as regular mortar in various packages just the same way it is done in most of the world's developed countries. This, indeed, is the only way that we can stop more than five million tons of cement from going to waste in our country and start to see buildings that are more resistant and last for years to come. Though, based

on what the experts claim, we don't have any cement shortage in our country, and to the contrary, we actually have a surplus, still a shortage will always be felt if we do not find a feasible solution the correct cement consumption.

### **Donya-e-Eqtesad Newspaper**

#### **The negative impact of the unauthorized concrete production units**

The apparatuses, which undertake urban and civil projects, are required to use standard concrete, and hence the project contractors and executors must submit documents indicating that their concrete supply was obtained through licensed and standard cement factories. Pursuant to the National Standard No. 6044, only authorized concrete production facilities qualify to produce the material. Thus, processing and making concrete, contrary to the claim of being engineered appropriately, by the unauthorized workshops and executing companies on-site is strictly prohibited. In accordance with the Article 13 of the Governmental Discretionary punishment Act, all illegal concrete production units immaterial of the ownership, must be shut down immediately and have their operating permits submitted to the court of law for completing the lawful protocols. Since concrete has a major role in building and structure safety, it seems that filing lawsuits against the non-standard concrete producers is something that the attorney general should do on the public's behalf. Indeed, such action is crucial given the fact that Iran is earthquake prone country, and we are at constant risk. Another matter related to the unauthorized concrete production units is the method by which they procure their cement. In reality, none of these units do actually receive a cement quota, so by tracking down those that supply the material, the public and judicial officials can take some serious steps in combating the country's cement smuggling mafia.

## 40 The Story of the Concrete Man

Preventing the trucks that transport the unlicensed production units' concrete by the police is another necessary action to stop the distribution of non-standard building materials. To help enforce the law, the factories, which make central mixed concrete, can install special stickers in their transport vehicles that would make it easy for the law enforcement agencies to identify the mixer trucks that haul non-standard concrete. Moreover, to get the all the producers to standardize their operations, special customs duty discounts could be considered to enable them to import machinery and equipment to replace the old and worn out ones that are often being used now. Another issue is the failure of the unlicensed production units to provide insurance coverage for their workers because these units do not have an operating permit, and really don't care or want to provide such benefit for their workers anyhow. Therefore, their argument in defence of the rights of their workforce based on the requirements of the Labour Act does not seem all that realistic. Of course, a large number of the manpower in the unauthorized concrete production units, especially the ones active in concrete transportation can be provided with basic training to enable them to work in the licensed factories should their illegal work shop close down. In addition, the standard production units could be required to recruit such workers once the unauthorized workshop they work at is forced into closure. There is no doubt that if these workers are skilled enough in the concrete business, they will be recruited by the licensed factories in no time at all. Anyone else that does not have the right qualification and know-how had better go on and look for another job.

Furthermore, the argument that there is going to be a concrete shortage if the unauthorized production units are forced into closure is not a valid one either since according to Tehran

Province Office of Industries & Mines, the central mixed concrete produced by the standard factories is way more than the actual demand - this is particularly true considering the fact that the said factories are operating on less than fifty percent of their actual capacity. As far as the rise in demand is concerned due to civil projects, the rise in the number of production units can ultimately lead to the promotion of concrete quality as well since mass production factories must also hire the skilled and specialized manpower to handle the job. Non-standard construction materials are the root and main cause of weak buildings. However, because of the availability of all the needed resources from the proficient workforce to high quality materials, we don't have far to go before we reach the optimal point. Since one production unit, namely IRAN FRAMECO is already making the highest ever recorded resistant concrete in accordance with terms and condition of the corresponding National Standard, then other producers can do the same without any problems. When the Iranian students are able to win the first place at three consecutive International Concrete Olympiads, it is truly a shame when only one percent of the country's concrete is being made in standardized manner.

### **Donya-e-Eqtesad**

#### **Eight points for producing standard concrete**

The process through which a production or manufacturing unit is formed has to be on par with the development of the government's sustainable and projected plans. The philosophy of setting the feasibility studies is first based on the technical and economic aspect of the plan, and next on the coordination of establishing, commissioning and reaching the end product that have been projected in the country's macro plans in accordance with the proportional needs. Therefore, the entire industrial production units that operate without a feasibility

## 42 The Story of the Concrete Man

study and without completing the permit acquisition process, can be regarded as ‘economic disruptors’ because they disrupt the licensed units that are operating based on the fundamental and pre-projected needs, and thereby cause numerous problems for both the private and public sectors. Different industries must be established within a legal framework and in accordance with the country’s needs and requirements or pre-projected export goals, and not simply based on the individual’s’ random choice and decision, and the unlicensed production workshops and factories must be prevented from functioning any further.

The production- and industry-related laws have to simultaneously possess two qualities. Firstly, they must encourage and direct the producers toward quality promotion, and secondly confront and fight off the unauthorized production units that make poor quality goods in a strict and serious manner to discontinue their illegal activities and force them into closure. The rules and regulations, which the most important construction material, namely concrete is subject to, lack any kind of incentive to encourage the producers. What’s more, despite a great deal of talk regarding measures against the unauthorized production units, not much has been done to implement any viable actions. And regrettably, we still continue to witness the mushrooming of the unlicensed workshops that bypass all the country’s laws and the organizations responsible for enforcing them to make non-standard concrete. These producers, which produce standard products, have to totally comply with all the relevant rules and regulations in order to be issued a ‘certificate of standard quality.’ In addition, standard production and manufacturing requires highly skilled manpower, a fully-equipped QC laboratory, continuous efforts to correct the production line and the use of fine quality materials, all of

which are extremely costly. The unlicensed producers, on the other hand, don't have to deal with such costs, and under such unfair condition, where the standard producers' sole concern is the strengthening of the country's buildings and structures, requesting the government's solid support doesn't seem to be too much to ask for.

The first instructional guidelines on building resistance against seismological activities, issued and published over thirty three years ago by the United States Concrete Association, are accepted in most countries as the main set of criteria in the construction business. In Iran, the first comprehensive plan on designing concrete buildings and structures to withstand earthquake was published in Chapter 20 of Iran Concrete By-laws in 1993. Then, following lengthy research and study and numerous meetings, the Iran National Standard No. 6044 was finally compiled and made mandatory in Fall of 2002, whereby a grace period of one year was considered for the production units to take proper actions and apply for the 'certificate of standard.' Ever since that time, more than twenty concrete production units have succeeded in obtaining the certificate. And in compliance with the Iran National Standards Organization Act 6 pertinent to the establishment of production units, and also Article 6 of the Governmental Discretionary Punishment, any unit operating without the said certificate must be shut down immediately and without any further ado. However, as to date, there is really real no serious sign of efforts to execute and enforce the terms and provisions of these Acts. Of course, the quality production and supply's problems do not end here. For example, Concrete pricing in our country is not done based on resistance grade, but rather the cement grade used in each cubic meter of concrete. The ability to withstand and resist various forces is perhaps the concrete's best feature.

#### 44 The Story of the Concrete Man

And that's why best feature of concrete is its ability to withstand and resist various forces, and that's why cement grade alone cannot express concrete's specifications. Though, the cement grade used to produce concrete manually may be quite high, but it is, in fact, the production process that determines the concrete resistance ratio and not the content mixture. Creating the right background for standard concrete production and consumption requires redefining this element and its position in civil undertakings and economic ties as well as conforming the government's general policies with the standard concrete's specifications and features is a matter that needs apparent attention in all projects. To accomplish the aim, there are virtually no other alternatives, but to implement and complete the following stages:

- 1- The supply and delivery of Central mixed concrete to authorized producers should be banned until such time that they apply for and acquire the 'certificate of standard' from the Ministry of Industry.' Furthermore, the operating permit of such production units has to be suspended if they are unable to obtain the said certificate within a period of three months.
- 2- All the municipalities and other relevant apparatuses conducting urban and civil construction projects must be required to use standard concrete, and contractors and executing companies have to be asked to submit supporting documents that they already possess the 'certificate of standard' prior to proceeding with their construction projects. Since only the authorized production units that produce concrete in accordance with the terms and provisions of Iran National Standard No. 6044, once they have been issued the 'certificate of standard,' the equipment and machinery of the unauthorized workshops and production units, which con-

trary to their claim fail to engineer the concrete mix, must be confiscated promptly and legal actions must be taken against their ownerships at once.

3- The unlicensed concrete production units, regardless of the private and public entities that they belong too, have to be shut down immediately, and their operating permit must be referred to the judicial authorities for considering the correct legal actions. Because of concrete's importance to structural safety, the attorney general should file lawsuits on the behalf of the public against the illegal concrete producers straight away and [prosecute them the fullest extent of the law. our country is sitting on top of numerous fault lines, and hence the entire population is at constant risk and danger of tremors, so playing with the people's safety and security for personal gain and profiteering is not something that the public officials should take lightly.

4- Another issue next to the operation of illegal concrete production units is the question of how they are able to obtain their supplies. The government does not allocate a quota to these producers, so by tracking down and prosecuting those individuals that supply the cement, public authorities and officials can deal a severe blow to and end such illegal activities once and for all.

5- The inspection of the mixer trucks by the road and highway police patrols is yet another action that can lead to less trafficking of non-standard concrete. For this purpose, the licensed producers could be required to install special stickers or labels on their mixer trucks to facilitate the identification of the illegal transport of non-standard concrete by the law enforcement agents and officials.

6- To get the all the producers to standardize their operations, special customs duty discounts could be considered to enable them to import machinery and equipment to replace

## 46 The Story of the Concrete Man

the old and worn out ones that are often being used now.

7- The unlicensed production units cannot provide insurance coverage for their workers because these units often do not have an operating permit. of course, it should be pointed out in most cases they don't really don't want to provide insurance plans anyhow. Therefore, their argument in respect of defending the workers' rights based on the requirements of the Labour Act is simply not realistic. Of course, a large number of the workforce in the unauthorized concrete production units, especially the ones active in concrete transportation can be provided with basic training to enable them to work in the licensed factories should they lose their job because their illegal workshop has been forced into closure. In addition, the standard production units could be required to recruit such workers once the unauthorized workshop they work at close down. There is no doubt that if these workers are skilled enough in the concrete business, they will be recruited by the licensed factories in no time at all. And hence, anyone else, who does not have the right qualification and know-how had better go on and look for another job.

8- The suggestion that there is going to be a concrete shortage if the unauthorized production units are forced into closure is not realistic either since according to Tehran Province Office of Industries & Mines, the central mixed concrete produced by the standard factories is way more than the actual demand. Such claim seems even more unrealistic considering the fact that all concrete production factories are operating on less than fifty percent of their actual capacity, As far as the rise in demand is concerned because of civil projects, according to the Manager of Tehran office of Industries & Mines, Tehran has reached complete concrete sustenance, and there is no shortage across the county. What's more, the increase in the existing production units can ultimately lead to the

promotion of concrete quality since mass production by factories means recruiting skilled and specialized manpower to handle the job as well. Non-standard construction materials are the root and main cause of weak buildings. However, because of the availability of all the needed resources from the proficient workforce to high quality materials, we don't have far to go before we reach the optimal point. Since one production unit, namely IRAN FRAMECO is already making the highest ever recorded resistant concrete in accordance with terms and condition of the corresponding National Standard, then other producers can do the same without any problems too. When the Iranian students are able to win the first place at three consecutive International Concrete Olympiads, it is truly a shame when only one percent of the country's concrete is being made in a standardized manner.

### **Keyhan Newspaper**

#### **Confronting the producers of non-standard concrete is just talk**

Pursuant to Iran National Standard No. 6044 – aimed to optimize building mortars and materials in order to strengthen structural resistance and durability – the application of standard concrete is compulsory in all construction projects. 'The concrete industry in the country lacks a proper supervisory and regulatory body, and as a result, the industry's problems and challenges are not being properly addressed on the national scale,' Engineer Keyhani, Managing Director of IRAN FRAMECO said. He further added, 'the importance of the concrete industry rivals that of the medical and auto industries in the developed countries. Our country already has the best materials, skilled workforce and modern equipment and machinery to produce first-rate concrete. As a matter of fact, Iran ranks third among the world's top three countries that

## 48 The Story of the Concrete Man

have the highest quality aggregate mines. The fact that our students have been able to take the first place at three consecutive concrete Olympiads is testament to the kind of resource that we have available to us in our country. Notwithstanding, the situation of the concrete machinery and transportation and pumping vehicles and equipment is still far from being ideal. Indeed, there has been no modernization of the same in the past thirty years. This is part of the reason that illegal concrete production units are popping up around the cities almost daily. Regrettably, the responsible government agencies and ministries have failed to take any serious action against such illegal activity; even though, pursuant to the mandates of Iran National Standard Organization and the Governmental Discretionary Punishment Act, the unlicensed production units that resort to making non-standard concrete must be forced into closure at once. But, as to date, confronting the producers of non-standard concrete has remained nothing but talk.

### **Iran has joined the countries possessing the self-consolidating concrete technology**

By using the new generation of additives, which is one of the most advanced concrete processing and production methods, IRAN FRAMECO has succeeded in placing Iran's name on the list of the countries that possess this technology. 'Our research facility has been able to improve concrete water retention ratio in proportion to cement as well as concrete consistency by a significant degree through applying the new super-additives. Doing this without using vibration, removes air-bubbles resulting in a integrated and coherent concrete inside the casting mould,' Engineer Keyhani, the Concrete Association's inspector said. He also added, 'The application of additives in the concrete production and consumption process is one of the main factors that is used to measure a given country's techni-

cal and scientific potentials. Most developed countries have doubled the capabilities of 85% of this strategic construction material by simply using additives. However, additives are used in only 5% of the concrete made in Iran. The method used to make concrete is a technically advanced process requiring precise water to cement ratio in order to guarantee concrete resistance and durability. But, due to improper control and in spite of having access to quality sand and gravel, we, for the most part, have been unable to come up with long-lasting and resistant concrete in Iran.'

'often, to facilitate moulding or to easily pump water to a structure's upper parts, people resort to adding water to concrete to make it more consistent – something that is ensued by a noticeable drop in quality. According to research, 85% of the times, next to the lack of sufficient skills to produce resistant and durable concrete, the concrete homogeneity, consistency and coherency is lost at the final stage because of adding water.' By pointing out to the fact that super-additives are not currently being produced in the country, Keyhani also said that IRAN FRAMECO along with other companies are now ready to start making the additives that not only could drastically help cut down on the volume of consumed concrete, but also assist the growth and promotion of the associated industry if the country's developers welcome the idea. In fact, according to Keyhani, because of the relative advantages in our country, we could very easily take the super-additives' market in the world.

### **The News Report Agencies**

#### **Two years after Tehran municipality's bylaws, the City's street curbs are still manually-made**

The bylaw to use factory-made concrete street curbs and slabs in the City of Tehran was approved by Tehran Municipality

## 50 The Story of the Concrete Man

Technical & Civil Deputy-management went into effect in Fall 2002. Based on an official report prepared by Tehran's municipality, the City has incurred millions of dollars in lost revenues over the past three decades because of the use of poor quality concrete street curbs. This is while installing factory-made concrete street curbs could easily prevent such large scope economic loss. Though, the cost for both curbs is the same, still many of the City's district municipalities prefer to have hand-made curbs installed. Ever since the ratification of the bylaw on using standardized concrete street curbs in early 2000, various city mayors have emphasized a number of times on total compliance with the bylaw through the Tehran's different districts. But, for some reason project contractors and executors continue to install manually-made concrete curbs and slabs. In spite of guaranteeing to buy the standard producers' machine-made concrete street curbs and slabs for five years, the said producers claim that they are still facing multiple obstacles and challenges. For instance, the City of Tehran's accredited laboratory approves the manually-made curbs and slabs, but takes a stance against the ones that are made by factories. The curbs made by hand, with a lifespan of zero to five years, have been approved by the City's laboratory ever since the beginning, and the approach and attitude still seem to be the same.

### **The News Reporting Agencies**

#### **The production of the City of Tehran's factory-made concrete street curbs has not begun yet**

The presence of university professors at the City of Tehran's top managerial posts is the most notable advantage of the city municipality's new team of managers - something that has most definitely breathed new life into the hope that the City's problems. Finding the right solution to solving the problem

of poor quality concrete street curbs and slabs that have incurred a heavy economic loss on the City of Tehran has been an unresolved issue, which has posed serious challenges to the City's management for a long time. Most of the concrete curbs and slabs are poorly made, and as result their useful lifespan hardly ever extends beyond two to three years. According to the findings of a research conducted by the City's Technical Consulting & Engineering Organization, Tehran has sustained millions of dollars in lost revenue because of the constant reinstallation of street curbs over the past thirty years. What makes this outrageous figure even more hurtful is the fact that the damage caused by transporting the construction debris, for instance, air-pollution and contamination of the environment, has not been taken into account when calculating the said number. This; however, does not mean that there is no scientific and practical solution for elongating the useful lifespan of the concrete street curbs since a production and research company called IRAN FRAMECO claims to have been manufacturing machine-made street curbs for more than twenty years. The Company's products have passed their test of time with flying colour, and some of their street curbs in Tehran's coldest districts still look the same way as they did thirteen years ago, when they were first installed. According to the Company's spokesperson, the street curbs - designed to last for fifty years - are guaranteed for fifteen years. The Company's managers believe that solving the street curbs' durability is as easy as one-two-three and the reason that the problem has lingered on for so many years, despite the staggering economic loss, should be sought at municipalities' mid-management since all the top managers display a keen interest in solving the issue.

By expressing his displeasure with City of Tehran's Concrete Committee, Engineer Keyhani, the Managing Director of

## 52 The Story of the Concrete Man

IRAN FRAMECO, had this to say: ‘Because of the sensitivity shown by the media regarding the quality of concrete street curbs, Tehran Municipality together with the City Council and the City’s Technical & Civil Deputy-management ratified and approved a bylaw in 2002 making the use of factory-made curbs compulsory. The City of Tehran even put a delegation together and formed the Concrete Committee and asked a gentleman by the name of Dr Family and I to join. Incredibly enough, only two out of the eighteen concrete street curb production units that the Committee paid an inspection visit to were found to have the right qualifications to produce standard concrete street curbs and concrete slabs in accordance with the terms and provisions of the existing bylaws. However, the head of the Committee, in a discreet and independent move and without informing the rest of the members, proceeded to introduce ten workshops as authorized street curb producers. In my earnest opinion, a workshop that is incapable of executing the terms and provisions of the bylaw on guaranteeing street curbs against climatic elements, does not qualify to produce resistant and durable curbs in accordance with the requirements of Iran Concrete Bylaw. The member of the Homogenous Concrete Industry Association and Managing Director of IRAN FRAMECO, Engineer Keyhani, further added, ‘The fifteen-year experience in conjunction to the different articles of Iran Concrete Bylaw has clearly and explicitly defined the requirements, which govern the production of concrete pieces that have to withstand frigid temperatures. But, anyone else, who may have a different scientific method, may have it documented for proper examination. Notwithstanding, the truth of the matter is that while poor quality street curbs have undergone rapid deterioration, none of the factory-made curbs are showing any sign of breaking apart in over fifteen years. A few years ago, I wrote one of the City’s municipali-

ties that if your intention is to split the money among the favoured contractors, then why don't you just draw names out of a hat instead of destroying Tehran's streets since the curbs that those contractors are going to install won't last against cold temperatures.' 'Our method is scientific, and hence we have high hopes for the future. We have been waiting for so long to see how the story of the concrete street curbs is going to end, and hope that because of the City's municipality efforts and measures, the use of hand-made street curbs comes to an end soon to stop any further economic loss. Surely, the people and the country's highest ranking officials couldn't be pleased by such unjustified loss and damages to the country's wealth and resources.'

### **Money Newspaper**

#### **These concrete street curbs do not last**

The public's awareness and opinion regarding the concrete curbs used to line Tehran's creeks has led to drastic change in the City's policies toward the procurement of concrete parts and pieces. The formation of the Concrete Technical Committee and the issue of different bylaws requiring the use of durable factory-made street curbs have been in line with the said policies. The City's top management is just as serious about standard concrete curbs as it is about Tehran's notorious traffic issue. The initiatives have generated positive income like the Tehran Municipality Technical Deputy-management's bylaw approved in 2002, which can literally put an end to the story of the street curbs once and for all and prevent millions of dollars from going to waste. Despite of its effectiveness if implemented correctly, the bylaw has really never been enforced by the different districts' municipalities because, according to knowledgeable sources that are familiar with urban problems and know the Tehran Municipality's internal structure well,

## 54 The Story of the Concrete Man

the system's downstream experts and supervisors tend to act against the City's highest ranking official; something that is directly linked to Tehran Municipality's wide range of actions and organizational structure. This is actually the Achilles heel of the City's new management. Though, studies have found solutions for every single problem existing in Tehran today, still the correct implementation and performance of the findings is a far cry from ideal.

The only thing that keeps changing in Tehran's Municipality is the top level management, but the mid-level managers remain since they are not subject to this policy – this something that can be easily proven in several districts. In Azadegan Expressway or Tehran Ring-way, which is currently under construction, unskilled workers can be seen moulding wide hand-made street curbs, According to what the other workers say, and also the dust that is circulating in the air, it is quite clear that sufficient water is not used and that there is no QC laboratory to monitor quality. These curbs are the exact same ones that based on the studies conducted by the City of Tehran will not withstand freeze cycles for no longer than two years. Strangely enough, it seems that people, who are responsible, just want the curbs to remain intact until the opening ceremony, when the red ribbon is cut. In addition to millions of dollars in lost revenue, the constant changing of curbs broken apart when exposed to extremely cold temperatures, causes numerous problems and complications for the City's residents like congested traffic due to street crews' working, negative impact on the environment, damage to the streets' asphalt, etc. The aforementioned facts prove that Tehran's Municipality has to devise plan to ensure proper performance by the mid-managers and supervisors and experts alike or risk running into a dead-end.

## **Shargh Newspaper**

### **Reverse engineering; the solution to eliminating the cement issue**

Cement, as the most important construction material, has a crucial role in the country's construction projects. To reach sustainable development, we need different structural spaces like residential, commercial, industrial, administrative and educational buildings as well as the basic infrastructures such as dams, tunnels, roads, etc., all of which rely heavily on concrete as the main construction ingredient. The most significant aspect of these structures is their resistance and durability. Therefore, to increase resistance and static ratio against imposed external forces, and also to ensure durability under extreme weather conditions, the ability of these buildings not to be affected by the said elements is only attainable through precise and accurate designing, planning and executing. Consistently, concrete resistance and durability is something that is considered critically at the planning and construction stage, so that the structural lifespan can be extended. Next to its potentials and usefulness, cement, which is the main ingredient used to produce cement, also presents serious environmental concerns and challenges for the community at the production phase. To cite an example, nearly a ton of carbon is released into the air to make one ton of cement. In point of fact, the entire process requires 125 litres of fossil fuel (mazut or natural gas) and 125kW of power. According to the existing statistics, over 8.5 percent of the greenhouse gases in the world are caused by the production of 1,800 million tons of cement per year. Thus, the developed countries have prioritized the efficiently optimized utilization of this element on the top of their agendas. In our country, where the cement factories' fuels and other consumable energies are subsidized by the government, planning cement operations and production processes must be

## 56 The Story of the Concrete Man

aimed at addressing and meeting the national interests and the consumers' protection rights. While we spend millions of dollars to subsidize the cement industries required energies, we also have to spend millions to deal with the negative social and environmental impact caused by the emission of over 32 million tons of greenhouse gases. Next to the environmental concerns, the global rise in the price of oil means that we have to maximize cement efficiency from every given aspect, just like the developed countries do. The measures to plan cement production optimization should be followed by keeping the points below in mind:

The importance of saving on energy consumption: Considering the high amount of fuel needed to process cement, cutting back down on fuel consumption has become the cement production factories' number one priority in recent decades. There is a 50 percent difference from theory to practice in the energy consumption required to make a ton of cement. Thus, it is literally impossible to try and save that much energy. However, by correcting the production line and defining new systems, a rather noticeable reduction in energy consumption may be achieved. Most developed countries have actually been able to lower the cement production energy consumption by 33 percent. The attempt to find alternatives to fossil fuels that present serious environmental issues is yet another praiseworthy initiative undertaken by the cement factories.

Promotion of cement and cement products' quality: Cement quality is essential to the consumption rate of the material and the quality of the end product. Accordingly, developed countries now use high-resistant cements for buildings and structures and produce customized cements for special projects and make regular cement for masonry type work.

**High-resistance cements:**

If the most common type of cement, meaning Portland cement (32.5) is replaced with high-resistant cements (42.5, 52.5 and 62.5), cement consumption drops by something like 20 percent. In fact, research shows that changing concrete's resistance grade facilitates achieving a structure with the correct dimensions and concrete compressive strength, which needs less concrete. So, if consider cement consumption at 10 million tons, then we can produce as much high-performance concrete using 10 million tons of 42.5 cement as we would using 12.5 million tons of 32.5 cement . Indeed, using resistant cements (about 10 million tons a year) could save more than 243.750 tons of fuel (the equivalent of USD43 million) and over 280 million dollars in investments as well as prevent the emission of 2 million tons of greenhouse gases into the atmosphere. The cement price in America and most other developed countries is determined based on the material's resistance grade; however, the pricing in our country is done on the basis of the cement grade used in making the concrete. According to Prof Neville, 'bad concrete is a mixture of aggregates, cement and water , and hence the only difference between the two is the science and knowledge that is put into making the good concrete. So, the clear deduction is that cement grade alone is not enough without the correct know-how cannot possibly be a viable representation of the entire concrete features and specifications.

**Masonry cement:**

Masonry works like erecting walls, bricklaying and stone and tile installation constitute the second largest source of cement consumption. However, in spite of the existence of the National Cement Standard No. 3516, the production of masonry cement seems to have been forgotten altogether. The correct

## 58 The Story of the Concrete Man

masonry cement composition is obtained by mixing 40 to 70 percent clinker, 60 percent of various Pozzolana and slag cements. Consequently, due to the low clinker consumption, production of masonry cement benefits the cement factories and communities alike. Furthermore, because of the low potential for usage in structures, which literally eliminates the need to relocate or manually produce concrete structures or the motivation to make hand-made and non-standard concrete, making masonry cements can also assist in organizing distribution systems and consumption rates too. The annual production of 10 million tons of masonry cement can lead to a saving of over 650 thousand tons of fuel per year and prevent 5 million tons of greenhouse gases from being emitted into the atmosphere while lowering the investment costs for building new cement factories by 600 million dollars.

### **Customized cements:**

Since concrete structures and concrete parts and components are subject to different application and climatic elements, thus changes in cement's chemical composition to retain the resistance and durability factors and promote efficiency and prevent building and structure risks are necessary. Consistently, customized cements for organic environments or places, where concrete and mortar is exposed to sulphate attack or unconventional climatic conditions such as dam projects and special industrial structures, to ascertain efficiency and durability is highly recommended.

Different Types of Domestically Produced Cement and the Corresponding National Standard Numbers

Product Name	National Standard No.	Standard	
		Compulsory	Incentive
Portland cement	389		
Masonry cement	3516	*	
Portland limestone cement	4220	*	
Trass-based cement	990	*	
Slag cement	3517	*	
Portland Pozzolana cement	3432	*	
White cement	2931	*	

**Cement distribution stage:**

The distribution networks are the most important component of any given society and serve to narrow the gap between production and consumption effectively. Indeed, they have played a vital role in the further growth and promotion of the developed countries. Every distribution system and organization has to have a special model for transporting and storing its goods based on the latter's specifications and requirements. Accordingly, distribution models each have three fundamental stages: 1- Deliver of the producer's goods, 2- Storage and inventory and 3- Delivery to the consumer. On par with this, speed, accuracy and quality retention from production to delivery to the consumer is the most significant requirement for any efficient distribution network.

## 60 The Story of the Concrete Man

### **Planning the right distribution system:**

Unfortunately, the distribution network system in our country is grossly different from that of the developed countries'. In the latter, the distribution networks are meant to promote correct cement consumption while in Iran the case is totally the opposite, and efficient cement consumption seems to be the last thing on the distributors' minds. Each country's produced cement is divided up as follows:

- 1- For producing concrete structures and parts – Cement is supplied to central mix concrete and concrete part producers.
- 2- For use in civil project – cement is supplied to the civil project companies and contractors.
- 3- For masonry purposes – Cement is supplied to dry mortar production factories or building material retailers' distribution networks.

The proportion of cement received by the aforementioned groups is based on the requirement of the different civil project sectors. However, cement allocation is still done in a traditional and incorrect method in our country.

The Share of Cement for Different Sectors

Year	Civil & Governmental Sector	Public & Retailers	Cement-requiring Industries	Total Consumption (million tons)
1990	65%	20%	5%	15.06%
1996	26%	50.8%	12.2%	17.55%
1997	25.4%	51.9%	11.7%	19.03%
1998	30.1%	60.7%	10.2%	19.9%
1999	28.5%	62.5%	10%	20.03%
1980	31%	59%	11%	22.5%
1981	28.2%	60.7%	11%	25.4%
1982	26%	62.2%	10.8%	27.5%

Source: The Cement Journal, No. 88, p. 52

The same break up in the developed countries is based on the consumption structure as shown in the table below:

Row	Country	Cement Used to make Central Mixed Concrete	Cement Used in Concrete Moulding
1	Japan	73.2%	13.2%
2	US	55.7%	11%
3	Turkey	62%	12.4%
4	Russia	52%	19.3%
5	Iran	8.64%	2.16%

Source: The Cement Journal, No. 88, p. 100 and the Cement Messenger (Peyk) Journal, No. 30

## 62 The Story of the Concrete Man

The gap difference between sectors that consume cement in this country illustrates the fact that the cement distribution structure does not conform to the consumption structure, and the network is simply being run by the retailers. This is while the cement, which is distributed by the retailers, is made in the worst possible manner because most of what they sell is used for non-standard construction projects or ends in the hands of the black market dealers. So, the complete overhaul of the distribution network and conformity of the same to the consumption structure is a crucial matter that needs proper addressing using different methods such as the reverse engineering of the consumption, distribution and production cycle.

### **Cement calculation for the housing sector:**

The average cement consumption is typically calculated as set out below based on whether or not a structure has a metal or a concrete frame or it is made of bricks. By considering 150 kilograms cement for construction and 75 kilograms for masonry works per square metre of a conventional building, the maximum amount of cement required to construct 70 million square metres per year is as follows:

- $70,000,000 \times 150 = 10,500,000$  tons for construction
- $70,000,000 \times 75 = 5,250,000$  tons for masonry works
- Total:  $70,000,000 \times 115 = 9,450,000$  tons

As seen, the cement need for the construction and non-construction works is less than 15.75 million tons per year. Out of this cement volume, more than 10.5 million tons is used for construction while 5.25 million tons for masonry. Therefore, more than 65 percent of the 32 million tons of cement, 21 million tons to be exact, is sold to the public by building mortar retailers. What is amazing is that despite the increase in cement supply, the retail market is always experiencing crisis and drastic fluctuations due to relocation of cement among

various sectors and incorrect consumption. The steps indicated hereunder are necessary for organizing the cement consumption by the building construction sector:

First, grade 42.5 and 52.5 cement should be supplied to the authorized central mixed concrete production factories. Next, the cement required for large-scale civil and government projects must be classified based on the consumption structure. Consistently, projects, which use a significant volume of the country's produced cement such as dam projects, should use Pozzolana or other special type cements. Moreover, the distribution of concrete parts and components must be left up to the factories that produce them. Essentially, when dealing with the topic of cement, we virtually have no choice but to select one of the following methods:

- 1- By properly calculating each constructional and non-constructional sector and project's needed cement.
- 2- By critically selecting the cement type and specifications through determining the exact applications and based on the relevant standard's requirements pertaining to cement consumption and utilization.
- 3- By delivering cement to the organizations that can process the material correctly, to make cement-based products.

This article is the summary of the research plan titled 'The Examination of Cement Production, Distribution and Consumption Structure,' has been prepared by IRAN FRAMECO Research Centre.

### **Hamshahri Newspaper**

**Enough cement to build five standard sport stadiums goes to waste each year in this country!**

When cement factories are being tolerated; even though, they

## 64 The Story of the Concrete Man

cause pollution and consume a large amount of energy, they must be producing a valuable commodity – something that has transformed the building and construction industry in the past two centuries. However, in certain cities such as Tehran, this precious product seems to have no value except for going to waste. According to the industry's most active managing director, Engineer Ali Asghar Keyhani of IRAN FRAMECO, which by the way is collaborating closely with the country's higher learning centres to completely standardize the cement and concrete manufacturing, 'Scientists and researchers have specified an average lifespan of one hundred and fifty years for concrete structures, but the mean lifespan of concrete-made street curbs in Tehran is two to five years. Since more than three million curbs are installed in City's streets each year, by doing a simple calculation, we can see that a staggering 120 thousand tons of concrete is junked annually because of improperly processed concrete used in producing street curbs, whose cycle of removal and reinstallation is never ending. Of course, we shouldn't forget adding the 600 thousand tons of wasted sand and gravel to the said figure either. All of these resources going to waste when we can remedy the problem readily by installing factory-made street curbs is truly disheartening.' Engineer Keyhani did not stop here, and to continue making his point, he put forth some more shocking figures and said, 'Every single year, 500 thousand tons of cement in addition to 2.5 million tons of sand and gravel is wasted because of non-standard concrete used in making street curbs and slabs. This much concrete is enough to build five standard size sport stadiums that can seat one hundred thousand spectators like Tehran's own 'Azadi Stadium. So, if the high-resistant and durable concrete street curbs that easily last more than fifty years had been welcomed twenty years ago when their use was recommended, by now we could've

had ten one-hundred-thousand-seat stadiums in Tehran alone.’

Tehran Municipality’s Technical & Civil Deputy-management had also pointed out the same tragic issues several months ago when it reiterated and cautioned the concerned public officials that a precious commodity is being wasted an alarming rate due to the vacuum of regulatory measures, which allow a noticeable number of workshops and factories to produce non-standard concrete products. The cement factories on their own use 125 litres of fossil fuel and 3.5 percent of the countries generated power to make a ton of cement. What’s more the production of this volume of cement also releases a ton of carbon-laced gas into the atmosphere. All of these rather disturbing figures and numbers convince the top producer of concrete in the country, Engineer Keyhani to conclude that the unlicensed producers that produce non-standard concrete are not being dealt with seriously. ‘Concrete production and consumption is subject to mandatory standard and all the concrete production units have been required to obtain a certificate of standard from Iran National Standard Organization ever since Fall 2002. Additionally, based on the same requirement and the Governmental Discretionary Punishment Act, any unauthorized production operating without the said certificate is supposed to have been forced into closure. However, such thing hasn’t happened in numerous instances.’ Finally, to bring his report and recommendation to closure, this concrete industry expert urged all citizens to pay critical attention to the kind of concrete they use in their projects and who they actually obtain their needed supply from.

### **Hamshahri Newspaper**

#### **Honouring to the Olympiad students in the absence of the officials**

‘Should I end up staying in Iran, and be lucky to land myself a job in a factory, at the very best, I’ll be carrying out routine tasks and duties.’ Hearing such a thing from our young elite is now so common that it is hardly considered news. The young of this land have been achieving extraordinary feats in the scientific and industrial domains over the past several years, and who know? Perhaps, that is the reason, why the public officials have gotten used to their winning and don’t care to grant much deserved attention to the country’s young talent anymore. Needless to say that even when they did pay any homage; it was basically in the form of commendation letters and awards, and nothing more. Why have we forgotten so quickly that our young elite are always so triumphantly victorious when competing against the elite of the most scientifically and technologically advanced countries.

#### **A commendation ceremony**

We get to a place approximately 50km outside Tehran. We are looking for a road that isn’t easily found. When we finally get to the place, we recognize it as a concrete production factory by the sight of the tall storage towers. The entire event should take around two hours, but considering the commute time, we’re certainly going to lose a better chunk of our day here. This is where the Olympiad students are supposed to be honoured today. Actually, this is the only sentence that the reporters were told when they got invited to attend the function. What astonishes us the most is not seeing an amphitheatre or conference hall. So, where is the event going to be held?! The number of attendees is limited to the reporters only. Five young university students have won the first place at the ACI

Tournament held in the United States by successfully making the lightest and most resistant concrete. The events is simple; an award followed by the presentation of an envelope, which probably contains cash prize, with IRAN FRAMECO Managing Director and Research Center Manager, in the empty yard of a factory. Ms Bahareh Abdollahi, and Messrs Mehdi Bakhshi, Abuzar Bonekdar, Mohammad Jahangir and Hamed Yazdani - the five students from Tehran University - step forward in order to get their wards and commendation letters. It is obvious from their facial impression that they are waiting to say something. So, they all jump at the first opportunity. When they speak about their two-year project, their eyes glitter. Remembering the difficult days and the success in the heart of United States is way too sweet to just describe in words. May be that's why, Bonakdar brings a scrap album to the lunch table. He opens it up and points to a young girl in one photo standing next to him, and calls her 'Karina.' The presence of only two young girls amidst fifteen male students sparks the reporters' interest. She was a Mexican student participating in the Tournament. Bahareh is the next young lady at the ACI Tournament, and the presence of this successful Iranian female is surely a joy. But, she doesn't seem to think what she has accomplished is all that important. 'The most important part of the project for me was the fact that I was doing it as a university student,' Bahareh tells us.

### **An engineer girl**

Civil engineering, and in particular the construction and concrete business is typically thought of as a major mainly preferred by male students. This is, indeed, something that Bahareh feels too. This general consensus becomes even more apparent when we see only two female participants in the ACI Tournament. Bahareh tried to ignore, or better put deny the

gender difference. 'There's no difference between women and men when it comes down to finding a job,' she says, and adds, 'I really don't think that I'll miss out on job opportunities just because I'm a girl.' In spite of this, even she's quick to admit that managerial positions usually go to men regardless of the individual potentials and qualities. 'The question of going abroad, on the other hand, is entirely different for men and women. I just can't easily decide on leaving because I'm a girl. In contrast, to my male university mates, the conditions are different for me. I'm a girl, and I'm simply not allowed to live abroad without my family.' This is what Bahareh says. For her studying outside of the country is conditional.

### **Stuck in a limbo; staying or leaving**

The initial questions about age and year of entering university are answered quickly. However, differences of opinion began to emerge when answering the next series of questions. Young Iranians have succeeded in attaining first place at several scientific tournaments over the course of last several years. But, quite peculiarly, a short while following such competitions, you would have a hard time finding any of them in the country, if you were to try and look them up. The reason is that nearly all have opted to move to developed countries. The 'brain drain' phenomenon has been under the spotlight for quite some time now, yet not much appears to be done about it. The sad truth is that it everyone just thinks of it as fate. 'It is these young people's prerogative to go wherever they please,' one of the reporters shouts out. If you were to hear how universities unkindly and unjustifiably neglect these students after graduation, you would undoubtedly agree too. 'I'd really like to stay. There's no place for me better than Iran. But, staying next to my family here in my own country isn't the sole factor for deciding whether or not to stay or to go. Just look at our

universities. They resemble high schools rather than higher learning academies. Their job is literally turning jobless high school graduates into jobless university graduates. We have succeeded in making fibre reinforced concrete and can also make highly resistant and durable concrete as well. But, is there anyone in this country, who is actually willing to buy them from us? Every year all kinds of bridges and high profile buildings are built across the nation. But, which ones have really had their construction materials researched scientifically? And which ones have applied new and flexible concretes in their structures? Should I end up staying in Iran, and be so lucky as to land myself a job in a factory, at the very best, I have to carry out routine and daily tasks and duties only,' Bakhshi says in an emotional-ridden voice, and further adds, 'Even if one person would buy fibre reinforced concrete from us in two years of research, you bet that we would have thrown a party.' Nonetheless, Jahangir wants to stay. He believes that finding the right job in Iran requires a certain amount of slyness. 'A person, who is first and foremost rich scientifically speaking, and second, has hands-on experience gets a job in our country – something that isn't easy,' Jahangir says and adds, 'All that some university students know how to do is to study.' Jahangir considers himself as one of those students with great stamina and fortitude to achieve beyond time and space limitations. Well, no doubt that is why he has been recruited by IRAN FRAMECO before even completing his university studies.

### **The Iranians win the first and second place**

This victory becomes even sweeter when we are informed that another Iranian team from Khaje Nasir University has won the ACI Tournament's second place. In addition, two of the same University of Tehran students, meaning Yazdani and Bonakdar had already won first and second place, respectively at the

## 70 The Story of the Concrete Man

ACI Article Competitions prior to this Tournament. The University of Tehran's team travel costs to the United States and Europe were made possible through the financial assistance by the Minister of Economy and Ministry of Oil as well as the private sector companies like IRAN FRAMECO.

### **The habit of using poor quality concrete needs culture building**

Although the student appreciate the help they have received from the university and the government, but they have numerous complaints as well. However, their complaints are literally dwarfed by what IRAN FRAMECO has to complain about. Engineer Ali Asghar Keyhani, the Company's Managing Director starts voicing his criticism and objections in regards to construction and building mortars and materials before the students do. 'Tehran Municipality constantly announces figures showing lost revenues that reach into millions of dollars because of the City streets' poor quality concrete curbs have to be continuously replaced. Strangely enough, the same reports indicate that Tehran could save itself hundreds of millions of dollars by installing standard curbs, yet there seems to be a preferential tendency to use hand-made street curbs. The dilemma of not possessing the correct culture seems to have transmitted to the concrete sector also. Consequently, even the richest Tehrani, purchasing a home in one of the City's most affluent neighbourhoods, never questions the grade and resistance of the concrete used to construct the structure. We are still far away from the culture that allows everyone to be present at work one hour after an early morning earthquake like nothing's happened. Regrettably, the wealthiest person living in the Bam died in that City's catastrophic earthquake.' Culture building is crucial. As long as a simple worker is permitted to make concrete on-site, expecting measures to strengthen

and reinforce buildings and other structures is just a mistaken belief. Changes in mortar type and quality promotion must be started from demand and the construction market.

### **Abrar-e-Eqtesadi Daily Newspaper**

#### **Change in the consumption model; the only way to solve cement's problems**

Cement is the most important product used in construction projects, and as such it has a crucial part in nearly all civil activities. Ever since the Portland cement was invented, a large number of studies have been conducted on this precious construction material's capabilities and potentials as well as weaknesses and drawbacks. Indeed, after steel, among all the other construction mortars, cement and concrete have been the main focus of a wide range of research and studies. Furthermore, as far as consumption per capita is concerned, after water, concrete has the highest consumption rate in comparison to various other building materials, and its global consumption per capita reached one cubic metre per person in 2002. One area that the said studies have granted a great deal of attention to is the cement and concrete processing method and consumption model. As Prof Neville said, 'Bad concrete is a mix of aggregates, cement and water, and good concrete is also a mix of aggregates, cement and water. The only difference is the science and the knowledge that goes into making it.' The technical know-how, within the format of an academic science, was transferred to our country simultaneously as cement; however, the gap between those that possess the knowledge and the consumers is still a wide one. Though, numerous books, bylaws and standards have been compiled on the correct consumption of cement, almost none has ever been paid any attention to. The poor quality of concrete and concrete-made products next to low-resistance and durability

## 72 The Story of the Concrete Man

resulting in the rapid deterioration and wear-out of the material is testament to the fact. In truth, the missing technical know-how in our country is what ultimately causes the short lifespan of the concrete structures and products. Currently, what little technical information that is available in the country will only do to suit university purposes, and hence cannot have a viable bearing on any systematically planned actions. Due to different reasons, the developed countries have dealt rather seriously with the question of correct cement consumption for nearly a century now, and what's more, they have even gotten extra serious about the matter over the recent decades. Some of the reasons for revving up this seriousness are as follows:

1- High energy consumption: The processing of a single ton of cement requires 125 litres of fossil fuel, 100kW of power and 1.5 ton minerals. Moreover, the manufacturing process also releases over a ton of carbon gas into the atmosphere. Consistently, cement efficiency has been the main objective of the relevant research and studies in the recent decades.

2- Short lifespan: According to the scientists' findings, while complying with standards can elongate the concrete structures and products' lifespan, the opposite is also true, and the durability of non-standard concrete is extremely low. So, with little knowledge and cement and aggregate, concrete street curbs can be produced, which could easily last over a hundred years. But, poor quality concrete made without the right knowledge deteriorates and falls apart within just two to five years. In the never ending street curbs' replacement and re-installment cycle in our country, something like 500,000 tons of cement and more than 6 million tons of aggregates is wasted and reduced to debris and rubble every year incurring an economic loss for the municipalities that literally runs into hundreds of millions of dollars. Such staggering damage, which can readily be remedied by using high-durability, factory-made street curbs, is

tragically incredible.

3- Not knowing how to consume: Unfamiliarity with cement consumption is the reason for buildings' short lifespan. The figure in our country stands at 35 while the same number for a building's useful life exceeds one hundred. The lack of know-how at the production stage next to short lifespan is the reason for rise in cement consumption. In many instances, and mistakenly so, in an attempt to reinforce concrete, higher grade cement is used; however, concrete's resistance and durability is the result of correct mixing. In fact, most 400kg cement per cubic metre grade curbs in which the factor of water to cement or w/c has been neglected, have had a lifespan of zero! But, factory-made curbs made by observing a low w/c ratio and a lower grade than the one above have a useful life of over twenty years.

4- Changes in the chemical composition: Cement can attain special features and potentials for implementation at the consumption stage if certain changes are made to its chemical composition. Actually, optimal results could be achieved in all kinds of structure such as dams, tunnels, pillars and columns, and as a result a great deal effort has gone into diversification of this valuable construction material in the past few years. So, customized cements are now available to suit almost any structure and condition. For example, construction cements designed for use under special climatic conditions, reinforced cement for concrete products at risk of sulphate attack and active cement ions, customized concrete for dams and special cements for masonry. Using these types of cement not only lowers consumption rate, but also helps promote the end products quality.

5-Special machinery and skilled manpower: Having special machinery and skilled manpower is essential to any kind of cement my consumption. Consistently, it is necessary that ce-

## 74 The Story of the Concrete Man

ment is supplied only to those that have the right potential and means and the required permits and licenses to use it. A significant amount of cement in the developed countries is produced by licensed factories possessing the needed equipment and machinery in conjunction to a trained workforce to produce high-end concrete and concrete products. But, in our country, most cement is used on-site by untrained basic workers using bare minimums and incorrect methods to mix the material and make poor quality concrete for routine construction work. Changing this trend - something that this report has examined critically - is the only way to restructure and organize the cement industry.

### **Eghtesad-e-Pooya Newspaper**

#### **Cement distribution in the stock market in need of executive bylaw**

The recent approval by the Cabinet to permit cement to be traded in the Metal Commodities Exchange in order to restructure the supply chain of this valuable commodity is the second important step taken by the government this month in respect thereto. Of course, it seems that both measures have been carried out without the necessary expert feedbacks since they are, at least partly, in dire contradiction to some of the country's relevant laws. The point that evidently keeps being missed is the need for change in the cement consumption model based on the realities of life, construction systems and operations, safety and resistance precautionary measures and total compliance with cement production and consumption standards. However, not only have these important points been left forgotten, but we have also witnessed the opposite being encouraged and practiced in certain cases. The government's move to enter cement distribution into the stock market is apparently aimed at improving the stock market's pervasive conditions.

According to the existing statistics, cement companies have a twenty-five-percent share in the stock market, so cement can play a role in promoting the market's overall state. However, the wisdom of this decision has to be questioned since cement may act as a 'painkiller' to alleviate conditions in short-term, but its long-term negative impacts will surely begin to emerge in later years. Most cement company managers and representatives unanimously agree that price regulation by the government is the number one barrier to new investment being made in the cement industry. But, the government's lift on price control will attract the needed investments and help the country reach self-sustenance in cement and even enable it to start exporting this precious commodity to the other countries in the region and across the globe. The price control lift advocates urge the government to end the regulations through assortment of formats. Fortunately, their efforts have not been ineffective and have generated some hopeful results, whereby cement is the main topic of many hot discussions and debates these days. To firmly institute their point, the country's advocates of the end to the government issued pricing, have the following several arguments to make:

1- The process of producing a ton of cement, which emits an equal amount of carbon-laced has into the air, requires 125 liters of fossil fuel. Moreover, the reason that exporting cement is still worth it, considering the extremely expensive transportation costs and expenses, is because of the government's energy subsidies that allow the cement producers some leeway. If we take the environment into account in this equation, then we see the extent of economic loss that our people have to burden for the export of a ton of cement at the cost USD51, so that only direct and indirect cement shareholders can benefit greatly from the hidden oil rent-seeking individuals.

2- Cement is an industrial commodity or goods used as the

## 76 The Story of the Concrete Man

main ingredient in most construction projects. Accordingly, the optimal use of the material requires special type of machinery and equipment together with a knowledgeable and skilled workforce. Should any of these be missing, the end product whether used in foundation or in columns and ceilings or concrete parts will not turn out resistant and durable enough. According to the Ministry of State managers, the country's municipalities sustain millions of dollars in lost revenue each year due to the cost of having to constantly remove and reinstall non-standard concrete street curbs. In addition, to the staggering economic loss, nearly 500 thousand tons of cement has to be junked and shipped to the construction debris graveyards. It would not be unfair to deduce that over the years many tragic incidents must have happened, right under the officials' noses, because of poor quality concrete that is made by unskilled workers on-site.

3- Pursuant to different world banks' reports, 25% of Iran's per capita income is invested in the housing sector. In spite of this, the average usefulness of a building is 45 years; whereas, the same is close to a hundred in buildings, which comply with cement and concrete standards.

The three arguments are not something that any decision maker in the cement production, distribution and consumption system cannot remain indifferent to. Lifting the ban on price control and offering cement in the Metal Commodities Exchange needs a complete and comprehensive execution move bylaw, which can guarantee the correct consumption trend as well. Otherwise, trading cement in the Stock exchange without having implemented the necessary regulatory measures that can promote optimum cement will not only solve and eliminate the materials' distribution and consumption trends, but will also lead to the formation of a condition, which can

threaten the country's buildings' resistance and sustainability. The Cabinet's recent decision this month is the second one, which, unfortunately, has not covered the topic's various aspects. The problems confronting cement are embedded in the wrong consumption model, but the government has decided to deal with the issues by tackling the price instead. The challenges that the Cement Comprehensive Plan was facing two years ago when it was first approved, are still there. Of course, the officials eventually admitted to their mistake and accepted it. Still, the Commission's recent decision to whether cement into the Commodities Exchange only appears to be an attempt at helping to improve the Exchange's existing condition and not really a move to correct cement distribution and consumption. Because cement companies have a twenty five percent share in the stock exchange, it is believed that by ending the price control on cement, the share value of cement companies will grow and help break the stock exchange out of stagnation.

The stock exchange's existing condition has different reasons, and trading cement at a fixed or open rate doesn't seem to fit anywhere amongst them as a problem solver. So, at the very best, this measure will act as a 'pain reliever' for a month, after which time the stock exchange problems will begin to re-emerge once again. The cement factories in the stock exchange earn a greater profit under the same conditions, and anyone, who thinks that raising cement price is the solution to saving the industry, is only looking at the general picture. If Iran enters the WTO, whose number one prerequisite is joining the Kyoto Pact, the cement factories, which will have to give up subsidized energy and strictly adhere to environmental requirements will face serious crisis. So, those that claim Iran will become a cement exporter in the next several years should really think about how much it is going to cost to pro-

## 78 The Story of the Concrete Man

duce and export cement then. As far as trading cement in the Metal Commodities Exchange is concerned, it is important to bear in mind that her since 2002, any type of cement production and consumption is regulated, and hence if cement is going to be bought and sold in the stock exchange, we have to make sure that the recipient is authorized to handle and process the material. Again, pursuant to Iran National Standard Organization and the governmental Discretionary Punishment Act, delivery of any raw material subject to compulsory regulations to unlicensed production units is strictly prohibited. Thus, the Metal Commodity Exchange management has to figure out how it is going to implement this law before cement is allowed to be traded. Moreover, something has to be done for the use of cement in masonry work since regular people cannot just walk into the stock exchange to purchase four or five sacks of cement. So, they will be left with no choice but to go to the building mortar distributors that are actually the promoter of the black market. Therefore, people should not assume the mistaken belief that the retail cement price will rival that offered in the Metal Commodities Exchange.

Consistently, it is not very hard to imagine that the cement retail market is going to be manipulated by the small-time distributors during the peak construction months. Pursuant to the official report published by the Ministry of Commerce on cement, out of the 29.8 million tons of grey cement distributed in 2003 by the building mortar distributor, nearly 61% was delivered to the people. This means that the building mortar retailers were supplied an estimated 18.2 million tons of cement, which based on the supply mechanism of 100kg of cement per one square meter infrastructure, this volume should have sufficed to construct more than 182 million square meters worth of structures. However, according to the Ministry

of Housing, only 62 million square meters of construction was achieved using that much cement. So, it can be deducted that the amount of cement supplied to this group was two and a half times more than the society's actual requirement. What is really surprising is that even with this much cement people are always complaining about late and untimely supply deliveries. The numbers and figures presented here, are clearly indicative of one thing only, which is the inability of the current cement distribution organization is facing problems from delivery at the factory to distribution among the people. Thus, so long as these problems continue to exist, there is little hope that the story will ever end. The first step to correcting the cement distribution system's structure is to determine the mechanism and the manner of distributing 18.2 million tons of cement among building mortar retailers and the exact recipients. As long as we don't find out the right answers, entering cement into the Metal Commodities Exchange will only give the dealers the upper hand to dealers to play with this valuable goods any which way they please. There is no doubt that the problems and issues plaguing the cement's macro distribution network have led to the creation of the dealer and broker network. But, this wheeling and dealing network is mostly operating in the retailers' distribution system, and the Cabinet's recent decision has no effect and control over this network. Hence, trading cement in the stock exchange prior to having a complete executive bylaw to control the cement consumption processes is only bound to intensify the existing problems and not solve them. Indeed, offering cement in the stock exchange makes it conveniently easy for the dealers to purchase as much cement as they want.

Trading cement in the stock exchange is a great idea, providing that the cement consumption structure is corrected too.

## 80 The Story of the Concrete Man

While people continue to make non-standard manually-made concrete; even though, the practice is illegal, offering cement in the stock exchange will only encourage this ruinous habit. In the absence of serious control measures, most housing developers and construction operators are going to use hand-made concretes. Certain restrictions have to be considered for the uncertified cement production units, so that they are unable to purchase their supplies from the stock exchange. In addition, the cement used in masonry mortar has to possess unique specification in order to make converting it to concrete impossible. Heeding critical attention to such points is of utmost importance; otherwise, the method being implemented now will not only untie any of the existing knots, but it will also become a setting for extra mayhem and disarray in the cement and concrete consumption trend. The best way of distributing cement is to make cement by-products like standard concrete, concrete parts and components and masonry mortar. This type of distribution has already been tried in the developed countries successfully. The system has a number of advantages like maximizing cement productivity and supply and price control capabilities. More than 90 percent of the 600 thousand tons of cement supplied to central mix concrete producers in 2003 in Tehran province was processed based on the existing standards. So, it could have worked out fine if these producers would have been surveyed to get their feedback on the cement distribution system. The concrete and concrete product producers are the best distributors because they operate under license and provide the end user with the country's finest quality cement. Consistently, cement distribution must be in line with promoting the consumption of standard concrete. However, this crucial point is nowhere to be seen in the Cabinet's latest decision.

The radius within which cement can be distributed is limited due to transit costs and cements chemical properties. Therefore, concentrated supply of cement will automatically find its way into the local markets. Accordingly, the cement offered in the stock exchange cannot be traded too far outside the geographical location of the producing factory. So, the claim that trading cement in the Metal Commodities Exchange can create healthy competition among the producers is simple fallacy. To prove the point, almost 75 percent of the country's produced cement cannot be transported to Tehran Province because the added expenses will not be cost-effective for the consumer. Another main issue is the question of standard. Pursuant to the stock exchange regulations only standard goods are approved and accepted for trading. However, a large number of cement factories have difficulty with continuously supplying standard cement. All in all, trading cement in the stock exchange has certain requirements that have to be addressed and met expertly – something that needs more time. However, it appears as though the empirical method of trial and error, which has been utilized by the governmental apparatuses for years, is going to remain the top principal in the decision makings.

## *About the Year 2005*

**T**he Year 2005 was the cornerstone of the media's role and impact on the government's decision to change the government's macro policy regarding the cement and concrete sector. The presentation of the cement and concrete production, distribution and consumption corrective action package to the Cabinet by IRAN FRAMECO led to the ratification and approval of the bill by the Commission of Ministers on the restructuring and reorganizing the production, distribution and consumption of standard construction mortars and materials throughout the country in the final days of the year.

### **Hamshahri Newspaper**

#### **Five points for five cement ministers**

The parliament has assigned the task of generating and putting forth new proposals and recommendations within a period of one week regarding the provision of cement production, distribution and consumption as well as pricing to five Cabinet ministers. According to the Parliament's head of Civil Commission, the proposals and recommendations will be submitted to specialized committees for further review and consideration, and a final report on the findings will be presented to

the Civil Commission for decision making. Though, plenty of numbers and figures and statistics are already available to the kind ministers, but it is necessary that they be put more accurately in order, so that the said proposals and recommendations may be looked at from several different angles.

Cement is the main ingredient in many building products, and hence has a crucial role in construction. The production of suitable cement requires a correct processing system to be converted into construction concrete, masonry mortar and concrete parts and components. High-grade concrete is a mix of aggregates, cement and water, and bad concrete is also a mix of aggregates, water and cement. And the only difference between the two is the technical intelligence and know-how that goes into making them. Consistently, any decisions regarding cement requires a well understanding of the production processes and controlling the consumption stages; otherwise, cement efficiency can never be achieved. In fact, the country has sustained wide scope economic loss due to poor quality concrete. For instance, the average usefulness of the concrete street curbs being used in cities and towns across the country is less than five years. However, by complying with the existing standards this number can readily be increased to over one hundred years. Actually, some of the standard-made curbs used in various places have already passed the twenty-five-year mark without showing any noticeable sign of wear and tear. According to the Ministry of State officials, the country's municipalities incur millions of dollars in lost revenues each year because of having to continuously remove and replace the poor quality street curbs. The staggering economic loss becomes even more evident when we consider that three million cubic metres of concrete produced by using over one million tons of cement is junked and discarded in construction

## 84 The Story of the Concrete Man

debris and rubble graveyards annually due to the production of non-standard curbs. Therefore, the presentation of a model for the cement production and distribution system has to include a viable guarantee to ascertain correct cement consumption. The production of a ton of cement requires 125 litres of fossil fuel and 80kW of power. The process also releases about a ton of carbon gas into the atmosphere and uses more than a ton of the country's natural resources like limestone and clay as well. You have to really wonder about the wisdom of this kind of exploitation and the consequential negative economic and environmental impacts when you take into account the USD52 per ton price of the final product. The USD120 per ton price claimed by some as the commodity's export price is outrageously false. Even if for the sake of argument, we assume that the USD120 per ton cement price in Iraq is correct, more than 55 percent of this rate is related to the transportation costs. But, based on the available reports Iran's cement is being exported at USD52 per ton – a rate, which clearly does not make sense.

Indeed, if we were to export the fuel that goes into making a ton of cement, we would generate higher revenues since the price of fuel oil in the region stands at USD296 currently. In truth, the cement factories' profit is not really from exporting the valuable material, but rather from the subsidized cheap fuel. So, there is no way to justify cement export, and it seems to be nothing more than hidden oil rent-seeking because as pointed out, we could make more money by exporting the fuel that goes into making cement and at the same time prevent over a ton of carbon gas from polluting the country's environment. Another fundamental point that has to be heeded regarding the question of increasing cement output capacity with the aim of covering the entire region's markets is the future of the

cement industry when the country finally joins WTO. One of the main prerequisites to joining the WTO is total compliance with the Kyoto Pact's terms and conditions on controlling greenhouse gases. The global cement industry is responsible for generating more than 8.5 percent of the total greenhouse gases. Thus, joining the WTO means imposing strict regulations on the cement production units. Thus, another reason for the final cement price in Iran is the failure to consider the environmental associated costs. As mentioned previously, making a ton of cement requires 125 litres of fuel, which emits more than one ton of carbon gas into the atmosphere. Therefore, if all the associated costs and expenses are considered critically and added up, and subsequently compared to the commodity's going rate at the present, not only the economic advantages of cement production cannot be viably justified, but the future of the cement factories also appears to be rather bleak. The only way to remedy the situation and avoid such nightmare is to promote and improve the different cement production systems, cut down on fuel consumption and replace the existing filtering systems with standard ones in order to make the entire process as efficient as possible.

Unfortunately, the concrete resistance grade in our country is 200 to 250kg per square centimetres; whereas, the same ratio in the developed countries it is 1000kg per square centimetres. Today, industrial concretes possessing a resistance of 2000kg per square centimetres are also being manufactured and used. So, higher concrete resistance and lower rate of cement consumption in the production process must be prioritized in any planning that concerns cement and cement by-products. Furthermore, trading cement in the Metal Commodities Exchange without taking into account such improvements will only land cement in the hands of those that are going to buy unregu-

## 86 The Story of the Concrete Man

lated volumes, and subsequently proceed with making manually-made concrete on-site. Ever since 2002, the country's cement production has been subject to strict regulatory measures, and hence in accordance with Clause 4 of Article 6 of the Iran National Standard Organization Act, supplying and delivering cement as well as granting loans or other bank amenities to the unlicensed producers is strictly prohibited. Accordingly, cement distribution via the stock exchange or any other mechanism must be done in such manner as to prevent this precious commodity from getting into the wrong hands. Iran is an earthquake prone country and manually-made and non-standard concretes used in construction buildings and structures pose a serious threat to people's safety. In the past, 60 percent of the country's produced cement would be distributed among the people, while the public and civil projects and concrete and concrete part production units would receive 25 percent and 15 percent, respectively. The distribution of 60 percent of the so called 'people's cement' is based on 100kg cement per one square metre infrastructure. So, if based on the Ministry of Housing's statistics and the number of issued construction permits, we assume the country's constructions to be 70 million square metres, only 7 million tons of cement would have been more than enough to cover all the projects. However, according to the statistics put forth by the Ministry of Commerce, over 19,200,000 tons of the country's total cement production has been distributed for this purpose. This means that the distribution network, mostly made up of and run by mortar retailers, has received 19,200,000 tons of cement out of which only 7,000,00 tons could have been distributed at the government issued price, and no one knows what's happened to the remaining 12,000,000 tons.

By reading such figures and numbers, one can only deduce

that the country's cement distribution network is flawed, and if this network, without being corrected first, becomes the acting intermediary between the people and the cement being offered in the commodities exchange, you can bet that a different style of black market run by the same characters is going to emerge. People, who only need ten to twenty sacks of cement, can't really go the stock exchange and buy them, and thus have no other alternatives but to go to the building mortar retailers that pretty much set their own prices. The very same thing will happen at the commodities exchange too when the retailers' distribution network immaterial of the price on the board will set one, which it deems fit. Another tactic that black market players resort to is the sudden surge in demand during the peak construction seasons. The reason that they are able to do so is because based on the budgeting system and the country's climatic conditions; construction calendar is divided in two work seasons and two non-work seasons. However, cement production is constant throughout the entire year. This set up leads to significant changes in the supply and demand system and creates the ideal setting for the formation of the black market. So, reaching a balance between supply and demand in the commodities exchange is highly unlikely. We really shouldn't forget that stock exchange can't perform miracles. Concrete has a history of 130 years while central mixed masonry mortar has a history of 60 years in the developed countries. Given such lengthy history, defining a suitable organization to restructure and reorganize the cement consumption trend should be heeded critical attention in all decision makings; otherwise, the ongoing story of the non-standard concretes and cement's black market will continue on forever. What's more, establishment of concrete production units with the aim of processing quality products throughout all months is the only way to create a balanced supply and demand sys-

## 88 The Story of the Concrete Man

tem that works optimally throughout the year. A positive future can be envisioned for the most important construction material since our country possess everything that is needed from the best natural resources and the right technical know-how to the highly skilled workforce. The delays in supplying cement coupled with non-compliance with the relevant standards in the past years has stopped the growth and development of the country's concrete production factories, and also resulted in the bad habit of using low resistance and durability, which not only incurs irrecoverable economic losses, but also places the safety of countless citizens at risk. What really makes trading cement in the commodities exchange controversial is the absence of the proper structures to control the different consumption stages. In short, cement distribution mechanism and pricing system are bound to fail unless the cement consumption trends are not corrected first. This is a point worthy of serious consideration.

### **Hamshahri Newspaper**

#### **Why only Lavizan's trees?!**

Pursuant to the results of studies conducted in the United States, a five-year-old tree benefits the environment in each year of its existence as follows:

32 dollars' oxygen, 37 dollars moisture absorption and regulation, 25 dollars protein generation, 625 dollars air-pollution control, 31 dollars animal shelter and 31 dollars erosion. in the meantime, each acre of forest produces 5.2 tons of oxygen, absorbs 10.4 tons of carbon dioxide and filters 3 tons of dust annually. In other words, each tree on average is capable of ridding the air of approximately 15 kilograms of carbon dioxide yearly. This amount of carbon dioxide is equal to how much an automobile travelling 10 kilometres produces. Because of the accumulation of all kinds of pollutants and con-

taminants in the urban centres, building parks and green landscapes within cities and greenbelts around them has gained much importance. Next to their crucial existence for the urban centre managers, a large number of volunteer groups and NGOs have also been formed to watch over and preserve the cities' green areas. One of the most significant features of the environmental issues and concerns is the fact that they are a coherent whole, and once they cannot be dealt with separately and per case. So, if chopping down 12 thousand trees in Lavizan (a north-eastern neighbourhood of Tehran) in the name of controlling and reducing pollution is justified and important, then the monitoring the performance of the other urban management's divisions, which, incidentally, are responsible for most of the polluting, is justified and important too.

It seems that most of the protests involving the cutting down trees in Lavizan is not stemming from the importance of preserving the environment, and the critics have other motivations. Because the very responsible municipality inflicts damages to the environment that far outweigh chopping down ten or twelve thousand trees – damages, which surprisingly, never face any protests or objections from those that are now protesting the incident in Lavizan. One crucial point, which we believe is being ignored here, is outlined below in brief:

- The cement production process generates and releases one ton carbon gas into the air, so the work of eighty trees is needed to refine and clean that volume of gas in one year.

According to the Tehran Municipality's official statistics the useful lifespan of the City's street curbs is zero to three years. Each year more than four million curbs are used in Tehran, which require 150 thousand cubic metre of concrete and 60 thousand tons of cement to make. With the 5 percent exception of the factory-made curbs, the rest are manually made

## 90 The Story of the Concrete Man

and non-standard with low resistance and durability and a mean average lifespan of less than three years. Furthermore, non-standard and poor quality street curbs don't long and must be replaced continuously – a needless process that is responsible for the emission of more than 60 thousand tons of carbon gas into the air. While machine-made curbs retain their usefulness longer than fifty years, but there is literally no support in the City's management for their utilization. Considering the five million trees (6 thousand acres) needed to rid the air of the said volume of carbon gas, we can deduct that the number trees chopped down in Lavizan is equal to the pollution caused by making eight street curb blocks. But, in the highways and roads surrounding the neighbour so many street curbs have been removed and replaced that even the city officials may not know the exact number. So, perhaps the reporters, who take these highways and roads to reach Lavizan should stop on the way and prepare a report on the real resource wasters and pollution makers. Let's not forget that for every non-standard, low durability curb that deteriorate in a short time, another one has to be made, which emits 20 kilogram of carbon dioxide into the atmosphere. Such shameful act can be easily prevented if the urban management is willing and able to start using concrete blocks, which last a hundred years or more.

### **Sobh-e-Eqtesad Newspaper**

#### **Each machine-made curb plays the role of one tree**

The production and installation of a single curb requires over 20 kilograms of cement and generates and releases another 20 kilograms of carbon gas into the air. The endless cycle of replacing the non-standard, low resistance curbs with a short lifespan can easily be stopped if standard, factory-made curbs that last over one hundred years are used instead. This is while the usefulness of non-scientifically and manually-made curbs

ranges from zero to maximum five years. As pointed out, the production and installation of each curb releases 20 kilograms of carbon gas, which is the exact amount of CO<sub>2</sub> a tree can remove from the air each year. Accordingly, the use of each factory standard curb helps the environment as much as planting a tree can. Another destructive aspect of replacing so many curbs due to poor quality workmanship is the generation of piles of concrete debris and rubble that pose a serious threat to the environment. . The close to 4 million hand-made street curbs with the average usefulness of zero to five years, which the City of Tehran installs annually, something like 60,000 tons carbon-laced gas enters the air. Unfortunately, the absence of a proper acceptance criterion and lack of attention to past experience still encourage the devastatingly bad practice of using non-standard, manually-made curbs.

### **The News Agencies**

#### **The building reinforcement measure; the big forgotten factor**

One of the issues causing great concern among the people recently is the question of building and structure reinforcement and retrofitting - something that the public officials should address more seriously. The catastrophic Bam earthquake left behind a large number of casualties and caused enormous irrecoverable economic loss, when, regrettably, many lives could have saved and much damage could have been prevented had standard building and structure construction mortars and materials been used. In QC country, where according to the World Bank statistics, 25 percent of per capita income is invested in the housing sector, one can only imagine the importance of standard building materials. While pursuant to the Ministry of Housing's official numbers, the average lifespan of buildings in Iran hardly ever extends beyond 35 years, the same number can reach one hundred if standard and high resistant materials

## 92 The Story of the Concrete Man

with a long life are used. In other words, high-grade building materials and mortars are not only effective against earthquakes - a constant threat to the entire population of the country because of its geographical position - but they also help to improve buildings' long-lasting durability and prevent the loss of millions of dollars. With the exception of the safety issues and short building and structure lifespan, Iran is among the countries that possess the best natural resources, the scientific and technical know-how and the highly trained and proficient workforce to produce high-grade building and construction mortars and materials. Indeed, the students from the country's various universities and higher learning centres have won first place in several International Concrete Olympiads. As far as different building materials such as cement, concrete, steel, brick, etc. go, Iran is completely capable of meeting the entire domestic demand with products that are made based on the most recent global standards. So, the main reason for the creation of the unsuitable situation is the non-compliance with the construction standards and the failure to accurately execute the engineering laws and production principles; the result of which is poor quality building and construction mortars and materials with a relatively short lifespan. Concrete along with concrete products is considered as strategic construction material it is used in virtually every part of a building from foundations and ceilings to columns and large civil and industrial structures. Pursuant to Iran National Standard No. 6044, which went into effect in Fall 2002, all civil, private, public and governmental projects are required to completely comply with the terms and provisions of this standard. However, we are still witnessing non-standard and unlicensed production units operating all across the country and people, who make non-standard concrete the traditional way and on-site.

While Tehran Province Industries Office reports that the Province has reached complete self-sufficiency in cement, the producers claim that their factories are running on twenty percent capacity. Nonetheless, because of the failure to deal seriously with the unlicensed concrete producers and the officials lack of real concern with the violation of the compulsory construction standard, people still refuse to comply with the law; even though, the technical, engineering and executive capabilities are all available. The only real solution to this dilemma is to close down the unauthorized building material production units and stop illegal activities in the housing construction projects. By implementing such measures, the private sector may become more willing to make long-term investments in importing the modern technology needed to produce new and standard construction materials. The housing sector's existing condition is undoubtedly due to the absence of any serious support for the standard construction material producers, and the officials' inattentiveness to implementing the relevant rules and regulations by the officials, which could markedly improve the situation.

### **Hamshahri Newspaper**

#### **A look at the solutions for the cement problem**

Cement is an important construction material with an undeniable role in the country's construction projects. Many different spaces like the residential, commercial, industrial and educational buildings in conjunction to the basic infrastructures e.g. dams, tunnels, bridges and roads that are crucial to reaching sustainable development have one common denomination, namely concrete. Building resistance and durability that is designed and executed correctly and accurately is a decisive factor in ensuring a structure's long-term-applicability and useful life against a host of external elements such as the various cli-

## 94 The Story of the Concrete Man

matic conditions. Consistently, concrete resistance and durability are critically considered in the mix design and manufacturing stage to ensure long-lasting end products. Despite the numerous advantages, the concrete production process with cement as the main ingredient creates serious environmental challenges and concerns. To give an example, processing each ton of cement to concrete consumes 125 litres of fossil fuel (mazut or natural gas) and 90kW of power and releases over a ton of carbon gas into the air. Indeed, based on the existing reports, 8.5 percent of the world's greenhouse gases are caused by the production of 1800 million tons of cement, and hence all developed countries have prioritized the efficient utilization of this element on the top of their agendas. In our country, where the cement factories receive energy subsidies, planning for cement has to take into account the national interest and the consumers' protection rights. The subsidised fuel, which the cement factories burn off, results in the emission of over 32 million tons of carbon gas into our country's environment causing millions of dollars in damages. Thus, it is quite evident that immediate decisions are necessary to overhaul and organize the production, distribution and consumption of cement, which is the number one ingredient of all construction mortars and materials including concrete.

One way of achieving this goal is to implement reverse engineering, which should be set into motion by the compilation of the proper consumption processes followed by the establishment of comprehensive policies to govern the distribution network and continue on with the aim of achieving correct cement consumption. Because of the hike in the global oil prices in recent decades, the developed countries have granted a great deal of attention on cement and concentrated their efforts on optimizing its efficient usage. The plans to reach

cement efficiency have been followed in these countries as described below:

1- The importance of saving on energy consumption: Considering the high amount of fuel needed to process cement, cutting back down on fuel consumption has become the cement production factories' number one priority in recent decades. There is a 50 percent difference from theory to practice in the energy consumption required to make a ton of cement. Thus, it is literally impossible to try and save that much energy. However, by correcting the production line and defining new systems, a rather noticeable reduction in energy consumption may be achieved. Most developed countries have actually been able to lower the cement production energy consumption by 33 percent. The attempt to find alternatives to fossil fuels that present serious environmental issues is yet another praiseworthy initiative undertaken by the cement factories.

2- Promotion of cement and cement products' quality: Cement quality is essential to the consumption rate of the material and the quality of the end product. Accordingly, developed countries now use high-resistant cements for buildings and structures and produce customized cements for special projects and make regular cement for masonry type work.

**High-resistance cements:** A noticeable amount of cement is used to make concrete. Hence, if the most common type of cement, meaning Portland cement (32.5) is replaced with high-resistant cements (42.5, 52.5 and 62.5), cement consumption drops by something like 20 percent. In fact, research shows that changing concrete's resistance grade facilitates achieving a structure with the correct dimensions and concrete compressive strength, which needs less concrete. So, if consider cement consumption at 10 million tons, then we can produce as much high-performance concrete using 10 million tons of 42.5 cement as we would using 12.5 million tons of

## 96 The Story of the Concrete Man

32.5 cement. In a country such as ours, where majority of the population is at the constant risk of earthquakes, producing high-resistant grade cement, which all the licensed factories are fully capable of doing, only needs closer monitoring at the production phase. This measure not only ensures the production of durable construction materials that guarantee both the citizens' safety and prevent millions of dollars from going to waste due to poorly made building materials, it can also help fight environmental pollution and contamination to a large degree. Indeed, using resistant cements (about 10 million tons a year) could save more than 243.750 tons of fuel (the equivalent of USD43 million) and over 280 million dollars in investments as well as prevent the emission of 2 million tons of greenhouse gases into the atmosphere. The production and consumption of high-performance concrete has been the centre of attention in the United States and Europe since the 70s. To cite an example, concrete with resistance property of 100Mpa was used in the construction of a tall commercial building in the City of Chicago in 1982. Moreover, the cement price in America and most other developed countries is determined based on the material's resistance grade; however, in our country pricing is done on the basis of the cement grade used to make the concrete. According to Prof Neville, 'bad concrete is a mixture of aggregates, cement and water and good concrete is a mixture of aggregates, cement and water', and hence the only difference between the two is the science and knowledge that is put into making the good concrete. So, the clear deduction is that cement grade alone is not enough without the correct know-how cannot possibly be a viable representation of the entire concrete features and specifications.

### **Masonry cement:**

Masonry works like erecting walls, bricklaying and stone and tile installation constitute the second largest source of cement

consumption. However, in spite of the existence of the National Cement Standard No. 3516, the production of masonry cement seems to have been forgotten altogether. The correct masonry cement composition is obtained by mixing 40 to 70 percent clinker, 60 percent of various Pozzolana and slag cements. Consequently, due to the low clinker consumption, production of masonry cement benefits the cement factories and communities alike. Furthermore, because of the low potential for usage in structures, which literally eliminates the need to relocate or manually produce concrete structures or the motivation to make hand-made and non-standard concrete, making masonry cements can also assist in organizing distribution systems and consumption rates too. The annual production of 10 million tons of masonry cement can lead to a saving of over 650 thousand tons of fuel per year and prevent 5 million tons of greenhouse gases from being emitted into the atmosphere while lowering the investment costs for building new cement factories by 600 million dollars.

**Customized cements:**

Since concrete structures and concrete parts and components are subject to different application and climatic elements, thus changes in cement's chemical composition to retain the resistance and durability factors and promote efficiency and prevent building and structure risks are necessary. Consistently, customized cements for organic environments or places, where concrete and mortar is exposed to sulphate attack or unconventional climatic conditions such as dam projects and special industrial structures, to ascertain efficiency and durability is highly recommended. The distribution networks, which are any given society's most important economic component, have had a vital role in the further growth and promotion of the developed countries. Every distribution system and organization has to have a special model for transporting and storing

its goods based on the latter's specifications and requirements. Accordingly, distribution models each have three fundamental stages: 1- Deliver of the producer's goods, 2- Storage and inventory and 3- Delivery to the consumer. On par with this, speed, accuracy and quality retention from production to delivery to the consumer is the most significant requirement for any efficient distribution network. Accordingly, all distribution organizations must compile and codify the necessary standards and bylaws and establish a specific mechanism to define them in order to correctly implement every single one of the said stages. Unfortunately, the distribution network system in our country is grossly different from that of the developed countries'. In the latter, the distribution networks are meant to promote correct cement consumption while in Iran the case is totally the opposite, and efficient cement consumption seems to be the last thing on the distributors' minds. Each country's produced cement is divided up as follows:

- 1- For producing concrete structures and parts – Cement is supplied to central mix concrete and concrete part producers.
- 2- For use in civil project – cement is supplied to the civil project companies and contractors.
- 3- For masonry purposes – Cement is supplied to dry mortar production factories or building material retailers' distribution networks. The cement allocation ratio for each group is determined in accordance with the volume of cement needed by the various civil sectors. The gap difference between sectors that consume cement illustrates the fact that the cement distribution structure in our country does not conform to the consumption structure, and the retailers are running the system for the most part. This is while the cement, which is distributed by the retailers, is made in the worst possible manner because most of what they sell is used for non-standard construction projects or ends in the hands of the black market dealers. So, the

complete overhaul of the distribution network and conformity of the same to the consumption structure is a crucial matter that needs proper addressing using the right methods such as the reverse engineering of the consumption, distribution and production cycle. The average cement consumption depends on whether or not a structure has a metal or concrete frame or it is made of bricks. Nevertheless, the maximum amount of cement required for the construction and non-construction projects is calculated for 70 million square metres of construction work per year as follows:

- $70,000,000 \times 150 = 10,500,000$  tons for construction
- $70,000,000 \times 75 = 5,250,000$  tons for masonry works
- Total:  $70,000,000 \times 225 = 17.5$  million tons

As seen, the cement need for the construction and non-construction projects is less than 17.5 million tons per year. Out of this cement volume, more than 10.5 million tons is used for construction while 5.25 million tons goes to masonry works. Therefore, more than 65 percent of the 32 million tons of cement, 21 million tons to be exact, is sold to the public by building mortar retailers. What is amazing is that despite the increase in cement supply, the retail market is always experiencing crisis and drastic fluctuations due to relocation of cement among various sectors and incorrect consumption. The steps indicated hereunder are necessary for organizing the cement consumption by the building construction sector:

- 1- Grade 42.5 and 52.5 cement should be supplied to the authorized central mixed concrete production factories.
- 2- The cement required for the masonry sector has to be made based on the specifications inserted in Iran National Standard No. 3516, and subsequently distributed by the retailers' distribution network. Of course, it is worth mentioning that currently certain measures to improve consumption trends by

## 100 The Story of the Concrete Man

establishing factories, which specialize in producing masonry type mortars, have been undertaken. Though, supplying masonry mortar instead of cement is quite common in the developed countries, and the United States has a masonry association that is already over ninety years old, no feasible actions have been carried out in our country to supervise and control cement consumption in the masonry sector.

3- The large-scale civil and government projects must be classified based on the consumption structure. Consistently, projects, which use a significant volume of the country's produced cement such as dam projects, should use Pozzolana or other special type cements. Moreover, the distribution of concrete parts and components must be left up to the factories that produce them. The corrective actions to improve cement consumption can ultimately lead to the promotion of the production processes and distribution mechanisms and building and structures resistance and durability. The City of Tehran alone incurs millions of dollars in lost revenues yearly due to the never ending cycle of having to replace poor quality concrete street curbs that simply cannot withstand climatic elements like frigid temperatures. All of this senseless waste of resources is happening while by installing standard factory-made curbs that last over fifty years something close to 500 tons of cement can be save annually. Essentially, to correctly deal with and manage the topic of cement, we virtually have no choice but to select one of the following methods:

- 1- By properly calculating each constructional and non-constructional sector and project's needed cement.
- 2- By critically selecting the cement type and specifications through determining the exact applications and based on the relevant standard's requirements pertaining to cement consumption and utilization.
- 3- By delivering cement to the organizations that can process

the material correctly, to make cement-based products including:

- Central mixed concrete producers
- Concrete part producers
- Masonry central mixed mortar producers

What is rather apparent is that any plan defined for cement cannot address the community's problems and concerns unless it takes the proper consumption of this valuable commodity into account. Though, the moment that the topic of cement comes up, the cement production factories immediately start talking about supply shortage, capacity increase and price raise to reach the global price or go beyond it, the sector's subsidized energy and the creation of monopoly for irreplaceable goods has led to a situation, where they ignore the domestic projects and civil activities' cement requirements to take advantage of and exploit the region's high cement demand. What has happened in Iraq and Afghanistan over the past decades has resulted in a sudden surge in demand for cement. Consequently, the country's cement factories prefer to sell their products in those countries, where they would reap huge profits, even if they did not receive any subsidized cheap energy resources. Actually, they are not even satisfied with this, and hence make constant attempts to cause crisis in the cement, which is naturally ensued by a sharp hike in prices. So, unless the consumption habits are corrected, any plan will only serve the interest of a limited number of cement factory shareholders and the cement dealers' network or both. Amazingly enough, we have been witnessing a faceoff between the said shareholders and dealers in recent years to determine who should get the profits generated by the improper distribution structure – something that both are actually to blame for. Sadly, the most notable point that has gone missing in the mayhem is the community

## 102 The Story of the Concrete Man

and the consumer's right to take advantage of a sound and fair cement production, distribution and consumption scheme.

### **The Islamic Republic Newspaper**

#### **The production of each ton of cement releases a ton of carbon gas into the environment**

According to Ali Asghar Keyhani, the Concrete Guild Association's inspector, the production process of each ton of cement releases a ton of carbon gas into the environment and consumes 125 litres of fossil fuel and 90kW of power. 'Based on official reports, 8.5 percent of the world's greenhouse gases are caused by the annual production of 1,850 tons of cement. In fact, the negative environmental impacts and the large volume consumed energy, which do not justify cement's low global price, convinced the Europeans to move their cement production factories to the regions, where cheap energy is readily available,' Keyhani said, and further added, 'The volume of cement production is going to increase by 80 million tons annually within the next five years. Despite this increasing production and making more cement than we need domestically and selling each ton at USD52 abroad is not economically-speaking feasible and will only waste away a huge volume of energy and pollute the environment drastically. Currently, countries like India, Korea, Malaysia and Singapore are after the production of new materials, which they can sell at USD5000 per ton. This is while the global price for a ton of cement is USD52 at the moment. By transferring their cement factories to the areas, where they can buy cheap energy, the Europeans supply their cement demands and simultaneously protect their environments too. In the end, the inspector of Iran Central Mixed Concrete Guild Association reminded everyone how effectively important the officials' critical attention to improving the cement market's general

condition is.

### **Money Newspaper**

#### **Cement export; the hidden oil rent-seeking ploy**

#### **Closure of the civil projects for a fistful of dollars**

IRAN FRAMECO Research Centre: The transitions in the recent decades have defined a new production and export structure, whereby export has gradually drifted away from physical goods to include technical and engineering services. The decision of the industrial countries to move their production units to the developing countries or regions, where the involved costs are relatively low, instead of exporting the end products, with the aim of cutting down on energy and manpower costs and curbing environmental impacts has most certainly led to a totally revolutionary way of how export is done. The spread of this incredible transformation has gone far enough to even include a country like Korea, which only up to the very recent years was the willing host encouraging the foreign industrial production units encouraging to open up centres in its territory. These days; however, the story is completely different, and Korea is one of the biggest exporters of technical and engineering services to many countries across the globe. Based on the export rates, the exporting countries may be divided up as follows: 1- The raw materials exporting countries, 2- The industrial goods exporting countries, 3- The technical and engineering services exporting countries on par with the global changes, our country is also making full efforts to promote itself from an exporter of raw materials to an exporter of manufactured goods. Of course, the country has tried its hand at exporting technical and engineering services too, albeit at a limited extent. Cement production consumes about 125 liters of fossil fuel and 90kW of power. What's more the process also releases a ton of carbon gas per one ton of produced ce-

## 104 The Story of the Concrete Man

ment into the environment too. Pursuant to official reports, nearly 8.5 percent of the global gases are caused by the annual production of 1850 million tons of cement. In spite of the relatively high manufacturing costs, the result is an end-product that is traded at USD52 each ton at the country's ports. While other countries e.g. India, Korea and Singapore, among others, are looking for new construction and building materials that can be sold as high as USD5000 per ton, our country continuous to literally give away a ton of cement at USD52. The ingeniously calculative move by the developed countries to transfer their cement production operations to countries like Iran, where subsidized energy drastically cuts down on manufacturing and processing cement costs, is for that very exact reason. In truth, the cement's low cost in Iran is simply because the needed energies are subsidized by the government. Therefore, it can be deduced that certain hidden oil rent-seekers are involved in the cement market that intentionally prevent the cement consumption trends and practices from being overhauled and corrected. A big part of the cement's price is directly related to the energy sources use to make it - energies, which in our country are supplied through subsidies. If we were to sell the fossil fuel burned off by the cement factories, we could actually generate higher revenues. So, one just can't help but to wonder about the wisdom of wasting away 125 liters of fuel and 90kW of power and releasing one ton of carbon gas into the air just to sell an end product costing USD52.

Neglecting the domestic civil projects for a fistful of dollars illustrates the dire and disorganized condition of the cement production and export system. Even in countries with totally free economies, governments immediately step in to defend the overall national interests when the general public's interests are at risk. Pursuant to the terms and provisions of the Ce-

ment Comprehensive Plan, specific amounts have to be given to the cement factories as the cement's balanced rate difference in order to enable these facilities to cover clinker import costs, when the internal supplies are unable to meet demands during the peak construction seasons. However, after eighteen months of receiving these sums, the volume of cement imported into the country does not match the total these factories have received through this plan. What makes this even worse, according to one of Iran National Standard Organization's top officials, based on the domestic standards, the imported cement did not possess the right properties for concrete production, and so it was released for special purposes. In other words, the money that the factories got to help them import cement when demand is peaking was never spent for that purpose, and to top it off, hundreds of thousands of dollars went missing and the actual imported cement's quality was so low that it could not meet the national standards and had to literally be thrown away. Tragically, the cement factories don't stop here, and instead of injecting their product into the domestic supply network in the summer months when construction projects are at full swing, they ship it to the neighbouring countries, where they can get a higher price per ton. Just the fact that export permits are issued in the year's busiest construction period is rather suspicious and questionable. In the colder provinces, untimely supply of concrete means a delay of one year in the civil projects. According to the Cement Comprehensive Plan, factories are supposed to spend the difference of the balanced rate sales on importing cement when demand is high. One point with respect thereof is that most of this money has to be used to cover transportation costs because the cement rate in countries, where the imported cement is purchased, like India, Pakistan, Russia and Turkey is the same as the domestic rate. So, only the shipping and transportations

## 106 The Story of the Concrete Man

expenses are paid for by the money that the government gives to the factories to import cement, which incidentally is often sold at a higher price than the balanced rate too. Thus, the money is neither used to cover the cement import charges nor distributed among the shareholders, and in fact, no one knows exactly where it ends up.

The seasonal highs and lows of the cement market in the summer months at the height of construction is undoubtedly because of the incorrect distribution and consumption system within the last fifty years. This is the time of year, when certain terms such as ‘dealers’ and ‘cement mafia’ begin to circulate around, so that they can be used as scapegoats and cover up the weaknesses’ of the plan to restructure and reorganize the country’s cement distribution structure. The director of our country’s longest running story is unknown, but the characters are all well-known, and between the two, the black market dealers are nothing more than extras. Indeed, the real characters are the hidden ones, who avoid being identified, and instead have the extras do the dirty work for them. At a time when all of Tehran Province’s standard certified cement factories are operating at 25 percent capacity due to the lack of supply, seeing an unknown person’s ad on the front page of a leading newspaper advertising ‘bulk cement for sale and immediate delivery’ is tells the whole story of cement in our country, which has been going on for years.

### **Hamshahri Newspaper**

#### **Changing the consumption model; the only way to solve cement’s problem**

Cement is the most important material used in construction projects, and as such it has a crucial part in nearly all civil activities. Ever since the Portland cement was invented, a

large number of studies have been conducted on this precious construction material's capabilities and potentials as well as weaknesses and drawbacks. Indeed, after steel, among all the other construction mortars, cement and concrete have been the main focus of a wide range of research and studies. Furthermore, as far as consumption per capita is concerned, after water, concrete has the highest consumption rate in comparison to various other building materials, and its global consumption per capita reached one cubic metre per person in 2002. One area that the said studies have granted a great deal of attention to is the cement and concrete processing method and consumption model. As Prof Neville said, 'Bad concrete is a mix of aggregates, cement and water, and good concrete is also a mix of aggregates, cement and water. The only difference is the science and the knowledge that goes into making it.' The technical know-how, within the format of an academic science, was transferred to our country simultaneously as cement; however, the gap between those that possess the knowledge and the consumers is still a wide one. Though, numerous books, bylaws and standards have been compiled on the correct consumption of cement, almost none has ever been paid any attention to. The poor quality of concrete and concrete-made products next to low-resistance and durability resulting in the rapid deterioration and wear-out of the material is testament to the fact. In truth, the missing technical know-how in our country is what ultimately causes the short lifespan of the concrete structures and products. Currently, what little technical information that is available in the country will only do to suit university purposes, and hence cannot have a viable bearing on any systematically planned actions. Due to different reasons, the developed countries have dealt rather seriously with the question of correct cement consumption for nearly a century now, and what's more, they have even gotten extra

## 108 The Story of the Concrete Man

serious about the matter over the recent decades. Some of the reasons for revving up this seriousness are as follows:

1- High energy consumption: The processing of a single ton of cement requires 125 litres of fossil fuel, 100kW of power and 1.5 ton minerals. Moreover, the manufacturing process also releases over a ton of carbon gas into the atmosphere. Consistently, cement efficiency has been the main objective of the relevant research and studies in the recent decades.

2- Short lifespan: According to the scientists' findings, while complying with standards can elongate the concrete structures and products' lifespan, the opposite is also true, and the durability of non-standard concrete is extremely low. So, with little knowledge and cement and aggregate, concrete street curbs can be produced, which could easily last over a hundred years. But, poor quality concrete made without the right knowledge deteriorates and falls apart within just two to five years. In the never ending street curbs' replacement and re-installment cycle in our country, something like 500,000 tons of cement and more than 6 million tons of aggregates is wasted and reduced to debris and rubble every year incurring an economic loss for the municipalities that literally runs into hundreds of millions of dollars. Such staggering damage, which can readily be remedied by using high-durability, factory-made street curbs, is tragically incredible.

3- Not knowing how to consume: Unfamiliarity with cement consumption is the reason for buildings' short lifespan. The figure in our country stands at 35 while the same number for a building's useful life exceeds one hundred. The lack of know-how at the production stage next to short lifespan is the reason for rise in cement consumption. In many instances, and mistakenly so, in an attempt to reinforce concrete, higher grade cement is used; however, concrete's resistance and durability is the result of correct mixing. In fact, most 400kg cement per

cubic metre grade curbs in which the factor of water to cement or w/c has been neglected, have had a lifespan of zero! But, factory-made curbs made by observing a low w/c ratio and a lower grade than the one above have a useful life of over twenty years.

4- Changes in the chemical composition: Cement can attain special features and potentials for implementation at the consumption stage if certain changes are made to its chemical composition. Actually, optimal results could be achieved in all kinds of structure such as dams, tunnels, pillars and columns, and as a result a great deal effort has gone into diversification of this valuable construction material in the past few years. So, customized cements are now available to suit almost any structure and condition. For example, construction cements designed for use under special climatic conditions, reinforced cement for concrete products at risk of sulphate attack and active cement ions, customized concrete for dams and special cements for masonry. Using these types of cement not only lowers consumption rate, but also helps promote the end products quality.

5-Special machinery and skilled manpower: Having special machinery and skilled manpower is essential to any kind of cement consumption. Consistently, it is necessary that cement is supplied only to those that have the right potential and means and the required permits and licenses to use it. A significant amount of cement in the developed countries is produced by licensed factories possessing the needed equipment and machinery in conjunction to a trained workforce to produce high-end concrete and concrete products. But, in our country, most cement is used on-site by untrained basic workers using bare minimums and incorrect methods to mix the material and make poor quality concrete for routine construction work. Changing this trend - something that this report

## 110 The Story of the Concrete Man

has examined critically - is the only way to restructure and organize the cement industry.

6- Our country's cement production is at an acceptable level and enough to meet the entire demands. So, supply is not the problem. What really leads to seasonal crisis and the ongoing cement controversy, is the incorrect consumption, which has to be addressed first before there can be any hope of solving the cement problem.

### *About the Year 2006*

**T**he crisis in the cement market, whose roots are embedded in in incorrect production, distribution and consumption policies, was the mass media's number one topic of discussion and report. Among all the issues concerning cement, implementation of proper consumption measure took centre stage, and was the main focus. One of the actions that generated a positive outcome was the enactment of the compulsory requirement to use standard building and construction materials, particularly central mixed concrete, and especially in Districts 2, 5 and 22 in the City of Tehran.

#### **Moj News Agency**

#### **Chairman of the Board of Directors of Standard Concrete Producers Guild Association:**

#### **Only 10 percent of the country's cement is produced by the standard certified producers**

About 80 percent of the cement made by the developed and developing countries produce is given to the licensed factories to produce standard concrete and concrete products; however, the same figure stands at less than 10 percent in our country. According to Moj News Agency, Ali Asghar Keyhani, Chair-

## 112 The Story of the Concrete Man

man of the Board of Directors of Standard Concrete Producers Guild Association added to his comment and said, ‘The housing sector as one of the most important part of the country’s economy sectors, draws in about 25 percent of the per capita income in the form of investments. However, the lack of proper attention to the quality and durability of this volume of investment imposes a, sometimes evident and sometimes hidden, economic burden on the society, which has apparently left the officials in limbo. The talk of taking the necessary actions to reinforce and strengthen buildings has literally stayed just that – talk. The measures to standardize construction will remain just talk unless structural changes at the housing and building materials production stage undergo some major changes first. Because of the sector’s slow growth a couple of decades, standards were pretty much neglected. But, the case is now different and with the enormous investments being made in housing, implementing compulsory standards to ensure construction mortars and materials resistance and durability is a must. Making buildings that have no quality and standard of any kind is simply throwing away the national wealth. Risk of earthquakes is always looming in front of us in Iran, and using poor quality materials to construct should be taken as serious as an offense against the country’s national security.’

By citing Bam’s devastating earthquake, Keyhani pointed out the importance of using novel high performance building materials, which according to him, is more important than the building itself. ‘Although, the cement’s correct consumption model has been granted a great deal of attention in the past one hundred years, in our country, and regrettably so, cement is being consumed in the worst possible way imaginable. Poor quality materials inflict a heavy economic loss to the country and pollute its environment in one too many ways,’ Engineer

Keyhani said and then added, ‘Such damages could easily be prevented if people just use cement to make standard, factory-made by-products. Unfortunately, the building material retailers run the distribution network, and as result the cement, which they supply and distribute ends up being used in a totally non-standard manner. I have to say that the rubbles that killed literally thousands in Bam are the direct result of incorrect cement production and distribution. Despite such tragic catastrophes, the public officials still refuse to devote sufficient time and energy in examining the benefits and advantages of factory-made cement products. To give an example, on average, an estimated one million tons of cement is used to make manually-made street curbs, which typically have a lifespan of less than two years. However, standard certified cement factories are capable of producing the concrete curbs that easily last over one hundred years. So, you can see the savings if improper consumption practices are supervised and controlled. The cement that building material retailers supply and distribute is often mixed on-site by unskilled workers to make concrete that is a far cry from any kind of acceptable standard. Another problem with the retailers’ distribution network is that their cement always gets into the hands of the end user at a higher price than the approved rate.’

### **Keyhan Newspaper**

#### **Improper and uneven distribution; the cause of market turbulence**

‘A part of the cement market’s turbulence is the result of improper and uneven distribution. The correct cement consumption model has been the focus of much research and study over the last one hundred years; however, in our country, and regrettably so, cement is being consumed in the worst imaginable way. Poor quality materials inflict a heavy eco-

## 114 The Story of the Concrete Man

conomic loss to the country and pollute its environment in one too many ways,' Ali Asghar Keyhani, Chairman of the Board of Directors of Standard Concrete Producers Guild Association told the reporters. He also added, 'To give an example, on average, an estimated one million tons of cement is used to make manually-made street curbs, which typically have a lifespan of less than two years. However, standard certified cement factories can make concrete curbs and slabs that easily last over one hundred years. The building mortars' retailers' distribution network is the main culprit for the chaos and disorder in the distribution system and the creation of the cement black market. About 80 percent of the cement made by the developed and developing countries produce is given to the licensed factories to produce standard concrete and concrete products; however, the same figure stands at less than 10 percent in our country. So, the government has to pay critical attention to the cement is consumed since next to being a valuable national asset, cement quality also has a crucial role in guaranteeing people's safety.'

### **Sarmayeh Newspaper**

#### **The Cement Distribution Committee needs a serious house-cleaning**

A major part of the policy makings with regards to cement used to be carried out by a committee called the 'Provincial Cement Distribution Committee.' The Cement Comprehensive Plan's approval, which was ratified and passed by the Market Regulatory Assembly comprised of state, housing, industry and commerce ministers, was the basis for the formation of the said Committee. Pursuant to the terms and provisions of the Comprehensive Plan, each province has to have a cement production and distribution coordination and supervision committee made up of the Commerce Organization

president (as the main person in charge), Industries & Mines Organization manager, Provincial Transportation & Terminal manager, provincial Government's legal representative and the managers of each provinces' cement factories, whose job is to meet every fifteen days at the Commerce Organization to review the central committee's policies and approvals and make sure they are being implemented correctly, and also to determine the cement consumption index and monitor cement distributors and their distribution mechanisms in order to ascertain that the different sectors requiring this material are getting their share. Considering the different cement consumption structures in various provinces, having such a body to coordinate the central committee's approvals seems logical. However, the provincial committees' performance in Tehran Province doesn't appear to be in line with the aim and purpose of setting up such delegations. Indeed, the only thing that they have achieved is changing and often increasing the public and civil and governmental projects' cement quota while at the same time decreasing the province's concrete and concrete parts industrial production units' share. Currently, there are 38 standard concrete production factories throughout Tehran province with a capacity to produce 6 million cubic meters worth of central mix concrete annually. What's more all of these units were able to successfully complete their requirements and get their certificate of standard two years ago. in spite of their preparedness to make standard quality cement with long-lasting properties, which could ultimately lead to huge cut backs on spending, the amount of cement supplied to the units is only enough to cover around forty percent of their operations. While the law strictly prohibits the sales of the cement needed to make central mixed concrete to producers, surprisingly so, Tehran Province's regulatory committed, contrary to what it was supposed to do, has proceeded to decrease

## 116 The Story of the Concrete Man

the standard factories' cement quota in the last few years. Such decision makings and moves regarding cement deliveries to different sectors must first consider the total output capacity of the authorized cement factories before determining the proportional quotas – a point, which quite obviously has been missed by the provincial committee, since cement production across the country is on the rise and many factories already have their certificates of standard to start making high-performance concrete. In spite of numerous correspondences by the Standard Concrete Producers Association about supplying and distributing cement in a fair and suitable manner, Tehran's cement distribution committee has not done much to remedy the situation.

Unfortunately, the committees' stance in respect of cement distribution in the past was in total contradiction and contrast with the system's fundamental decisions. However, some signs of change have begun to appear in the past few months following the hard work and effort by the Tehran Province Commerce Organization's president. In the meantime, the general manager of Tehran Province governor's office has also communicated a mandate to the Commerce Organization's president to ban the delivery of the construction sector's cement to anyone else except the standard production units. Such sanction together with the 'Bylaw on Supervising the Implementation of Construction Mortar Standards' approved by the Cabinet in March 2005, and also Article (9) of the Bylaw, which assigns the full responsibility of making sure the requirements are being enforced to Iran National Standard Organization, are now making the provincial committee to more seriously take steps toward changing the distribution structure in favour of correct cement standard and consumption. Although, the certified cement producers are hopeful, it is un-

likely that the committee's existing setup and structure will let the changes to take effect soon unless they start to rethink their view of the 60 percent cement supplied to the retailers as an economic stimulant, and instead, see it as a vital ingredient for reinforcement and strengthening of the construction materials. To them cement distribution is important, and the committee members could care less who and how this valuable material is used. For the time being, the only thing to do is sit and wait for the outcome of the next cement committee's meetings and find out how they are going to respond to Iran National Standard organization's official requisition. Will the retailers' distribution network comply with the standard's directive on correct cement consumption?

### **Iran Newspaper**

#### **Drop in concrete quality is making buildings and structures unsafe**

'The absence of a proficiently skilled manpower in the country has caused concrete quality to drop sharply, which in turn, has put the structural safety of countless buildings and other structures at risk,' Engineer Keyhani told a group of university students visiting IRAN FRAMECO – the country's biggest standard central mix concrete research and facility. 'The first positive step toward construction material reinforcement is total compliance with concrete standards at the production and consumption stages. One of the most worthy advantages of moving toward concrete standardization is the potential of recruiting and putting to work over 5000 of the country's graduate and post-graduate students. The presence of this number of young and proficient manpower will surely have a huge positive impact on the industry in the years ahead,' Engineer Keyhani further added. By criticizing the lack of any relationship or cooperation between the industry and the country's univer-

## 118 The Story of the Concrete Man

sities and higher learning centres, the Managing Director of IRAN FRAMECO said, ‘Unfortunately, the relationship of the industry and universities in our country is limited to periodic student visits to factories. But, in the developed countries university professors and students cooperate with different universities and provide them with all kinds of technical and engineering consultation. The country’s top concrete expert also pointed out to the question of building reinforcement and retrofitting and said, ‘Building strengthening has a well-defined structure, which is formed through technical, engineering and administrative communications. The standard and high-resistance buildings in Japan are not the result of endless talks and speeches, but rather sound technical and engineering structure within which constructing non-standard structures is virtually impossible. So, unless we’re willing to redefine our cement and concrete production structure, rest assured that building reinforcement will continue to remain only talk. Central mix concrete production is subject to strict standards and the Governmental Discretionary Punishment Act, and thus illegal production units must be closed down immediately. But, most such units are still operating. Ever since 2002, all construction projects have been required to fully comply with building standards; therefore, the cement factories supplying cement to the unauthorized concrete workshops as well as Iran National Standard organization and Commerce Organization and municipalities will be the number one guilty parties for any disasters in the construction sector.’

### **Fars News Agency**

### **Concrete Association Chairman of the Board to Tehran’s Municipality:**

**Issuance of ‘project completion permit’ in return for the use of standard concrete only**

The Concrete Association Chairman of the Board, Engineer Keyhani said in an interview with Fars News Agency, ‘The City of Tehran must only issue construction permits to those that use standard concrete in their projects. Unfortunately, the cement, which has more use for concrete producers, is given to people and vice versa. The type of cement required by concrete manufacturing units is different in quality, and hence factories are forced to purchase their supplies because the kind of cement they’re supposed to get is ending up in the wrong hands. Pursuant to the 2002 standard bylaw, and in a praiseworthy move, the City of Tehran has been issuing construction permits only to those that use standard concrete. Type 325 cement is ideal for civil projects while Type 425 is the best for constructing buildings. Though, observing these specifications are mandatory, some cement factories, for whatever reason, still refuse to comply. Despite the government’s constant follow-up, regrettably, sufficient cement is not supplied to the certified producers, so that they can make standard concrete. What’s worse is that most such units are operating at 30 percent capacity.’

### **Eqtesad-e-Sobh Newspaper**

#### **Government cement policies don’t conform to resistance principles**

Cement – one of the most important construction materials – plays an important role in boosting building and structures resistance ratio. The three main cement consumers are central mixed concrete industry, concrete product industry and mortar and manual-cement consumers. Among the three groups, only the central mix concrete and concrete part producers possess the technical and engineering know-how and skill to correctly process and consume cement. More than 80 percent of the cement produced by the developed countries

## 120 The Story of the Concrete Man

is used by the standard central mixed concrete units to produce machine-made products, and only a small share is set aside for masonry works. Of course, new industries specializing in high-performance building mortars have emerged in recent years to help push the entire cement production process toward standardization. In our country; however, the story is completely different, and the share of licensed producers is only 15 percent while the remaining 85 percent goes to consumption outside of the cement production mechanism. Like Prof Neville, the most prominent concrete technology scientist, said the only difference between good and bad concrete is the process that goes into making it; otherwise, they both use the same aggregates and cement and water ratio. The cement, which is supplied to the certified factories, is turned into high-performance concrete with the right type of resistance and durability properties. However, the cement supply that ends in the building mortar retailers' network is often used to make manually-made concrete that lacks any standard and quality. Also, this distribution mechanism paves the way for the creation of a dealer-ridden black market. Actually, this is the very reason why the manual use of cement is so strictly regulated by the developed countries.

The nightmarish experience of countries like Mexico and Venezuela have in dealing with the cement retailers' distribution network is now haunting us here in our country. Not only does the retailer's network not care much about complying with standards, but in fact, it is the reason for the unrealistic surge in prices. However, distribution through industrial mechanisms and standard concrete production units ensures the quality of the end product and creates the right setting to control cement's quality and price. Based on the global statistics, standard concrete industry's distribution rate is 86.4 percent in

Japan, 66.7 percent in the US, 71.3 percent in Russia, 78.5 in the Eu and 74.6 percent in Turkey. But, the same statistics for our country show that only 10.7 percent and 14.8 percent of the distributed cement in 1991 and in 2004 respectively was factory processed, and the rest was distributed by the retailer's network through a shady and unclear mechanism. Over the past two years, one hundred percent of Tehran Province's cement and concrete units have succeeded in acquiring their certification of standard by making huge investments. But, these very same units are currently receiving zero or minimum support from the governmental organizations and apparatuses. For example, supply of sufficient cement is a major problem that has literally forced these factories to operate at 15 percent of their actual capacities. This is a challenge for both standard producers, and also for anyone else that is looking to find high-performance building materials. The unavailability of first-rate construction mortars forces many projects to use manually-made concretes in direct violation of the exiting bylaws. To eliminate the retailers' incorrect distribution network mechanism, and ultimately rid the market of dealers, the production units, which have been issued their certificate of standard by the Ministry of Industries and Iran National Standard Organization, should receive more support from the concerned government offices. The more the retailers' distribution network is pushed out of this equation, the more stability that the cement and concrete market is going to experience. While the presence of dealers, and the resulting black market's existence, both of which evolve around the retailers' distribution network, is detrimentally undermining the complete standardization of the cement market, the producers of standard central mixed concrete can play an important role in the control of a healthy and active cement market. Increasing the licensed producers share, as the Cabinet has emphasized

on so many times, is a point that requires more close attention in the Cement Distribution Committee's meetings.

### **Donya-e-Eqtasad Newspaper**

#### **Despite enforcing compulsory standards, buildings and other structures still being made by non-standard concrete**

According to the head of the Central Mixed Concrete Association and the special consultant to the president of Iran National Standard Organization, Ali Asghar Keyhani, only 14.5 percent of the 70 percent cement supply, which is supposed to be allocated to the production of central mix cement, actually reaches the certified factories hands. Thus, 55 percent less than the actual cement volume is used to produce central mixed concrete. 'The government passed a law in winter 2004 requiring production, distribution and consumption of standard construction materials. Based on the numbers provided by Tehran's municipality, one hundred buildings are constructed in the City every day,' Keyhani said, and then added, 'So, the issue of using high-performance building materials that can withstand forces and climatic conditions is extremely crucial. However, standard concrete producers are only getting a 14.5 percent share of the country's cement supplies - something, which I believe is clearly illustrative of the potential risks and disasters. Unfortunately, the wrong practice of using non-standard cement, which was formed years earlier, is still quite pervasive.' By citing the incorrect cement distribution mechanism as the main reason for the improper cement consumption in recent years, Keyhani added, 'Luckily, Tehran's mayor has signed an agreement with the standard Central mixed committee producers a while ago, which subjects and restricts construction projects to use standard building materials only, whereby the villagers will not be issued an end of the project certificate needed to utilize the building or structure.

Considering the forty or so licensed concrete production units in Tehran Province, we can meet the entire provincial needs and even have enough left over to export to the other counties and provinces too. Yet there are many projects that have come to a complete halt because of untimely cement deliveries. Currently, about 60 percent of the cement distributed in Tehran is supplied to ordinary people while only 70 percent of the cement used in a building or structure is for concrete and concrete part production and the remaining 30 percent is explicitly for other masonry work. Cement consumption needs a suitable mechanism, the absence of which is costing our nation millions of dollars in lost revenues. Though, Clause (4) of Article (6) of Iran National Standard, strictly prohibits the sale of cement to unauthorized concrete manufacturing units, still many cement factories continue to violate the standard. The technical know-how and production skill that go into producing concrete are quite unique, and hence placing cement in the hands of basic workers to make concrete on-site is both illegal and unethical. People spend money on high-performance materials to guarantee building resistance and safety. But, based on official reports nearly 60 percent of our country's buildings are weak and could easily crumble at the slightest tremor. This is tragically shocking in earthquake prone country such as ours.'

In further comments, the special consultant to the president of Iran National Standard Organization, Engineer Keyhani said, 'According to Tehran's Municipality an estimated one hundred buildings are built in the City every single day. So, if we start an all-aspect standardization of the cement industry today, that's one indeed high-resistance buildings that we're ahead. Now, add that figure to the 70 million square meters of construction projects carried out across the country annually, and you'll see how important producing standard concrete is.

## 124 The Story of the Concrete Man

Pursuant to Ministry of Housing & Urban Planning as well as the Building Research Centre, 4 sacks of cement are required per square meter of construction, which means an estimated 14 million tons of cement to cover these constructions; however, today nearly 21 million tons is used to do the work - a staggering 7 million tons in surplus! The inadequate distribution mechanism is causing a great deal of headache for the people, and the cement, which should be supplied and distributed among the real consumers simply ends up in the wrong.

### **Fars News Agency**

#### **Tehran Municipality and Tehran Standard Concrete Guild Association signed an agreement**

#### **Cooperation agreement to apply standard concrete, concrete products and beams**

Tehran Municipality and the Standard Concrete Guild Association signed an agreement, whereby making the application of high-performance concrete in all construction projects within the City mandatory. According to Fars News Agency, the Guild's public relations office has issued a notification to Tehran's district municipalities informing them that the by-law to use standard concrete in construction projects is now in effect, and this has to be fully enforced throughout the city. The standard building and construction materials are the main component of structure resistance and safety. However, among all such materials, concrete's role is unquestionably the most crucial. So, this agreement is an important, positive step toward restructuring and reorganizing the cement distribution and consumption model in Tehran. At the present time, all construction projects within the city's limit are subject to the terms and provisions of Clause (4), Article (6) of Iran National Building Standard as well as Article (13) of Governmental Discretionary Punishment Act and are required to

strictly use standard concrete and beams, and hence the supply and consumption of non-standard products is strictly prohibited. According to this report, the obligation of Standard Concrete Producers Guild is as follows: The Guild undertakes to provide and meet the demand of the entire civil and other construction within Tehran's city limit with standard concrete and beams as in a timely manner. Furthermore, the Guild also undertakes to provide services only to the construction workshops and projects, which have obtained the required permits from Tehran Municipality. The standard concrete Association is also required to analyse its prices based on the governmental rates specified for construction materials and always have the said price available for public information. In the meantime, Tehran Municipality's obligations are to ensure that standard concrete and beams are used in the City's buildings and other structures and only issue the project termination certificate in return for the submission of documentations evidencing total compliance with this regulation. The City is also required to closely monitor the concrete mixer trucks round the clock and ascertain that the standard construction material sticker and the producer's complete details installed on the vehicles and stop any building materials' transportation vehicle that does not have this label. Moreover, the City of Tehran must also enforce the law with respect to the use of standard concrete in all the construction projects within the city's limit and prevent the use of on-site manually-made concrete and concrete products, and pursuant to the terms and provisions of Article (13) of the Governmental Discretionary Punishment Act, proceed to immediately force the unauthorized workshops engaging in making non-standard concrete and beams within the city limit into immediate closure.

**Jahan-e-Eqtesad Newspaper**

**Producing masonry cement can resolve the cement distribution problem**

The winner of the national award for construction materials production believes that standard buildings without non-standard materials are not a possibility. Engineer Ali Asghar Keyhani, IRAN FRAMECO Managing Director, who was picked as the country's concrete industry veteran, and the top national production unit on the Industry & Mine Day says that the cost of making standard and non-standard buildings is the same, and people's perception that reinforcing and raising building safety by using standard construction materials is false. According to Engineer Keyhani, building reinforcement needs proper planning and not extra expenditure. He quotes Prof Neville's famous sentence about good and bad concrete being the same, but the process making the difference and explains that the same amount of raw material, energy and spending goes into making both good and bad construction mortars, but there's a great deal of excess and wastage involving non-standard mortars that ultimately raise the building's final price. In further comments, Keyhani calls the country's cement situation as unsuitable and says, 'The thirty eight licensed central mix concrete production units have acquired their certificates of standard; however, all are running on thirty percent capacity due to the improperly implemented cement distribution mechanism. Surprisingly, while standard concrete is supplied to any applicant with the assigned national identification number, there are at least fifty small workshops that also produce and supply illegal, non-standard concrete as well. So, consumers should only trust the concrete bearing the national standard organization's logo. The authorized concrete producers have both quality workmanship and legal commitments and obligations, and hence have to produce standard materials. But, the

manually-made concrete producers have no such undertaking and pretty much do as they please.

Engineer Keyhani cites the incorrect distribution mechanism as the main cause for the existence of so many unlicensed production units that churn out poor quality materials that are essentially a waste of national resources and a constant safety hazard. 'There's no hope of construction sector's total standardization unless the cement distribution system is first restructured and reorganized because it is, in fact, this system that has created the setting for people to make non-standard concrete,' Keyhani says and adds, 'At the consumption stage, cement is consumed in three different ways, namely as structure concrete, part and component concrete and masonry concrete. Each one of these requires a special type of cement, but this point has completely gone unheeded in our country, where, unfortunately, Type 2 Portland cement - mostly used for structural and parts production - is typically supplied to the building mortar sellers to be distributed and sold for masonry work while Portland Pozzolan cement is supplied to special concrete and concrete part producers. This type of distribution completely destroys the quality in all three sections.' 'What's more the wrong distribution mechanism often causes severe market turbulence and creates a black market because relocation of cement among the three sections is possible through this mechanism. But, if we produce and supply the right type of cement for each of the three sections, stability will return to the market within just three months since dealers hands is cut off and they're no longer able to operate.' Currently, central mix concrete production is highly regulated, and no one is permitted to supply raw materials to the unauthorized production units. Yet, this law seems to have been forgotten because a large portion of the country's cement is supplied to the public,

## 128 The Story of the Concrete Man

where it eventually falls into the hands of the wrong people, who do not qualify to make standard concrete. This is while by law, the cement used for construction must be supplied to the licensed concrete production units only.’ According to Engineer Keyhani, pursuant to the relevant National Standard, masonry cement has to be produced in a different colour than that of the Portland cement. This colour cement is for masonry purpose only and people can be readily obtained at any building mortar retailer. But, people have to go to concrete production factories to get the standard central mix concrete for their specific uses. Engineer Keyhani refers to the statistics available on the Cement Association’s official website and says, ‘65 to 85 percent of the developed countries cement is factory-made, but the same number in our country is less than 15. Unfortunately, a big chunk of our country’s cement is turned into non-standard concrete by unskilled workers on-site using just shovels and wheelbarrows. Given the fact, we all should be concerned about our safety.’

### **Moj News Agency**

#### **Head of Standard Concrete Producers Association criticising the Cement Distribution Committee**

The Cement Distribution Committee’s structure in Tehran Province has led the Committee to move against the flow governing the system’s fundamental decisions. In an interview with Moj News Agency, Ali Asghar Keyhani, the Standard Concrete Producers Association’s Chairman of the Board, named the provincial cement distribution committee as the sole policymaker for the cement distribution mechanism within the last three years and said, ‘The Cement Comprehensive Plan was the basis for forming the committee. One of the plan’s articles projects the formation of coordination and regulatory cement distribution committee for each province comprised

of the Commerce Organization's president (as the main official), the head of the Industries & Mines Organization, Provincial Transportation & Terminals Organization manager and the provinces' cement factories managing directors, which is supposed to meet every fifteen days at the Commerce Organization's main office.

### **Keyhani Cement Committee's tasks and duties**

This Committee's main job is to implement the Central Committee's approvals, determine the consumption index, supervise different sectors' cement distribution and continuously monitor cement agents' performance.

### **Dissatisfactory performance of cement committees in Tehran Province**

By criticising the performance of the cement distribution committees in Tehran Province, Engineer Keyhani had this to say regarding the difference in cement consumption structure across the country; 'Basically, what the Province's cement committees have done is to keep changing the quota for the public, civil and governmental projects while decreasing the increase the concrete production units share. This is while the thirty eight or so Province's cement factories have had their certificates of standard for the past two years and been ready to put out 6 million cubic metre of concrete per year.'

### **Reduction of Standard Central Mix Concrete Association's quota**

According to the head of Tehran Province Commerce Organization, while supplying cement to any unlicensed production unit is illegal, the Province's factories get enough to cover only 40 percent of their total capacity. Contrary to what it was supposed to have done, the provincial cement committee has continuously reduced the standard industry sector's needed cement supply. To increase the country's total cement output

## 130 The Story of the Concrete Man

and force the production units to apply for and obtain their certificates of standard, the provincial cement distribution committee should supply the requirements of the standard factories, and then proceed to supply cement to the public and civil and governmental projects. One the most fundamental problems with the committee is the members with the right to vote and create the existing turbulent market.

### **Cement Committee's uncoordinated moves**

By pointing out that the cement distribution committee in Tehran Province was moving the opposite of the flow governing the main decisions concerning the system, the Chairman of the Board of Standard Concrete Producers Guild Association added, 'The Tehran Province Commerce organization's president has made some remarkable efforts in changing the cement consumption practice. In fact, he has been working hard to implement Iran Standard Organization's bylaw on supervising the compulsory use of standard building materials to the extent possible. Of course, such actions require many legal details and the cement distribution committee does not seem to want to let any of them to take effect.'

### **Construction mortar retailers; the Cement Committee's executive problem**

Engineer Keyhani cited the construction material retailers' 60 percent quota as the Cement Committee's main executive problem and added, 'Construction material retailers look at cement from an economic point of view and the financial benefits it has for their businesses and not as a vital raw material for building reinforcement. The Chairman of the Board of Standard Concrete Producers Guild Association also said, 'The retailers could careless who buys the cement and how it's going to be used, and they only care about distributing the material.' He demanded that Tehran's attorney general immediately step in and review and investigate the cement dis-

tribution mechanism and make the necessary changes in the Committee's structure and said, 'Currently, we have no other choice but to wait and see if the Cement Distribution Committee and the construction mortar retailers' network will ever comply with the bylaw on standard cement.'

### *About the Year 2007*

**T**he poor quality cement has created numerous problems for organizing the cement market in our country, whereby the black market dealers are taking the most advantage and reaping the benefits. The public disclosure of the wrong and unethical business relationships that have created the dealers network and fuelled its existence was covered extensively by the media in this years. The first standard central mix concrete producers' convention to discuss the industry's future was another plan to address the problems in this sector.

#### **Jahan-e-Sana't Newspapaer**

The producers of standards concrete, as the main consumers of cement, have been examining the questions involving cement from different angles. Accordingly, a wide range of statistics and data have been made public, in respect of both the producers and the consumers of cement which represent the industry's various aspects. The cement producers claim that the current cement rates (Rls. 365,000 per ton) do it justify the high costs of establishing a cement factory, which currently, the old factories' cement is priced at 240 thousand rials while the new factories is 360 thousand rials both of which are fi-

nally sold at the government's approved rate of 365 thousand rials per ton. So, the cement production units either incur a loss or gain little profit. Meanwhile, the rate indicted in the official cement factories' reports is somewhere between 150 thousand to 165 thousand rials and the profit or the return on return on the investment needed to establish a cement manufacturing plant is 350 thousand rials per ton. The collection of such documents and records together with the industry's experts' views and opinions, which address and respond to some of the cement industry managers' claims could serve to make up some of the topics that the Economic Council has to review and examine in its meeting. Though, many believe that the Economic Council's meetings are unidimensional, whereby the sole aim is to increase the cement price, and other issues such as the production and distribution costs are not be on top of the agenda.

This may be partly true since the Council has neither officially invited any cement and concrete experts to its meetings nor asked the biggest industrial consumers of cement like the central mix concrete producers and concrete products' manufacturers as well as the mass production housing and building developers and contractors to put forth their views and recommendations. Therefore, it isn't hard to deduce that the Economic Council decisions in no way, shape or form grant any attention to the consumption stage and the needs and requirements of the real consumers. Pursuant, to the cement industry's internal reports, the sum of 135 billion tomans (the super unit of the official currency of Iran, the rial) is used as the basis to calculate the cost of investing and establishing a one-million-ton per year cement facility. However, industry experts have presented valid supporting documents that prove this sum can be reduced to 80 billion tomans (The Cement

## 134 The Story of the Concrete Man

Journal, No. 113, p. 4). This , people shouldn't have to be the ones paying for the weaknesses of the managers planning to establish cement factories, and likewise the weaknesses involving the exploitation period should not be compensated by increasing the cement price. According to the industry experts, the annual saving of 1.6 million barrels of crude oil is not farfetched just by eliminating the so called 'false air phenomenon.' This volume of savings is equal to 720 billion rials and 2 thousand tomans per ton of cement each year. But, this cut back on the national wealth and resources is going unheeded because of the cheap energy prices supplied to the cement factories. Furthermore, the numbers and figures presented in the industry's various publications and journals, show that the amount of fuel used by the domestic cement factories is more than the amount used by the world's cement manufacturing plants. The global value of the fuel consumed by the country's cement producers, which is paid for by the governments in entirety, is 300 billion tomans (equal to 10,000 tomans per ton of cement), we agree to having cement exit the government's support and assistance basket to determine the industry's exact competitive edge against so long as the other world cement producers, so long as the needed fuel is supplied at the accepted global prices. Moreover, contrary to the USD97 rate for delivering cement at the Iran-Iraq border announced by the Cement Producers Guild Association secretary in 2005, the Iran Industry Modernization & Development has declared the real price to be USD51 and USD54 for 2005 and 2006 (including the transportation costs) respectively. Asked on what has been said so far, it may deduced that the restructuring and reorganizing cement consumption is not possible unless the consumption stage is first corrected; otherwise, the cement market will spiral out of control resulting in increased housing and construction products price increase.

### **Central mix concrete producers first ever convention**

The country's central mix concrete producers will meet for the first time in February to discuss and consider the challenges and problems facing the industry. The convention has been made possible through IRAN FRAMECO Managing Director's initiative and close cooperation of Tehran Province General Standard & Industrial Research Bureau. The concrete industry has been the focus of widespread attention in recent years, and as result the number of certified concrete production units has jumped from just one unit in 2003 and to 300 by 2007. In addition, more than 700 other units have also applied for the certificate of standard and their applications are currently pending. What's more the certified central mix concrete production units operating across the country are now being closely monitored by Iran National Standard Organization - a great measure which, indeed, has led to significant overhaul and transformation of the domestic cement industry. So, to most experts, the incorrect cement distribution policies are the main culprit for the country cement market's turbulence and crisis. Engineer ALI Asghar Keyhani, IRAN FRAMECO Research & Production Unit Managing Director and winner of seven standard concrete manufacturing national awards has this to say about the convention: 'The central mix concrete producers make the most important construction material structure. In fact, this building material is so crucial that executing construction and civil projects is literally meaningless without it. Because of the lack of public officials' attention, the cement industry hasn't experienced a noticeable growth in the past years. The cement consumption trend is the main assessment criteria for the durability and lasting properties of the civil projects quality worldwide. Currently, something like 70 percent of the global central mix concrete and standard concrete parts are supplies by the licensed c many production units.'

**Donya-e-Eqtasad Newspaper**

**Cement shortage; central mix concrete's main problem**

The head of the Standard Central Mix Concrete Association said that the untimely cement supply is the central mix concrete producers number one problem. In an interview with IRNA News Agency, ALI Asghar Keyhani, furthered his comment by stating, 'The 42 certified central mix concrete producers only in Tehran Province are currently operating at 29 percent of their total output capacity. These production units' nominal production capacity is 8.5 million cubic meter per year - a number that is a far cry from the real number. According to the official cement statistics, 2.47 million cubic meters of cement was supplied and delivered to the aforementioned factories. Based on the daily registered production output, providing that they have used their entire cement supply to make concrete, the total capacity of the said production units could be increased by 6.3 million cubic meters per year, which is 76 percent less than their nominal capacity.' Engineer Keyhani also reiterated, 'According to the year's first quarterly report on the cement companies performance, the concrete consumption rate shows a growth of over 9 percent in comparison to the same time last year. Based on the output registered by these companies' production units on certain days, it seems that increasing their cement quota to match their specified capacity could easily meet and satisfy a great deal of the country's cement demand, and thereby stabilize the cement market.' With regards to the civil projects – including the ones undertaken by the government – he said, 'the standard central mix concrete producers are capable of producing can meet a wide range of the government and the municipalities' demands for street curbs, concrete parts and components and central mix concrete for sidewalk improvement and new factory construction projects.'

**Jahan-e-Eqtesad Newspaper**

**Standard Concrete Association's president:**

**Quality of domestically-produced cement is dropping**

As long as cement factories continue to receive subsidized fuel, measures to exit this product from the government's assistance basket should not be taken. In his interview with ISNA News Agency, the head of Standard Concrete Producers Association added more to his comment and said, 'the government pays 262.7 tomans per litre for imported fuel oil; whereas, every subsidized litre of this fuel costs the cement factories 10 tomans. This means that the government is subsidizing around 252 tomans of the total cost. Undoubtedly, subsidizing programs help developments and encourage increased productivity – in this case cement. Still, this manner of production is ensued by irrecoverable environmental damage and improper use of unrenewable mineral resources and huge power consumption. Based on the exiting statistics, cement transportation comprises 14 percent of the country's road consignment shipment operations; therefore, considering the shipping cost each ton of cement should be sold at USD80.' According to Engineer Keyhani, a big chunk of the revenue generated through cement has to be reinvested in troubleshooting and fixing the consequences of this style of production. By pointing out the incorrect cement policies, he said, 'the reason that the Cement Comprehensive Plan called for exports was due to the cheap energy and huge mineral resources. However, we have to see whether the advantages of cheap fuel go to the people of this country or the countries in need of cement. The Chinese factories, whose fuels are not subsidized, are supplying a great part of our neighbouring countries' demands. The main reason for the differences between Iran and China's cement markets has to be sought in the cement production units' management. While the developed countries are more focused

## 138 The Story of the Concrete Man

on quality promotion and output reduction, the exact opposite is done in our country.’

He estimated the cost of producing a ton of cement – including the raw materials, workers’ wages and fuel and power expenses – to be 15 thousand tomans and added, ‘the producers consider 14 thousand tomans profit and 12 thousand tomans to cover their bank loan interest charges and another eighty seven hundred for their factories wear and tear per ton of cement while based on the balanced rate and Cement Comprehensive Plan, they have already received these amounts from the people. Currently, every ton of cement is priced at 36,500 tomans, and pursuant the Cement Comprehensive Plan, the difference between the balanced rate and the cement’s base price has to be invested in the industry’s development, and also cover the factories’ amortization costs. Each cement factory has received something like 30 billion tomans annually in the recent years to make up for their costs. But, these costs have already been added to the cement sales invoices and collected from the buyers. In fact, if we were to put together the amounts that each factory has received so far, we could construct a 3000-ton capacity cement factory every three years.’ To emphasize his points in respect of incorrect cement consumption practices, Engineer Keyhani said, ‘based on the Cement Comprehensive Plan, each square metre of construction work needs about 200 kilograms cement. Thus, 14 million tons of cement is needed annually to construct 70 million square metres worth of construction projects. However, due to the incorrect distribution mechanism more than 13 million tons of surplus cement has been supplied to the market, whose exact fate is currently under investigation by the general attorney’s office. People have been wrongly over-charged in the name cement industry development, new factory construction and clinker purchase for

the past eighteen years, and by doing so, the cement factories' ownerships have caused the cement price increase and the creation of the cement black market.

### **Moj News Agency**

**Standard Concrete Producers Association president: Cement producers shouldn't be looking for foreign customers**

**We will buy their cement at the specified export price**

The Standard Concrete Producers Association made the following announcement: We are ready to purchase the cement being exported at the specified export rates. According to Moj News Agency, the topic of cement surplus has been the focus of extensive discussion of the Industries and Commerce Ministries various officials as well as cement producers. Nonetheless, industry experts claim that the talk of cement surplus is far from the. Cement market's realities since the consumers still have a difficult time getting their required supplies. Engineer Ali Asghar Keyhani, the Standard Concrete Producers Association president believes the talk of cement surplus is basically an attempt at fanning the domestic market's fire because the cement factories are well aware that the country's cement demand is far greater than what they are able to churn out. According to Keyhani, ever since the enactment of the Cabinet's directive in 2007 requiring the total standardization of the country's cement distribution and consumption mechanism and mandating the producers and government bodies to ensure conformity of the three production, distribution and consumption sectors to the relevant national standards by the end of the said year, standard concrete producers are still facing severe shortage of cement supplies, and as a result are operating on 40 percent of their capacity. In the meantime, the sudden surge in demand for cement supplies has left people puzzled and hanging, and they really are at a loss to know

## 140 The Story of the Concrete Man

why. Keyhani pointed out the to the fact that there is really no one specific in charge of running the concrete industry and added, ‘the standard concrete industry has turned into a one-hundred-percent private sector and undergone remarkable growth and development with regards to product quality without receiving any exclusive incentives like the country’s other industries do and solely through reliance on its own abilities and skills as well as proper management systems. Moreover, the standard concrete producers issue technical certificates for their entire line of products, which is unprecedented among the construction mortar producers.’

According to Keyhani the factory made concrete products are designed to last over one hundred years and they are backed by the producers’ two-year guarantee. These measures and initiatives have been made possible simply by the industry due diligence and perseverance and the support of the university professors, which have provided valuable consultations. Keyhani considers the insufficient cement supplies as the standard concrete industry’s number one nemeses, which has incurred extensive losses onto the industry. He claims that despite modernizing the machinery and the production lines and equipping the laboratories and recruiting highly skilled workforces, the licensed factories do not receive cement to run at full capacity. Keyhani also claims that the Cabinet’s directive mandates that the cement distribution mechanism is fine-tuned in such way to guarantee that cement is used to produce standard construction materials; however, nearly 60 percent of the country’s cement is currently being used for manual, non-standard consumption. And only 15 percent of the country’s cement is given to standard concrete industries. This much cement does not conform to the realities of making buildings, and the Commerce Ministry and the cement distribution commit-

tees are, regrettably, working against the Cabinet's directive and in favour of the construction mortar sellers and dealers. The country's top construction industry expert believes that 70 percent of the cement used in constructing a building is used to make concrete and the remaining 30 percent is used as masonry mortar and other detail works. Thus, the share of the central mix concrete from the country's cement supply is only 15 percent, and should this trend continue, the government's requirements in the famous building reinforcement and complete mortar standard compliance will never be fulfilled - not within the concrete industry anyway. 'Cement shortage in the concrete sector is not only threatening the future of this developing industry, but it is also undermining the efforts to implementing strict building reinforcement codes.

Therefore, it's necessary that the Housing & Urban planning minister, as the main apparatus in charge of building reinforcement and cement distribution take the necessary measures to lead the correct cement consumption practices,' Keyhani said. He also reiterated that almost 70 percent of the cement supplies in the developed countries is allocated to the standard concrete production units, but the same number in our country is a meagre 15 percent. 'Unfortunately, the Commerce Ministry's officials are under intense pressure not to change this ratio and the manual tasks and projects are still consuming 60 percent of the country's total cement output; something that cause turbulence and crisis in the market and leads to the non-standard cement uses. The cement distribution committees are to blame since they have virtually closed their eyes to the country's cement consumption hard facts,' Keyhani said, and then added, 'it's true that we can't increase the standard concrete factories' share across the entire country, but we can at the very least raise the factories' quota that are located in bigger provinces

## 142 The Story of the Concrete Man

like Tehran. The Tehran Municipality's move to subject the issue of project completion certificate to the use of standard building materials is effective and praiseworthy. However, the cement distribution committees, which know well they must fully comply with the standard concrete bylaw by the end of 2006, are attempting to take full advantage while they can, and as a result are completely oblivious to implementing the standard construction material codes. The supply shortages are artificial and fake, and hence we're ready to buy any factory's cement that is planning to export its product right at the factory's door. Or they can give us enough cement, and we will give it back to them across the border and prevent unnecessary transports and the wastage of the free transportation subsidies. Again, if we have surplus cement and are planning to export it, we will buy it all at the export specified rates.'

### **Donya-e-Eqtasad Newspaper**

#### **Proposed to the President through a plan:**

#### **15-million-ton cement saving**

The Housing & Urban Planning Ministry has proposed a plan - prepared based on the studies conducted by IRAN FRAME-CO - to the country's President, which once implemented, could result in the saving of 15 million tons in cement production and consumption in five years' time. The plan aiming to improve the condition of cement production and consumption will not only reduce demand for cement by 4.7 million tons, but it will also increase its production by 47 million tons. Cement is a main component of all civil projects, but we still don't have an optimized model for producing and consuming it in our country. The cement's role in building reinforcement and useful lifespan is undeniable, and this is the exact reason why planning to use this valuable material in improved ways is of utmost importance. Though, the developed countries'

approach is to drastically cut down on cement consumption or in certain cases even stop using it altogether due to environmental concerns, the necessity of sustainable development in the developing countries such as ours requires constant increase in cement production. However, production increase should not be done arbitrarily, and a smart and goal-oriented management system has to be implemented to regulate and supervise the correct output rate and volume. Using cement in traditional ways does not involve any sort of engineering and the lack of know-how often leads to cement wastage. The cement production volume reached 35 million tons in 2005, and according to the Housing & Urban Planning statistics, 37 million tons is projected for the first quarter the following year. Moreover, 32 million tons of clinker was produced in 2005 as well, and the volume is expected to reach an estimated 35 million tons in the current year. Based on the Commerce Organization's numbers and figures, the country will need about 40 million tons of cement annually – including 3 million tons of Pozzolana and limestone.

The results of the studies carried out by the Housing & Urban Planning Ministry Research Centre, show that the implementation of the plan to improve and optimize the cement production and consumption process can result in the cement demand reduction (about 4.7 million tons in 5 years) and cement production increase without the need to make extra clinker (8.7 million tons in 5 years). To make clinker, mineral rocks have to be grinded, and subsequently converted into cement. The Housing & Urban Planning Ministry plan is improve and optimize the cement production and consumption methods and practices by using the existing clinker currently to reduce demand for cement. The improper cement utilization and application is the biggest challenge confronting attempts

## 144 The Story of the Concrete Man

to correct and improve cement consumption. For instance, the same cement that is used in basic masonry works is also used to execute dam and pier projects – something that will undoubtedly waste cement. Consistently, by creating the right consumption culture and observing factors like balancing the Pozzolan cement (low-priced cement used for special purposes) rate against the regular cement's price, the plan can improve Pozzolan cement's quality in five years without having to increase the clinker production, and thus help raise the cement production output by 4.7 million tons. Once this plan reaches the implementation phase, the Ministry of Industries & Mines will have to conduct research on the novel cement production methods for one year, and also examine and estimate the factories' capacity to produce mixed cement and construction mortars, and subsequently create the right setting for the production in proportion to consumption. Furthermore, the Ministry of Industries & Mines in cooperation with the Environmental Protection Agency and the Housing & Urban Planning Ministry will have to estimate the reduction in pollutants and contaminants when clinker production is lowered to determine the exact impact on the environment and submit relevant reports on the same to Cabinet.

In addition, the plan requires the Standard & Industrial Research Institute will have to work with the Housing & Building Research Centre and compile and codify the necessary standards. The latter is also responsible for preparing a 'method manual' on solutions for decreasing cement consumption and wastage at workshops, and submit it to the Building Engineering System Organization. As a part of the plan, the Housing & Urban Planning Ministry (Building Research Centre and Housing & Building Deputy-management) along with the Labour & Social Affairs, Education, Culture & Higher

Learning Ministries are assigned the task of forming a work-group, which will cooperate closely with the private sector, to organize the proper training programs on cement and cement products consumption at all levels (basic workers, architects, experts, etc.). Furthermore, the Housing & Urban Planning Ministry was put in charge of the promotional programs such as television commercials while the Commerce Ministry in cooperation with the Ministry of Industries & Mines was delegated the task of determining the prices for the mixed and masonry cements in a way as to encourage their applications and usage in construction projects. On top of the duties, the five-year plan assigns to the Housing & Urban Planning Ministry, the latter also has to appraise and determine the tariffs, which have to be inserted in the price list. The plan further charges the Power, Oil, Education and Housing & Urban Planning Ministries with the duty of preparing their timetables for at least the next ten years regarding their mixed cement uses and the volume, which they require, over the said period of time, and submit the same Ministry of Industries & Mines. The production of mixed cements and correct consumption practices can undoubtedly lead to significant saving of a huge amount of cement each year. However, reaching the point of optimal cement and cement product consumption needs the full cooperation of the entire governmental bodies as well as the support and assistance of the people, who are, in essence, the main consumers of this material.

### **The housing sector's 25-million ton cement demand and the producers' obligations and commitments**

An industry expert believes that the cement's nominal and actual capacity show an increase for the year's first six months. Though, the Ministry of Industries & Mines goal was to have the cement factories produce 42 million 316 thousand tons of

## 146 The Story of the Concrete Man

the product by the year's end, but the total output of the factories was nearly 19 million 700 hundred thousand tons, which shows a growth of 5.12 percent in comparison to the previous year. According to the same industry expert, if the current production current continues, nearly 39 million 500 thousand tons of the product will have been produced by the end of the year, which by taking into account the new plans and projects requirements for cement, means that the factories' actual output capacity has change to 47 million tons. But, based on what the Housing & Urban minister has said, the housing sector alone will need more than 25 million tons of cement annually, whereby the country's Economic Council has decided to proceed and import cement to meet part of the housing sector's demand. Of course, it worth mentioning that the domestic cement producers have repeatedly announced their preparedness to make enough cement to cover the nation's entire civil and housing projects, providing that the necessary measure are implemented first to correct and improve the product's distribution mechanism. According to another industry expert , instead of importing the end product, by relocating the domestic factories' capacities and using the semi-active industrial units' clinkers, the housing sector's needs and requirements, particularly in the cold season, can be easily met. We have to bear in mind that the importing cement has a lengthy process that sometimes takes up to over five months. Currently, at least three cement factories' clinker supply is 320 thousand tons, and there are also other factories that have surplus clinker.

### **Donya-e-Eqetsad Newspaper**

#### **Iran Central Mix Concrete Guild Association President: Government does not have a clear-cut policy for cement distribution**

Basically, the government does not have a clear-cut policy

based on the domestic market's condition for cement distribution and in the absence of cement supplies in proportion to the construction projects' demand; the consumers often have no other choice but to get their requirement from the free market. While the consumers have to resort to other channels to get their cement, the government could easily remedy the problem and alleviate the consumer market's concerns and curb the dealer's black market by restructuring and reorganizing the cement distribution mechanism. According to what the president of Iran Central Mix Concrete Guild Association told Donya-e-Eqtasad, there's no cement shortage anywhere in the country. However, the lure of the higher rates paid by the neighbouring countries is taking cement out of the domestic distribution network and diverting it abroad. Additionally, cement price increase typically followed by the creation of false shortages raise the price of this vital goods to a degree that is enough to tempt any cement distributor or bill of exchange holder to try to sell the government's cement in the free market. The Association's president also said that the construction permit's statistics indicate that the cement, which is distributed among the construction project developers, is 50 percent of what it should really be. Thus, there are a number of escape routes within the distribution network that have to be identified and eliminated by the government as soon as possible. Unfortunately, the government's estimate of the cement supply needed to meet the consumers' demand is not correct, and it isn't clear why and based on what studies it is always getting approved. Consistently, what is expected of the government is to seek the industry's research and study sectors' consultation to determine the exact volume of cement for the metal or concrete frame structures based on the issued construction permits.

## 148 The Story of the Concrete Man

‘Inadequate cement distribution forces the consumers to look to other places for supply, where they have to buy it at noticeably higher prices. So, the individuals and groups that have an ample cement supply reap huge profits by selling their goods in the free market. Incorrect government estimates can lead to numerous complications in the cement market – something that we have witnessed quite often. We recently got a report that shows the cement that a number of standard concrete and concrete product producers receive does not match their production output by a significant difference. Of course, we neither confirm nor reject the validity of such reports; however, some kind of organization has to oversee and make sure that the supply received by those that have a cement bill of exchange will eventually match their production outputs. And proceed to either issue fines or revoke operating permits,’ the Association president told our reporter and further added, ‘currently; cement price in the free market is three times the government issued price. But, even if, for the sake of argument, we assume that the country actually has a cement shortage, still a price three times higher than what it should be is totally unjustifiable. So, distribution is the problem, and it takes the government along with the other responsible sectors to fix it.’ When asked about whether or not taking cement out of the government’s support and assistance basket will end the black market, he said, ‘I don’t think anything could be better to the people, who are the real consumers, than the narrowing the gap between the government and free market’s prices. This move will undoubtedly eliminate the temptation to divert cement from the official cement distribution network. Surely, if the government had some plans to curb illegal cement distribution, the results could have been seen today. Indeed, everything seems good on the surface, but a closer look reveals something completely different. Since cement price affects

concrete quality, high cement will cause people to cut corners and use unconventional methods to produce non-standard concrete and jeopardize their buildings durability and safety.'

### *About the Year 2008*

**T**he Cabinet Ministers' resolution on complete standardization of cement production, distribution and consumption went into effect in 2008. The extensive media coverage pressured the entire executive bodies to make plans to closely comply with the enactment. Another important change in this year was removing cement from the government's support and assistance basket and allowing the prices to be set based on free exchange rates.

#### **Aftab News Agency**

#### **Standard construction mortar producers' ongoing protest spreads to the Parliament**

Pursuant to a proposal put forth by IRAN FRAMECO and the Housing & Urban Planning Ministry, the Cabinet Ministers approved a set of bylaws in 2004 mandating the strict adherence to the construction materials standards throughout the entire production, distribution and consumption phases. Accordingly,, anyone subject to the terms and provisions of the bylaw, had to take the needed actions to ensure that they were in full compliance with the new rules by the beginning of 2006. Early on, the Ministry of Industries & Mines and Iran Standard & Industrial Research Organization, got assigned the

task of overseeing the standardization of all the construction mortar factories, and in fact, some great improvements were achieved, and by 2006 all the cement producers had received their certificate of standard. Based on the Industrial Research Organization's official report, 70 percent of the country's cement producers now have their certificate of standard, and the remaining have already filed their applications, and their cases are currently pending. The situation in the building's non-construction materials' group, the situation is even better. And all the tile, ceramic and glazed ceramic manufacturers have their certificates of standard. So, at the present time, nearly the entire construction materials and mortars are produced based on accepted industry standards. Moreover, the job of supervising cement's even distribution and correct consumption across the country was delegated to the Commerce and Housing & Urban Planning Ministries. It is interesting to know that with the exception of cement, the rest of the construction materials were not regulated by the government in any way. And removing cement from the government's support and assistance basket and the increase in production, which has ultimately surpassed demand, this valuable building and construction ingredient's production, distribution and consumption is subject to standardization of the packaging as well as transportation and relocation operations only, and hence consumers no longer have to deal with strict government regulations and office bureaucracy to get their cement supply.

The poorest performance in implementing the Cabinet Minister's resolution is seen at the consumption stage, where the Housing & Urban Ministry has the responsibility. However, the Ministry is not the sole decision maker, and different municipalities and engineering system organizations also have a say in how they want cement to be consumed in their districts.

## 152 The Story of the Concrete Man

One way of narrowing the existing gap among these apparatuses is to issue building technical certificates. Needless to say that this is something, which the Housing & Urban Ministry hasn't been able to do in four years; though, the City of Tehran and the Ministry initiated a handful of measures, but they were never followed through completely and most were left unfinished, and Tehran Municipality opted to go its own course by forming a control headquarters and requiring the construction projects to use standard building materials in order to get their building operations start and end permits. The City implemented its plan on trial basis in three different districts in 2004, and finally mandated the requirement for all districts in the winter of 2006. One notable step on par with the City's efforts to standardize construction materials was the promotional advertisements in the various publications and journals with the aim of encouraging and engendering the right cement consumption culture. Although, the task of standardization at the production stage is much more difficult in comparison to drawing up technical certificates, yet the presence of the private sector in the manufacturing phase made it possible to move ahead with implanting the Cabinet Ministers' resolution in a timely manner; however, the Housing & Urban Ministry has not succeeded in preparing the necessary technical certificates in a period of over four years.

### **Standard concrete production plants are operating at 30 percent actual capacity**

According to Central Mix Concrete Producers' representative, a great deal of efforts has gone into standardizing the entire concrete manufacturing process. Currently, 70 percent of the 550 standard concrete production facilities have their certificate of standard, and the rest are in the process of getting theirs. Ali Asghar Keyhani also said, 'Despite the high

cost of obtaining the certificate of standard, these factories are operating at 30 percent capacity because there is no specific structure to control the consumption practices., and as result, people are still making non-standard manually-made concrete on-site.’ ‘The country’s cement industry ownerships have taken the Cabinet Ministers’ resolution more seriously than the government ministers and have invested over 10 thousand billion rials to standardize their operation, yet many are facing bankruptcy due to the absence of proper consumption control measures,’ Keyhani said and further added, ‘More than four years after putting forth its own proposal plan, the Housing & Urban Planning Ministry has recently announced its intention to stop non-standard construction materials from being delivered to construction project workshops starting the second six months of the following year. What this basically translates into is that the Cabinet Ministers’ approval, which is already one year late in being implemented, is going to be put on hold for another extra year.’ The Central Mix Concrete Producers’ representative has protested this Ministry’s decision through a formal letter to the country’s President and the Parliament members asking that they hold the Housing Ministry responsible for neglecting and putting off this delicate matter. Like Keyhani argues, if the government is unwilling to implement its own resolutions, then how can one expect the private sector to cooperate with the public sector in any future plans? The protest of the Central Mix Concrete Producers’ representative has been responded to positively by the members of the Parliament.

### **The Housing & Urban Planning Minister has to answer**

Pursuant to this report, the Parliament’s Civil Commission has declared its opposition to the Housing Ministry’s decision by issuing an official statement indicating that the Ministry’s re-

newal of the due date for making the use of standard construction materials and mortars is not justified, and the Ministry has to answer to the Parliament in respect thereof.

### **Hamshahri Newspaper**

#### **Excuses for using non-standard construction materials are not acceptable'**

Not long ago a tall building collapsed in a Tehran neighbourhood causing the death of several of our countrymen. What really sheds light on this tragic incident, technologically-speaking, is the existence of a concept called the 'sustainability triangle' with designing, constructing and supervising forming each angle. Designers do their designing and calculating based on the needs and requirements and the aim of meeting the technical specifications. The executor and the developer, take care of everything from zero to one hundred, and hence are responsible for the possible occurrence of any future incidents. The supervisory group's duty here is to document and control the acceptance standards and frameworks for each project in order to curb and prevent any digression from the projected criteria by submitting regular reports to the executor. So, were all these stages observed in the building that collapsed and took so many innocent lives? Ali Asghar Keyhani, the Central Mix Concrete Producers' legal representative, is going to answer this question in this article.

'Regrettably, the potential for similar disasters is likely in nearly every large and small country. In general, the error factor is an accepted principle in the science of engineering. However, all engineering activities are closely documented stage by stage, and by investigating the exiting reports and documents, the cause for that building's collapse in Tehran and the responsibilities thereto can be easily determined.

### **The collapse of a tired building**

The permit for the construction of a three-story building with two basements is issued in 1991, and the construction project is completed in 1994. Three years after the City of Tehran, following consultation with the supervising engineer and a structure expert, issues the permit for the construction of an additional five floors on top of what's already there. The project of adding five extra floors and two floors of parking area also takes an additional three years, and an eight-story building - including two floors of parking area - is finally ready for utilization in 2000. Within just two years, cracks begin to appear and the neighbours can actually hear the cracking noise as they are formed. The News reaches Tehran Municipality and the Parliament in 2004, following the neighbours multiple complaints, the judiciary appointed investigator reports the building's condition as unsuitable due to several reasons, among which the poor quality construction materials being the most important. And as a result, the building is at great risk and there's little, which can be done to save it. The case of the building that could crumble down at any moment is run through the judicial system for the next four years but to no avail. Finally, on June 30th, 2008, the building's main columns could no longer wait out the repeated delays in finding a feasible solution to do something before it was too late, and simply gave out, and the entire structure collapsed in a blink of an eye burying the poor souls, who were making futile attempts at retrofitting the building. According to the available reports, the structure wasn't even fit to withstand three floors never mind eight.

### **The House was rotten at the core!**

There may other factors involved in causing the building to collapse, all of which are surely identifiable through closer ex-

## 156 The Story of the Concrete Man

amination of the existing technical documentations. However, the question is whether or not such documents and records, especially concerning the doomed project's initial stages, have been prepared and retained on file. Well, the answer is most likely not. Had the various early stages been documented, the Municipality would have most certainly reviewed them and never allowed for five additional floors to be built on top of three others, in a building whose concrete compression strength wasn't enough to provide one fourth of the support needed for the original three floors let alone five other ones. Indeed, adding extra floors to tall buildings in the City of Tehran is subject to rigorous regulations and proven engineering principles and the application of high-performance construction materials, particularly standard concrete, and as such there can be no excuses of whatsoever kind for using sub-standard materials, which pose serious safety issues. Though, the lost lives will never be recovered, but the very same district's municipality issues construction operating permits only to those projects that document their using of standard concrete and high grade building mortars. As far as why that building was constructed the way that it was is something that the supervising engineer and the consultant, who approved the building before the Municipality did, have to be held liable and must answer for the tragic loss of so many young lives. The report prepared by the Municipality's building and construction specialist a short time following the incident, indicates the observation of construction debris and sacks of cement in the building's columns. Moreover, the laboratory reports showing concrete sampling during the building's construction phase are non-existent. So, different elements form non-standard concrete to failure to jot down and register the construction materials and mortars' technical specifications went hand in hand to cause the disaster. What is really frightening is that the negligence

to correct construction principles were not only limited to this building, and based on official reports, currently over 600 thousand housing units are facing the same dilemma.

### **The rules and regulations are not taken seriously**

Though, standard central mix concrete has been subject to strict Iran National Standard No. 6044 ever since fall 2003, only 20 percent of the country's cement supply is being produced based on the said standard's requirement. This is while according to official reports, the 80 or so central mix concrete and concrete beam factories in Tehran Province have an production output that is sufficient to meet the entire Province's construction project demands. What is rather surprising is that many of these factories are now at the brink of bankruptcy due to inadequate cement supplies and lack of any viable control on the consumption practices. Most mixer trucks, which should be treated as perishable item transport vehicles, are stopped by the authorities for a few hours, and then let go after a few hours. To make matters worse, we also have the individuals, who do their concrete pouring at night time, when they cannot be seen, and many building columns are being built by non-standard manually-made concrete - a thoughtless acts whose dire consequences are easy to guess. All the officials and authorities, who have commented and put forth their views in respect of the doomed building, should be asked seriously about their roles and duties in preventing such things from ever happening. At the very least, Tehran Municipality, and specifically City's District 2 Municipality, where the unfortunate incident occurred, have voluntarily made the use of standard construction materials and mortars, in particular factory- made concrete and beam compulsory ever since two years ago - a wise decision, which is most certainly worthy of praise. Had the other governmental apparatuses and offices

## 158 The Story of the Concrete Man

cooperated more in the past, we would have undoubtedly witnessed the standardization of construction materials in Tehran a while ago. Regrettably, it seems that some lessons are not learned fast enough since the Cabinet's early 2007 resolution mandating the application of standard building materials is still not being implemented seriously six months after it actually went into effect. To top things off, and to everyone's bewilderment, the Housing & Urban Planning Minister postponed the implementation of the construction material standardization 2004 bylaw for six months. In a country, where the public officials fail to heed and respect the enactment of their own ratifications, how could one expect the people to take the law seriously?

### **Hamshahri Newspaper**

#### **Reverse engineering plan to correct cement consumption**

To compile and codify a set of comprehensive guidelines on correct cement production, distribution and consumption, the Building & Housing Research Centre called for the country's engineering community to put forth their proposals. Among the numerous proposals turned in, IRAN FRAMECO's was picked as the top one and won first prize for the best model for correcting the cement consumption structure. Ali Asghar Keyhani, IRAN FRAMECO's Managing Director said, 'we Based our proposal, titled 'reverse engineering,' on the developed countries' experiences as they would relate to the pervasive domestic conditions. If our plan reaches the execution phase, not only it would improve the building reinforcement measures to a great degree, but also cost the government nothing, and at the same time, create over 50 thousand new jobs. Cement has to be produced in accordance with the consumption structure.' The Managing Director of IRAN FRAMECO also reiterated, 'more than 60 different Portland cements are pro-

duced in the world, and special cement is designed for every type of construction. However, in our country still 30 percent of the overall cement supply is used for masonry work. In the meantime, the resistance grade of the produced cement is extremely low, and as a result the cement consumption level is quite high in Iran. Reaching specific compression strengths requires more cement per cubic meter of concrete.' According to Keyhani, every construction projects' cement requirement is as follows: 55 to 65 percent is used as structural concrete, 25 to 30 percent is masonry concrete and 5 to 10 percent is used for making concrete parts and components. Therefore, to comply with the accepted standards and create product long-term resistance and durability, the concrete used in structures has to be produced by certified factories. Also, special type cement has to be produced for masonry work and the private sector has to be encouraged to establish dry mortar industrial production units. The Managing Director of IRAN FRAMECO believes that the implementation of the plan to issue technical certificate and compliance with the cement products features at the consumption level, the concept of producing cement in proportion to the consumption needs and project types can be turned into reality. He says that if we were to review cement consumption in different countries, we would reach the conclusion that it is pretty much uniform. But, in our country, this structure is, regrettably, flawed and defective since in contrast to 80 percent of the construction cement, which is fed into the industrial processing cycle in the developed counties, the same number in our country is closer to fifteen. In Turkey, for example, where cement production and consumption is the same as Iran's, there are at least 3600 concrete production units, but we have less than one thousand. Thus, the only thing that I can say is that the failure to implement measures to closely control consumption is the cause of the current situation.

### **Moj News Agency**

#### **Cannot have standard buildings through non-standard actions**

When the government does not respect its own resolution, why should the private sector? In protest to the six-month suspension of the government's resolution on the application of standard construction materials by the Housing & Urban Planning Ministry, the Standard Central Mix Concrete Producers legal representative, Ali Asghar Keyhani said, 'Engineer Sa'idi Kia (Housing Minister) was in Bam and saw the aftermath of the devastating earthquake there close up. He saw with his own eyes what happens to buildings when they are made of poor quality materials. The industry's biggest problem in our country is instability in decision making, whereby many rules and circulars are interpreted, revised or suspended at will. This makes the domestic market unsuitable for investment, which needs stability more than anything else.' According to Keyhani, the resolution to make the use of standard construction materials mandatory was approved in 2005, and starting that year on, the entire public organizations as well as the Housing Ministry, Iran National Standard Organization and the Engineering System were given two years to take the necessary actions to ensure that standard construction materials would be used in all projects. The country's top central mix concrete producer also told our reporter that the construction mortar producers, particularly the central mix concrete manufacturers have made huge investments in the process of standardizing their products within the past two years. In fact, the progress has been so great that today, in comparison to 2005, when we only had 80 central mix concrete production units in the country, we have over 450 separate units. To reach this point, something like 1000 billion toman has been invested to modernize production lines, rebuild the transportation fleets,

equip laboratories and recruit the skilled manpower. The factories, with a net worth of 2000 billion tomans, are ready to work toward the government's goal of building and structure reinforcement, and the Housing Ministry's suspension of the government's resolution is not justified, and the only thing that it will eventually achieve is damaging the government and the private sector's relationship.

By pointing out the central mix concrete factories' running at 20 percent capacity currently, Keyhani said, 'the use of manually-made concrete is quite common in the country today, but instead of dealing with the non-standard building producers swiftly, the government's is doing something to bring the standard concrete producers, who have trusted it and its resolutions, to the brink of bankruptcy. Because of the government's resolutions, the standard concrete producers have made huge investments and created numerous binding obligations, so if the government decides to unilaterally suspend its own resolution, from now on none of the industries will ever take any other resolutions seriously. This truly jeopardizes the future of a country that is in need of investments in nearly every sector. The building material standardization resolution had been originally proposed by the Housing & Urban Planning Ministry, so if the Ministry's experts have been unable to take the preliminary actions to execute it after three years, then they should introduce the potential guilty parties, and not incur huge loss and damage onto the society. According to Keyhani, the standard concrete producers will hold their first convention in Tehran in winter to discuss and consider the problems confronting them.

## **News Agencies**

### **Iran Concrete Association**

#### **Iran's biggest concrete pumping record has been set**

Nearly a year after the government's plan to mass produce housing units, the transformations meant to increase the country's capability to build homes are starting to emerge. The move toward construction industrialization requires the formation of units that can work as a team and based on pre-determined plans in building projects. Concrete is a big part of making different structures, and since the government is planning to execute a large-scale plan to mass produce over 1.5 million housing units, big companies capable of working on pre-specified plans to produce high-performance construction materials and mortars are absolutely essential. But, the limited number of companies, which can provide sufficient construction services in a short time and still manage to maintain quality, is the government's Achilles heel, which needs to be remedied first.

## **Moj News Agency**

### **Consumption structure is wrong in every aspect**

The consumption structure is not only defective when it comes to gasoline and oil, but it is also in need of correction in many different domains. Experts believe that the consumption structure of all the subsidized products is wrong and eliminating subsidies is the only way of fixing it. However, other experts think differently. They say that Iran's economy is not potentially ready to make such a change. Nonetheless, the country's top concrete expert says, 'the damage caused by incorrect construction materials is not any less than the wrong consumption of fuels, particularly gasoline. The production of each ton of cement takes about 125 litres of fuel and 112kW of power, the process releases over ton of carbon gas into the air

as well. In addition, an estimated 11.6 percent of the road construction transportation is for carrying cement loads. Cement, which is vital construction ingredient costs a lot to produce, but there is no one to supervise and control it correctly at the consumption level, and as a result the industrial and standard cement use is less than 25 percent.' The Managing Director of IRAN FRAMECO also said, 'The developed countries allocate 80 percent of their cement supply to standard industrial production; however, most of our country's cement is being manually-made without any real standard. Converting cement to the end-product has to be done in a certain way, and only the certified concrete and concrete part manufacturers have the right facilities to carry out the process correctly. This is the reason why a national standard has been compiled and codified. Yet, despite the existence of the compulsory standard and a host of other regulations and bylaws, and even the Cabinet's resolution, people still continue to use hand-made concrete.' As stated by Keyhani, something like 500 thousand tons of cement is wasted every year through the use of poor quality street curbs that have a lifespan of less than five years and cause millions of dollars in lost revenues for the municipalities. This is while such staggering loss could be easily prevented if standard factory-made concrete curbs, which have a useful life of over 50 years are used instead. The plan to correct cement consumption, which was proposed several years ago, is now ready for execution, and the Housing & Urban Planning Ministry together with the municipalities and the Engineering System Organization have to start taking charge and carrying out their responsibilities with respect thereto. According to our country's top cement industry expert, 'While 70 percent of the National cement supply has to be processed into central mix concrete, this percentage is only 20 at the present time. The mean average of the buildings' useful life in Iran is

## 164 The Story of the Concrete Man

about 35 years, but the consumption of standard construction materials can raise it to over one hundred. We shouldn't forget that three percent of our national income is invested in the housing sector.'

### *About the Year 2009*

**T**he series of talks on the effectiveness of target-oriented subsidies, and the action's impact on the cement and concrete production was the industry experts main concern in this year. On the other hand, deregulating cement prices increasing the cement production output brought some relative stability to the concrete product market, which did actually result in concrete and concrete part prices.

#### **Donya-e-Eqtasad Newspaper**

**A central mix concrete producer's regarding the Cabinet's two-year-old standardization resolution:**

**There is no supervision on the use of standard construction materials**

The Cabinet's resolution regarding the construction materials' standardization, which was supposed to have gone into effect at start of this year after several delays, but the responsible organizations still seem unwilling to execute the standardization approval. Currently, non-standard construction projects are being executed all along Tehran-Karaj HWY; whereas, based on the Cabinet's bylaw, the municipalities examine and approve the entire documents evidencing the use of standard building materials in every building and structure prior to is-

## 166 The Story of the Concrete Man

suing the project completion certificate. Ali Asghar Keyhani, a central mix concrete producer, told our reporter: ‘Currently, the Cabinet’s standardization resolution is enforced in only three districts in the City of Karaj (in suburb of Tehran).’ IRAN FRAMECO Managing Director reiterated further, ‘Tehran Standard & Industrial Institute is seriously pursuing the Cabinet approval’s complete implementation regarding the use of standard building mortars. But, this isn’t enough, and the municipalities and supervising engineers must also lend a hand. The municipalities must make sure that the construction materials used in any project confirmed to standards before issuing premises’ utilization permits, and the supervising engineers must not permit the use of non-standard materials at any construction phase. Unfortunately, total compliance with the Cabinet’s standardization resolution is rarely seen in Tehran and Karaj. But, the bylaw needs to be fully enforced throughout the country promptly.’ To end his interview in a more positive note, Keyhani said, ‘fortunately, mandating the compulsory use of building materials won’t cause any problems, and the supplies are enough to meet the demand. Also, great investments have been made into processing central mix concrete in Tehran. Province, and we hope that by using the right tools and through the cooperation of the municipalities and supervising engineers, we can see an end to the application of non-standard materials.’

### **Moj News Agency**

#### **Iran Standard Concrete Factories’ Representative: Government must live up to its promises**

A government resolution on the standardization of construction materials’ production, distribution and consumption was approved in winter 2005, and the relevant ministries and the municipalities across the nation were required to take the ap-

appropriate actions to ensure its strict enforcement within two years, meaning 2007. The correction of the consumption model was one of the resolution's main areas of focus. Ali Asghar Keyhani, Central Mix Concrete Producers' Standard legal representative told Moj News Agency in an interview, 'Following the communication of the bylaw, the standard concrete factories made huge investments in modernizing their machinery and laboratories and hiring the necessary skilled workforce. But, unfortunately, the bylaw has recently been suspended until the end of 2008. But, the only thing that has come out of the unexecuted bylaw is the pile of debts that the factories have accumulated by investing in upgrading their facilities. Engineer Keyhani reiterated, 'The failure to execute the resolution and the widespread use of non-standard construction materials has created serious challenges for the standard concrete producers. For instance, factories, which have invested over 250 billion rials in modernization, are now running at 15 percent capacity; something that is pushing them closer to the brink of bankruptcy day after day. By pointing out the fact that the implementation of the Cabinet's standardization has remained only a slogan and nothing more, Iran Central Mix Concrete Factories' representative said, 'Correction of the consumption model means improved and correct consumption. But, we are wasting away millions of tons of cement annually on producing non-standard cement by-products. If the government, municipalities and city councils live up to their obligations and commitments and take the consumption model seriously and refuse to issue project termination permits unless the use of standard building mortars can be proven, a part of the central mix concrete producers problems will be resolved in no time at all.. Currently, we have a surplus of central mix concrete due to incorrect consumption practices. Nonetheless, the central mix concrete factories are totally capable of meeting the

country's entire demand when called for.

**To promote building construction quality; we shouldn't stop talking to the government**

Engineer Ali Asghar Keyhani, the nation's top producer of standard construction materials, demanded the full cooperation of the private sector and the entire expert groups to help the government's plan to make great investments in the housing sectors over the next several years. According to him, those areas of the government's actions that are related to the general public's housing, health and treatment and occupation are not the best place to stop communicating with the government over trivia. So, the private sector, technical and engineering organizations and universities have to lend a hand to the government to work together toward the promotion of buildings and other structures across the nation. By pointing out that 600 urban and rural residential units are constructed in the country every day, Keyhani reiterated, 'While the sector draws huge investments, still based on official reports, the average useful age of most buildings is only 45 years. But, through quality promotion, this number could be easily raised to over 120. However, it's important to remember that making changes to raise quality is not possible without the aid and assistance of the private sector. Immediately following the 2005 presidential election, IRAN FRAMECO presented a proposal package to the newly elected administration regarding improvements to building quality and compliance with construction mortars' production, distribution and consumption standards. The package was warmly received by the administration's various departments, and was approved as a set of bylaws by the Cabinet in winter 2005. The resolution has constituted significant transformations in promoting building quality and production and consumption model ever since. What this really means

is that the private sector as well as the professional and engineering organizations can reach suitable results if they present the government with decent proposals, and then follow them through. The correction of the country's housing production structures, which is beneficial for the entire society, particularly the low-income class, needs everybody's help. Making it possible for every citizen to own a home has been a dream of politicians ever since the country's revolution. So, to make sure that this goal is realized all the construction material production companies and the executive contractors together with the professional and engineering organizations must work hand in hand and push forward. Furthermore, they should not let this collaboration be influenced by political motives, and cut off communications with the government in areas that matter the most over insignificant matters, which most certainly is not such a wise move.'

### **Donya-e-Eqtesad Newspaper**

#### **About correcting the cement consumption method using the reverse engineering method**

Cement is one of the most interesting construction materials involving a range of social and economic costs. Consistently, we have to examine and understand its consumption structures in order to be able to correct any wrong practices. The high potentials enabled cement to position itself as the most important raw material and greatly impact the construction structure in our country nearly 80 years ago, when it found its way into our country. At first, it was mostly used in large civil project workshops, especially road construction to make concrete and also in private and public buildings to do the detail masonry work. But, as its potentials were discovered more and more, cement eventually reached such a stature in our country, whereby it is now used in all foundations, a big part of ceilings

## 170 The Story of the Concrete Man

and the entire road, water canal and dams. In point of fact, in most constructions, cement is not the sole solution for the engineering community. As cement's popularity in comparison to the other construction materials was growing, the country's engineering community paid particular attention to its quality as well. The task of quality control began with the translation of the relevant international standard manuals, and eventually pursued further through the compilation of national standards and technical bylaws covering the entire cement and concrete production and consumption cycle. In spite of remarkable progress in standardization and the existence of comprehensive control and regulatory measures, the mechanism that has formed and established a foothold at the production, distribution and consumption levels does not appear to be willing to comply with the mandatory requirements.

Therefore, it is essential that the current structure is subject to reverse engineering and classified accordingly. In this method, first, a comprehensive examination of the concrete production and consumption is conducted. Next, cement uses in buildings and civil projects are classified based on the experiences of past construction projects, and finally, a correct and standard consumption model corresponding to different building construction sections is presented. Dr Ali Asghar Keyhani's Industrial Engineering PhD dissertation titled 'The Environmental Outcome of Correcting the Cement Consumption Model in Iran' was deleted as the top research plan by the International Technical & Paramount Engineering University's faculty. Dr Ali Asghar Keyhani, the Managing Director of IRAN FRAMECO and PARS LANEH, is one of the country's leading concrete industry veterans, and his research is the result of nearly six years of extensive studies. Among the large number of proposals on correct cement consumption sub-

mitted to the Building & Research Centre last year, his were picked to serve as the basis to create the most primal cement consumption models. According to the results of Dr Keyhani's research, over 2200 million tons of cement is produced in the world each year. Moreover, the production process emits one ton of carbon gas per ton of cement into the atmosphere, and hence the cement industry is responsible for 8.8 percent of the global greenhouse gases. Likewise, in our country, where the annual cement production reaches 60 million tons an equal amount of greenhouse gases are released into the country's environment. Based on the assessments and estimations presented in the research, one square meter of foundation requires between 145 to 175 kilograms of cement. Due to the poor, low-level concrete production technology in Iran this estimate stands at 240 kilograms. However, by promoting the cement and concrete production and consumption, the said volume can be lowered to get closer to the accepted global standard.

The research data indicates that the move to standardize concrete-based products initiated six years ago is , in effect, the prelude to reaching the desirable point. Pursuant to this report, the research has also studied the furniture and urban road construction sectors critically too. As far as the city facilities go, the research results indicate that concrete street curbs and sidewalk tiles exposed to extreme cold deteriorate within 3 to 5 years, but the same standard, factory-made pieces easily have a lifespan of over fifty years. The research results further indicate that each year over 1.2 million tons of cement is consumed to make street curbs that have to be constantly removed and replaced, and the generated debris and rubbles turn hundreds of acres of land areas around the cities into construction debris graveyards. According to this report, 60 kilograms of cement is needed to produce and install a single normal size

## 172 The Story of the Concrete Man

street curb. In the meantime, a tree is capable of removing twenty kilograms of carbon gas from the air in one year. So, the removal and replacement of every poor quality street curb is like cancelling out the filtering and cleansing power of three trees in one year. Because of the positive impacts on the environment and its applicability in many different countries, the International Technical & Paramount Engineering University's Arbitration Committee and Faculty Members have selected and introduced the research's consumption model as the country's top scientific study. In fact, Dr Keyhani of Iran was picked as the University's top researcher because of this research and introduced and honoured at the higher learning centre's M.S. and PhD graduation ceremony.

### **Donya-e-Eqtesad Newspaper**

#### **Correction of the road transportation regulations can help save 9800 million litres of diesel fuel**

Pursuant to the conclusions of a research carried out by IRAN FRAMECO, the road load transportation regulations cause the increase in the associated costs. The correction of these regulations, which are already more than 50 years old will make it possible to expand the country's transportation fleet by 36 percent. The Company's research has examined the historical transportation rules and regulations and the impact of the different costs for the transportation system, and has thereby determined that the load transportation trucks costs is approximately 45 to 55 percent of the gross weight of displaced loads. However, by changing the capacity of load transportation vehicles in accordance with the auto manufacturer's specifications, the net load transportation capacity can be raised to 60 percent, which in turn can lead to a 20-percent reduction in the road transportation costs and saving of over 9800 million litres of diesel fuel per year. According to this report, the

permissible capacity specified for trucks and trailer trucks is disproportional to the actual capacity of the new load transport vehicles that enter the transportation fleet network. The maximum load weights of six wheels 19 tons, ten wheels 26 tons and eighteen wheels 46 tons were set for a time when the transportation vehicle's braking systems and other safety features did not have the same power and technology as they do today. Today, all trucks have ABS, and thus are capable of carrying heavier loads safely. The maximum load specifications auto manufacturers specify in their catalogues are considered as the loading criteria in the world. Based on this report's findings the transportation vehicles useful capacity is promotional to the different loads that it has to carry. For example, an average concrete mixer truck - including the drum and an additional motor - has a gross weight of 15.5 tons, so pursuant to the 26-ton law for ten-wheel transportation vehicles, the maximum load a cement mixer truck can move is 10.5 tons, which is 42 percent of the total weight being displaced. However, the case is different with the new mixer trucks because they can easily handle a load of up to 34 tons or the equivalent of 17.5 percent of the net weight they are moving. So, the addition of the new mixer trucks will increase the net load displacement capacity by 66 percent.

The roads and highways' load capacity and the roads' sub-grade and surface construction works executed based on Road Ministry's bylaws and the AASHTO standard presented by this report, prove that increasing the trucks load capacities to the corresponding maximum load specified in the manufacturer's catalogue will not cause any problems for the country's road network. According to Dr Ali Asghar Keyhani the Managing Director of IRAN FRAMECO, the results of the research, which was entirely based on library studies and

## 174 The Story of the Concrete Man

field work, have been submitted to the Road & Transportation Ministry, and it is sincerely hoped that the Ministry will take the needed actions to implement the necessary changes soon. With regards to the situation of concrete transportation, Keyhani mentioned, 'Concrete is classified as perishable goods everywhere in the world, and hence it is subject to the relevant rules and regulations concerning the transport of such loads. Concrete has to be used in no longer than three hours after production, so our country's concrete transportation regulations need to be rewritten based on the perishable goods' law.

### **Moj News Agency**

#### **Next administration should be thinking about protecting the construction material industry**

Despite last year's slow housing market, there are signs of improvement. Should the government's plan to mass produce housing units be executed, many construction-related businesses will become active. Currently, our country is facing a shortage of over 2.5 million residential units, and the number keeps growing by 850 thousand each year. Consequently, if the plan to construct 1.5 million homes annually is not followed through, the country's housing market will surely run into turmoil. Many construction material producers have made huge investments in anticipation of having to meet the demand for enough cement supply to build 1.5 million housing units per year; however, the continuum of the exiting situation is posing a real threat to capacities to produce concrete. Ali Asghar Keyhani the Managing Director of IRAN FRAMECO and the country's largest central mix concrete believes that the government should grant special attention to protecting the building materials and mortars' producers, so that they are able to ride out the current crisis and avoid being forced into closure, which is the last thing anyone wants at a time when the hous-

ing sector is experiencing some relative stability and growth once again. Keyhani mentions the Cabinet's 2005 resolution and explains how so many factories that proceed to standardize their operations in anticipation of the bylaws execution are now facing multiple problems because of their rather significant investments in modernizing their machinery and laboratories and recruiting skilled manpower. Many factories are drowning in debts incurred by bank loan interests and delayed payments to the vehicle leasing companies, where they have gotten their new transportation vehicles. So, if the Housing & Urban Planning Ministry and the Ministry of Industries & Mine don't do something soon most of these factories will have to shut down operations. Keyhani believes that the government has to put together an incentive package – including financial aid and assistance and provision of working capital and exemption from loan interests – in order to save the construction material producers outlive and survive the current situation. The slow housing market may last to the year's end, but the government has to do something to help industry to maintain its current status until the housing sector picks up again. The next Housing & Urban Planning minister must present a clear plan for eliminating the industry's problems and place the Cabinet's standardization on the top of the Ministry's agenda.

### **Consumers Rights Protection Organization's Public Relations:**

#### **Second wave of the construction materials' price reduction is on the way**

According to the Consumers Rights Protection Organization's Office of Public Relations, IRAN FRAMECO, the country's largest producer of concrete products, has reduced its prices by 17 to 26 percent in an attempt to support the customers'

## 176 The Story of the Concrete Man

rights - a move that is expected to impact the construction projects and the rest of the other building mortars' costs and rates. 'The price reductions have been implemented based on the engineering calculation of the product and the elimination of the side costs,' Engineer Ali Asghar Keyhani, the Managing Director of IRAN FRAMECO and the country's largest concrete producer says,' and further explains, 'Despite cement's 40 percent price hike and 25 percent price increase of sand and gravel, the central mix concrete producers have dropped their product rates to a level that is even lower than the previous year's. Putting into effect lower prices under the pervasive construction market's condition shows that the private sector has performed much better than the public sector by offering reasonable prices aimed at protecting the consumers' rights.' According to what Engineer Keyhani said, the cost of cement sold at the factory's door is 50,000 tomans per ton; however, this price should be lowered to correspond to the actual rate, which is closer to 30,000 tomans. 'The structure of the cement factories' shareholders is such that in a concerted effort, they lower their production output to prevent prices from falling. Their action will affect the housing market directly and cause it to enter a stagnation phase because the price of cement delivered at the factory door in most other countries is less than what's being offered at the factory door here in our country. Consistently, the Social Security & Welfare Minister and the Social Security Organization Management - the two public organizations, which are the cement factories' principal stockholders, should have to answer,' said Engineer Keyhani. He also reiterated further by saying that setting actual cement prices can lead to a 40 percent drop in the end product's market price, which given cement's major role in construction, the reduction could ultimately result in cost cutting in the housing sector as well, and hence help save a ton of money for the con-

sumers. Had the cement factories' stockholders not owned the stocks in a crossed-stockholding scheme, the cement industry would not have faced the kinds of problems it is facing today. The review of the cement industry's formation and last year's events can serve well to shed light on the situation, and thereby clarify many ambiguities.

### **Moj News Agency**

#### **A standard concrete producer:**

#### **Cement factories coordinate their efforts to raise prices**

The structure of the cement factories' stockholders has created a condition in which most cement producers, instead of reducing their prices, coordinate efforts not to do so. According to Moj News Agency, the standard concrete producer, Ali Asghar Keyhani pointed out this issue and said, 'The cement factories refusal to reduce their prices could seriously impact the country's construction projects because in most countries, the cement delivered at the factory door is cheaper than our country, where cement delivered at the factory door is 500,000 rials per ton while it should really be offered at 300,000 rials. Consistently, the Social Security & Welfare Minister and the Social Security Organization Management, as the cement factories' principal stockholders have the duty and responsibility of pursuing the matter to find out why cement producers are refusing to lower their prices. Adjusting cement rate to what it actually should be reduces can reduce their valuable product's price by 40 percent, and thereby help improve costs and prices in the construction sector too. Indeed, had the cement factories' stockholders not owned the stocks in a crossed-stockholding scheme, the cement industry would not have faced the kinds of problems it is facing today. Despite cement's 40 percent price hike and 25 percent price increase of sand and gravel, the central mix concrete producers have dropped their

## 178 The Story of the Concrete Man

product rates to a level that is even lower than the previous year's. What this really indicates is that the private sector has performed much better than its counterpart, namely the public sector, in offering reasonable prices aimed at protecting the consumers' rights. Concrete is an important construction material and any reductions in its rate can cause other building materials' prices to drop too.'

### **The Islamic Republic of Iran News Agency (IRNA) Country's monetary system is not in line with the plan to make housing**

Concrete Association Board Member said, 'The country's monetary and banking systems are not extending their full cooperation in assisting the government to execute its plan to mass produce housing units. Ali Asghar Keyhani also added, 'The Housing & Urban Planning Minister should be able to get the other governmental department to cooperate in executing the Ministry's plan, which is simply too large and beyond the control of one ministry unless the other government office and organizations are willing to cooperate.' Keyhani recommends that when the government and the Parliament examine the plans of the Housing & Urban Planning, Commerce, Economy and State Ministries' proposed ministers, they should pay critical attention to how these Ministries intend to undertake their duties and obligations in the housing sector. He also mentioned the importance of providing the necessary amenities for the construction material producers to enable them to standardize their processes and produce high-performance products that are suitable for an earthquake prone country like Iran. In addition, he also demanded that the national conditions coupled with the necessary amenities are also provided for the housing applicants, so they can buy the home they're looking for.

### **Moj News Agency**

#### **Recommendation of a construction material producer regarding the housing & Urban Planning Minister**

A construction material producer has put forth a recommendation to the country's President and the Islamic Parliament regarding the Housing & Urban Planning minister. According to Moj News Agency, a building industry expert believes that although, the management experiences of the minister proposed for the Housing & Urban Planning Ministry is rather impressive, but the experience of the pre- and post-revolutionary years proves that the Housing Minister has to be able to get the other governmental offices and organizations to cooperate. Consequently, even if the strongest manager is appointed to the post, she or he won't be able to help the housing sectors problems unless the other concerned public departments are willing to help. Ali Asghar Keyhani, the Managing Director of IRAN FRAMECO says, 'Engineer Sa'idi Kia (Housing Minister) was an exemplary manager and the strongest that one could ever imagine, yet he didn't succeed in tackling and working out the housing sector's problems because the country's monetary system and banking system refused to cooperate with him. The realization of the vision to make 1.5 million homes a year is not something that only one ministry can achieve alone, so when the government and the Parliament examine the plans of the Housing & Urban Planning, Commerce, Economy and State Ministries' proposed ministers, they should pay critical attention to how these Ministries intend to undertake their duties and obligations with respect to the housing sector. The country's building material top expert believes that there several different dimensions to the housing sector one of the most important of which is the existence of complete policies for the production sector. According to Keyhani, the Ministry of industry has to support and cooperate

## 180 The Story of the Concrete Man

with construction material producers to turn the fulfilment of the industry's goals into reality.

In the meantime, the country's executive and technical system – including the Building Engineering System and the municipalities' regulatory bylaws – also has a significant role in the housing unit production. Therefore, it is necessary for the State Ministry, as the government's main supervisory body overseeing the municipalities, has to be properly coordinated with the Housing Ministry. Moreover, Keyhani also sees bank loans and other financial assistance packages as another important element because they enable the home applicants to buy the kind of home that they like. What's more bank amenities also help the construction material producers to make constant upgrades and improvements to make standard quality materials, which according to the Managing Director of the country's largest standard concrete producer is of utmost importance in an earthquake prone country like Iran. 'Engineer Sa'di Kia told the Parliament four years ago that he would either build standard and resistant buildings while he was in charge or none at all. Though, he never achieved his goal completely, but his statement has left behind a legacy, which we hope the new Housing minister will live up to and fulfil in whole.

### **Donya-e-Eqtesad Newspaper**

#### **Cement optimum consumption model has been prepared**

The representative of the Iran Standard Central Mix Concrete, Ali Asghar Keyhani told Donya-e-Eqtesad that the cement's optimum consumption model has been prepared. According to him, since 75 percent of the country's cement is used to make masonry mortars, the change in the cement culture is pivotal to promoting correct cement uses. In the correct cement consumption method, 75 percent of the produced cement is sup-

posed to be used to make central mix concrete, which is then used in constructing buildings and structures. Currently, all construction projects in the City of Tehran are required to use central mix concrete. The proper implementation of this by-law can save millions in cement consumption and production. The Managing Director of IRAN FRAMECO mentioned the harmful effects of cement production, which is not any less than gasoline pollution, and said, 'For every ton of cement produced, an equal amount of carbon gas is released into the air. In addition, the process needs 125 litres of fuel and 122kW of power as well as 11.6 percent of the country's load transportation capacity. However, something that costs so much to make is left unattended at the consumption level, and thereby the share that is set aside for industrial purposes is less than 25 percent. This while most developed countries allocate over 80 percent of their cement products to standard factories.' According to the country's top building expert, cement can only be converted into standard end products by certified producers, and that's why we have a compulsory National Concrete Standard now. Yet, in spite of the circulars, bylaws, regulations and even the Cabinet's resolution, we are still witnessing the use of manually-made concrete street curb that only last 2 to 5 years. Because these curbs deteriorate in such a short time, they constantly have to be removed and replaced, and as a result something like 500 thousand tons of cement is wasted every year causing the municipalities millions of dollars in lost revenue. The government's bylaw on the correct production, distribution and consumption of cement approved in 2005 still hasn't been implemented like it was supposed to. In fact, ever since that year, its execution has been delayed three separate times. So, the plan to optimize the cement consumption model has been on the table for several years, and now it is the Housing Ministry and the Engineering System as well as

## 182 The Story of the Concrete Man

the municipalities to enact it.

‘The country’s cement isn’t used in a standard manner. In a conventional building, 70 percent of the cement is made into standard concrete while 25 percent is used for masonry mortar and 5 percent goes to producing concrete parts and components. But, this proportion is the opposite in our country, and that’s why there’s no quality guarantee’ Keyhani says and further adds, ‘Poor quality concrete is susceptible to tremors and other forces and deteriorates rapidly when exposed to severe climatic factors like frigid temperatures. Thus, buildings’ normal usefulness rarely goes beyond 35 years, but the use of standard building materials can increase the number to over one hundred. We can’t forget that nearly 25 percent of our country’s national income is invested in the housing market.’ To this building expert, strict regulations to stop the use of manually-made and nonstandard construction mortars are the most appropriate way of improving and optimizing the building materials and mortars’ consumption model.

### **Donya-e-Eqtesad Newspaper**

#### **Correction of the consumption model and reduction of the environmental pollutants if manually-made concrete is eliminated**

Pursuant to the Tehran Pollution Monitoring Centre’s official report, the annual economic loss due the air-pollution is a staggering 7 billion dollars. Based on this report 1, 645,000 tons of toxic gas is released into Tehran’s air by cars and other vehicles. The City’s air-pollution has always been of great concern for the City’s officials, residents and media alike. Digital air-pollution signs installed in different areas warn the elderly and those with heart and respiratory complications to stay indoors when the pollution level is dangerously high.

Several years ago, when the City cut down a large number of trees, the story made headlines for a few months, and the Municipality ended it unilaterally when it publicized planting several hundred trees in another part of town to make up for the ones that were cut down. There is even a big sign next to one of the City's main underground tunnels declaring how the project saves close to 400 thousand litres of fuel every day. Green trees and landscapes are quite important in Islam, and even Prophet Mohammad has warned against their destruction. So, nowadays there's a greater sense of awareness regarding the harmful pollutants and many efforts are underway to control and reduce them. Of course, we have to bear in mind that with the existence of so many different industries and industrial machinery that rely so heavily on fossil fuel as their primary energy source, we have to deal with a host of new and different class of chemical pollutants and contaminants, whose management control takes careful planning. Though, everyone agrees on strictly regulating the activities and operations that cause pollution, the approaches in dealing with the issue are quite different. For instance, while the auto makers are implementing different measures to reduce carbon emissions, certain other industries that cause a greater amount of pollution seem to have forgotten about it altogether. The cement industry is one of them. The 58-million litres of gasoline consumed in our country every day releases 80 thousand tons of toxic and greenhouse gases into the atmosphere. This means that each year up to 31 million tons of dangerous gases enter our environment. The production of every ton of cement requires 125 litres of fossil fuel, which emits 630 kilograms of CO<sub>2</sub> gas generated by the reaction of limestone calcination. In addition, 310 kilograms of polluting gases are released by the furnace fuel used to generate the power needed to produce the ton of cement. So, 0.94 ton of different carbon

## 184 The Story of the Concrete Man

gases enter the atmosphere when a ton of cement is made. Accordingly, the production of 45 million tons of cement per year releases about 42 million tons of greenhouse gases into the environment. What's more, the transportation of this volume of cement takes more than 11 percent of the country's road capacity, and the cement transportation vehicles emission compensates for another 3 million tons of toxic gases released into the air. In other words, the 45 million tons of greenhouse gases generated by cement production is 1.5 times more than that produced by automobiles. Yet, the pollution caused by the cement industry does not even get half the attention that car pollution gets.

### **Moj New Agency**

#### **A concrete expert:**

#### **Building resistance and durability in Iran today unlike any before in history**

To inspect the status and extent of compliance with the compulsory standards, Tehran Governor's office officials paid an inspection visit to several central mix concrete production units in Karaj and Hashtegerd area near Tehran. According to Moj News Agency, during the visit to two of the these units, IRAN FRAMECO and PAR LANEH, the managers of the two companies, described and outlined the existing building materials and mortars' production and consumption condition. Ali Asghar Keyhani, IRAN FRAMECO's Managing Director, told the visiting team that important steps had been taken in recent years to standardize the construction materials and if the municipalities and the Engineering System pay more serious attention to their assigned duties and responsibilities, we can be hopeful that the buildings constructed during this period may be registered as the country's history most resistant ever. Keyhani also reiterated that following the approval

of the Cabinet's resolution in 2005 mandating the standardization of construction materials, we have witnessed an extensive changes and transformations at the production level, and today all the central mix concrete factories produce nothing but the highest quality materials. 'What is being made these days is markedly different from what used to be available ten years ago, the country's top concrete expert said.' According to him, the moves that were initiated back in 2002, entered a new phase in 2004, and today more than any other time, people are paying extra attention to the quality of central mix concrete and the associated standards. The buildings that are constructed using standard concrete have a useful lifespan of over 100 years. And considering the long life and the actual price, which has been reduced to one third, we can claim that today's buildings are the most durable ever in Iran's general construction history. Indeed, at no time in our long history has anyone paid so much attention to the category of quality and strength and durability as today. And the positive outcomes are most definitely going to be seen in the long-term. 'A new era in the concrete quality growth and promotion has begun, and the establishment of PARS LANEH, the most modern central mix concrete facility in the entire Middle East, in the City of Karaj marks the start of this fundamental transition in the production and correction of the consumption model. The transformation phase; however, is not only limited to our Company, and all the other factories are in the process of replacing and modernizing their production lines,' Keyhani said. He also added that; although, the existing production plants produce their central mix concrete in accordance with the corresponding National Standard's specifications, but we need to promote the National Standard and rebuild and modernize all of our concrete factories, so we can conform to the accepted global standards. 'Of course, as far as providing concrete durability is con-

## 186 The Story of the Concrete Man

cerned, our National Standard's quality specifications and requirements are no different than the relevant world standards. However, when it comes to concrete's resistance, actual cost and energy consumption, we're still lagging,' Engineer Keyhani further explained. At the end of the inspection visit, the Governor's Office representative commended these two large production facilities for their high-performance products, and declared their preparedness to follow up the standard building material producers' legal rights and demands.

### **Donya-e-Eqtasad Newspaper**

#### **Concrete industry; successful in correcting the consumption model**

In the year, when the government has requested everyone's help in correcting consumption models at all levels, some effective steps have been taken to correct the country's cement and concrete consumption. One of these positive moves is the establishment of the Middle East's most modern central mix concrete production plant called PARS LANEH, which has the total output capacity of 2.5 million tons per year. Moreover, the compilation of the comprehensive plan on cement consumption model by IRAN FRAMECO, which has been approved by the Building & Housing Research Centre, is another very important step. Engineer Keyhani, the Managing Director of IRAN FRAMECO and the country's top concrete industry veteran had this to say on the 'National Concrete Day: 'The correct consumption of this product has been a great concern for the engineering community for a long time. However, within the past few years, people have begun paying more attention to the quality factor of this valuable material, particularly when it is used to make concrete. The compilation of the National Standard together with the enactment of a series of regulatory bylaws – including the Cabinet Minis-

ters' cement and concrete standardization resolution – have created the right setting for the complete standardization of construction materials and mortars at the production, distribution and consumption levels. Another very significant measure is Tehran Municipality refusal to issue the 'project completion permit' unless the required documents evidencing the use of standard building materials are first submitted for verification.' The country's number one concrete industry expert, whose proposed plan has been selected as the top executive cement consumption correction plan, evaluated the role of Iran Standard & Industrial Research Organization and Tehran Governor General Office and Municipality's Building & Housing Research Centre in recent years as quite positive and said, 'The engineering potentials and capabilities of the construction materials and mortars produced in our country are pretty high, and thus we can now construct high resistance and long-lasting buildings and structures in almost every corner of the country, regardless of the geographical and climatic conditions and elements. For example, the 'Versek Bridge,' which was built 70 years ago by the Danish contractor, Kampsax Company, using cement and sand mortar and bricks without the use of reinforced concrete, was guaranteed by the said contractor for 70 years. But, today after that many years, the structure is still in a pretty acceptable condition. Indeed, the Bridge is a testament that constructing resistant and durable buildings and structures is possible with the most basic construction materials if the right engineering principles and standards are applied and observed. So, with the kind of high-performance materials like sand, gravel, different standard concretes and additives as well as advanced calculation devices and fully-equipped and accredited laboratories, we ought to be able to construct buildings that can easily last over 150 years.'

## 188 The Story of the Concrete Man

According to Engineer Keyhani, the moves that have been initiated to correct cement consumption, have provided the best opportunity for us to think about promoting the necessary factors needed to ensure building durability in our country more than any time before. This is especially important since 25 percent of the national income is invested in the housing sector each year; and this is not a small number. He also reiterated that the correct cement consumption model has been a constant concern for the industry experts and concrete industry managers, and since the cement production process costs the community a lot, we should be even more concern these days and do whatever necessary to remedy the situation. To make cement a ton of cement means using 125 litres of fossil fuel, which in turs release more than a ton of carbon gas into the air when burnt. In addition, cement transportation take 11.9 percent of the country's road capacity as well. Thus, we have to find more solutions and enforce the existing bylaws more strictly in order to protect our country's citizens and environment against harmful pollutants and contaminants, and prevent millions of dollars of our natural resources to go to waste. To end his comments, Keyhani mentioned, "The factory-made street curbs and sidewalk tiles that were installed over ten years ago are still intact and great shape. The poor quality curbs are one example of incorrect cement consumption in the past years. Though, one million tons of cement per year would be used to make them, because of the failure to observe any kind of production standards, most just lasted 5 years or less. Like the late Dr Ghalibafian (an Iranian civil engineer and university professor credited with introducing reinforced concrete in Iran) always used to say, good concrete is a mix of cement, sand, gravel and a little intelligence. I think what he really meant by 'a little intelligence' is the correct cement consumption model."

## **Donya-e-Eqtasad Newspaper**

### **Start of a big transformation in the central mix concrete industry**

#### **Commissioning of the Middle East's most modern central mix concrete factory by IRAN FRAMECO**

Three main elements are needed to make good quality concrete: a fully-equipped system, standard material and mortar, technical knowledge and manpower. The modern, central production stations use raw materials such as cement, various aggregates, water and chemical or mineral additives as well as the relevant mix weight and composition calculations to produce homogenized and evenly consistent concrete. Accordingly, the concrete manufacturing machinery must be equipped with the appropriate systems, which accurately mix the raw materials in accordance with the concrete mixture plan's projections, in order to establish balance, and simultaneously combine the ingredients within set time intervals, and thereby guarantee the corresponding laboratory's design features and specifications for every concrete type. The main objective of commissioning central stations is to produce homogenized concretes that suitably fit the intended project's construction purposes, so that changes in concrete specifications during the production phase do not differ noticeably from the digression criteria indicated in the related standards. Of course, the design of the mixer truck drum's propeller blades is another rather crucial point, which seems to have been forgotten in our country. The reason that these blades are so important is because they have to maintain the concrete's features and properties during the transportation phase. Indeed, the tiniest change in the mix design of concrete with 50Mpa or more compression strength during transportation will impact affect the concrete's quality and performance. Some of the facts and numbers presented by the technology journals and books regarding the impact of the

## 190 The Story of the Concrete Man

raw materials' weight changes on the final product are shown below:

Table No. 1  
The Assessment of the Effect of Weight Changes of the Concrete Composition Ingredients on the Final Product's Compression Strength

Change %	Water			Cement			Additive		
	C20	C30	C50	C20	C30	C50	C20	C30	C50
1%									
2%	3	4	5	8	9	1	5	6	8
3%	5	8	10	2	1.6	2.2	10	13	16
4%	10	14	18	3.8	4.9	5.5	18	24	29
8%	20	29	32	7	8.5	9	35	35	39
16%	32	42	48	12	15	17	50	53	58

As seen in the above table, the weight of concrete components requires critical planning in order to ensure the even balancing of the raw materials. Furthermore, several other factors are also very important to obtain the best concrete mix, one of which is the additives timing and injection method. Generally speaking, the equipment and the technology used to produce concrete are imperative to the end products quality and performance.

### **A brief history of the emergence of the concrete industry in Iran**

The establishment of the first central mix concrete stations in Iran date back to the 70s. The entire equipment and machinery imported from Europe were pretty advanced for their time, yet

the industry really never kept pace with the industry's global transformations and improvements, and as a result it has regressed in the past 40 years, and not the other way around. Actually, the quality of the machinery used nearly four decades ago used to be much better than what has entered the industry in recent years. The industry's direction in Iran becomes rather evident when the range of concrete compression strengths in the US, Europe and Japan from 1960 to 2000 is compared and contrasted with the same numbers in this country.

Comparison of the Mean Average of the Compressive Strength of the Concrete Produced in the Last 40 Years

Row	Country	60s	70s	80s	90s	2000s
1	US	36-28	39-31	44-35	52-40	65-43
2	France	35-38	38-30	42-34	50-39	62-42
3	England	35-27	38-29	42-32	49-38	60-43
4	Germany	35-28	38-30	42-32	51-39	63-43
5	Japan	30-25	32-27	39-30	47-33	55-40
6	Iran	20-18	20-18	20-18	21-18	21-18

The most important factors leading to concrete compression strength are the higher rate of production accuracy, advent of a host of new chemical- and mineral-based additives coupled with highly trained and proficient manpower. Though, cement quality has increased remarkably these years, the exiting concrete production machinery in Iran (dry systems, non-mix-

## 192 The Story of the Concrete Man

ing or the Iranian rotary drums) are not compatible with the chemical and mineral additive injection systems. What's more the precision tools essential to measure and maintain concrete quality are also currently unavailable in the country. The most effective element in concrete quality, meaning water, which guarantees the end product's exact specifications based on the water-cement ratio (W/C), is simply added at the operator's discretion in the absence of correct calculations. But, as explained, water weight change is extremely important to proper concrete production. The sand and gravel producers don't give any how-to-use information to their customers because they don't have the necessary information either and are unable to determine the precise water content of sand and gravel per ton. Additionally, sometimes uncontrollable conditions cause the moist sand and gravel to be stored for several days, where it undergoes unregulated changes and the same sand and gravel is used immediately by the workshop upon delivery. Also, accurate and controlled moisture content assessments are not carried out at batching plant – something that makes maintaining the water to cement ratio virtually impossible. Other factors like constant changes in grading and the level of soil fluctuation in the sand and gravel also impact the concrete's overall quality. No wonder that factories' which supervise their aggregate supplies experience less fluctuation in their product consistency. Essentially, extreme fluctuations of concrete compression strength during a given project are the direct result of uncontrolled factors; the most important of which is water. The concrete's low compression strength in Iran could have other reasons such as cement quality, but even with the kind of cement available in the country, compression strength ratios higher than what we have now are attainable. Again, uncontrolled concrete water content fluctuation at the batching plant or at the construction site workshop due the

non-existence of the needed machinery and tools is the most important factor affecting the concrete's overall compression strength - of course, assuming that the mixer truck drivers do not manipulate their load during transportation and concrete pumping.

### **The environmental and audit dimensions**

Saving energy is another very sensitive area involving the concrete industry. The modern concrete production systems are designed to plan every production stage in such way in order to guarantee maximum energy conservation. The accuracy and efficiency of the modern batching systems enables the producers to plan properly to cut down on power consumption costs during the production hours. Indeed, the combination of the power generation and transfer systems' optimal design and the batching pot's correct capacity mean a cut back of 40% in power consumption costs per cubic metre of concrete. In reality, the larger the batching pot is (up to 3m<sup>3</sup>), the more the energy consumption per cubic metre of concrete drops. So, a half-metre batching pot uses 2.5 times more energy than a three-metre batching pot. The new batching plants in the developed countries have other features like dust control and complete compliance with the environmental standards. The process of unloading sand and gravel as well as weighing, injecting and displacing cement release a huge amount of dust into the air, which poses a serious threat to human health and the environment, particularly to the areas closer to cement production factories. However, the novel batching plants are equipped with state-of-the-art filtration systems, which enable production increase while minimizing dust propagation (production of 3500m<sup>3</sup> per day requires the unloading and weighing 1250 tons of cement in addition to loading and displacing 7000 tons of sand and gravel and over 300 tons of additives).

## 194 The Story of the Concrete Man

Since a batching plant's entire inlets and outlets are sealed, they are permitted to set up administrative offices within the production compound as well.

The PARS LANEH FACTORY located in Karaj Province, equipped with one of the most modern production lines in the world, is the start of a great transformation in Iran's central mix concrete industry. The batching system's highly advanced closed depots on top of the batching pot, keep the construction mortars away from direct sunlight and strictly regulate moisture content, and hence it is possible to calculate and determine the existing moisture level with less than 5% ratios. The Factory's machine consists of two separate three-cubic-metre batching pots and the entire weighing; injecting, mixing and unloading are done independently by a smart system, which also closely monitors the end product's features, specifications and uses over the entire production process. The systems computer is capable of saving the specifications of up to 45 cement types and 100 different kinds of aggregates as well as 20 mineral and 150 chemical additives to make over 450 different cement mixes. Moreover, the machine's smart system closely monitors and regulates the water to cement ratio, which is critical to making high-performance concrete, in three separate phases. Additionally, the smart system controls the concrete consistency or slump inside the batching pot. The mixer trucks' waiting time is normally about two minutes, and each machine can produce about 9 cubic metres of concrete (for a total of 18m<sup>3</sup>) during that time. To ensure concrete consistency, every project, is assigned a concrete pouring operation's tracking number for future reference. Other information like the temperature, moisture content in open air, temperature changes in freshly made concrete up to the consumption time and changes in physical specifications from production

to consumption are registered separately for all concretes to accurately analyse the collected data after 7 and 28 days respectively. Furthermore, other types of information on cement such as the special weight, initial and final setting times and compression strength class are defined and saved on the machine's computer system, so that the results obtained from the concrete made from different cements can be evaluated on weekly and monthly basis in order to have some reliable records on the different cements' actual and empirical behaviours. Though, the new cement factory machinery does not require a large number of operators, it does need the management and leadership of proficient specialists. Finally, since the machinery with such high precision and cutting-edge technology is new to the country's cement sector, the establishment of PARS LANEH can be thought of as a giant step toward the total transformation of the concrete industry in Iran.

### **A producer:**

#### **Joining the prime cost reduction movement; the only way to help the industry survive**

To survive and endure, our industry has no other choice but to join the movement for prime cost reduction. In an interview with our reporter, Dr Ali Asghar Keyhani, the Managing Director of IRAN FRAMECO, added to his comment and said, 'The reduction of the prime cost gives agility to the industry to out compete the foreign goods locally and at the same time find its way into the international markets. However, to do so, we must first increase efficiency and correct the production structures in the country because this is the only way that we can have a strong presence in the markets abroad.' The country's top authority on economic and production problems called the plan for targeted subsidies, the 'supplemental route' for boosting the growth of the industry's might and said,

## 196 The Story of the Concrete Man

‘Subsidizing energy may appear to support the industry in the short-term but it will actually produce the opposite effect in the long-term and cause the quality of industrial goods to drop and prevent the opportunity for our industries to move into moving into the global markets. So, not only subsidies don’t benefit the end user, but also turn into a barrier blocking the country’s industry modernization and development.’ Keyhani believes that in certain instances, the cheap, subsidized energy prompts individuals to enter our industry into a domain, where there’s no advantage for producing goods except to use them as a front to cover up the profiteering of oil’s hidden rent-seekers. In truth, subsidized energy has done nothing more than reducing efficiency, or better put wasting energy. This kind of wasting does not make any sense economically speaking, and it’s in dire contradiction to our religious teachings and beliefs. We rank among the worst consumers of energy resources in the world. This is truly un-Iranian and not befitting of our culture’s honour and prestige. The high energy consumption by the production units in the industrial sector is one of the first negative impacts of subsidized energy because it causes the producers and manufacturers not to care about modernizing their production lines, energy audit and the goods prime cost - something, which is typically ensued by industrial sluggishness. If energy is given to the industries based on the global prices, they will surely welcome and embrace it, but as long as the other countries’ production and trading terms are implemented in our country as well.’ Keyhani demanded the equal opportunities for the Iranian companies for competing against their foreign counterparts and added, ‘Therefore, next to targeted subsidies, we also have to target-orient the production and commerce rules and regulations, so our industries can gain a global market share that is befitting of our nation. Accordingly, to fix the subsidy situation, first and foremost, we

have to work on correcting the consumption model. In fact, targeted subsidies will most definitely cause problems for the people unless there's a comprehensive plan to correct the consumption model.

### **Moj News Agency**

#### **A concrete industry expert:**

#### **Country's economy has no other alternative but to targeted subsidies**

Targeted subsidises are a major action for our country, but there's really no other alternative left and sooner or later we have to, so to speak, perform this surgical procedure. According to Moj News Agency, the concrete industry's chief expert, in his speech on the 'Consumers Protection Day' said, 'The targeted subsidies plan will be executed next year, but the other part of the equation, meaning the correction of the energy consumption model, which is necessary for the plan's success, is still far from ideal. The energy subsidies have left behind deep adverse effects on the society like drop in efficiency or wastage. Unfortunately, we have to admit that we're among the worst energy consumers in the world. The production units' high energy consumption rate is one of the first negative impacts of the subsidizing energy because it causes the producers and manufacturers to ignore modernizing their production lines, energy audit and the goods prime cost; the result of which is industrial sluggishness. Subsidizing energy may seem to support the industry in the short-term but it will actually produce the opposite effect in the long-term and cause the quality of industrial goods to drop and prevent the opportunity for our industries to move into the global markets and compete. So, not only subsidies don't benefit the end user, but also turn into a barrier blocking the country's industry modernization and development. To endure and survive,

## 198 The Story of the Concrete Man

our industry has no other choice but to join the movement for prime cost reduction we have no choice but to join the prime cost reduction movement. This will grant agility to the industry to out-compete the foreign goods locally and at the same time find its way into the international markets. However, to do so, the government, particularly the important economic ministries must remove some of the impeding barriers to enable the nation's industries to upgrade and modernize their production lines. If energy is given to the industries based on the global prices, they will surely welcome and embrace it, but as long as the other countries' production and trading terms are implemented in our country as well. All of us fully trust the Iranian management capabilities and know that they can take a share of the global market, which is befitting of our country if they are given the chance to compete against their counterparts. Therefore, next to targeted subsidies, we also have to target-orient the production and commerce rules and regulations. Accordingly, to fix the subsidy situation, first and foremost, we have to work on correcting the consumption model. In fact, targeted subsidies will most definitely cause problems for the people unless there's a comprehensive plan to correct the consumption model first.. The Iran National Standard Organization's missions have to be redefined to correspond better to the production and consumption trends and practices, and based on experience the private sector performs much more efficiently than the public sector in carrying out these missions. The Consumers Protection Organization and its appointed units will have a key role too in reducing the effects and consequences of this transition period,'

### *About the Year 2010*

**T**he Year 2010 started off with the publication of Tehran Standard Office's book listing and introducing the construction material producers. In addition, the differences and disagreements among the different executive apparatuses on how to implement the Cabinet Minister's standardization resolution constituted part of the building and housing sector's concerns.

#### **Moj News Agency**

##### **Return of Pozzolan cements threatening building quality**

Ali Asghar Keyhani, the Managing Director of IRAN FRAME-CO Research Facility: Consumers have had a great deal of complaints about the qualities of Pozzolana cement. When cement market was hot, Pozzolan cements were a way for the cement factories to earn a bigger profit. Back in those years, the price of different cement's were pretty much the same, but because 20 percent of Pozzolan cement's composition consisted of grinded minerals, the producers reaped huge profits from the sales of this particular kind of cement. Consistently, by 2004, Pozzolan cements accounted for more than 75 percent of the country's total cement production. In other words, while cement factories were adding over 4 million tons of Pozzolans

## 200 The Story of the Concrete Man

to the production clinkers, they still sold the end product at the price of pure cement. The widespread protests and objections to the poor quality of the Pozzolan cements never got anywhere, and in fact, in the presence of the wrong distribution mechanism, the cement factories never even bothered to register the numerous complaints they were receiving. So, the cement was sold in the black market at two to three times its regular price, and there was demand for the Pozzolan cements too. As the distribution structure changed and the cement was removed from the government's support and assistance basket, the factories also began to pay more attention to their customers' demands and requirements. Moreover, because of the bad experiences that the consumers had with the Pozzolan cements their use slowly diminished and was reduced to zero, and with the exception of the dam projects' periodic demand, everyone else stopped using it. Of course, because of cement's high price (Rs. 500,000 per ton of bulk cement), in essence, the factories compensated the profit they used to earn through selling Pozzolan cements by raising their cement price by 40 percent. In the meantime, the plan to implement 'targeted subsidies,' has raised the alarms, and the cement producers are once again turning to Pozzolan cements.

In a related meeting, a number of cement and concrete experts approved of the Pozzolan cements and their advantages, albeit rather cautiously. Despite this, one can't help but to wonder and ask what exactly is the advantage of Pozzolan for the general public? With the targeted subsidies' plan on the verge of being implemented, energy prices are going to undergo drastic changes, and the industries that rely heavily on subsidized energy are going to feel the pinch almost instantly. On the average, the production of each ton of cement burns up an estimated 125 litres of fossil fuel or an equal amount of natural

gas. The process also consumes about 118kW of power. Currently, the price of the subsidized fuel supplied to the cement factories is Rls. 95 per litre, which is 2.5 percent of the global price. The situation with the natural gas is also the same. This means that the fuel bought and sold at the price of USD128 per litre in the world is given to our country's cement factories at USD1! So, by doing a simple arithmetic, we can see that the cement factories are given USD2.5 billion annually to produce 50 million tons of cement. Of course, it should be pointed out that the new cement factories are designed to save energy, and as a result they have been able to reduce their fossil fuel consumption to 105 litres a ton. Yet, the saved amount is negligible and literally nothing when compared to the huge number that the subsidies cost the government, and also considering the global price of USD50 per ton. Another side to cement production is the question of pollution, whereby the process of making a ton of cement releases an estimated ton of greenhouse gas into the environment. The combination of these two issues has prompted the developed world to grant extra attention to regulating and controlling cement manufacturing. In fact, the environmental concerns together with the high energy costs has forced the developed countries to cut down on cement production and raise efficiency in utilization, and at the same time look for less costly and safer alternatives. So, Pozzolan cements and other mortar mixtures are produced elsewhere based on this philosophy. Though, there are other technical reasons too like the slight increase in concrete's ability to resist and withstand acid attacks when Pozzolan is added to the mixture. But, in general, the main reason is the manufacturing process' economic and environmental concerns.

Today, the natural Pozzolans that are added to cement are undergo rigorous quality control measures, and it is not like the

## 202 The Story of the Concrete Man

material is grinded and injected into cement without taking into account the empirical effect and field performance. Still, despite such close supervision and strict quality control, the developed countries' engineering community often voices its opposition to the use of Pozzolan by the cement factories. The late Prof Neville, the world's true authority on concrete, in his book titled 'The Properties of Concrete' talks about how the cement factories collude to continue Pozzolan cement production. Pozzolan cements cost less to produce, and hence cost the consumer less to obtain, and the cement factories are well aware of this. Consequently, even in the developed countries, where industries are highly regulated, cement factories, in a concerted effort, still proceed to make Pozzolan cements. Likewise, people look at the Pozzolans in Iran as an opportunity for making profit and dragging the experts and university scholars in is simply to justify their action from a technical stance. Indeed, when it serves their purpose, they quote the technical and educated views, but in cases when it matters the most, they just close their eyes and ears to them. Needless to say that some of the local experts and professors lack the necessary field study background anyway to put forth such views and opinions. Pozzolan production and consumption, and whatever they actually do present is literally an excerpt from the various concrete journals and publications. Thus, as long as these fairy tales please the cement factories and serve their intentions, there will always be a platform somewhere for certain experts and specialists to give unsubstantiated information. One of the best examples in respect thereto is the story of the Portland limestone cement in our country. At the onset, the industry authorities and university professors were invited to compile a national standard on the said cement, and since Germany was the major producer of the material, the country's DIN Standard was partly considered and applied as the basis.

Had Portland limestone cement been produced based on this standard, the cement could have been quite suitable for certain concrete factories. However, the cost of implanting and complying with the standard was too high, and hence factories started pushing for the revising the national standard instead of upgrading and modernizing their production lines. Next, the factories organized and held the standard compilation and codification meetings in a way to ensure that no independent industry expert or university professor would be present. In fact, the country's sole expert on Portland limestone cement, who had helped out with the preliminary works and had experience working with the cement in Germany was not invited to the national standard's review and reconsideration meeting. The changes in the cement's features resulted in drastic drop in its quality, yet the cement factories were selling the product to the consumers in the unprecedented cold of the 2006 winter. While this was going on, no one voiced their concern and opposition, and the consumers were left completely unprotected against the cement factories' ploy.

### **Conclusion:**

At a time when the cement industry is on the brink of undergoing major transformations, it is a much better idea to deal with the existing problems and issues more rationally in order to avoid making the past mistakes again. The first step is to audit energy consumption by the cement industry's different sectors. Many cement production processes need to be renovated and modernized in order to correct the associated energy consumption models and draw them closer to the accepted global standards. Undoubtedly, such actions won't be easy and will need serious management; however, they are necessary and there's virtually no other choice. Though, certain cement factories have taken some positives steps, but the situation is still

## 204 The Story of the Concrete Man

far from ideal. Over the course of the last several years, some cement factories have resorted to establishing new production plants instead of allocating a part of their revenues to reconstructing and correcting their energy consumption practices and have accumulated huge debts as a result of their over-ambition. The second step is promoting and raising the quality of the domestic cement, so that the concrete industry can model its concrete-made products by counting on the availability of high-quality cement. The production of resistant grade cement can unquestionably trigger drastic transformation in the concrete industry. With the exception of Iran, where concrete is classified by the percentage of cement content, in the other countries concrete is classified based on its compression strength class. So, making cement containing high-resistance properties can direct the country's concrete industry toward the more standard classification of concrete in accordance with the latter's technical specifications rather than cement content. The next step is the production of masonry mortar, which has been forgotten by the country's cement industry. In general, Pozzolans make up around 40 percent of the masonry mortars' compositions, and since a huge amount of cement is used in masonry works, this provides a decent opportunity for the cement factories to reach what they have been after this way instead of through Pozzolan cement production. Making Pozzolan cement is a great idea, providing that all the associated requirements are considered, and the Pozzolans are selected carefully and tested critically in order to determine their different performances. Also, the price of this cement has to be lower than the other cement type to appeal to the public and the concrete industry. Another crucial prerequisite to Pozzolan cement production is zoning and issuing ID certificates based on chemical specifications and performance types under different conditions. In the end, No other action could benefit

the future of cement in Iran like Pozzolan cement production can, yet it seems that nothing has damaged Pozzolan cement's position in the past like the cement industry itself has.

### **Donya-e-Eqtesad Newspaper**

#### **Revenue generation standing against retrofitting**

#### **Reasons for the semi-implementation of building's technical identification certificate**

A building expert and activists claims that Tehran Municipality and the Engineering System perceive construction quality monitoring and supervision as a source of income. So, to protect the revenues generated through construction tax and duties, the Municipality is unwilling to implement strict regulatory and control measures lest it loses one customer. Meanwhile, the Engineering System only requires a handful of building types to get a technical identification certificate, and surely it wouldn't have done so had it not generated any revenues. Ali Asghar Keyhani, who has played the role of the government's right arm in pursuing the approval of the bylaw on construction material's standardization told "Donya-e-Eqtesad" that the Engineering System Organization has become interested in issuing building technical identification certificates recently only as a means of creating a new source of revenue for its members. Whenever there was a talk of supervising the construction regulations in the past, the Engineering System Organization would immediately object and claim that the existing tariffs were not even enough to clean a buildings never mind supervising its construction. However, once the subject of issuing building technical identification certificates was put forth, providing the potential and the opportunity for the Engineering System to charge a fee for drawing up and issuing the certificates, the Organization has suddenly turned interested and seems to be more willing to cooperate to have the plan

## 206 The Story of the Concrete Man

implemented. The Engineering System says that construction quality regulations have nothing do with the building's area, which is a very positive step. However, we shouldn't forget that exempting buildings and structures with a total area of less than 3000 square metres from having to get their technical identification certificates was the Engineering System's own proposal. So, we have to set aside the double standard policy when it comes to the question of building reinforcement and retrofitting and stop making decisions about observing construction standards based on what serves our organization's interests the best.

### **The construction developers are turning the Municipalities financial wheels**

Keyhani also said, 'Tehran Municipality has the preconceived notion that the implementation of strict construction rules and regulations will scare away the investors, so it is not very eager to cooperating with the technical identification certificates plan because it simply doesn't want to disappoint the customers, who apply for building permit. Indeed, the Municipality views construction investors and developers as its financial wheels. When the construction permits' tax and duties comprise a large part of the Municipality's revenue sources, this kind of attitude and witnessing the disregard for using standard building materials and mortars should not come as a surprise.. One thing that construction developers should keep in mind is that compliance with the technical regulations and the use of standard building material doesn't necessarily mean an increase in the final cost.

### **Standard construction materials aren't expensive**

Keyhani named the Standard Organization, the Engineering System Organization and the country's municipalities as the

public bodies assigned with specific duties and responsible to ensure that construction standards are being implemented in every project. He evaluated the performance of the Standard Organization as acceptable and said, 'By identifying the construction material production units and establishing a quality control and auditing system next to issuing standard certificates for the different building mortars, it has created the right setting for the production of such materials. Accordingly, based on the published statistics, the capacity of the certified construction material units is proportional to the community demands and requirements. Tehran's major problem is actually its Municipality's revenue generating system. Municipalities are the most important supervisory and regulatory apparatuses responsible for overseeing construction projects. They can easily check everything after any given project is completed to make sure that the entire requirements and standards have been fully complied with and fulfilled prior to issuing the project completion certificate. However, the municipalities often consider their budget deficits first before deciding on whether or not to implement the standard control measures.' With regards to the central mix concrete producers' experience, the country's chief building and concrete expert said, 'Though, the price of cement has increased by 40 percent in the past three years, but central mix concrete's price has actually dropped. Still, the factories have proceeded with standardizing their product over the same length of time anyway. So, the misconception that standard materials cost more is not really true.' According to "Donya-e-Eqtasad," currently following a one-year delay, the plan to issue technical identification certificates for buildings is once again being implemented. Although, the plan was approved in the winter of 2006, but the difference of opinions between Tehran Municipality and Engineering System Organization led to its suspension just

several months after it was approved.

### **Moj News Agency**

#### **Correction of the energy consumption and quality increase; two ways of saving the cement industry**

Ali Asghar Keyhani, the Managing Director of IRAN FRAME-CO Research-Production Facility said, ‘Now that the cement industry is undergoing a fundamental price transformation, we’d better face our problems more optimistically instead of repeating the same past mistakes.’ According to Moj News Agency, the first step is auditing the energy consumption rates by the cement industry’s different sectors and modernizing the production processes in order to draw the fuel consumption rates closer to the global standard. Undoubtedly, such actions won’t be easy and will need serious management; however, they are necessary and there’s virtually no other choice. Though, certain cement factories have taken some positives steps, but the situation is still far from ideal. On the average, the production of a ton of cement burns up an estimated 125 litres of fossil fuel or an equal amount of natural gas. The process also consumes about 118kW of power. Every year, the government allocates 4.2 billion dollars’ worth of subsidized energy to the cement industry to make 50 million tons of cement. In the past several years, some cement factories have resorted to establishing new production plants instead of allocating a part of their revenues to reconstructing and correcting their energy consumption practices and have accumulated huge debts as a result of their over-ambition. The second step is promoting and raising the quality of the domestic cement, so that the concrete industry can model its concrete-made products by counting on the availability of high-quality cement. The production of resistant grade cement can unquestionably trigger drastic transformation in the concrete industry. With

the exception of Iran, where concrete is classified by the percentage of cement content, in the other countries concrete is classified based on its compression strength class. Considering these issues can greatly aid and assist the country's cement and concrete industry to reach its goals.

### **Abrar-e-Eqtasad News Paper**

#### **Municipalities and executive apparatuses welcome the Book of Standards**

The Book of Standards listing and introducing the country's standard construction material producers distributed among Tehran province municipalities by the Tehran Province Standard & Industrial Research General Bureau has been welcomed and embraced warmly. In fact, even the City of Karaj (near Tehran) has communicated a circular to its ten districts asking them to give a copy of the said book to the building permit applicants, so that they can sign and seal the 'letter of commitment' inserted inside the book, which subjects the issue of the 'project completion certificate' to the use of standard construction materials and mortars. Currently, the use of standard building products is being strictly enforced in all of Karaj's ten districts. Of course, the City of Karaj is not alone, and other municipalities across the country have welcomed the Standard General Bureau's action with open arms. In the Capital, the Chairman of Tehran Islamic Council also communicated the matter to the City's Municipality, whereby the Mayor immediately had a copies of the book distributed throughout the different districts. It is noteworthy to mention that Tehran Islamic Council had already approved resolution on the use of standard construction materials, and the developers had to sign and seal a statement attesting the utilization of quality grade building materials such as iron, central mix concrete, rebar, ceramic tile, facility pipes and plasterwork and brick-

## 210 The Story of the Concrete Man

work. According to Engineer Masoumi, Tehran Architecture & Urban Development Deputy-manager, the use of standard material and work supervision are important solutions to promoting building quality. The Deputy-manager also added that the City of Tehran was planning to open up several standard construction material and mortar distribution centres in different districts, where people could purchase standard goods. In further measures to guarantee high-resistance and durable buildings and structures, many municipalities and their corresponding districts have the property owner or the land developer as well as the supervising engineer sign a letter of commitment acknowledging their full intention and undertaking to use standard construction materials. As stated by Ali Asghar Keyhani, the chief advisor to the General Bureau of Standard's managing director, 'The Standard Organization's step to publish a book of standards for the construction materials is in line with final step in fulfilling the Cabinet Ministers' standardization resolution approved so many years ago. Indeed, the way that the public and the municipalities and executive bodies have responded to the Standard Bureau's action illustrates the importance of building reinforcement and resistance to the society as a whole.' Regarding the production units listed and introduced by the book, Keyhani added, 'The information given in the book was collected based on the information available in the General Bureau's computer database. So, if all production units complete their information, the next volumes are going to include additional details. In fact, even the certified construction material producers based in other provinces that sell their products in Tehran can complete their information and have their names published in the book. This is completely free of charge, and it's only meant to promote standardization.'

## **Moj News Agency**

### **The side news surrounding the construction materials' standardization report**

Tehran City Council's questions weren't standard

The Tehran General Bureau of Standard report to the Islamic Parliament and the questions posed by the Council members was a huge success for the Standard Organization regardless of the irrelevancy and the quality of the questions and answers. The fact that the importance of standards in construction is being probed into is in itself an act of promoting standardization. Though, the current situation is not too far from ideal, it is still has a little ways to go. To reach that point, the different agencies' performance in proportion to their legal tasks and duties must be re-examined. To produce standard buildings, various sectors of the society have special duties, the most important of which have been delegated to the Standard & Industrial Research Organization. However from the legal perspective this does not mean that the Standard Organization has to be held liable for the poor performance of the other public departments. In reality, enquiries to the Standard Organization have to be limited to the follow-ups on standardization and compliance thereof that have been legally assigned to the latter. Based on the existing laws, the Standard Organization is responsible for compiling, mandating and supervising the implementation of the construction materials' standardization bylaws. The supervision is mainly done on auditing the construction material production units and issue of the standard certificate for the production factories, on the condition of total compliance with all standards. Needless to say that building materials distribution and consumption processes are often outside the range and scope of the Standard Organization's activities, and hence most of the latter's focus is on standardization of the construction materials' production. The job of regulating and

## 212 The Story of the Concrete Man

supervising the industry's distribution mechanism has been assigned to the Commerce Ministry, and Article (13) of the Governmental Discretionary Punishment Act is the executive guarantee to back up the Ministry's supervisory measures. Furthermore, based on other technical and engineering laws, the Engineering System Organization and the municipalities are in charge of monitoring the building materials and mortars consumption from the start to the end of a project. Though, the Standard Organization is authorized to run quality control inspections during the consumption phase, the supervising engineer is responsible for the direct assessment of how construction materials are being used. There are two reasons why the consumption control duties have been assigned to the Engineering System Organization and the municipalities. First of all, next to the quality of the material, which enters the workshop, the important application and consumption processes requiring a wide range of control measures, have made the recruitment of skilled manpower and direct controls during the implementation and application of construction materials literally inevitable. The standardization laws for preventing the use of non-standard construction materials is a long road that takes a long time; however, the Engineering System Organization and the municipalities are in constant contact with the producers and know who they are and how they operate. Additionally, the project completion certificate issued only if the entire works have been carried out in total conformity with the standard regulations is an effective tool in raising the certainty issue that there are no violations of the compulsory building regulating terms and provisions. In early 2005, the District 2, 5 and 22 actions to make the use of standard construction materials and mortars mandatory, produced effective and positive results in the three districts in less than a month.

The quality of a building or structure made up of several building mortars and built based on a calculated system is the most crucial point. So, the quality of the goods produced and distributed is virtually useless unless they are applied in accordance with the construction regulations and building codes at the consumption stage. Consistently, controlling the use and application of materials and mortars at the consumption stage is the key element to constructing a resistant and safe building. For example, the central mix concrete is an important construction material, which is a major determinant in how the quality of the end product will turn out. The central mix concrete factories make their products in accordance with the specified standards and regulations, and ship the requisitioned supply volume to the project site, where according to the existing law, their legal responsibilities and obligations end. This is pretty much the routine everywhere in the world. However, the failure to observe the conventions and standards after the supply delivery and at the consumption stage, when the central mix concrete is supposed to be used to construct foundations, ceilings, columns and moulded into concrete slabs and blocks, can render even the highest-quality building products into a pile of non-standard materials. Thus, it is extremely important that consumption control measures be taken very seriously. But, the Standard & Industrial Research Organization is not the responsible department for implementing the consumption regulatory provisions. Moreover, the Building & Housing Research Centre is in charge of compiling and codifying the executive bylaws or the legal instructions on consuming construction materials. And to the Research Centre's credit, they have done an excellent job so far in carrying out their assigned legal duties and tasks. In the meantime, the Engineering System Organization is responsible for ascertaining total compliance with the national building regulations, which

literally cover every subject and topic on building projects' execution and construction phase. So, based on what has been explained here so far, it becomes rather apparent that the questions posed by the Islamic Parliament members should have been asked from the Engineering System Organization or Tehran Municipality and not the Standard & Industrial Research Organization. In fact, the Islamic Council's own resolution approved in 2007 explicitly states that Tehran Municipality is the responsible organization for ensuring the correct consumption of building materials and mortars. Accordingly, what was and is considered the legal duty of the Standard Organization, is identifying the cement and concrete production units, establishing a comprehensive and well-integrated QC system, issuing certificate of standard and supervising the correct implementation of the said system in the production processes and nothing more. As pointed out earlier, the Standard & Industrial Research Organization's performance with respect to carrying out its responsibilities is not only remarkably significant, but also unprecedented. Pursuant to the Tehran Province General Bureau of Standard's report, currently one hundred percent of the demand for cement, central mix concrete, plaster, sand and gravel as well as moisture insulations, ceramic tiles, building beams, illumination and lighting bulbs, various tile glues, steel components, power on-off switches, building paints, polymer pipes and connectors and gas pipes needed in construction projects across the Province can be met without any problems by the licensed production units, that have been issued a certificate of the standard by the Ministry of Industries & Mines. This is the very same big mission that the Standard & Industrial Research Organization was supposed to have accomplished, and admittedly they have done a superb job in successfully completing it. Likewise, it is hoped that the Engineering System Organization and municipalities take

serious actions too and do their part also to implement the control measure as strictly as possible.

Though, no reports on the shortage of standard construction materials have been submitted by any of the concerned organizations and agencies, this does not mean that non-standard mortars are non-existent in the market. However, standard materials comprise most of the building materials that are available in the market currently. Should the responsible public apparatuses like the Engineering System Organization perform their legal duties more assertively and prevent non-standard construction materials from getting into the market, these kinds of goods will disappear altogether in virtually no time. We can't forget that supply is subject to demand. Nearly 18 months following Tehran Islamic Council's resolution requiring the City's different districts to print 'The Use of Standard Building Materials is Compulsory' on the top of their building permits by, this simple step, which literally cost nothing, has not been fully implemented yet. Furthermore, Tehran Municipality to date has done nothing about printing the latest list of the construction material producers. Indeed, the measure was postponed so many times by the City officials that the Standard & Industrial Research Organization took it upon itself to print the Book of Standards and distribute it free of charge among the province's municipalities. What's peculiarly interesting is that the distribution of the book by Tehran Municipality across its districts became the victim of office bureaucracy and was delayed for over two months. Thus, Tehran Islamic Council members should address their questions and enquiries to the Municipality instead of the Standard & Industrial Research Organization and ask the City officials why Tehran's City Council's resolution has not been implemented to date after eighteen months. When the City's management does not care

and pay any attention to the Council's resolution, the Standard Organization cannot be expected to enter into the other government institutes and agencies' areas of responsibilities or take on duties that are the job of other public apparatuses. As far as the report, which received extensive coverage by the newspapers, on the ample supply of standard construction materials and mortars is concerned, it seems that the statements made by the City of Tehran Islamic Council's spokesperson were based on the incorrect understanding and impression of the people, who helped prepare the report since it claimed that only 7 percent of the 14 thousand or so compiled standards cover the construction sector, and the rest are for the other production and manufacturing units like the food, electronic and metallurgy producers (as indicated in the distribution booklets). Consistently, to state that the only 7 percent of the building materials in the market are standard is not in line with the existing realities. Actually, most of the construction materials in the market today are standard, and this is good news for the consumers. At the present time, the standard capacities in Tehran Province are proportional to the building construction demands and requirements, and there is a higher level of tendency to use standard products. If the Engineering System Organization and the municipalities perform their legal duties and obligations as required by the Tehran City Council's Resolution No. 154, there won't be any place for non-standard materials in the City anymore. Nonetheless, today nearly 95 percent of the structural mortars and 85 percent of the mortars used in the other construction and building products completely conform to the required standards.

## **Donya-e-Eqtasad Newspaper**

### **Investigation of the transportation of the most consumable construction material by the Road & Transportation Ministry**

Overcoming the challenge of transporting central mix concrete to the construction project workshops is the most troubling dilemma facing the building developers. The situation is sometimes so bad that some projects within and Tehran and in its vicinity have to put their operations on hold and wait hours for the mixer trucks to arrive. Meanwhile, the concrete producers have to subject the transportation of their product to the rules and regulations specified for other materials since concrete has not been classified as a perishable material to date. This often leads to numerous problems in supplying and distributing one of the construction projects' most necessary materials. Central mix concrete has a mandatory standard and pursuant to the corresponding technical specifications, it has to be unloaded at the project site in less than three hours following its production or it will rot and spoil. However, the mixer trucks often end up spending a longer time stuck in the City's notorious traffic. Ali Asghar Keyhani, the managing director of General Bureau of Standard's chief advisor told Donya-e-Eqtasad: After endless follow-ups by the central mix concrete producers, the officials at the Road & Transportation Ministry are supposed to make some final decisions on classifying the said material as perishable goods. Concrete, which is subject to standardization regulations, is an important building material and plays a decisive role in structures' resistance and durability. Central mix concrete has to be used within just three hours after production; otherwise, it will begin to rot and lose its compression strength ratio and cause damage to the mixer truck too. Therefore, certain perishability guidelines have to be determined, so that central mix concrete can reach

## 218 The Story of the Concrete Man

every project site in a timely manner and while it's still fresh.

### **The ball in the Road & Transportation Ministry's field**

According to a report by Donya-e-Eqtesad, following the central mix concrete producers' demand, the Engineering System Organization communicated a written letter to the Housing Ministry and its affiliated Housing & Building Affairs Deputy-management requisitioning the classification of central mix concrete as a perishable substance in order to resolve the challenge of transporting the material. Currently, the Road Ministry is reviewing and considering the options and alternatives, and a relevant meeting is planned for later on this week. Based on what one of the Ministry's experts told Donya-e-Eqtesad, pursuant to the perishable goods bylaw, all food and drug items are subject to strict regulations when being transported from the producer to the consumer. Since central mix concrete deteriorates within a relatively short time after its production, different ways are now being examined at the Road & Transportation Research Facility in order to classify the material as a perishable substance.

### **Tehran Municipality's follow-ups**

According to Donya-e-Eqtesad Newspaper, considering the central mix concrete's perishable properties, the City of Tehran has recently initiated certain programs to closely cooperate with this product's producers. On par with this, the municipality has conducted a number of field tests to determine the rate of deterioration, and thereby coordinate its efforts with the City's traffic and driving authorities to make sure the mixer trucks commute when traffic is the lightest, and also to stop mixer trucks, which don't have a standard logo sticker installed on their vehicle.

### **Concrete file now ready and waiting at the Engineering System Organization**

A senior ranking official at the Engineering System Organization told Donya-e-Eqtasad: ‘Following the numerous requisitions by the construction project contractors to classify central mix concrete producers as perishable goods, the Organization’s Civil Commission held a meeting to consider the available alternatives, and shortly thereafter conducted a series of communications with the Housing Ministry in order to fulfil the demand.’ Dr Mahmoud Moghdam also said, ‘The Engineering System Organization is quite serious about classifying central mix concrete under perishable goods, and we hope that the Housing Ministry extends its full cooperation in this matter, so this reasonable demand can very soon be enacted into law.’

### **Donya-e-Eqtasad Newspaper**

**Ali Asghar Keyhani, the production units’ legal representative, at the Standard Organization’s former and new managers’ farewell and introduction ceremony:**

**‘No one will bid standard farewell’**

It appears as though the farewell and welcome ceremony of the former and new managers at the Standard & Industrial Research Organization should not be referred to by that name since no one can really say goodbye to standard. When looking at today’s societies, we readily see that standards are an unavoidable part of day to day life. Indeed, nobody can detach from standards even if they wished to do so because they are present in every corner of human life. Organizational posts and duties surely end, and former managers are replaced by new ones. However, one thing is certain, even when someone is heading the Standard Organization; they’re still more in contact with standards in daily life than in their administrative

## 220 The Story of the Concrete Man

affairs. Everything from the foods that we eat to the health products and other commodities are all subject to standards, and in a way, we can say that we live within a geographical boundary called a 'standard,' which is practically surrounding every single aspect of our lives. Though, we may move from time and time, wherever we happen to go is going to be inside the boundaries of this map. Those that have felt and tasted standard are well aware of its joys and pleasures. Now, that Engineer Poorhashem's term as the manager of the Standard Organization has come to end, he's still going to be in direct contact with standards because they are present in every corner of life. Despite presiding over the Organization for a short time, Engineer Poorhashem's management was quite fruitful. During the limited time, when I was attending the Standard Organization's farewell and introduction ceremony, I noticed a very interesting point, namely the industry and services managers' belief that the Organization most active period was under Mr Poorhashem's management. We, the construction material producers, think that the Standard Organization has been extremely active in the area concerning our industry. But, when we talk to the other industries' producers, they say the same thing about their sectors. So, when everyone unanimously agrees on the same point, we can only deduce that Engineer Poorhashem's management has been positive and constructive for the nation's entire industry sectors. Indeed, the priority that he gave to the people's safety led the public to believe and trust standardization, and this is a great legacy left behind from his management.

The drop in services and the degradation of the past accomplishments, once the Standard Organization's management changes, is a great concern among the production industry ownerships. But thankfully, the Organization's new managers'

performance has remained just as good as before if not better. In fact, not only the new managers bring along innovativeness of their own, but they also continue the former managers' unfinished works until they are completed. Consistently, it is our hope that the new managing director, Engineer Moslem Bayat, who has an impressive managerial work history at the Standard Organization, will continue in the footsteps of his predecessors. Next to being the country's capital, the City of Tehran is also the nation's major industrial pole that has served as a model for the other cities and towns. So, working in Tehran along with all its complexities and challenges, has twice the importance of being assigned to a similar post in the other places. Experience shows that the Province's industry has always served as the executive bodies' support pillars, and this is particularly true when it comes to the Standard & Industrial Research Organization. Through their foresightedness and carrying out their commitments and obligations, the production and service units located in Tehran Province have had a distinguished role in promoting and developing standardization. In the end, I would like to extend my sincerest appreciation and gratitude to the Standard & Industrial Research Organization's hardworking and honest staff members, without whom many of today's accomplishments in the national standardization plan would not have been possible.

### **Donya-e-Eqtasad Newspaper**

#### **Tehran General Bureau of Standard has published the Book of Standards**

The Tehran Province General Bureau of Standard & Industrial Research has published the Book of Standards listing and introducing the construction materials and mortars' certified production units. The book will be distributed among the Province's entire executive bodies, Islamic councils and mu-

## 222 The Story of the Concrete Man

municipalities in the next few days to ensure that the construction projects required materials are obtained from the licensed producers and distributors listed in there. Based on the General Bureau's Public Relations, the book contains information and data on the construction producers' products such as central mix concrete, sand and gravel, beams, slabs, blocks, cement, electrical and mechanical equipment as well as ceramic tiles, elevators and temperature resistant insulators. The producers and distributors names, addresses and telephone numbers are also provided, so that the land developers and civil projects can contact them and find out about their products directly. Moreover, the newspaper article also reports that the production capacity of the Province's factories is more than sufficient to supply the entire Province's civil projects and urban and rural demands. And there are no reported shortages anywhere. The best part about this book is the fact that the entire listed production units have already succeeded in obtaining their certificate of standard form the Standard & Industrial Research Officers, and thus when it comes to total compliance with the standard rules and regulations, there's really no major difference among them. Furthermore, based on the approved bylaws to enact the Cabinet Minister's standardization resolution, the municipalities are required to give an issue of the book to the building permit applicants and receive a signed receipt in return in order to establish binding obligations to purchase construction materials and mortars from the certified producers and distributors only or else the project completion certificate will not be issued. In addition, licensed producers in other Provinces, whose products are sold and distributed in Tehran Province, may complete their information and have their name and details listed in the book free of charge. Finally, the book also lists the names of the accredited laboratories and the certified inspection companies in Tehran Province for

those project ownerships requiring further tests and inspections.

### **For the first time in Iran**

Central mix concrete consumption manual has been published According to Ali Asghar Keyhani, the Managing Director of IRAN FRAMECO and PARS LANEH Research and Industrial Facilities, the consumption manual has been published in line with Cabinet Ministers' compulsory resolution on standardizing the entire production and distribution processes applied in producing construction materials and mortars. Since the necessary infrastructures to produce central mix concrete were already in place, it was about time that the central mix concrete consumption was also standardized within a specific framework. The manual's content, published by IRAN FRAMECO and PARS LANEH Companies, is derived from various concrete bylaws, national standards and experiences gained from the concrete structure projects that have been executed so far. Nearly 80 years since the advent of cement to Iran, and despite the compilation and translation of dozens of books, bylaws and standards for producing and consuming cement and concrete, this is the first time that a manual guidebook on central mix concrete is published in Iran. The manual, which is the result of 30 years of experience accumulated by IRAN FRAMECO contains valuable information on how to order, transport, displace, mould and keep central mix concrete in accordance with the national and international standards explained in easy to understand language – including photos and tables for the convenience of supervising engineers, contractors and project execution teams. Moreover, copies of the manual have also been given to local experts in order to get their approval of the manual content's conformity to the national standards and domestic bylaws. The manual's electronic copy is also avail-

## 224 The Story of the Concrete Man

able for download at IRAN FRAMECO's official website and anyone else, who wants a hard copy of the manual, can contact our public relations' office. What's more, the manual is also free for university students, supervising engineers and contractors' executive apparatuses and concrete pouring teams. According to IRAN FRAMECO's public relations' report, Keyhani said, 'Training classes and workshops on the topics covered by the manual will be held free of charge and those that complete them will be presented with a 'concrete technician certificate.' Central mix concrete is one of the most important construction materials currently being produced in a standard manner by many of the country's production units. In the past, projects often faced difficulties at the consumption stage once their supply of central mix concrete was delivered to their sites. However, the utilization of this consumption manual can act as the missing link to complete the cycle of total compliance with the entire production, distribution and consumption standards. . The interested parties can contact us at +9821 22831321-5 to receive a hard copy of the manual or visit our website at [www.iranframeco.org](http://www.iranframeco.org) to download its soft copy.

### **Fras News Agency**

#### **Displacement of central mix concrete based on the regulations on transporting perishable materials**

A concrete industry demanded that central mix concrete is treated as a perishable material. According to Fars News Agency, Ali Asghar Keyjani said, 'The special requirements on the transportation of perishable goods, illustrate the importance of such goods and their roles in people's lives. Central mix concrete is an important construction material, and it has a direct effect on buildings and other structures quality, resistance and durability. Therefore, it is essential that the product's

standard specifications are maintained throughout the production, distribution and consumption stages.’ With respect to the transportation of this material, Keyhani said, ‘In the rest of the world the most convenient conditions are taken into account to facilitate the mixer trucks, which carry central mix concrete since the material has to be consumed in maximum three hours after being produced; therefore, it has to be transported to the final destination point via the shortest route. In addition, the mixer trucks must not be stopped during transport. So, because of the limited delivery time, central mix concrete has to be treated as a perishable item and subject to the same considerations that are granted to the other classes of perishable goods. The strict laws governing the transportation of the other construction materials like sand, gravel and brick, are applied to central mix concrete as well, and this makes it very hard for the mixer trucks to commute inside and outside of cities. Thus, it is necessary that central mix concrete transportation regulations be corrected in accordance with the laws governing the shipping and transport of the perishable goods. Indeed, the restrictions for the commute of mixer trucks in certain neighbourhoods and the discriminatory attitude in others are among the most challenging problems facing the central mix concrete factories.’ Keyhani also mentioned that according to the country’s technical and engineering organizations central mix concrete is a necessary construction material with a short consumption window. Hence, its classification as a perishable material can resolve part of the current problems. The case of classifying concrete as perishable goods has been submitted to the Road Management Organization, and we hope that they make the necessary decisions soon.

### **Donya-e-Eqtasad Newspaper**

#### **Resisting the use of standard construction materials**

##### **Abacus to calculate construction quality**

Though, the government organizations and agencies have coordinated their efforts to implement and enforce the terms and provisions of the bylaw on the use of standard construction materials, some municipality managers, particularly in the City of Tehran still don't extend their cooperation the way they should. A large producer of building materials and mortars told Donya-e-Eqtasad: 'The recent action by Tehran Province Standard & Industrial Research Institute to publish a book listing the names and other details of the certified construction material producers is a praiseworthy move that has been received warmly by the entire Tehran Province's municipalities except the City of Tehran's. After 25 days since the plan's implementation, certain City managers are still using their abacus trying to calculate the plan's extent of impact on their number one source of revenue, meaning the issue of construction permits. Though, the Cabinet Ministers' resolution has already completed the necessary legal phases, and consequently, the entire executive bodies are now required to cooperate with implementing the standard, there are talks that mandating the land developers and the other building and housing investors to use standard construction materials has to be reviewed and examined by the relevant experts first! Ali Asghar Keyhani also added, 'The executive apparatuses like the municipalities have to bear in mind that expert studies and examinations happen before laws and bylaws are ratified and approved and not afterwards. So, they must implement the law now without any further delays. To notify and remind the construction developers that they have to use standard building materials and must purchase what they need from the certified building material and mortar producers doesn't really need

an expert's professional view.' Engineer Keyhani pointed out the directives issued by Tehran's Mayor and communicated to the City's entire districts in 2006, 2007 and 2008 and also the Mayor's notification to the other concerned organizations regarding the use of standard materials and said, 'When Tehran's Mayor emphasizes the use of standard materials in all the construction projects on several occasions and Tehran Islamic Council ratifies a similar resolution through majority vote and communicates the same to the Municipality, this means that all the City managers and experts are obliged to comply. The Standard & Industrial Research Institute has requisitioned that the Book of Standards, listing the names and details of the licensed construction material producers, be distributed immediately. So, when the regulatory measures have all been approved and even a standard book on certified manufacturers and suppliers has already been published, that means that all the necessary studies and investigation have been carried out and that there is no further need for additional reviews and considerations by any other experts. Hence, as the City's main executive body, Tehran Municipality has no other choice but to comply with the Standard Institute's legal demand.' Pursuant to a report by Donya-e-Eqtasad, Tehran Province Standard & Industrial Research Institute published a book last month titled 'The Standard Construction Material Producers,' listing the names of all the certified construction material producers. Accordingly, pursuant to directives of Tehran Province Governor's Office and the Standard Institute's regulations, all those applying for a construction permit undertake to purchase their required construction material from the producers and suppliers listed by the book. In addition, once the construction project is completed, Tehran Municipality is obligated to requisition the specifications of the materials and mortars used in carrying out the operations and match them with names of the

producers in the book priori to issuing a project completion permit.

### **Donya-e-Eqtasad Newspaper Cement and the targeted subsidies**

Despite the different names, the cement factories have three principal stockholders that do the decision making. In reality; though, the three stockholders are actually one. Cement is an irreplaceable commodity, whose production is exclusively in the hands of few individuals. Thus, because of the existing monopoly in the cement industry, any possibility should be taken seriously and not dismissed as extremely unlikely. The economy experts have already delineated and presented their views aplenty in respect of irreplaceable goods, and as a result all of th unanimously agree that under the existing conditions consumers incur the highest loss and damages. There are obvious signs that the cement factory are attempting to raise the cement price by 30 percent to Rls.650,000 per ton before the targeted subsidies plan takes effect. This way they are going to have a good executes for increasing their rates once their subsidized energies are cut off. Consequently, despite the country's annual cement production output of 71 million tons, the cement factories, in a concerted attempt, have lowered their production output by 65 percent to reduce supply and prevent market saturation. The investments in the cement market, which incidentally are mostly stand at borderline, is mainly a ploy intended for the oil industry's hidden rent-seekers, who have exploited the cheap subsidized energy prices and the local market's cement monopoly to reap huge profits from cement export. Consequently, the implementation of the targeted subsidy plan is going to be quite costly to this group. On the average, 125 litres of fossil fuel, whose Persian Gulf FOB price is USD42 per litre, is used to produce a ton of cement.

However, the cement factories get their fuel at the rate of Rls. 1,000 (around 10 cents at the time when this report was made). Accordingly, over Rls. 380,000 worth of subsidized energy is spent to produce a ton of cement while the exported cement's going rate is USD55. When we calculate the transportation costs to the border, we see that the cement factories are actually making less than Rls.300,000 per ton, which is markedly lower than the product's domestic price. Hence, the only thing that can be deduced is that cement export is a blatant attempt to prevent the saturation of the local market. Currently, the cement factories are resorting to any means to export their cement to take full advantage of their cheap subsidized energies before the targeted subsidy plan's implementation. It; therefore, seems necessary that the government, for the sake of the basic goods whose prices are supposed to be corrected over a five-year period, should calculate the price difference corresponding to the export rates of such products because the five-year grace period's sole aim and objective is to protect the domestic consumers' rights and not the profiteering of the oil industry's rent-seekers operating within the an export network shipping goods abroad that are produced using subsidized energies. The experience of recent years shows that the cement factories' reports shouldn't be trusted and relied upon when determining the price of cement or calculating its prime cost. About two years ago when the cement factories were pursuing a 37 percent hike in the cement price (from Rls. 365,000 to Rls. 500,000 per ton), they claimed that cement's prime cost for the new factories was Rls. 480,000 while the same cost stood at less than Rls. 300,000 for the old factories, whose equipment based on the financial documents are outdated and worn out. So, the cement factories argued that unless the cement price was not increased to Rls. 500,000 per ton, establishing new factories would not stand a chance. Accordingly,

## 230 The Story of the Concrete Man

they proceeded ahead using this reasoning and raised the cement price to Rs. 500,000 while simultaneously taking 200 million dollars out of the country's foreign currency exchange fund. Perhaps, all of this would be just fine, except for one thing. Strangely enough, one year after the cement price hike, the new factories are selling their product cheaper than the old factories! To find the answer to why this is happening, the cement monopoly and the hidden hands running have to be scrutinized and investigated. Some of the older cement producers are not willing to sell their product for less than Rs. 500,000 under any circumstances since they are certain that due to the associated transportation costs within the range and boundary of their given market, there is no way that the other factories in proximity could sell theirs for any less. Therefore, they are not afraid of the impending risks to their exclusive control of the supply. In the meantime, the cement factories outside of this exclusive possession of commodity or the non-holdings, as they are known in the industry, have sold their product at Rs. 42,000 at the factory door in order to be able to enter the old factories' monopoly. So, the justification behind raising cement price in the past two years has been totally wrong. The cement's real prime cost in our country requires critical attention to the mechanisms, which can provide the primary capital. Of course, next to exploiting the cheap subsidized energies, the cement factories have also used other unique techniques to procure their primary capital. For example, a few years ago, they would add a surcharge to every cement purchase invoice in the name of the end consumer's share in helping out the industry's development. In other words, the primary capital needed to establish the new factories has come out of the consumers' pocket too. Given the fact that the current cement's principal stockholders have not made any real contribution, it is essential that the interest on the primary capital is deducted

**About the Year 2010 231**

from the final price in favour of the consumer when calculating the cement's prime cost.

## 232 The Story of the Concrete Man

### «IRAN FRAMECO» Production & Research Facility's Awards and Honours

Row	Accomplishment	Plaque	License	Award	Certificate	Other	Presented by	Year
1	Commendation letter for the production and supply of high C50 grade compression strength concrete	P					Savojbolagh County Commerce Office Management	
2	Recipient of the permit to use the compulsory standard logo for Grade C50 compression strength central mix concrete	P					Savojbolagh County Governor	
3	Recipient of the permit to use the compulsory standard logo for Grade C50 compression strength central mix concrete	R					Iran Concrete Association Chairman of the Board (Hormoz Family)	2003
4	Recipient of the permit to use the compulsory standard logo for Grade C50 compression strength central mix concrete at the 1 <sup>st</sup> Concrete Day Convention	P					Construction Material Laboratory Supervisor (Mahdi Ghalibafian)	2003

5	Membership in international student exchange program	P					IA.E.S.T.E	
6	Legal membership in Iran Concrete Association	P					Iran Concrete Association	2002
7	First ranking at the Top Concrete producers Tournament	P					Iran Concrete Association Chairman of the Board (Hormoz Family)	2004
8	Cooperation with the University of Tehran students winning the First Place at the ACI Tournaments held in the US	P					Construction Material Laboratory Supervisor (Mahdi Ghalibafian)	2003
9	Recipient of the commendation letter at the National University Students Concrete Tournament (simultaneously with the 3 <sup>rd</sup> Concrete Day Convention	P					Iran Concrete Association Chairman of the Board (Hormoz Family)	2005
10	Establishment of the R&D Unit			P			Ministry of Industries & Mine Planning, Development & Technology Deputy-manager (Mohammad Hasan Saghfi)	2005
11	Appreciation award for design of the light, high-resistance concrete	P					Iran Concrete Association Chairman of the Board (Hormoz Family)	2004
12	Selected as Tehran Province's top production unit	P			P		Tehran Province Industry & Mine Home	2006
13	Winner of First Place at the Top Concrete Producers Tournament	P					Iran Concrete Association and Azad University Housing Research Centre	
14	Honouring Prof Ahmad Hami			p	P		Iran Concrete Association	2003
15	Top Quality Production Unit 2004	P					Iran Standard & Industrial Research	2005

## 234 The Story of the Concrete Man

							Institute (Asadollah Majidi)	
16	Top National Production Unit			P			Iran Standard & Industrial Research Institute	2006
17	Tehran province Top Standard Production Unit			P			Iran Standard & Industrial Research Institute President	2007
18	Selected as Province's Top Producer			P			Iran Standard & Industrial Research Institute	2004
19	Manager of the Year			P			Savojbolagh County Workers Home	2005
20	International Earthquake Retrofitting Convention			P			Dr Adl Parvar	
21	Country's Top Concrete Structure			P			Iran Concrete Association	2007
22	Promotion of standard concretes			P			Iran Concrete Association	
23	National Quality Production Unit						Iran Standard & Industrial Research Institute	Oct 2006
24	Appreciation of Quality Production Unit (World Standard Day)	P					Iran Standard & Industrial Research Institute	Oct 2006
25	Appreciation of Exemplary Production Unit in Tehran Province	P					Iran Standard & Industrial Research Institute	2007
26	4 <sup>th</sup> National Production Festival	P					Industry & Mine House	Mar 2006
27	4 <sup>th</sup> National Production Festival			P			Industry & Mine House	Mar 2006
28	Provinces' Test Laboratory Approved				P		Tehran Province Standard & Industrial Research Institute General Manager	2005
29	Establishment and utilization of workshop- proximity and inter-workshop training centres		P				Technical & Professional Organization and Labour & Social Affairs Minister's	Oct 2006

							Deputy-minister	
30	Patent of the rolled, high density method for asphalt processing				P		Companies Registration & Intellectual Property Right General Bureau	2005
31	Certificate of Quality Management System ISO 9001:2000				P		IQNet	2009
32	Certificate of Environmental System ISO 14001:2004				P		IQNet	2009
33	Certificate of Safety Management System OHSAS 18001:1999				P		IQNet	2009
34	Certificate of Quality Management System ISO 9001:2000				P		OQS	2009
35	Certificate of Environmental System ISO 14001:2004				P		OQS	2009
36	Certificate of Safety Management System OHSAS 18001:1999				P		OQS	2009
37	Commendation letter on the establishment of THE FIRST R&D Unit and acquisition of permit to use the compulsory standard logo for Grade C50 concrete	P					Tehran province Industries & Mines president (Mokhtar Ghanoon)	2003
38	Country's Top Young Industrialist - 1 <sup>st</sup> Young Industrialists National Festival	P		P			Central Council and Industries and Mines Home Presidents	2007
39	Commendation letter for holding the 4 <sup>th</sup> Concrete Training Course for the Technical & Professional Organization's instructors	P					Industry Training Affairs Office (Farokh Eftekhari)	
40	Commendation letter and appreciation award for Top National Quality Production Unit	P					Savojbolagh County Governor (Seyyed Mohammad Mir Bozorgi)	2006

## 236 The Story of the Concrete Man

41	Appreciation award for the reinforcement plans, particularly for RCCP	P					Worker's Home Secretary General	
42	Appreciation award for the Top Concrete Design at the 5 <sup>th</sup> Concrete Day Convention – Engineer Ghalibafian Honour Ceremony	P					Iran Concrete Association president (Mohsen Tadayon)	
43	Appreciation Award for helping and supporting cancer patients, poor families and orphans	P					The Political-Faith Council, the Inspection Bureau and Khaneh-e-Sabz Charity Foundation	
44	Commendation letter for building standardization	P					Comprehensive Scientific & Applied University Branch (5), Savojbolagh (Samanipoor)	
45	Appreciation award for ranking first at the Central Mix Concrete Top Producers Tournament	P					Iran Concrete Guild Association General Secretary (Hossein Forootan Mehr)	2005
46	For conducting research and development activities				P		Tehran Province Industries & Mines Organization President	
47	Commendation letter for the financial and spiritual support granted to help the first round of Scientific & Applied University students graduate	P					Savojbolagh County Governor	
48	Acquisition of the permit to use the compulsory standard logo for the large and small aggregates used Central Mix Concrete No. 302		P				Iran Standard & Industrial Research Institute's President (Mehdi Poorhashem)	2007
49	Acquisition of the permit to use the compulsory standard logo for building pre-		P				Iran Standard & Industrial Research Institute's President	2007

	fabricated pre-woven and normal beams No. 2909						(Mehdi Poorhashem)	
50	Acquisition of the permit to use the compulsory standard logo for building pre-fabricated pre-woven and normal beams No. 2909		P				Iran Standard & Industrial Research Institute's President (Mohammad Nazemi Ardekani)	2006
51	Acquisition of the permit to use the compulsory standard logo for building pre-fabricated pre-woven and normal beams No. 2909		P				Iran Standard & Industrial Research Institute's President (Ali Asghar Tofigh)	2005
52	Acquisition of the permit to use the compulsory standard logo for central mix concrete with the entire compression grades No. 6044		P				Iran Standard & Industrial Research Institute's President (Mehdi Poorhashem)	2007
53	Acquisition of the permit to use the compulsory standard logo for central mix concrete with the entire compression grades No. 6044		P				Iran Standard & Industrial Research Institute's President (Ali Asghar Tofigh)	2006
54	Acquisition of the permit to use the compulsory standard logo for central mix concrete with the entire compression grades No. 6044		P				Iran Standard & Industrial Research Institute's President (Ali Asghar Tofigh)	2004
55	Acquisition of the permit to use the compulsory standard logo for central mix concrete with the entire compression grades No. 6044		P				Iran Standard & Industrial Research Institute's President (Ali Asghar Tofigh)	2005
56	Acquisition of the permit to use the compulsory standard logo for central mix concrete with the entire compression grades No. 6044 C25 and C50		P				Iran Standard & Industrial Research Institute's President (Mohammad Reza Mamdoohi)	2003

## 238 The Story of the Concrete Man

57	Commendation letter for being selected as the Top Manager during the Work and Worker Day 2003-2004	P					Karaj Province Labour & Occupation Office General Manager (Nazari), Savojbolagh and Nazar Abad Counties Workers Home Executive Secretary	2005
58	Approval Certificate for the appointment of Mr Khatibi - Engineer as IRAN FRAMECO COMPANY QC Manager				P		Iran Standard & Industrial Research Institute's President (Asadollah Majidi)	2005
59	Appreciation Award for the top concrete design at the 5th Concrete Day Convention Engineer Ghalibafian Honour Ceremony	P					Iran Concrete Association Chairman of the Board (Mohsen Tadayon)	
60	Reception of Iran Concrete Association's membership card				P		Secretary General (Behrooz Riyahi), Board Chairman (Ali Asghar Tofighi)	2006
61	Commendation letter for supplying Nazar Abad County's standard concrete and warming the Top Standard Concrete Producer	P					City of Nazar Abad Islamic Council President (Akbar Amir Khani)	2004
62	Appreciation Award at the 3rd Nationwide Civil Engineering Students Conference	P					President (Prof Behbahani) and Secretary (Engineer Mohammad Reza Mirza Hoseeini)	
63	Scientific Research Cooperation Agreement between IRAN FRAMECO and Meli Bank Central Branch					P	Between. IRAN FRAMECO and Mohammad Hossein Rezaie Shayesteh	2003
64	Commendation and Appreciation Award Presented by Tehran Municipality	P					Tehran Municipality (Mahmoud Ahmadinejad)	2004

65	Appreciation Award for graining the First Place Top Central Mix Concrete Producer Tournament	P					Savjobolagh County Commerce Bureau Manager
66	Appreciation Award at the 2nd Concrete Convention	P					Iran Concrete Association Chairman of the Board (Hormoz Family)
67	Commendation letter for being selected as the Top Concrete Street Curb Producer simultaneously as the 2nd National Concrete Day	P					Iran Concrete Association Chairman of the Board (Hormoz Family)
68	Industry & Mine Technical Research & Development Centres Specialized Association				P		Industry & Mine Technical Research & Development Centres Specialized Association
69	Orphan Assistance and Support	P					Imam Hasan Mojtaba Charity Foundation. Chairman of the Board (Mehdi Falalhnnejad)
70	Permit to use the compulsory standard logo for building pre-fabricated, pre-woven and regular beam No. 2909		P				Iran Standard & Industrial Research Institute President (Ali Asghar Tofigh)
71	Scientific and research agreement between IRAN FRAMECO and City of Bam Islamic City Council					P	IRAN FRAMECO and City of Bam Islamic City Council
72	2001:9001 Certificate						AFQM
73	Appreciation Award for the acquisition of the permit to use the compulsory standard logo for central mix concrete up to compression strength Grade C50	P					Construction Materials Laboratory Manager (Mehdi Ghalibafian)
74	Commendation letter for putting	P					Deputy-minister and

## 240 The Story of the Concrete Man

	forth excellent proposals						Organization President (Mohsen Bahrami)	
75	Certification for participating in the Standard, Safety & Health Scientific-Technical Convention						Standard Research Centre (Behrooz Riyahi)	2007
76	Acquisition of the permit to use the compulsory standard logo for the wall and load-free concrete blocks						Iran Standard & Industrial Research (Mehdi Poorhashem)	
77	Acquisition of the permit to use the compulsory standard logo for all the central mix concretes with compression strength grades No. 6044		P				Iran Standard & Industrial Research (Mehdi Poorhashem)	2008
78	Acquisition of the permit to use the compulsory standard logo for all the central mix concretes with compression strength grades No. 6044		P				Iran Standard & Industrial Research (Mehdi Poorhashem)	2008
79	Tehran Province Top Standard Unit	P					Tehran Province Standard & Industrial Research General Bureau	2008
80	Tehran Province Top Production Unit	P						2005
81	Selected as the country's Top Young Industrialist						Tehran Province Industry & Mine Home	2007
82	The Top Collaborative & Cooperative Laboratory to the Tehran Province Standard Organization			P			Tehran Province Standard & Industrial Research General Bureau	2008
83	Selected as the Best Unit among Iran's Top 100 Brands	P					Iran Industries & Mines Chamber of Commerce	2008
84	Consumers' rights protection efforts				P		Consumers & Producers Rights Protection Agency	2008

85	First Rank in the consumption sector	P					Building & Housing Research Centre	2008
86	Honouring Ceremony held by University of Tehran Technical College	P					University of Tehran Technical College	82
87	Appreciation Award for constructing and executing high-resistance building	P					Standard & Industrial Research General Bureau	2008
88	Appreciation Award for the top concrete producer					P	City of Nazar Abad Islamic Council	2004
89	Appreciation Award for supporting Civil Engineering Students 12 <sup>th</sup> Conference					P	Iran University of Science & Industry	
90	Commendation letter for the acquisition of the permit to use the standard logo C50					P	Savojbolagh County Governor	
91	Appreciation Award for supporting the 1st International Marketing & Sales Management Conference	P					The Conference's General Secretary	
92	Acquisition of the permit to establish IRAN FRAMECO Technical & Professional Training Centre		P				State Technical & Professional Training Centre	2008
93	Affiliated laboratory certificate				P		Iran Standard & Industrial Research General Bureau	2008
94	Certificate for the acceptance of the article on the correction of the consumption model using reverse engineering National Concrete Day	P					Iran Concrete Association	2009
95	Certificate for the acceptance of the article on concrete's effects in building architecture	P					Iran Concrete Association	2009

## 242 The Story of the Concrete Man

	Honouring the Late Ghalibafian							
96	Selected as the nation's Top Production Unit	P					Tehran Province Standard & Industrial Research General Bureau	2009
97	Selected as the most efficient production unit at the 7 <sup>th</sup> National Production National Pride Festival	P		P			Iran Industry & Mine Homes Network	2009
98	The Exemplary QC Authority 88	P					Tehran Province Standard & Industrial Research General Bureau	2009
99	Selected as the industry's longest lasting personality at the 5 <sup>th</sup> Industry Champions Festival	P		P			The Higher Council of Policy Making	2009
100	Selected as the industry's longest lasting personality	P					Industries & Mines Organization, Chamber of Commerce, Trade Development Organization	2009
101	Recipient of the Consumers Rights Protection Certificate				P		Consumers & Producers Rights Protection Agency	2009
102	Selected as the Top Innovative Organization	P		P			Industries & Mines Research & Development Technical Association	2010
103	Reception of the technical verification for the semi-prefabricated reinforced concrete system IRAN FRAMECO					P	Building & Housing Research System	2010



## 244 The Story of the Concrete Man





246 The Story of the Concrete Man





248 The Story of the Concrete Man





## 250 The Story of the Concrete Man





252 The Story of the Concrete Man

